



المؤتمر العالمي الثالث لعمارة المساجد
3rd International Conference on Mosque Architecture
الكويت 2022

THE MOSQUE

A CROSS-CULTURAL BUILDING

RESEARCH BOOK

المسجد
مبنى عابر للثقافات

3rd International Conference on Mosque Architecture
Sheikh Jaber Al-Ahmed Cultural Centre - Kuwait

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Edited by

Mashary A. Al-Naim | Mohammed Al-Ajmi | Hani M. Al-Huneidi | Omar Khattab



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International Conference on Mosques Architecture

جائزة عبد اللطيف الفوزان
Abdullatif Al Fozan Award

لعمارة المساجد | for Mosque Architecture



كلية العمارة
COLLEGE OF ARCHITECTURE
جامعة الكويت
KUWAIT UNIVERSITY



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مبنى عكابر للثقافات

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INTRODUCTION



The Mosque: a Cross-cultural Building

The title of this conference raises many questions about what we mean by claiming that mosques are transcultural.

Clearly, mosques throughout the world have left a rich architectural legacy linked to their local settings and the diverse cultures they have interacted with. We see that on the personal level, this supremely influential building is characterized by a cultural identity that is rarely found in other places of worship; seamlessly incorporating local components yet strictly maintaining a defining constancy. This characteristic has resulted in a cumulative development of mosque architecture and spatial form over the many centuries of its continuation.

It is natural for any building to express a relationship with the local natural and cultural environment, but in the case of the mosque, its form is free from restrictions of design and components except for the orientation of the prayer hall to the qiblah. And since this orientation changes from one place to another, it has inspired builders and architects with a high degree of flexibility with regard to the fundamental shape of the mosque and its relation to the surrounding urban fabric.

This third staging of the International Conference on Mosque Architecture is entitled 'The Mosque: A Cross-Cultural Building'. Organized by the Abdullatif Alfozan Award for Mosque Architecture in collaboration with Kuwait University's College of Architecture, and held by the Sheikh Jaber Al Ahmad Cultural Center, the conference will see the expert participation of 15 architects and specialists in mosque architecture and arts, with some 40 refereed scientific papers from 50 researchers.

The ICMA is a unique symposium which since its first edition in 2016 has been methodically exploring future issues of mosque architecture for anyone interested in mosque architecture on either professional or academic levels. Before the inception of conference and the Abdullatif Alfozan Award, mosque architecture did not receive sufficient scientific attention from neither researchers nor designers – but thanks to the ICMA, we are now building up a substantial knowledge base that is contributing to changing the reality of mosque architecture worldwide.

Several factors have made the mosque one of the most important types of building in the world. From a functional point of view, it is the place where prayers are performed. From a social point of view, it is where Muslims gather to discuss their affairs. From a scientific point of view, the mosque was a place of study. Finally, from an architectural and aesthetic point of view, the mosque is a thing of beauty, inspiring creativity and generating ideas.

Despite all these different aspects – and their variations across time, place and cultures – the mosque has been able to maintain its unique character which has enabled it to bridge and embrace cultures. It does so by interacting with diverse cultures deeply in order to express their particular creative expressions and reflecting these as mosques spread and evolve.

We have taken into consideration the daily relationship that has developed between people and mosque, so it is difficult to imagine the building separate from its community surroundings and prevailing culture. This controversial research topic represents the backbone of this conference, but by no means does it exclude other issues, whether design or technology. Indeed, the conference will include discussion of a number of other important and urgent topics about the role of the mosque and its architecture. First and foremost is a conversation about global context and local culture.

Another important topic is the spirituality inherent in any mosque's architecture and how to harness this to serve worshippers. We will also discuss the future of the mosque in light of the move towards sustainability and the resulting technical and environmental concepts. Over the past two years, the Covid-19 pandemic had a profound impact on mosques and worshippers, in response to which the conference will also be discussing how to design mosques that resist communicable diseases.

Each of these and other issues represent the general direction of research, but going forward the conference aims to draw the attention of researchers to specific issues and study them in detail to develop practical ideas and solutions.

It is also important to mention mosques often experience behavioral issues from worshippers – which are often overlooked in scientific fora of this type, possibly because they are seen as intractable problems. We do not take this view, and within the Abdullatif Alfozan Award for Mosque Architecture, we are addressing how visitors should behave as soon as they first set foot in the building as a matter of urgency. This issue is related to the human architecture to which these buildings were intended ever since the construction of first mosque in the city of the Prophet. It also relates to the multiplicity of cultures that the mosque welcomes, counterbalancing the flexibility of approach that allows users to express their lifestyles without going beyond the behavioral expectations that underpin the mosque's sanctity. However, this conference doesn't include specific scientific initiatives on this issue, but it is an important topic that will be discussed in greater depth in future conferences.

Clearly, scientific research in mosque architecture is still a developing discipline, largely because this topic has not yet become a focus of Arabic and Islamic architectural education. To date, mosque architecture has not been studied seriously, so until that changes, it is unlikely that a rigorous scientific approach will develop. There is general agreement among scholars that ideas and interests develop only when research and educational seminars are integrated. This is exactly what this conference is seeking to accomplish, with the participation of both educational and scientific partners as represented by the School of Architecture. This is a critical partnership that promises so much in both professional expertise and knowledge advancement.

In order to achieve a qualitative leap in knowledge regarding mosque architecture, we need strong support from related scientific institutions in Islamic countries and all around the world. Sharing interest in scientific research in mosque architecture with these institutions will constitute the fundamental shift that we seek to achieve in this nascent sphere of learning. For this reason, our hope is that in future editions, the ICMA is hosted in different locations around the world, enabling deeper knowledge and partnerships to be developed internationally – just as is happening now in the third International Conference on Mosque Architecture being held in Kuwait University.

Our ambition is that the discussions held at ICMA, and the publication of this book, will represent, over time, the broadest field and the main channel for the accumulation of knowledge about mosque architecture globally.

Editors

Kuwait at 14 November 2022

المسجد: مبنى عابر للثقافات

ربما يثير عنوان المؤتمر كثيراً من الأسئلة حول ماذا نعني بالمسجد العابر للثقافات؟. من خلال متابعتنا لما تركه المسجد من إرث معماري عميق، ارتبط بالثقافات المحلية التي وصل إليها وتفاعل معها، وجدنا أن هذا المبنى المؤثر على المستوى الإنساني يتصف بخاصية ثقافية قلما نجدها في مباني العبادة الأخرى، فهو يتشكل ويتداخل مع المكون المحلي بسلاسة ولكنه يحافظ على ثوابته بصرامة. ولذا كنتج عن هذه الخاصية تطور متراكم للشكل المعماري والفراغي الذي اتخذه المسجد عبر القرون الممتدة لعمارته.

من الطبيعي أن يعبر أي مبنى عن علاقته بالبيئة الطبيعية والثقافية المحلية، ولكن المسجد لم يرتبط بأية قيود مفروضة على مكونه، إلا بتوجيه قاعة الصلاة إلى القبلة. ولأن هذا التوجيه يتغير من مكان إلى آخر فقد أوحى ذلك لكثير من بناء المسجد ومصممه بمرورته العالية على مستوى التشكيل، وعلى مستوى العلاقة مع النسيج العمراني المحيط.

تنظم جائزة عبد اللطيف الفوزان لعمارة المساجد، بالتعاون مع كلية العمارة في جامعة الكويت النسخة الثالثة من المؤتمر العالمي لعمارة المساجد في دولة الكويت الشقيقة، وذلك في مركز الشيخ جابر الأحمد الثقافي، وسينعقد هذا المؤتمر تحت عنوان « المسجد: مبنى عابر للثقافات» بمشاركة 15 من المماريين والمتخصصين بعمارة المساجد وفنونها وتناقش فيه حوالي 40 ورقة علمية محكمة لـ 50 باحثاً. يمكن اعتبار هذا المؤتمر الفريد في موضوعه الذي يعتزم أن يستمر في المستقبل كي يخوض في القضايا المستقبلية لعمارة المسجد سجلاً علمياً مفتوحاً للمهتمين بعمارة المساجد على المستوى المهني والأكاديمي. ومن خلال عملنا في الجائزة تبين لنا حقيقة، أن المسجد بعمارته لم يحظ خلال العقود المنصرمة بالاهتمام الكافي، ليس من قبل الباحثين فقط ، بل من قبل المصممين المهنيين أيضاً، ووجدنا أنه من واجبا أن نضع هذا المبنى في مكانه الصحيح، والتقاء الباحثين دورياً يعني أننا نسير في الطريق الصحيح لبناء تراكم معرفي يسهم في تغيير واقع العمارة المسجدية حول العالم.



هناك عدد من الأسباب التي تجعل المسجد من أحد أهم المباني في العالم، فمن الناحية الوظيفية هو المكان الذي تؤدي فيه الصلوات، ومن الناحية الاجتماعية هو المكان الذي يجتمع فيه المسلمون لمناقشة أمرهم، ومن الناحية العلمية كان المسجد مدرسة للعلم والمعرفة، ومن الناحية التخطيطية العمرانية كان مكانه في مراكز المدن والأحياء، وأخيراً من الناحية المعمارية كان المسجد بيت الجمال و منبع الإبداع و مولد الأفكار. وعلى الرغم من كل هذه العوامل المختلفة باختلاف الزمان والمكان والثقافات، إلا أن المسجد استطاع أن يحافظ على كينونته الفريدة، وتمكن من عبور الثقافات، والاحتفاظ بخصوصيته دون أن يتجاهل تلك الثقافات، بل تفاعل معها بعمق، وعبر عن بنيتها الإبداعية وعكسها على كل مراحل انتشاره وتطوره.

لقد وضعنا في حسابنا العلاقة اليومية التي نمت بين الناس والمسجد عبر الزمن، لذلك يصعب تصور هذا المبنى منفصلاً عن المحيط المجتمعي وثقافته السائدة. ولعل هذا الموضوع البحثي الجدلي يمثل عصب هذا المؤتمر، ولكنه لا يلغي القضايا الأخرى سواء التصميمية، أم التقنية، ولهذا يهدف المؤتمر إلى مناقشة عدد من المواضيع المهمة والطارئة، من خلال مسارات تناقش دور المسجد وعمارته، وسيناقشها في عدة محاور: المحور الأول: المسجد ما بين السياق العالمي والثقافة المحلية، والمحور الثاني: الروحانية في عمارة المسجد وكيفية تسخيرها لخدمة المصلين. والمحور الثالث: يناقش مستقبل المسجد في ظل التوجه نحو الاستدامة بمفهومها التقني والبيئي. ومحور يتطرق الى الأثر الكبير التي تركته جائحة كوفيد-19- على المساجد والمصلين، وكيفية تصميم مساجد تتفادى وتقاوم الأمراض السارية.

هذه المسارات تمثل توجهات عامة من الناحية البحثية، ولكننا نأمل في المستقبل إثارة انتباه الباحثين إلى قضايا معينة وبحثها بالتفصيل، وتطوير أفكار وحلول حولها. ونعتقد أن الفرصة سانحة لتحقيق هذا الهدف في المستقبل القريب.

ومن الجدير بالذكر أن المسجد يواجه قضايا سلوكية حضارية، تتطلب كثيراً من العمل لمواجهتها على المستوى العلمي، وغالباً ما تهمل هذه القضايا في أكثر الملتقيات العلمية، وقد لا تُذكر في الكتابات حول المسجد، ربما لاعتقاد بعضهم أنها قضايا مستعصية على الحل.

لن نتردد في جائزة عبداللطيف الفوزان عن القول: أننا نحاول أن نطرح هذه القضايا بجرأة كونها مرتبطة بمستخدم المسجد، وماذا يجب أن يُعمل عندما يبدأ خطواته الأولى داخل هذا المبنى. المسألة هنا مرتبطة بعمارة الإنسان التي يهدف إليها هذا المبنى، منذ المسجد الأول في مدينة الرسول. كما أن المسألة مرتبطة بتعدد الثقافات الإنسانية التي يتعامل معها المسجد ويفترض أن يطور ضوابط سلوكية مرنة، تسمح لمستخدميه متعددي الثقافات، أن يعبروا عن أنماط حياتهم دون أن يتجاوزوا الضوابط السلوكية التي يجب أن يكون عليها استخدام المسجد. ومع ذلك من الواجب أن نقول: أن هذا المؤتمر لا يحتوي على كثير من الأطروحات العلمية حول هذه القضايا، وهذا يجب تفكير فيه ملياً في المؤتمرات القادمة.

ويمكن الملاحظة بشكل جلي أنه لم تتطور حتى الآن تقاليد عالمية منضبطة تقود البحث العلمي في مجال عمارة المساجد، ربما لكون هذا الموضوع لم يصبح محور اهتمام التعليم المعماري المتعلق بالعمارة العربية والإسلامية. ويبدو أن العمارة المسجدية لا تؤخذ بجديّة تعليمية يمكن التعويل عليها، ولذلك من المستبعد أن تتطور تقاليد علمية طالما أن هذا التجاهل قائماً.

ثمة اتفاق بين المختصين على أن الأفكار مثل الاهتمامات تتطور فقط عندما تكامل الحلقة البحثية مع الحلقة التعليمية، ولعل هذا ما يسعى إليه هذا المؤتمر الذي يشترط وجود الشريك التعليمي والعلمي، المتمثل في مدرسة العمارة، وما يمكن أن تمثله هذا الشراكة من تغذية مهنية ومعرفية.

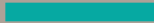
ونؤكد هنا أنه حتى نستطيع تحقيق نقلة نوعية في المعرفة العلمية حول عمارة المساجد، نحتاج إلى مساندة المؤسسات العلمية في الدول الإسلامية والعالم. وإن نقل الاهتمام بالبحث العلمي في العمارة المسجدية إلى هذه المؤسسات سيشكل النقلة الأساسية التي نسعى لتحقيقها.

وما تتصوره هو أن استمرار هذا المؤتمر، وانتقاله إلى محطات متعددة في العالم في المستقبل سيطور الشراكات المعرفية بين الجائزة والمؤسسات العلمية التي تعمل معها في تنظيم هذا المؤتمر، كمؤتمنا هذا مع جامعة الكويت الشقيقة. وأن استمرار إصدار مثل هذا الكتاب سيكون مستقبلاً مجالاً واسعاً وقناة رئيسة للتراكم المعرفي حول عمارة المساجد في أرجاء العالم.

المحررون

الكويت في 14 نوفمبر 2022

The Scientific Committee



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Conference Track 1

Mosque Architecture
Between Global Contexts and Local Traditions

المحور الأول للمؤتمر

عمارة المساجد
بين السياقات العالمية والتقاليد المحلية



MOSQUE ARCHITECTURE FOR THE BOSNIAK COMMUNITY IN EUROPE: CHALLENGES OF MODERNITY



Aida ABADZIC HODZIC

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Sub-theme: Compatibility of mosque architecture with urban tissues worldwide

Abstract

The construction of modern Islamic, religious, and cultural centers is one of the increasingly present architectural themes in Western Europe. In their visual identity and basic design principles, these centers seek to harmonize the recognizable elements of the vernacular cultural and historical heritages with the environment of contemporary life. In recent years, the Bosniak community in various European countries has been confronted repeatedly with this open question. The topic brings together complex social, political, and cultural issues related to the representation of the religious and national identities of a minority ethnic/national group within wider globalization processes. The issue of people's attitudes toward Islam has become a more common issue in some European countries and recently has become particularly sensitive. The international architectural competition for the project to design a new Islamic religious and cultural center for the (predominantly) Bosniak community in Ljubljana, Slovenia, was recognized by the public as the most important European architectural competition of 2011.

This paper analyzes the modalities of dynamic understanding and defines the concepts of Islamic art and architecture and contemporary mosque architecture in Europe where mosques become multifunctional centers with religious and socio-cultural content of wider importance. The paper focuses on the mosque architecture for Bosniak communities, within the time frame that stretches from the construction of the Islamic Cultural Centre in Zagreb, Croatia in 1987 to the recently opened Islamic Religious and Cultural Centre in Ljubljana, Slovenia in 2019. The Ljubljana project was awarded the 2020 *Plečnik Award*, which is given for the greatest successes in shaping the Slovenian environment as well as the European cultural environment. Special emphasis is given to the Islamic Religious and Cultural Centre in Ljubljana and the analysis of its formal and stylistic determinants, including their harmonization with the models and patterns of traditional architecture on the one hand and with the challenges imposed by the necessity of integration into local environments and the search for a new style on the other.

Key words:

Islamic art and architecture, contemporary mosque architecture, Euro-Islam architecture, identity issues, Muslim diaspora

Introductory remarks

Parallel to the growing interest in Islamic arts and architecture after the 1970s, and incited by major global events after which *the study of Islamic art changed dramatically* (Blair and Bloom, 2003:156-8), there has also been a growing number of scholars and academics calling for its revision (Shalom: 2012). These critical voices have underlined the necessity for questioning basic terminology commonly used while speaking about Islamic arts and architecture, as well as the necessity for re-examining the cultural context in which Islamic art is discussed, especially regarding "the myth of monolithic Islam," a concept frequently used when speaking about Islamic arts and architecture (Shalom: 2012). Trying to respond to the contemporary challenges in this "unwieldy field", Sheila Blair and Jonathan Bloom formulated the basic questions:

"What exactly is Islamic art? How well does this category serve the understanding of the material and does a religiously based classification serve better than geographic and linguistic ones?...to what extent does the Islamic art and architecture of a particular region owe its distinct qualities to religion, ethnicity, or geography creation?" (Blair and Bloom, 2003: 152, 159).

According to Blair and Bloom, *although it looks similar, "Islamic art" is not comparable to such concepts as "Christian" or "Buddhist" art, which are normally understood to refer specifically to religious art* (Blair and Bloom, 2003:153) since Islamic art generally encompasses various domains: from congregational mosques to metal and textile works produced by anonymous craftsmen. When speaking about mosque architecture, there is no doubt that this specific topic can be defined as "Islamic art". However, the challenges of finding a contemporary definition of this specific area of Islamic arts and architecture have been growing. Some of them can be outlined in the following questions:

- What is the relation of "Islamic arts and architecture" to (the generally presumed notion of) "Contemporary arts and architecture"?
- Is there any canon or principle by which contemporary mosque architecture should be designed and judged?
- How to harmonize the symbolism of vernacular forms with the challenges imposed by living in dominantly non-Islamic societies?

Contemporary mosque architecture in the frame of contemporary culture

Trying to answer the question, *What Is Islamic Architecture Anyway?* (2012), the Aga Khan Professor and Director of the Aga Khan Program for Islamic Architecture at MIT, Professor Nasser Rabbat, remarked:

"Questions still abound in academic circles and in the world of practice about whether there is an Islamic architecture or not in the first place. Some of those who doubt the validity of the term raised the following rhetorical challenge: what is Christian about European architecture? And the ready - and correct - the answer is usually, 'very little, except for the architecture of churches. The parallel conclusion for Islamic architecture thus becomes, 'Islamic architecture is mosque architecture'."

Following this challenging conclusion, the very essence of contemporary Islam should be detected in the architecture of contemporary mosques. When Professor Rabbat offered to *change the tense in the first question and ask 'what was Christian about European architecture?'*, the accepted answer has taken into account an epistemological break that had happened in Christianity first with the Renaissance and later with the rise of Enlightenment values. While Medieval Christianity had heavily contributed to shaping not only faith and rituals but also various patterns of life in Europe and consequently architectural manifestations and cityscapes, today, just like in the Islamic world, that is no longer the case. However, to understand and explain the mixed, and perhaps paradoxical, but definitely dynamic character of the cultures of the Islamic world today, as Professor Rabbat suggests, it is necessary to take into account how religion interacts with and modifies the effect of Western, secular modernism on those cultures and vice versa. The role of the modifier 'Islamic' in framing the term 'Islamic architecture' should rightly be understood as a sign of its contemporary, dynamic character. It is not necessarily the formal or stylistic attributes that Islam produces; it is rather the persistence of religion in defining many aspects of life in the Islamic world which is not a value judgment, as Professor Rabbat pointed out, but rather a historical fact (Rabbat, 2012).

Islam came out of its encounter with modernism changed but not defeated. It has remained a major force not only in dictating the ethics and beliefs of Muslims today, but also in shaping their social relations, their individual behaviour, and their collective imagination, even if its adherents had to adapt to modern means and methods. Religious motives, interpretations, and inhibitions still inculcate many aspects of modern life in the Islamic world, known as the *Ummah*. The study of Islamic art and architecture is relatively new; it began at the end of the nineteenth century and was of interest primarily to European and American scholars. It seems that artistic expressions were such an integral part of everyday life and religious experiences in the countries with dominantly Islamic culture that *there is no indigenous tradition in any of the Islamic lands of studying Islamic art, with the possible exception of calligraphy, which has enjoyed a special status since the seventh century* (Blair and Bloom, 2003:153). In short, Islamic art in the early twenty-first century is largely a creation of Western culture. This all-embracing view of Islam and Islamic art was a by-product of European interest in delineating the history of religions, in which the multifarious varieties of human spiritual expression were lumped together in the normative notion of a single 'Islam', which could be effectively juxtaposed to equally normative notions of 'Christianity' or 'Judaism'. However, there never was, nor is there today, a single Islam, and so *any attempt to define the essence of a single Islamic art is doomed to failure* (Blair and Bloom, 2003:153). While emphasizing the need to investigate the art of the Muslim diaspora since Muslim populations emigrated in the twentieth century from their traditional homelands to Western Europe and the Americas, Blair and Bloom underlined the complexity of the study of Islamic arts and architecture in a contemporary context (Blair and Bloom, 2003:152).

In the last few decades, Islamic art history *began to open its folds to a burgeoning area of inquiry: the study of contemporary Islamic art; although the juxtaposition of the two terms still carries a paradox* (Rabbat, 2018:1) and the notion of "Islamic arts" has generally been seen as incongruent with the very notion of "contemporaneity". Until at least the 1980s, the chronology of Western architecture, from its presumed Classical origins to its triumphant culmination in modern times, constituted the living core of architectural discourse and relegated the architecture of other cultures to marginal places in its prescribed hierarchy. Furthermore, the authoritative historiography of Western architecture promoted and even required the study of other architectural traditions to be confined within clearly prescribed and exclusive time frames, spaces, and cultures (Rabbat, 2012:12-13). The history of Islamic arts and architecture is usually presented as a separate unit in the history of the Western world and, according to Professor Rabbat, *the relationship with Western architecture is indeed the main problem that Islamic architecture has still to resolve in order to acquire its rightful place as an active and contributive component of world architecture* (Rabbat, 2012:12). The creation of the Aga Khan Program for Islamic Architecture at Harvard and MIT in 1979 has been one important step in this ongoing mission. It somehow coincided with the publication of Edward Said's seminal book, *Orientalism*, in 1978, after which students of Islamic architecture *began to question the received methods and conceptual structures of their discipline and to extend their domain of inquiry, reaching back in time to points of convergence between Islamic architecture and the architecture of other cultures, and forward to the modern and contemporary scenes* (Rabbat, 2012:12).

Contemporary Islamic Centres in Western Europe: how to shape a new paradigm?

The construction of modern Islamic religious and cultural centers is one of the increasingly present architectural themes in Western Europe. The growing public visibility of Muslims in Western Europe and the United States conditions an increasing fear of and preoccupation with “the other”, often revealing xenophobic and orientalist thinking. Having analyzed these processes for many years, Azra Akšamija¹, an Associate Professor in the Department of Architecture and the MIT Program in Art, Culture and Technology, remarked without hesitation:

“What the conflicts over the newly planned mosques in countries such as Slovenia, Austria, Germany, Italy, and the United States have in common is the attitude that it is acceptable to build a new mosque, as long as it does not look like one.” (Akšamija, 2009)²

These new Islamic centers belong to different national communities that, in their visual identity and basic design principles, seek to harmonize the recognizable elements of the vernacular cultural and historical heritage with the contemporary context of life and work. *While mosques were once quietly accommodated in old school buildings, factories, or churches, today the construction of new mosques is up—one of the factors literally increasing the visibility of Islam in Dutch (Western European) society*, as stated in the foreword to the study on political, social, and architectural transformations of contemporary mosques.³ In 2008, the art historian Christian Welzbacher wrote an essay on the architecture of the so-called *Euro-Islam* architectural style, in which he pleads for an architectural awakening and advocates for a “quality debate about the new form of Islamic architecture in Europe”.⁴ Welzbacher’s interest is, above all, in current and international construction activities. The headings of the three sections: “Europe and Islam”, “Islam in Europe” and “A Euro-Islamic Perspective” reveal an intention to speak about the contemporary understanding of Islam and its integration in the European context. “If”, as Welzbacher writes, *“something like Euro-Islam is emerging, a corresponding Euro-Islam architecture must develop with it, which differs in its appearance from previous Islamic traditions”* (Wittmann-Englert, 2010). The author seeks or demands a “new, independent form of building culture that is reflected in the planning of the new mosques” (ibid.) - and finds it in the Islamic Centre in Penzberg, a small Bavarian town, not far from Munich. This mosque, designed by the Bosnian architect Alen Jašarević (b.1973) in 2005, is often cited as a good example of contemporary mosque design in which the principles of local and universal are respected. Jašarević was guided by the principle that a mosque must have neither a dome nor a minaret: the only requirement set in the Qur’anic text is that the space must be directed towards Mecca; that is, *Makkah al-Mukarramah*, the holiest city in Islam and the birthplace of the Prophet (Photo 1). With this fundamental, minimal requirement, the creative

1 Azra Akšamija is an artist and architectural historian of Bosnian origin. She is the Director of the MIT Future Heritage Lab and an Associate Professor in the Department of Architecture and the MIT Program in Art, Culture and Technology.

2 Azra Akšamija (2009), *Echo of Islam in the West: Reactions to the Wearable Mosque*, Arte East, Spring 2009
<http://arteeast.org/quarterly/echo-of-islam-in-the-west-reactions-to-the-wearable-mosque/>
(01.02.2021.)

3 *The Mosque: Political, Architectural and Social transformations* (2009), ed. Ergün Erkoçu and Cihan Bugdaci, NAI Publishers

4 Christian Welzbacher, (2008), *Euroislam-Architektur. Die neuen Moscheen des Abendlandes*, Amsterdam.

space for experimentation and reflection became much wider. In an effort to redefine the established and quite exclusive interpretation of mosque architecture in Bosniak communities, in which recycling of the forms from the classical period of Ottoman architecture is generally expected, Jašarević united various elements in his project: from decorations inspired by ornamental motifs of Spanish, southern Italian, and Indian architectures to the elements of the local mining tradition of this Bavarian, subalpine town. The whole concept of the Penzberg mosque design could be summed up in the following words: to design from the centre to the outside space. Through sophisticated lighting of the mosque, with a blue light reflected in the outdoor space, Jašarević wanted to highlight the connection of the Islamic community with its social surroundings (Photo 2).



1. Islamic Forum Penzberg, section
2. Islamic Forum Penzberg

© Architectuul (<https://architectuul.com/architecture/islamicforum-penzberg>)

The mosque is Islam's most emblematic building and therefore mosque architecture is very important in expressing identity issues. What is recognized as a mosque depends not only on cultural traditions or regional building traditions, but is also based on a certain interpretation of religion in which Islam should model its architectural expression as a living faith. *Can one recognize a building as a mosque without domes or without minarets?* questions Professor Khan, a Distinguished Professor of Architecture and Historic Preservation at Roger Williams University (Khan, 2008:53). The easy use of the familiar — domes and minarets—is more common, as it is in many mosques all over the world, from Indonesia to North America. Is this the only representation of Islam that we are willing to accept in the world we live in today? These (unchangeable) models have already been questioned in contemporary mosque architecture in Turkey, as, for example, in the 1989 project of the eminent Turkish architect Behruz Çinici (1932-2011) for the 1995 Aga Khan awarded Mosque of the Grand National Assembly in Ankara. Udo Kultermann wrote that the oeuvre of Çinici would inevitably have to be found in all modern architecture manuals (Kultermann, 2010:315). The Aga Khan Award Jury found of particular interest, *"the manner in which elements from traditional mosque architecture have been abstracted and fragmented... as well as design strategies [by which] the mosque acknowledges its secular*

environment but brings, through a fully glazed qibla wall, worshipers closer to nature"⁵ (emphasis added).



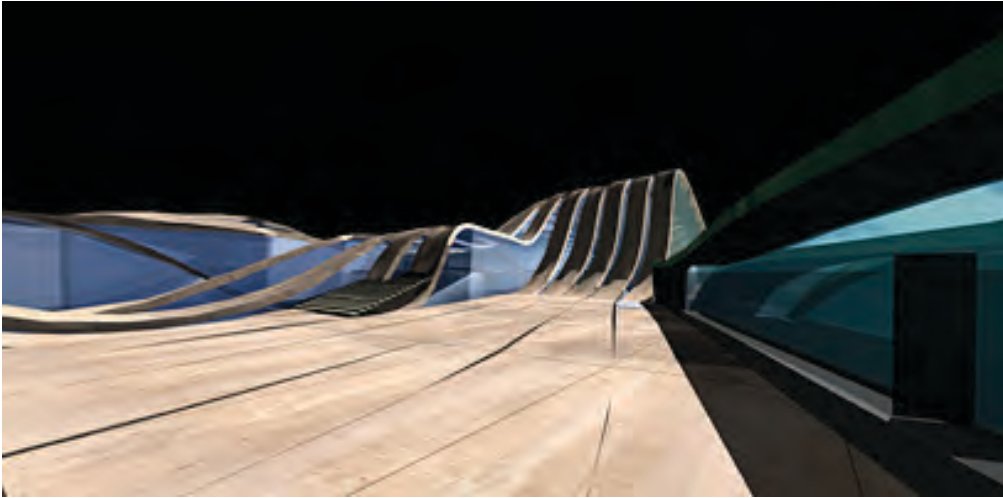
Mosque of the Great National Assembly, Ankara
© mosqpedia (<https://mosqpedia.org/en/mosque/298>)

Rare are those architects who manage to inject fresh thinking into an ultraconservative subfield of design that has not been able to liberate itself from the 'cube-with-a-dome' idiom since the codification of the Ottoman mosque typology by the great architect Sinan at the end of the 16th century, as Professor Nasser Rabbat defined tendencies in contemporary mosque architecture. As one rare example in the opposite direction, he emphasized Zaha Hadid's entry in the Strasbourg competition (in 2000) which he described as her most cutting-edge project. In this entry, as Rabbat explained:

"she used her signature fluid forms to wrap the entire complex, comprising a mosque and various spaces for a community center, endowing them with a deep symbolism that translates Islamic sonic rituals into undulating shapes based on the visualization of the actual sound waves of the voice of the mu'adhin chanting the call to prayer (Photo 4). Coupled with these allusions is a metaphoric association with the curvilinear flow of Arabic calligraphy, suggested by the buildings' fluid contours and materialized in actual calligraphic carvings inside. This reference in turn resonates with the wavy curves of the Rhine running nearby, lending the mosque a sense of place. Finally, the

5 "The mosque is composed of a triangular forecourt, and a rectangular prayer hall overlooking a large, triangular, terraced garden and pool. Of particular interest to the jury was the manner in which elements from traditional mosque architecture have been abstracted and fragmented. Instead of a full courtyard with porticoes, for example, the architects have cut the courtyard in half along a diagonal line connecting the southern and northern corners. Bordering the courtyard porticoes, and taking their place within the structural module, are column bases without shafts or capitals, intended as echoes of traditional sheltered promenades. Other consciously incomplete references to the past include the truncated minaret, and the stepped pyramidal roof in place of the expected dome. The qibla wall opens onto the terraced garden, and this unorthodox arrangement completely transforms the act of prayer. The customary orientation of the qibla wall and mihrab toward Mecca is maintained, but by conceiving these elements in glass, with a landscaped garden beyond, worshipers are brought closer to nature. By means of these design strategies, the mosque acknowledges its secular environment while new centre for worship is an important step in the development of a suitable architectural vocabulary for the design of contemporary mosques." Source: Aga Khan Trust for Culture, Grand National Assembly Mosque, Ankara, ArchNet https://archnet.org/sites/781/media_contents/27684 (22.2.2021.)

rippling concrete strips that define the entire complex alternate with open, glazed slits that drench the whole space inside with natural light, another powerful—and universal—symbol of the Divine. It is indicative of the conservatism entrenched in mosque design that Hadid's lyrical submission was not selected. Instead, the competition went to the postmodern Italian architect Paolo Portoghesi, whose project is but a pale rehashing of the magnificent Grand Mosque of Rome, completed in 1995. (Rabbat, 2016)



4. Strasbourg Mosque Competition, 2000. © Zaha Hadid Architects

These Strasbourg entries represent the two paths that contemporary European mosque concepts generally follow: on the one hand, in line with integrative Euro-Islam, European and contemporary in design, on the other hand, traditional and exotic through the importation of foreign forms (Wittmann-Englert, 2010).

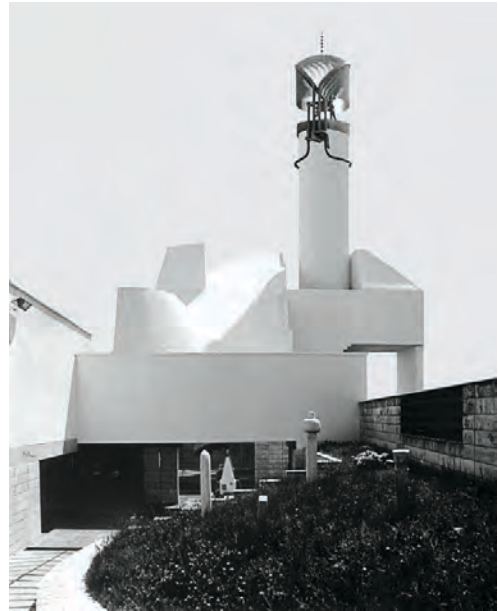
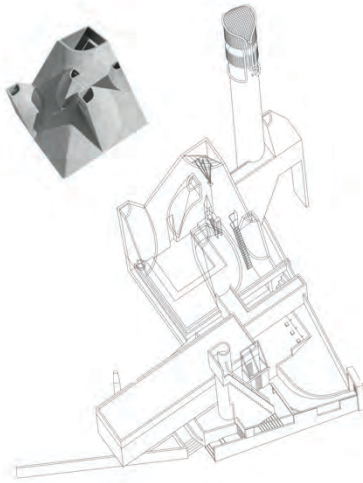
When talking about contemporary mosque architecture, Professor Khan reminds us that *it is its symbolism that conveys what the mosque is about*. The importance of mosque architecture lies not only in the forms or architectural language but also in the collective meanings transmitted over time. *Architecture is*, according to Professor Khan, *not about buildings, it is about people*. The dome of a mosque built in the year 2000 in Shanghai, China, is used as a sign of the presence of Islam. It has no relationship whatsoever to the buildings' interior spaces or structure—it merely sits atop the flat roof. The community was conscious that it is needed to proclaim the presence of Islam (Khan, 2008:53). Sometimes, the symbolic capacity and quality of architecture is degraded by poor political compromises. In her studies on the influences of mosque architecture on the creation of a cultural memory⁶, Professor Azra Akšamija

6 Azra Akšamija, "Our Mosques Are Us: Rewriting the National History of Bosnia-Herzegovina through Religious Architecture", PhD Dissertation, 2011, Aga Khan Program, MIT. Her articles on this topic also include essays 'Die Welt als Moschee', in the exhibition catalogue Kunstmoschee (Secession Vienna, 2007); 'Generative Design Principles for the Contemporary Mosque' in the book *The Mosque. Political, Architectural and Social Transformations* (NAi Publishers, 2009); and 'Echo of Islam in the West: Reactions to the Wearable Mosque' in *ArteEast Online* (2009).

mentioned two negative examples of contemporary mosque architecture in Austria - the mosques in Telfs and Bad Vöslau. According to Akšamija, there is often hostility towards foreigners behind the recent discussions about mosque architecture in Austria. In arguments such as: "mosques do not fit into the local environment" there is, in fact, a simple thesis: "we do not want you here". A similar attitude echoed in the kindly formulated words of the Mayor of Graz, mag. Siegfried Nagl who, at the presentation of the Graz mosque project – *Islamisches Kulturzentrum Graz* (done by the architectural bureau from Graz - GSP Architektur), highly praised the project as "a modern solution that fits into a Central European city of the 21st century".⁷

Islamic Centres for Bosniaks in Western Europe: from Zagreb (1987) to Ljubljana (2019)

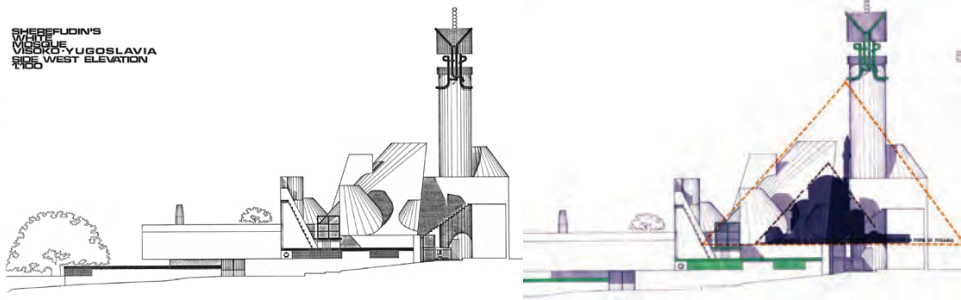
The majority of the recently built mosques for Bosniak communities in Western Europe (in Zagreb, Graz, Rijeka, Ljubljana) are multifunctional centres, including within them libraries, youth clubs, conference halls, restaurants, sales areas, nursery schools, and multipurpose halls for various cultural and sports events. These centres have consequently gained wider importance in the life of Western European cities. When the Islamic Cultural Centre was opened in Zagreb (1987), it was then the most important and most modern multifunctional Islamic centre in former Yugoslavia, located at the very entrance of Western Europe. Almost simultaneously, an exceptional project of contemporary mosque architecture put Bosnian architecture on the world map: it was the prestigious Aga Khan Award for the project of Sherafudin's (White) Mosque in Visoko by Zlatko Ugljen (Photo: 5, 6, 7).



5. White Mosque in Visoko
 Courtesy: Ugljen Studio, Sarajevo
 6. White Mosque in Visoko
 Courtesy: Ugljen Studio, Sarajevo

7 <https://islamgraz.org> (03.02.2021.)

SHEREFUDIN'S
WHITE
MOSQUE
VISOKO, YUGOSLAVIA
SIDE WEST ELEVATION
1982



7. White Mosque in Visoko, elevation
Courtesy: Ugljen Studio, Sarajevo

As the mosque was described by the Aga Khan Award for Architecture jury, in the award cycle 1981-1983:

The archetypal Bosnian mosque has a simple square plan crowned by a cupola and entered by means of a small porch. The White Mosque's plan conforms to the archetype, but its roof is a freely deformed quarter of a cupola pierced by five skylights, themselves composed of segments of a quarter cupola. The effect is one of confrontation between the elementary plan and the sophisticated hierarchy of roof cones. (...) Commending the mosque for its boldness, creativity, and brilliance, the jury found it "full of originality and innovation, laden with the architect's thought and spirit, shared richly with the community, and connecting with the future and the past."⁸

After Zagreb, other cities with significant Bosniak diaspora, such as Graz (2011), Rijeka (2012), and Ljubljana (2019), have also built modern Islamic centers with interesting architecture, ranging from contemporary interpretations of Ottoman tradition (Zagreb) to abstract and minimalistic language (Ljubljana), reflecting in their formal elements the ongoing discussions on the "visibility" of Islam in public space. Analyzing formal elements of the *Islamic cultural center in Zagreb*, Professor Khan recognized in the tall pencil-thin minaret, influenced by Ottoman tradition, a desire to associate oneself with Islam within what was then socialist Yugoslavia (Khan, 2008:52). The Ottoman influence (the most recognizable of such forms being the minaret and the dome) has been widely adopted because it actually fits well into modern construction technology and it is a pure modern geometric form. The central dome, according to Khan (*ibid.*), has a modernist image and reflects the aspirations of the inhabitants to portray themselves as "modern Muslims". The narrative of multicultural Yugoslavia, with proclaimed values of *brotherhood and unity*, certainly needed, in its symbolic architectural language, references to the Ottoman heritage, as a constitutive element of its multi-layered cultural history. The prevailing form of traditional, representative Ottoman-style mosques in Bosnia followed the type of a standard single-unit domed mosque with various typological variations. Many of the most representative ones, such as the Aladža mosque in Foča (1549), had a porch roofed by three small cupolas and one minaret adjoining the central cube (Photo 8).

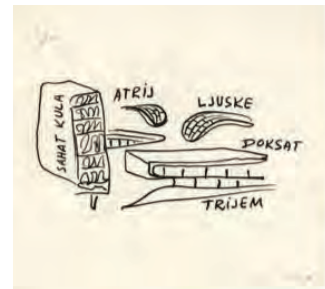
8 Sherefudin's White Mosque, Aga Khan Award for Architecture, Cycle 1981-1983, <https://www.akdn.org/architecture/project/sherefudins-white-mosque> (2.8.2022.)



8. Aladža mosque in Foča, old photograph
 9. Hugo Charlemont, Interior of Aladža mosque
 ©The Austro-Hungarian Monarchy in Word and Picture Vol. 22: Bosnia and Herzegovina. Vienna 1901, p. 421

However, the Zagreb project originally marked an innovative approach in the oeuvre of its first designers, Juraj Neidhardt and Džemal Čelić. Although the design had been chosen as the best and had won the first prize, it was not implemented according to the accepted solution. The competition started in 1969, and over the next 2-3 years, Neidhardt and Čelić created a design project for a center complex, along with a mosque, as recorded by Neidhardt in his conceptual design: *“Analogy: The Play of Sub-Domed Forms of the Past and the Concrete Shells of the Present. The Positive and Negative in Architecture.”*

During this period, Professor Neidhardt placed a greater emphasis on implementing shell-like reinforced concrete structures which are the dominant characteristic of molded architecture (Photo 10). In this project, Neidhardt followed his research in shell-like forms from other, secular compositions, such as his project for the National Assembly in Sarajevo.



10. Islamic Centre with Mosque in Zagreb, scale model vs. National Assembly of the Republic of Bosnia and Herzegovina, elements of the composition, 1954.
 Courtesy: Neidhardt Archiv, ANUBiH, Sarajevo

According to the suggested form of the conceptual design, the Islamic Centre complex had a relatively low elevation, where the fifth façade is a wide horizontal line, perforated with small ovals and lacking a central spherical form. Years of fund-raising and program-changing followed and, after Juraj Neidhardt's death, Džemal

Čelić and the architect Mirza Gološ began implementing an altered project, characterized by opting for the central accents of the complex: the cubes and the minaret on one side and the managerial-administrative block on the other. The design significantly reduced the fragmentation of the fifth façade elements, providing the structure with a silhouette quality, now prominent in the city's panorama (Krzović, 2019: 242-243).

Rijeka Islamic Centre (2012), built after numerous controversies arose related to its location and the height of the minaret, has more sculptural qualities since it was designed according to the initial project of one of the most gifted Yugoslav sculptors, Dušan Džamonja (1928-2009)/ D.Vlahović and B.Vučinović, co-authors (Photo 11). Although the construction of such centers significantly contributes to the image of these cities as places of coexistence of different cultures and religions with equal democratic freedoms and civil rights, these projects are entirely funded by Islamic communities and their members.



11. The main entrance of the Mosque in Rijeka / Courtesy of Islamic Community in Rijeka

The *Islamic Religious and Cultural Centre* in Ljubljana was opened in 2019 and the international architectural competition was evaluated by the public as the most important European architectural competition in 2011. The authors, a pair of Slovenian architects, Bevk and Perović, managed to activate a neglected urban zone in the vicinity of the city center. What was also assessed as a special value of this project is the fact that *it does not repeat historical patterns* but tries to challenge the idea of what it is that makes up the very essence of Islamic sacred space. Bevk Perović's scheme comprises a mosque with facilities for ritual ablutions and a minaret, an educational building, an office, a residential complex, underground parking, a restaurant, and a sports hall. Providing more than simply a place for worship, the design also affords a venue for the local Islamic community to gather and socialize. Developed to cater to the needs of the Muslim community in Slovenia's capital, the huge complex covers approximately 129,167 ft² (12,000 m²).

The building is characterized by a muted material palette where the white of the façade and the light-colored concrete work in harmony. Terrazzo has been used for the floors and ceramics to create a richly textured space while the wood of the panels and doors form a distinct contrast to the architecture,

providing a warm, human character to the project.⁹ A distinctive accent comes from its blue dome, colored by IKB (International Klein in Blue) which proves the detailed preparatory studies of the architectural team (Photo 12). Searching for a color that would most perfectly manifest a state of absolute spirituality, famous French artist Yves Klein designed this color, in cooperation with chemists during the 1950s. It was the result of his long-lasting artistic research and encounter with the world of the East. The dome, as the dominant symbolic and visual accent, hangs suspended within a glass, structurally shaped, cube, like a *hanging textile construction in blue that unobtrusively evokes the memory of the nomadic tradition of the first centuries of Islam, as well as evoking a serjada (prayer rug) extended in the direction of the Ka'bah*.¹⁰



12. The Blue Dome of the Islamic Cultural and Religious Center in Ljubljana, Photo: David Schreyer, Courtesy of Bevk Perovic Architects, Ljubljana, Slovenia

Although there are no direct references to the forms of classical Ottoman mosque architecture and the project is “acceptable” for the European context, being described by the Jury as a *mix of the abstract language of contemporary European architecture that reflects the modernistic cubic shape*, there is a subtle reference to the traditional patterns. The net pattern on the façade of the mosque is an allusion to the wooden ornaments found in traditional Bosnian houses (Photo 13, 14), separating the male from the female part of the house, and thus very evocative for Bosniaks who form the majority of the Ljubljana congregation.

This exceptional project was awarded *The 2020 Plečnik Prize*, the highest recognition for achievements in architecture, landscape architecture, urbanism, and interior design in Slovenia. The jury found the project exceptional in both ¹¹.the national and the European contexts

9 <https://www.designboom.com/architecture/guilherme-da-rosa-bevk-perovic-islamic-center-ljubljana-10-29-2019/> (11.01.2021.)

10 According to Professor Janez Koželj, Jury President for Ljubljana Islamic Centre project.

11 <https://www.total-slovenia-news.com/made-in-slovenia/6483-2020-plecnik-prize-won-by-architects-of-ljubljana-mosque> (01.02.2021.)



13. The Islamic Cultural and Religious Center in Ljubljana
Photo: David Schreyer

Courtesy of: Bevk Perovic Architects, Ljubljana, Slovenia

14. Wooden partitions on the traditional Muslim house,
Begovina, Herzegovina, 19th c.

Photo: Mirza Hasanefendic

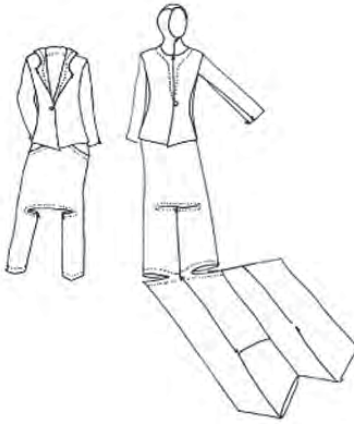
Architecture perceived as a catalyst for change and participation?

The basic elements of a mosque are defined neither in the Qur'anic text nor in the *hadith*. In a way, the prayer rug directed towards Mecca could be understood as the smallest architectural space built and shaped by the believer in the act of praying. It unites and implies all the necessary and fundamental elements of a sacred place: purity, focus, and the idea of communication and communion. A question of mosque architecture in the West is obviously a question of the "visibility" of Muslims in public space. Architectural forms, such as domes and minarets, as recognizable design elements in mosque architecture have gained the power of symbolic markers. But let us try to think about this delicate issue in a new way by asking:

"Can art inspire and empower increasingly alienated Muslim communities? In what ways can an artistic and architectural representation of an Islamic community contribute to better cross-cultural understanding?" (Akšamija, 2009)

These challenging questions have inspired Professor Azra Akšamija, over the past several years, to develop a series of art projects entitled the "Wearable Mosques": clothes that can be fashioned into minimal prayer spaces. A wearable mosque is a portable religious device through which Akšamija has tried to deconstruct the prevalent image of a Muslim as an alien "other" while the variety of its forms challenged the prevailing monolithic interpretations of Islam. Different site- and person- specific 'individual facades' (*Nomadic Mosque, Dirndl Mosque, Survival Mosque...*) represent the specific experiences and needs of the Muslim diaspora living in different geographical, cultural, and political contexts (Photo 15, 16). Akšamija's vestments are endlessly transformable, helping their users shift more fluidly between different identities: secular and sacred; traditional and contemporary; material and spiritual, addressing the complexities of an interwoven global world.

By making this heterogeneity visible, Akšamija wanted to contribute to a more complex debate about Islam in the West, understanding it as a dynamic process, which allows for its own change, in a more active and participatory way (Akšamija, 2009). In 2013, the artist won the prestigious Aga Khan Award for her contributions to a unique Islamic cemetery, the design of which was



led by the Austrian architect Bernardo Bader in the picturesque alpine town of Altach, Austria. For this project, Akšamija designed the interior prayer space — a golden, light-strewn room that combines the woodcraft of the region with Islamic aesthetics — to create a serene, natural environment (Photo 17).¹² The cemetery was the result of a nine-year process of mediating between town officials, immigrant communities, and longtime residents and it is a beautiful example of a creative synthesis between vernacular tradition and Islamic aesthetics. These projects, whether on the scale of a building or on the scale of a body — create the space to imagine the world differently and are essentially hopeful about the role of architecture in building community and facilitating dialogue in the midst of conflict.

15. Nomadic Mosque, 2005.
© Azra Aksamija, MIT

16. Dirndlmoschee, 2005.
© Azra Aksamija, MIT



17. Islamic Cemetery in Altach, © Adolf Bereuter

12 <https://news.mit.edu/2014/azra-Akšamija-creating-community-amid-conflict> (11.1.2021.)

Concluding remarks

It has been frequently highlighted, in the recent period, that the construction of modern Islamic, religious and cultural centers is one of the increasingly present architectural themes in Western Europe. In their visual identity and basic design principles, these centers seek to harmonize the recognizable elements of the vernacular cultural and historical heritages with the environment of contemporary life. In recent years, the permanently growing Bosniak community in various European countries has been confronted with the challenging question of how to harmonize the dominant legacy of the Ottoman tradition in mosque architecture, which dominated the Bosnian landscape of sacred architecture for more than five centuries, with the contemporary context of Western European culture which, as a rule, shows resistance to the visible symbols of Islam in its immediate environment, often revealing xenophobic and orientalist thinking. Already from the end of the 1960s and first projects for *the Zagreb Islamic Cultural Center* and, even more radically, with the Aga Khan awarded project of Zlatko Ugljen for *The White Mosque* in Visoko at the beginning of the 1980s, a dynamic and critical rethinking of the dominant model of traditional Bosnian mosque architecture had begun. Islamic architecture was, up-to-then, especially in its most representative forms, defined as a domed, single-unit mosque with a porch roofed by small cupolas and one minaret adjoining the central cube. This analytical research into vernacular architecture and the critical revitalization of traditional building practice, as shown in the projects by Neidhardt and Ugljen, echoed the spirit of the 'vernacularism' which was the most serious of the reactions against Modernism that demanded simple and functional forms. Modernism has been seen by many to promulgate a set of values and premises that fails to respect cultural identity and historical continuity. These late modernist forms have been recently used in mosque projects for the Bosniak diaspora in Western Europe, such as in Graz (2011) and Ljubljana (2019). However, in some of their elements, they have remained subtle references to the autochtone Bosnian residential architecture, such as the wall pattern of the Ljubljana Islamic Center echoing the wooden partitions on the traditional Bosnian houses and the importance of the private and secluded place. However, to fully understand the dynamic character of the cultures of the Islamic world today, it is necessary to understand the role of the modifier 'Islamic' in framing the term 'Islamic architecture' more as a sign of its contemporary, dynamic character rather than a formal or stylistic attribute (Rabbat, 2012).

The strength of Islamic architecture has arisen not only from the inherent cultural values of the societies that generated it but also from the fact that Islam has adapted itself in order to successfully interact with other cultures as it has spread. Islam came out of its encounter with modernism changed but not defeated. Some of the recent studies of contemporary mosque architecture of Europe re-examine the very essence of Islamic art as well as of the Islamic, dominantly mosque, architecture. Some of these studies, such as the "Wearable Mosque" (2005) project by Azra Akšamija seek to deconstruct the prevalent image of a Muslim as an alien "other" and to challenge the prevailing monolithic interpretations of Islam, highlighting the complexity and simultaneity of different identities of its followers in the Western cultural context, reminding us of the essential role of architecture as a catalyst for change and participation.

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GARDENS AND LANDSCAPES OF MOSQUES IN THE MODERN WORLD



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Islamic gardens are an important feature in the design of modern Islamic religious facilities such as mosques, a sacred place for praying, and a sign of Muslim identity in the built environment. Throughout history, many great mosques were built around the Islamic world, some with garden courtyards or images of gardens in their ornamental programs. For example, the Great Mosque of Cordoba has an open courtyard that was planted with fruit trees from at least as early as the beginning of the 9th century. Similarly, the Mosque of Seville (built 1172-82) had a garden with a large central water fountain and fruit trees, including orange and palm trees. In addition, many mosques, such as the Great Mosque of Damascus (8th century), with no actual garden, are decorated with various mosaic and stucco representations of trees and nature that symbolize the Garden of Paradise.

Today, hundreds of different kinds of mosques are being constructed in many regions of the world for various clients—including governments, public and commercial institutions, and private individuals (Khan, 1994). Because of this, the research on Islamic architecture since the early 20th century has focused on mosques. Prior and current research has thoroughly investigated the past and present history, theory, design approaches, and technology of mosques in the Islamic world and beyond (Hillenbrand, 1985; Holod & Khan, 1997; Necipoglu, 2005; Rizvi, 2015). However, little scholarly attention has been given to the gardens associated with modern and contemporary religious architecture. David Lambert in his study of memorial gardens, affirmed that monuments and architectural memorials received much more recognition than memorial gardens because gardens and parks “are physically less prominent...[and] analysis and recording of landscape is much less established than that of buildings and sculpture” (Lambert, 2014, p.34). This is also true with Islamic gardens, which historically have received less recognition than religious architecture. For example, in *The Contemporary Mosque*, Renata Holod and Hasan-Uddin Khan thoroughly surveyed contemporary mosques and Islamic centers built worldwide (Holod & Khan, 1997). The book’s main focus is on mosque architecture, with only a brief mention of some gardens and landscapes associated with those buildings. The Ismaili Jamatkhana and Center (1985) in Burnaby and the King Faisal Mosque (1986) in Islamabad are examples of mosques with courtyards and gardens designed in an Islamic style that merit much more in-depth analysis.

This paper explores modern and contemporary case studies of gardens and landscapes associated with Islamic religious institutions, more specifically mosques and Islamic centers in the Islamic world and non-Islamic countries where Muslim communities have been established. It also discusses the role of patrons and designers in forming the identity and meaning of the mosque and its garden across cultures.

Gardens, religion, and historic mosques

Gardens have long been considered to be a pleasant place for spiritual reflection and a space to encourage meditation and contemplation. Early civilizations marked specific landscape spaces and natural elements, possibly for their symbolic and scenic values, as sacred. They created sanctuaries or gardens (e.g., Babylonian gardens and the sacred gardens of ancient Egypt) for solitary contemplation. Therefore, in their simple definition of an enclosed

outdoor space, gardens have been the putative places for spirituality and religious activities for primitive societies.

Gardens in their many different forms are also a powerful theme in major religions of the world such as Islam, Christianity, Judaism, Hinduism, and Buddhism. Religious texts, such as the Qur'an and Bible, make clear reference to gardens and landscape. For example, in the Qur'an, God described the promised Jannah (paradise) as gardens with "all kinds of fruit." and "rivers of freshwater, rivers of milk that never changes in taste, rivers of wine delicious to drink, and rivers of pure honey" (Qur'an 9:72, 47:15, 36:55-58). Historians symbolically linked these descriptions of Jannah in the Qur'an to the Chahar Bagh layout (the four-fold garden with a central fountain and four streams flowing from it) that could be found throughout the Islamic world.

In the field of Islamic gardens and landscapes, most scholars who studied the history of Islamic gardens viewed and defined them from a religious perspective. For example, Annemarie Schimmel, a German historian, explained Islamic gardens as reflections of the Jannah mentioned in the Qur'an (Schimmel, 1976). Similarly, Jonas Lehrman described Islamic gardens as a metaphor for paradise in his book *Earthly Paradise*. Lehrman believes that Muslim civilization built their gardens based on the garden's description in the Qur'an, and they viewed them as earthly heavens (Lehrman, 1980). Other scholars such as D. Fairchild Ruggles argue that all gardens can generally be considered a representation of heaven on earth but the specific connection between gardens and paradise arose as Muslims began to use the garden as a "setting for tombs" (Ruggles, 2008, p.103). An example of this burial practice is evident in Abbasids in the late eighth century, when the wet nurse of Harun al-Rashid was buried in a garden near Wadi-i-Qanatir on the banks of the Euphrates, and a Qubba was built over her grave (Leisten, 1990).

In the course of Islamic history, gardens were suitable sites for constructing mosques. The intention for situating the mosques in garden sites could be for its symbolic spiritual meaning and functional value. One of the earliest examples is the mosque of Prophet Mohammed in Medina. According to historical records, the site selected to build the prophet's mosque was a palm tree plantation or a farm. (El Gohary, 1986). The trunks of the existing palm trees were used as structural columns, and the palm leaves were used to construct the mosque's roof. Similarly, the Umayyad Mosque of Aleppo (begun 715) replaced an older Byzantine church which had adjacent gardens (Ruggles, 2008, p.94). Another example of mosques built in a garden setting is the Great Mosque of Kairouan (7th century) in Tunisia. In *Futuj al-Buldan*, Al-Baladhuri wrote that the Kairouan mosque was built in a site planted with various trees, including Tamarix trees. (El Gohary, 1986, p.32).

Besides building mosques in or near garden settings, there was also a tendency to garden the courtyards of mosques. Those garden courtyards often are planted with trees and contain water features used for irrigation and ablutions (ritual cleansing before prayer). In some mosques, the courtyards were planted with fruit trees and used as a source of food. For example, the Great Mosque of Cordoba has an open courtyard planted with orange trees, narrow water channels used for irrigation, and a fountain for ritual ablutions (Figure 1). Another example is the waqf mosque of Ibn Silsila in Cairo (11th century- no longer exists) with palm trees planted in its courtyard. The mosque's waqf records states "this blessed mosque was built by Al- Husayan Ibn Abdallah Ibn Muhammad Ibn Silsila the cloth merchant, in his desire to seek the satisfaction of God and of the other world...The palm tree which is in this mosque is food for Muslims. It can neither be bought nor sold" (El Gohary,



Figure 1:

Great Mosque of Cordoba, Court of the Orange. (Source Left: D. Fairchild Ruggles. Right: Hameryko , Wikimedia Creative Commons)

1986, p.32). In addition, the famous traveler Ibn Battuta reported that he saw a mosque in the city of Tabriz with a garden courtyard planted with Jasmine. During his travel in al-Andulas, he saw a mosque in Malaga with an open courtyard planted with orange trees. (Ruggles, 2008, pp. 93-94).

The pictorial representation of nature and gardens are a common theme in early mosques. The mosque’s walls and columns are often decorated with mosaic and stucco in floral and naturalistic motifs, as for example, the Cordoba mosque (10th century) which had plant motifs adorning the qibla wall, mihrab, and the dome. Another example is the Great Mosque of Damascus’s inner courtyard façade, which has a mosaic panel decorated with floral ornament and landscape motifs such as trees, a river, bridges, and different types of buildings (Figure 2).

In this way, even when mosques did not have a real garden on their premises, they could be metaphorically planted with naturalistic representation. These floral representations in mosque architecture are symbols that evoke the spirit of paradise in the prayer’s mind. To illustrate, a rare historical record of an artist who worked on the expansion of the Prophet’s mosque in Medina (between 705-715) stated, “We made it according to the picture of the Tree of Paradise and its Palaces” (Ruggles, 2008, p.95). Therefore, similar to the Prophet’s mosque in Medina,

Figure 2:

Decorated mosaic panel at the Great Mosque of Damascus (Source: Dosseman, Wikimedia Creative Commons)



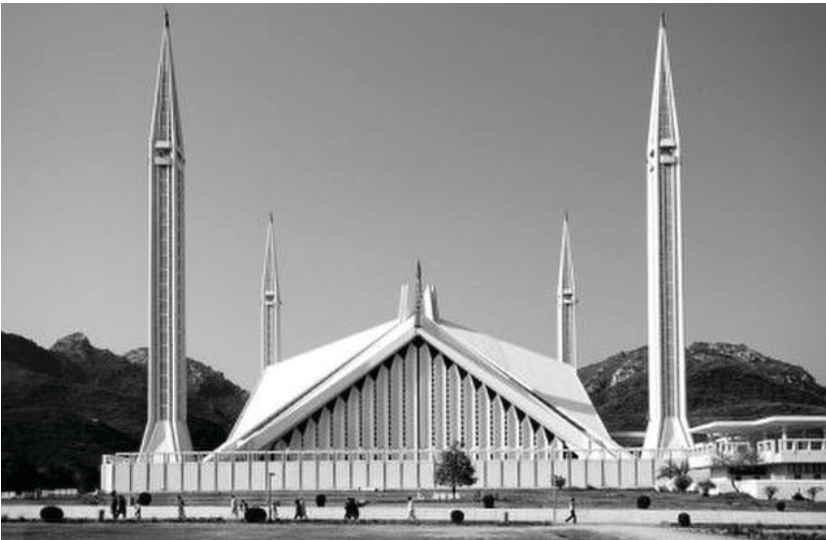
the representation of gardened cities and thriving vegetation in mosque architecture conceivably works as a signifier of the promised Paradise.

The deep connection between gardens and religion is manifested in the built environment. Muslims used existing garden sites to construct many great mosques. In some cases, gardens were part of the mosque's architecture, taking the form of planted courtyards with fountains used for irrigation and ablution. Later, the idea of gardens in the mosques became a metaphor for the promised paradise, and they were represented in the mosque architecture as symbols. Like the gardens of the historic mosques with their prominent features and meanings, the 20th and 21st-century gardens in mosques deserve closer attention.

Gardens of Modern and Contemporary Mosques

The dissolution of the Western colonial regime from the Islamic world and the formation of new Muslim nation-states and kingdoms in the 20th century encouraged the establishment of many monumental mosques. These new mosques were often commissioned as an expression of sovereignty and the national identity of the Muslim states. For example, the King Faisal Mosque (1986) was built as the Grand National Mosque and an iconic landmark for Islamabad, the new modern capital city of Pakistan (Mukhtar, 1991). The mosque was sponsored by the late King Faisal of Saudi Arabia and designed by Turkish Architect Vedat Dalokay after winning an international design competition. The Faisal Mosque represents the designer's modern abstract interpretation of Islamic and Ottoman mosque architecture combined with modern elements and construction techniques. (Holod & Khan, 1997, pp. 76-80). In his design, the Ottoman circular dome (such as the one in the Selim I Mosque) is replaced by a giant bedouin tent-like dome that creates a prayer hall space. The tent dome structure is formed by triangular folded concrete plates with glazed intervals between them, surrounded by four slender minarets that recall the tall Ottoman minarets. In this way, the designer was able to reflect the identity of the Saudi King through the abstract use of the Bedouin tent, his Turkish identity through the connection to Ottoman architectural traditions, and modern Islamic identity through the use of modern materials and modern construction techniques (Figure 3).

Figure 3:
Faisal Mosque, Islamabad. (Source: Jens Grubert 2006, Wikimedia Creative Commons)



However, the Faisal Mosque's monumental effect comes not only from its contemporary architecture but also from its natural and built landscapes. The mosque is located on a green plateau of Margalla Hills at the northern end of the city, dominating the natural and urban landscape of the new capital. At the site, the mosque is situated on a rectangular plane that constitutes a large park covered mostly with grass and few trees. The flat greenery highlights the monumental mosque with its white, giant tent-like dome against the Margalla Hills National Park's picturesque background (Figure 4).

The mosque has a central courtyard with porticoes, featuring a large octagonal pool in the middle. The pool has a central raised square basin with four water streams coming from each corner toward the center, a clear reference to the four rivers of paradise mentioned in the Qur'an. The mosque has two additional reflecting pools—one at the northern side and the other on the qibla western wall side—that mirror the architecture and the surrounding landscape.

Figure 4:

Faisal Mosque and the surrounding landscape. (Source: Shoab Zafar, Wikimedia Creative Commons)



South of the mosque is the tomb of General Zia-ul-Haq, the 6th President of Pakistan, constructed in 1988. Historically, when Islamic chahar bagh gardens were used as the setting for mausoleums, such as the tomb of Mehmet II in the Fatih Cami's garden in Istanbul (built 1460-73) and Humayun's Tomb in Delhi (built in 1570), they became a metaphor for the paradise promised to the deceased in the Qur'an. Thus, placing the tomb of Zia-ul-Haq at Faisal Mosque's outer garden evokes the same metaphor. However, the mosque is placed in a garden that does not follow the classical chahar bagh layout, and yet, the connection to Paradise is still made through the mosque as a sacred religious space, the central pool fountain with its four streams, and the surrounding natural fertile landscape.

In the 21st century, state mosques are also used to express the identity of their rulers, imposing it as a national identity. This is evident in the King Hussein Mosque (completed in 2006) as Jordan's official state mosque. King Abdullah II commissioned the 8,000-square-meter mosque to commemorate his father, the late King Hussein. One of the significant landmarks of the city, it

is situated on the highest point of Al-Hussein Public Park in the northwestern section of the park, overlooking the western edge of Amman, the capital city of Jordan. The design of the mosque reflects both the identity of the nation and its monarchy. For example, the Hashemite Royal Family claims that they are descendants of the Prophet Mohammed through his daughter Fatimah. Thus, to express this connection, Khaled Azzam (an Egyptian-British Architect) followed a direct historical approach, drawing from the pre-modern Islamic architecture heritage to design the mosque. In particular, he was inspired by the 11th century Fatimid Mosque of Al-Hakim in Cairo and from 14th -15th century Mamluk traditions (Al-Asad, 2012, pp.62-63).

The mosque represents a simple fort-like shape, with four low corner minarets and a single dome. It is a two-story building with male and female prayer halls, administrative offices, a library, classrooms, and a museum of the Prophet, displaying relics associated with the Prophet Mohammed. The mosque has a series of small courtyards formed by arches and vaulted arches connected to a larger open central courtyard used for praying and public socializing. These courtyards provide a source of natural light and passive cooling to the mosque. Some of these courtyards are planted with small trees, which also help improve the space's overall quality. The outdoor floors are decorated with Islamic geometric patterns, with additional detailed designs on the nodes. North of the building (the back of the mosque) is a large courtyard featuring two Chahar bagh gardens with water features. Along the mosque's south axis (outside the mosque) is a large courtyard connected to the Al-Husseiniya Royal Palace (built-in 2006). The Al-Husseiniya courtyard has a geometric floor pattern resembling a Chahar bagh with rows of trees around the edge (Figure 5). It is often used for royal celebrations and ceremonies, as, for example, when King Abdullah II welcomed Barack Obama there in 2013 and Joachim Gauck in 2015 (The Embassy of the Hashemite Kingdom of Jordan, 2013).

Figure 5:
King Hussein Mosque. (Copyright: Khaled Azzam 2011).



As part of the modern urban development in Islamic countries, many mosques have been constructed for new and existing urban communities, commissioned by local authorities that work under the central government. For example, the Riyadh Development Authority has commissioned several mosques for their urban development and revitalization projects in Riyadh, the capital city of Saudi Arabia, including Al-Kindi Plaza Jami (1986) in the Diplomatic Quarter. Designed as a hypostyle hall mosque, it is inspired by the traditional architectural vocabulary from Najdi (a central region of Saudi Arabia) combined with modern materials and construction techniques. The Najdi style is used to

express local and regional identity and the identity of Saud's house, the ruling family of Saudi Arabia. The mosque's landscaping consists of large outdoor squares paved with marble, shaded arcades, water features and planters (Figure 6). These squares are connected to the surrounding urban fabric and used for prayer, social gathering, and cultural events (Al-Radi, 1994; Holod & Khan, 1997).

Figure 6:

Al-Kindi Mosque Plaza. (Source: Abdullatif Alfozan Award for Mosque Architecture)



On the other hand, for non-monarchical Islamic states, state mosques and gardens are used to position religious identity with national and even political identity. For example, the Grand National Assembly Mosque in Ankara (1989) was built in the parliamentary complex as a symbolic gesture that counters the secularist image of the Turkish state (Holod & Khan, 1997, pp. 100-101). The mosque was designed by Behruz and Can Çinici in a modern idiom, as evident in the unusual design of the elevated pyramidal dome and glazed mihrab (Al-Asad, 1999).

The 2.5-hectare Ankara mosque is situated within a large natural style park and has two formal gardens on its north and south sides. The two gardens' design beautifully correspond to the architecture of the mosque and the surrounding landscape with its sloped topography. The northern open courtyard has a central fountain and a triangular water pool with an island in the middle. On the south side, the mosque and its glazed mihrab open to a sunken water garden, bordered by terraces, gradually connecting to the park's landscape. The design of the two gardens does not seem to copy or paraphrase any particular historic Islamic gardens. Still, the essence of Islamic-style gardens is manifested in the enclosed space, the connection to the surrounding landscape, the reflecting pool, and the geometric shapes (Figure 7). In this way, the mosque and its gardens express an image of an Islamic Turkey defined by modernity.

Public and commercial institutions in modern Islamic countries typically provide mosques or prayer halls in their universities, airports, hospitals and other facilities. For example, the Avicenne Military Hospital in Marrakesh was built in 1982 with a small mosque adjacent to it for the patients and the medical staff. The hospital complex is organized around a central formal garden courtyard

with a linear water channel, jet fountains, and a latticed pavilion at its end. The 420-square meter mosque was designed by Charles Boccara using a local, traditional design approach. It is located outside of the hospital complex to the west, with an enclosed paved small courtyard featuring a decorative central fountain and ablution area. In his original design, the architect proposed a more extensive formal garden with water features around the mosque to function as a transitional area between the sacred and profane spaces, but this was not realized due to limited funding (Holod & Khan, 1997, p.179).

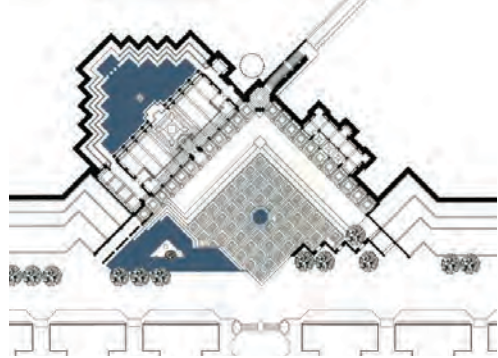


Figure 7:
The Grand National Assembly Mosque. (Copyright: Çinici Architects)

In contrast to the traditional approach used in Avicenne Military Hospital's mosque and gardens, the King Abdullah Petroleum Studies and Research Center's (KAPSARC) community mosque and garden in Riyadh follow a modern, abstract design approach inspired by Islamic traditions and regional landscape.

The mosque is situated within a linear public park (on an existing Wadi) that connects to the KAPSARC campus (designed by Zaha Hadid) to the residential district reserved for the international staff and their families. The mosque's site within the park is aligned east-west toward Makkah and features a series of formal paved and planted courtyards. The KAPSARC mosque (built 2014) was designed by the HOK architecture firm as a concrete cube perforated with mashrabiya patterns and covered with an outer skin of glass. The building is situated in the middle of the formal courtyards within a reflection pool with an elevated glass bridge that takes worshippers symbolically from the profane world into the sacred realm (HOK). The garden courtyards and the mosque landscape evoke the essence of Islamic gardens through their formal composition, design elements, and connection to the surrounding desert landscape (Figure 8).

Patrons will typically build mosques and Islamic centers as a sign of their religious devotion and as a gesture toward the community. Such patrons' role is not always limited to financing the project but may also involve making design decisions alongside the architects. One profoundly important patron of new contemporary Islamic architecture and gardens in recent decades is Prince Karim (the Aga Khan), the 49th Imam (leader) of Nizari Ismailism (a Shi'a branch of Islam).

The Aga Khans has sponsored many Ismaili centers around the world, including in London (1981), Burnaby (1984), Lisbon (1998), Dushanbe (2009), Dubai (2008), Toronto (2014), and an upcoming center in Houston. These centers are defined as religious, social, and cultural places designated for Ismaili communities.

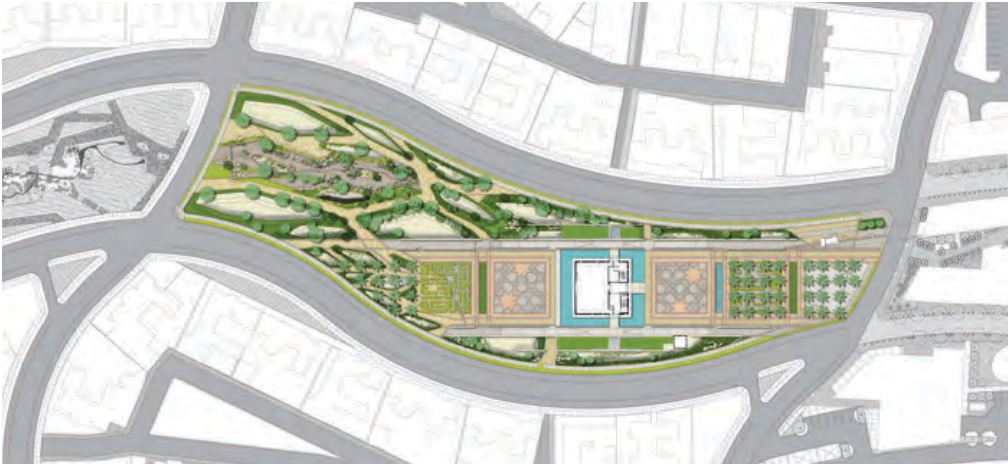


Figure 8:
The King Abdullah Petroleum Studies and Research Center's (KAPSARC) community mosque. (Source: Top, HOK. Image Credit: Abdulrahman Alolyan)

Renowned architects design them following Aga Khan's aspirations to integrate Islamic architecture with modern building designs and technologies to represent and serve the modern-day Ismaili community (Jodidio, 2008, p.173).

Gardens are an essential feature in Ismaili centers, inspired by traditional Islamic garden styles and principles but translated in a modern fashion. For example, the Ismaili center and Jamatkhana (congregational place) in London contain a rooftop garden designed by Don Olson of Sasaki Associates as a modern interpretation of a Chahar bagh Islamic garden (Jodidio, 2008, p. 178). The cross-axial rooftop garden is shaped by crisscrossed, narrow, sunken water channels with a central octagram (eight-point star) shaped pool and jet fountain that symbolizes the Khatim, or seal of the prophets. Water runs toward the central fountain from three raised basins that project from the south, east, and west entry doors of the courtyard and flows from the north basin on the enclosed and raised small courtyard. Elevated planters also surround the courtyard to provide the necessary soil depth for various shrubs and flowers (Figure 9).

Today, with the growing number of Muslims in the diaspora, more mosques are being built, representing a collective Islamic, ethnic, and cultural identity. One

recent example is the Cambridge Mosque (April 2019), designed by Marks Barfield Architects, after winning a design competition in 2009. The mosque was designed as a sustainable modern building inspired by Islamic and English architectural traditions. The architects imagined the mosque as a “calm oasis within a grove of trees” (Cambridge Mosque Trust, 2019). This theme was realized through the interior timber column structures abstractly imitating the shape of trees. The oasis concept is enhanced further by the Islamic garden at the front entrance, which works as a transitional space from the entrance road into the sacred prayer hall of the mosque.



Figure 9:

The Islamic roof garden at the Ismaili center in London. (Source: Author 2017)

Emma Clark designed the mosque’s front garden in collaboration with Urquhart and Hunt Landscape Design Studio in London as a modern interpretation of a classical paradise Chahar bagh garden mixed with English garden traditions. The garden, according to Clark, is “a small garden, not hidden or enclosed like traditional Islamic gardens” (Clark, E. Interview by the author. July 2017). Nonetheless, she states, the landscape design of the mosque is based on the values of Islamic gardens. According to Clark, the garden design contains various recognizable elements from Islamic garden traditions, such as the geometric Islamic patterns, the central octagonal stone jet fountain, and fruit trees.

Figure 10:

Cambridge Central Mosque garden. (Source: Aasem Alabdullatifief ,May 2019).



Conclusion

In the Muslim world historically, gardens were favorite sites for building mosques, and many other mosques had interior courtyard gardens or were decorated with natural motifs. Many historians viewed gardens in mosques from a religious perspective linking them to Paradise as mentioned in the Qur'an. Therefore, according to historians, the real and symbolic gardens in historical mosques were representation of the promised paradise.

The presence of gardens in mosques is a long tradition. But that the presence of the Chahar bagh garden in modern mosques is, from a historical perspective, new. The gardens of modern mosques reflect the merger of two traditions: the mosque courtyard (e.g., the mosque of Cordoba where the garden is in a grid plan) and the mausoleum garden (like Humayun's tomb, which is a Chahar bagh). Mosques and Islamic centers discussed in this paper are examples that demonstrate the role of patrons and designers in constructing the identity and meaning of religious buildings and their gardens. The architectural design of these religious facilities is typically inspired by past tradition but translated into a newly built form differently. For example, with the King Faisal Mosque and the Grand National Assembly Mosque, we see how Turkish architects used unusual forms in their designs. Conversely, the King Hussein Mosque in Amman and the mosque that serves the Avicenne Military Hospital in Marrakesh follow a traditional Islamic regional approach. Similarly, in Saudi Arabia, Al-Kindi Plaza Jami and its courtyard were designed in a traditional Najdi architectural style with few trees and large open spaces for social gathering. Other mosques, especially those built in non-Muslim countries, often make use of a hybrid style that reflects both the Muslim and the host cultures. Modernity implies change, and we saw this change reflected in the use of modern materials and new forms in the design of mosques and gardens. Yet, the essential elements of the mosque and garden don't change: a mihrab, an oriented place for prayer, and a garden as a metaphor for Paradise. Thus, as with mosque architecture, there is both continuity and change in garden design. Evidently, no matter the approach (traditional, modern, or hybrid) or the style (chahar bagh or courtyard), these religious facilities' gardens, and their landscape design reflect, complement, and celebrate their architecture.

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THE MOSQUE AS A POLITICAL PLATFORM



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Abstract

This paper examines the historical intersection between politics and mosque architecture and the contemporary shift in this architecture that is influenced by mosque phobia. It triangulates a systematic literature review with case study analysis and examination of mosques' modern history in Europe to explore mosques as a political tool used to legitimize power, merge cultures, and visualize presence. It focuses on how mosque phobia, triggered by the calamity of September 11th, has influenced mosque architecture specifically, and Islam's physical presentation in general. As a consequence of the unstable political situation in the Middle East today, there has been an increase in the number of Muslims travelling to Europe and, as a result, hate crimes have surged. In an effort to counteract this rejection of Islam, mosques have been reintroduced in a more contemporary form. This paper explores how mosques are being recreated within the surroundings of contemporary architecture in two European countries that are witness to the highest number of hate crimes against the Muslim community: Germany and France. The study concludes by examining the reintroduction of mosques in the contemporary environment through three different architectural approaches that determine its visibility: a traditional Mosque design, a partly deviated Mosque design, and a deviated Mosque design. Interestingly, deviation in mosque design reflects a creative response to the rejection of the conventional mosque and thus offers new insights into mosque architecture under the pressure of contemporary politics.

Keywords: Mosque in modern Europe, creativity in mosque architecture, September 11th, Mosque Phobia, Islam and modern Europe

The political development of Mosque visibility

“as a sacred space that is regarded as belonging to all members of a Muslim society, the mosque, therefore, has been exploited by some for various overtly political ends”. (Arkoun 2002)

Mosques have always been a physical tool used to represent the political power of caliphates, presidents, and patrons. For instance, the different ruling bodies in the major Muslim countries have been deeply involved in building monumental mosques that express their powerful existence (Ismail 2008). The great interest in monumental mosques stand in contrast with the early Islamic time of the Prophet's (PBUH) era when mosques took simple and clear functional forms, as can be seen in the first-ever mosques in Islam—the Prophet's Mosque in Al-Madinah Al-Munawara (figure 1).

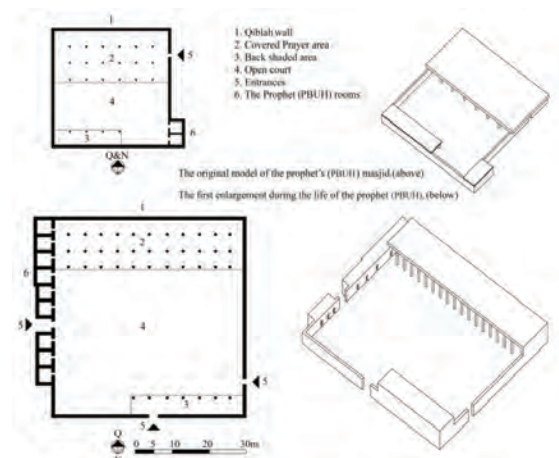
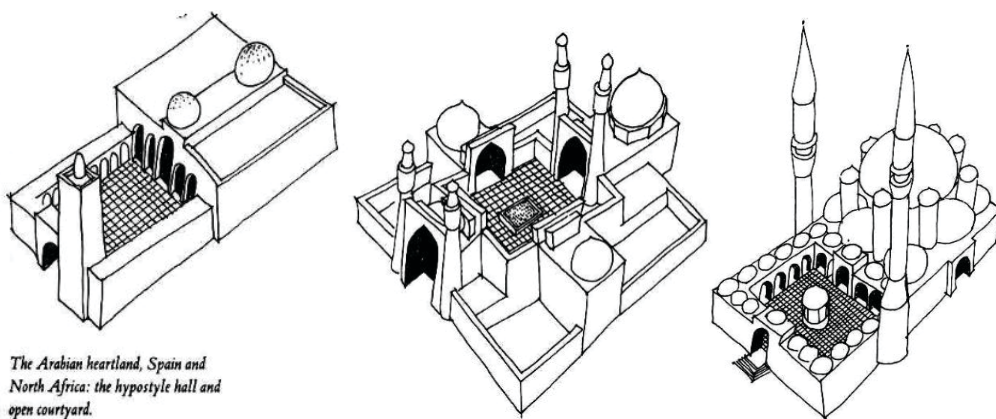


Figure 1:
The Prophet's Mosque. Source: (Elkhateeb et al. 2018)

The various Islamic caliphates have promoted mosques in a monumental physical image consisting of many features, such as minarets, domes, fountains, and gardens, which have mainly been borrowed or reinvented from pre-Islamic eras, then adopted and developed from an Islamic perspective (Al Kalifa 2017). Some features were mainly added to express Islamic political domination while also serving structural and functional purposes, such as minarets and domes (Al Kalifa 2017; Elkhateeb et al. 2018; Ismail 2008). The great need to reintroduce the conquered countries as Islamic political territories supported constructing the various monumental mosques, which were mainly influenced by the conquered countries' architectural style (Islam 2000; Ismail 2008). For instance, the Umayyads were influenced by Roman and Byzantine architecture while the Abbasids added elements from Persian architecture while the Ottomans were influenced by the different architectural styles in what became their extensive empire (Islam 2000).

The three main historically-recognized mosque types include the Hypostyle, the Four-Iwans, and the Centralized Mosque. Each mosque type developed as a consequence of and in response to the cultural influence of the different geographic areas the Muslims conquered. The Hypostyle Mosque (Fig2.A), also known as the Arab Mosque, is the earliest type, appearing during the Prophet's (PBUH) era. Hypostyle developed and was elaborated upon during the Umayyads caliphate (Al Kalifa 2017). It is important to mention that the Cordoba Mosque, built by the Umayyads in Spain in the 8th century A.D. and its extension in the following centuries, identifies with the Hypostyle type. The Cordoba mosque is arguably the earliest mosque in Europe. The second type is the Four-Iwans Mosque (Fig2.B), that mainly appeared and developed in the Abbasid Caliphate territories, in response to the Persian architecture. Accordingly, it was also known as the Persian type (Hoteit, 2015). The last type is the Centralized Mosque (Fig2.C), that extensively developed during the Ottoman caliphate as it was inspired by the design of Hagia Sophia (Kaptan 2013). Mosque architecture reached its peak during this period with development in structural and construction techniques carried out by the Sinan. Arguably, the constant and distinguishing features that may be observed in contemporary mosques first emerged during the Umayyads (Esfahani 2015).



The Arabian heartland, Spain and North Africa: the hypostyle hall and open courtyard.

Figure 2:
The three main types of Mosques. source: (Inangda 2013)

The historical presence of Mosques in modern Europe:

Apart from the Umayyad history in Spain and the early mosques dated to the 8th century there mentioned earlier, mosques began to appear in modern Europe under the Ottoman dynasty in the latter decades of the 19th century (Avcioglu 2014). Woking Mosque was built in England in 1889, eight kilometers southwest of London (Hassan 2015; Verkaaik 2019; Avcioglu 2007; Ahmed 2019). The Woking Mosque is considered the first purpose-built Mosque in modern Europe and was designed by William Isaac Chambers (Hassan 2015). As few Muslims were living in the area at the time the Mosque was built, it was designed as a small rectangular space, covering an approximate area of 30 square meters, and therefore able to hold only thirty to forty worshippers at a time (Hassan 2015; Avcioglu 2007). In a clear reflection of political and cultural ties between India and England, the mosque's onion dome and vaulted entrance reflected the Maghoul architecture and stands in resemblance of the Taj Mahal and its adjacent buildings (Verkaaik 2019; Avcioglu 2007).



Figure 3:

the Woking Mosque. Source: (The key Muslim spaces in Woking – Everyday Muslim, <https://www.everydaymuslim.org/education/woking-Mosque/the-key-muslim-spaces-in-woking/>).

The modern presence of Islam in Europe emerged post-WWI, at the beginning of the 20th century. Europe witnessed a considerable rise in immigration, especially Muslim immigration, which in turn raised the

Mosque construction activity in the region. The increase in the prevalence of mosques in modern Europe served as an announcement of the Islamic presence there during a politically unstable time, with the Ottoman Empire fading in influence and the world finding itself on the verge of war. According to a recent study, more than nine thousand mosques and Islam-relevant buildings have been constructed across thirteen European countries since the start of the 20th century (Green 2011). Since then, mosques gradually marked the image of Islam in many cities of Europe (Avcioglu 2014). The number of Mosques in Europe increased to reach 11,000 by the end of 2010 (Aksamija 2010). Nevertheless, Mosques are still an alien feature in modern Europe, even after the increase of the Muslim population caused by the different political and economic circumstances in the Arab world, especially the recent civil wars and Arab revolts that are generally referred to as the Arab Spring (Avcioglu, 2014; Göle, 2011).

The factors that influenced the design of Mosques in Europe from the 19th century onward:

The factors that influence the construction of Mosques in Europe vary. According to Farrag (2017), three main factors influence Mosque design in Europe: Muslim's multi-cultural backgrounds, funding sources, and internal governmental regulations (Farrag 2017). In this paper, we argue that counteracting mosque phobia and the increasing attempts to re-introduce Islam in contemporary contexts, especially in the West, are two of the factors that influence contemporary mosque architecture. We discuss this below under the title, 'Islamophobia and mosque visibility: from acceptance to intolerance. The following sections investigate each of the factors individually:

Muslims' multi-cultural background

The population of Europe accounts for 10% of the total population of the globe. Muslims make up about 5% of the total population of Europe (Rostan and Rostan 2019). The existence of mosques in Europe is mainly connected to the high number of Muslim immigrants and workers who settled there. A large number of Muslim immigrants who arrived in Europe for different reasons came from different backgrounds (Aksamija 2010; Farrag 2017). A statistical study focusing on the Islamic population in Europe showed that over 17 million Muslim people were living in the various European countries in 2010 (Aksamija 2010).

A study conducted in 2012 by the Pew Research Center that investigated religious diversity in Europe revealed that more than 13 million Muslim immigrants live in Europe (Pew Research Center 2012). The study clarified that a third of the European Union's Islamic population is of Middle Eastern or African origin. Meanwhile, half of the Islamic population is from the Pacific region. A significant number of Muslims are Indian and Pakistani in origin, while Russian Muslims usually come from neighboring Islamic countries such as Azerbaijan (Pew Research Center 2012). Another study by the Pew Research Center in 2017 noted that 86% of immigrants between 2010-2016 are Muslim (Pew Research Center 2017). The Arab Spring that started in 2010 increased Muslim migration to the West as the crisis released many refugees worldwide (Gvosdev 2015) and the year 2015 witnessed a great refugee influx into Europe, mainly from Syria and Iraq (Rostan and Rostan 2019). The Pew Research Center study demonstrated that Muslims exceed 90% of the Syrian and Iraqi refugees to Europe. Diagram 1 below clarifies the estimated number of refugees and the Islamic affiliation percentage (Pew Research Center 2017) while Diagram 2 below shows the distribution of the Islamic population, the number of Islamic places of worship, and the migrant percentages in different European countries. The diagrams demonstrate that Germany and France are home to the highest number of Muslim people as compared to other countries in Europe.

Top 10 origins of refugees		
Syria	670,000	91%
Afghanistan	180,000	100
Iraq	150,000	92
Eritrea	120,000	37
Somalia	60,000	100
Iran	50,000	96
Pakistan	30,000	96
Nigeria	20,000	44
Russia	20,000	8
Sudan	20,000	91

Diagram 1:

Refugee origins between 2010 – 2017 in Europe. Source: (Pew Research Center 2017)

Country	Population (million)	Immigrants (million)	Muslims (million)	% of Muslim population	Mosques	Muslims × mosque
Germany	81.9	7.2	3.2–3.4	4.0	2,600	1269
France	65.4	4.9	4.2	6.5	2,100	1571
United Kingdom	61.8	4.8 ³	2.4	3.9	850–1,500 ⁴	2824–1600
Italy	60.2	3.9	1.3	2.2	764	1702
Spain	46.2	4.5	0.8–1	2.0	668	1347
Netherlands	16.5	3.1	1	6.1	432	2315
Greece	11.2	1.2	0.2–0.3	2.2	< 400	625
Portugal	10.7	0.3	0.04	0.4	33	1212
Belgium	10.6	1.0 ⁵	0.4–0.5	4.2	330	1364
Sweden	9.4	1.2	0.4	4.2	> 50	8000
Austria	8.4	0.9	0.3	3.6	> 200	1500
Switzerland	7.3	1.3	0.4	5.4	> 100	4000
Denmark	5.5	0.5	0.19	3.5	115	1652
Finland	5.4	0.09	0.04	0.7	30–40	1143
Norway	4.9	0.6	0.12	2.5	120	1000
Bosnia and Herzegovina	3.8	6	1.5	40.0	1,867	803

Diagram 2:

The number of Islamic worship spaces in the different European countries in 2010. Source: (Aksamija 2010)

There is no doubt that Islam is now an essential part of the Western context, which is predicted to bring changes to Europe's social, economic, political, and cultural aspects in the coming years (Rostan and Rostan 2019).

While Muslim immigrants are pressing to express their presence in the physical sphere of the European context, their divergent cultural identity, in turn, influenced the design features and styles of the designed mosques (Farrag 2017).

Funding bodies:

Financial funding and support are some of the major factors that influence mosque architecture in modern Europe; each mosque's construction, size, form, style, and decoration are directly proportional to the financial support the mosque receives (Farrag 2017). Governmental and non-governmental bodies of the Islamic world usually provide partial or complete financial support, especially from the petro-dollar countries (i.e., the Arabian Gulf countries, including Saudi Arabia), the Muslim World League, and the Turkish-Islamic Union for Religious Affairs (Khan, 1990; Farrag, 2017; Aksamija, 2010)) which leads to an increasing demand for Islamic buildings such as mosques and Islamic centres. Mosques play an important role in Islam and Muslim life. In several countries, in particular, the Western mosques are seen as a newcomer whose building type is both unique and foreign to local people who are unaccustomed to the visual expression of Islam in the West. The mosque is one of the most visual expressions of global Muslim religious identity in non-Muslim context. The significant numbers of countries have a lot of different architecture styles of their Islamic buildings. Each mosque has its own individual touch. The most important factors behind this variation in form and styles can be divided into nature impacts as (local materials and environment. Most of this support goes to the purpose-built Mosques in European capitals (Avcioglu 2007). Thus, individual donations, religious charitable organizations, and external funding are the main financial sources that support the design and development of new mosques in Europe (Farrag 2017). The architectural preferences of the funding

sources deeply influence mosque architecture. A prominent example of this influence is Imam Ali Mosque in Hamburg, Germany. The Mosque was built in 1973, taking on the Seljuk architectural style, a style that prevailed in what is now known as modern Iran, due to the Iranian origin of the group that funded the Mosque. It is noteworthy that the mosque was designed by a local German company (Verkaaik 2019; Avcioglu 2007).



Figure 4:

Imam Ali Mosque in Hamburg, Germany. source: (https://commons.wikimedia.org/wiki/File:Hamburg_Imam-Ali-Moschee_5.jpg)

A country's building regulations and laws: controlling visibility of Islam

Countries' building regulations and laws play an important role in the design of religious buildings in general due to the significant size and presence of these buildings. Mosque construction is being restricted in Europe for different reasons: potential increase in noise and traffic, potential infrastructure pressure, and potential contradiction in style a mosque may have with its surrounding European urban context (Farrag 2017; Green 2011; Allievi 2016; Cesari 2009) which leads to an increasing demand for Islamic buildings such as mosques and Islamic centres. Mosques play an important role in Islam and Muslim life. In several countries, in particular, the Western mosques are seen as a newcomer whose building type is both unique and foreign to local people who are unaccustomed to the visual expression of Islam in the West. The mosque is one of the most visual expressions of global Muslim religious identity in non-Muslim context. The significant numbers of countries have a lot of different architecture styles of their Islamic buildings. Each mosque has its own individual touch. The most important factors behind this variation in form and styles can be divided into nature impacts as (local materials and environment. Restrictions are increasingly practiced over mosque architecture in response to these concerns. For example, in Switzerland, minarets have been banned since 2009 after a Swiss referendum supported the banning of minarets (Göle

2011; Allen 2017). A similar referendum was issued in many other European countries such as Denmark, Italy, Germany and Slovakia to ban the Muslim traditional call to prayer (the Adhan) to reflect these countries' rejection of Muslim presentation in their built environment (Aksamija 2010). Interestingly, architects and designers reacted to this by writing the words of the Adhan on some Mosques' exterior walls (Krausen 2014). Calligraphy was re-introduced to Mosque architecture as a creative reaction to Adhan's absence from the soundscape of European cities.

Islamophobia and Mosque visibility: from acceptance to intolerance:

The ex-president of the US, Barak Obama, eloquently described the relationship between Islam and the West as follows:

"The relationship between Islam and the West includes centuries of co-existence and cooperation, but also conflict and religious wars. More recently, tension has been fed by colonialism that denied rights and opportunities to many Muslims and a Cold War in which Muslim-majority countries were too often treated as proxies without regard to their aspirations. Moreover, the sweeping change brought by modernity and globalization led many Muslims to view the West as hostile to the traditions of Islam" (Obama, 2009).

The calamity of September 11th 2001 increased the tension toward and attention to religious studies in general and Islam in particular, especially after the claims that an Islamic terror organization organized the attack (Hoover 2012). It was deemed to be an essential turning point in the Islamophobia phenomenon, which is identified as dislike, irrational fear, rejection, and violence against Muslim society, rituals, politics, and culture (Alraouf, 2011; Tankle, 2012; Allen, 2017; Narkowicz and Pędziwiatr, 2017; Martín-Muñoz, 2010; Allen, 2017).

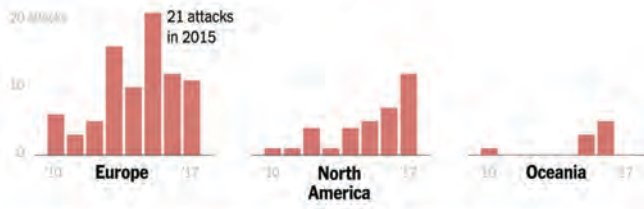
The 9/11 event raised concerns of Muslims for their safety and increased the attacks against mosques all across the world. Additionally, the considerable rise in the number of refugees as a result of the political circumstances in the Middle East led to population increases in Muslim communities in the West, paralleled with growing levels of Islamophobia, specifically in Europe (Green, 2011; Gvosdev, 2015). The absence of any significant sponsored and systematic integration of Muslim immigrants in the West and the devastating conditions of refugee camps housing Muslims led to further alienation of them (Gvosdev 2015); (Chinchilla, 2007).

Integration of Muslims within the West is now an urgency rather than an option (Abu-Zayd 2010) as there are now more than 20 million Muslims living in Europe under the fear of being attacked because of their religion (Chinchilla 2007). In 2017 alone, Germany recorded 1,413 verbal and physical attacks against visibly Muslim individuals as well as 71 mosque attacks (Bayrakli and Hafez 2017).

The concept of Mosque-phobia:

The Islamophobia phenomenon has given rise to a new phenomenon given the name 'mosque-phobia', which has the effect of subjecting, separating, and limiting the role of mosques, Islamic centers, and Muslims (Alraouf 2011). Alraouf (2011) defines mosque-phobia as the resistance of the Islamic physical appearance in the public sphere of the European context. The diagram below shows the increasing number of attacks on mosques between 2010 and 2017 in the western world.

Mosque Attacks in the West, 2010-2017



By Weiyi Cai | Source: Global Terrorism Database | Note: Includes attacks on Islamic centers and Muslim religious figures.

Diagram 3:

The increase of mosque attacks from 2010 to 2017. Source: (Ivanov, 2019)

According to Avcioglu, representing mosques in Europe’s public sphere is more difficult than representing any other religious building; even with the considerable population of Muslims across Europe, mosques are still seen as alien buildings that represent unwelcome culture and unwelcome nationalities (Avcioglu 2014). Cesari expressed the belief that the influence of the resistance to the construction of new mosques may be broader than the resistance to the mosque building itself; it’s a more in-depth socio-cultural resistance to transiting the minor Muslim society from the private sphere into the public one (Cesari 2005). The massive increase in the Muslim population in the West creates a critical need to (re)connect mosques and Muslim communities with the West by more creative and contemporary designs that capture the essence of Islam rather than convey specific architectural features traditionally associated with mosques (Alraouf 2011). This urgency can be seen in Western Muslims’ calls for focusing on the primary role of mosques in a time of mosque phobia, which is to reflect the values of Islam and to foster peace and tolerance among people. Consequently, western Muslims and mosque designers began to reshape western mosques, incorporating more contemporary forms in their design. This idea of reinventing mosque architecture to fit the context took many shapes through different times and cultures (Aksamija 2010; Khan 1990; Alraouf 2011; Haraty and Utaberta 2018; Narkowicz and Pędziwiatr 2017; Göle 2011). The following section examines the history of mosque architecture through case studies in modern Europe.

The reshaping of mosque architecture in the modern European context:

Contemporary mosques in the modern European context are divided into two different categories. The first category is mosques that are designed and built as mosques. This type usually occupies ample space in the urban fabric, featuring different architectural elements and ornamentation, and accommodating diverse cultural and religious activity related to Muslim communities. They are usually known as an Islamic center, “which has, in addition to the function of prayer and worship, a number of social and cultural functions through various forms of gathering (a Koranic school, courses, and opportunities for adults, women, and converts to meet; conferences and other educational and cultural activities)” (Aksamija 2010).

The second category is converted space, usually called Musallahs. They comprise mostly renovated spaces of basements or industrial structures converted for the use of Muslim communities. This type is characterized by its modesty: furnished

only with carpets, and slightly altered from the inside to accommodate a Minbar or simply to indicate the Qibla wall (Allievi 2016; Farrag 2017). The Mosque-phobia phenomenon usually targets visually obvious Islamic centers as well as purpose-built Mosques because they represent an unambiguous sign of Islamic community in a non-Muslim context and mark a move for Muslims from the private sphere to the public one (Green 2011; Cesari 2005). Recently, different movements in Europe calling for pluralism and globalization encouraged Muslims to exert their rights in Europe's public sphere under the terms of secularist legislation (Göle 2011; Avcioglu 2014). Consequently, the latter decades of the 20th century and the beginning of the 21st century have witnessed calls for more inclusive and modern mosque designs. More simple and straightforward models 'liberated' the mosque from its traditional elements added during different Islamic dynasties discussed earlier in this study (Elkhateeb et al. 2018; Frishman and Grabar 1995; Khan 1990).

Islam's only mosque architectural regulation was set by the Qur'an and the Prophet Mohammad (PBUH): for worshippers to face the Qibla direction while praying ((Al Kalifa 2017; Elkhateeb et al. 2018) Bin and Rasdi 2008). Accordingly, there is an increased recognition of the simplicity and modesty that the Prophet (PBUH) emphasized and encouraged in general, and a desire to extend this to mosque architecture: *"The Prophet preferred [his] followers to be simple, live in modesty and austerity, and one of the requirements is not to have buildings designed for anything more than the basic needs, as God will reward a believer with an affluent life in heaven including luxurious buildings"* (Islam 2000). Thus, there are no restrictions that limit the physical presentation of a Mosque as long as it is functionally suitable for performing the rituals of the daily prayers (Hoteit, 2015; Al Kalifa, 2017). The fundamental physical features of mosque architecture that were historically added and linked to the sanctity of mosques in people's perception are minarets, domes, arches, and Islamic decoration (Itewi 2007).

In line with Khan (1990), Verkaaik (2019) argued that religion's core lies in peoples' beliefs, faith, and rituals and not related to specific architectural features. Similarly, Alraouf (2011) argued for the need to reduce mosque phobia by incorporating mosque architecture within the contemporary context worldwide. Hotiet (2015) clarified that this incorporation should not compromise the spiritual and physical function of the mosque while accommodating new architectural trends (see also Bin and Al-Rasdi 2008). According to Allen (2017), new mosques in the West should reflect the critical situation and try to reduce the fear and the unacceptance of the *"otherness"* the west associates with Islam . Accordingly, many scholars have supported the concept of freeing the mosque from physical features that were historically associated to its architecture.

The production of contemporary mosques and their spiritual aspects:

As demonstrated above, mosque architecture is religiously bounded only by the Qibla direction, and the architectural features that are historically associated with mosque architecture were only cultural, structural and/or functional additions. This liberates mosque architecture from the abundance of architectural vocabularies associated with it. A mosque's sacredness lies beyond its architecture.

The development of mosque architecture through the different Islamic dynasties added different symbolic features to the spatial organizations of mosques; the features were added for different intentions such as a

representation of the economic and political power of the dynasty, the declaration of Islamic political presence in a certain region, and/or serving a congregational purpose in the main urban contexts as the most significant building politically and religiously. Muslims developed through time a psychological affiliation with certain architectural features, specifically domes and minarets (even certain shapes of domes and minarets), as comprising what constitute a proper mosque. These elements delimit the spiritual and visual aspects of mosque architecture. Due to this psychological/historical connection, the recent moves toward abstracting and reshaping the traditional mosque may be resisted among Muslims themselves in Muslim countries. However, such deviation in the West might be considered a move toward spatial and temporal integration with the 'other'.

The important role of the physical elements of Mosques in retaining the identity of Islam and facilitating a sense of nostalgia on the part of Muslims for their non-western origin and spirituality should not be underestimated. However, the spiritual aspects of mosques are directly related to the rituals performed in them that transcend the physicality of their architectural forms and their spatial configurations. Retaining the spiritual aspects of a mosque requires good environmental design treatments that correspond to site forces. For example, the implementation of light and shade design theory in designing the Bait Ur Rouf Mosque in Bangladesh retained the spiritual perspectives expected in any mosque while providing a contemporary design that is 'liberated' from traditional features of mosque architecture (figure 5). Despite the project's simplicity in concept and use of materials, the mosque won the Agha Khan award of 2016. Simplicity, and lack of traditional features, proved not to hinder the recognition of the mosque as being creative and ground breaking. Confidence in approaching the function of the mosque, rather than its function, with a sense of sacrality found its way among architects in such endeavours, and the form of mosques were reshaped either totally or partially as shown below:



Figure 5:
Bait Ur Rouf Mosque, an Agha Khan winner design in Bangladesh. Pictures source: (<https://www.dezeen.com/> 2017)

The totally deviated Mosque: this type of mosque design produces a new formation of the mosque that either abandons or reinvents some or all of the traditional elements in a creative way. This can be seen in the formation of the Cologne Mosque in Germany (Figure 6), as the mosque presents a fully deviated form of what is traditionally recognizable as a mosque. The formation of this mosque eliminates most of the Islamic design features in order to create a better integration with its German context. The mosque retained the element of minarets found in traditional mosques and presented them in a creative way, thus providing the mosque to inhabitants and visitors of Cologne as a landmark that is integrated with its surrounding skyline.



Figure 6:

The Cologne Mosque in Germany. Source: ([Http://mosqopedia.org/en/mosque/279](http://mosqopedia.org/en/mosque/279))

Another example of the totally deviated mosque type is Mosquée de la Duchère in Lyon, France. La Duchère is one of the most multicultural French cities as it hosts many working class people, including Muslims (Downing 2015). The mosque was reconstructed in 2015, and it is now more of a cultural center as it includes classrooms and a library in addition to its prayer rooms (Burlet 2016). The architecture represents an interesting reshaping of traditional features where the minaret was designed as a staircase that serves the different layers of the mosque, while at the top of the minaret we can see the conventional indication of Islam: the crescent. The building blends with the surrounding environment, and the small openings in the Qibla Wall can be seen as analogous to the openings found in Le Corbusier's Ron Champ cathedral, but reshaped and re-organized.



Figure 7: Mosquée de la Duchère, Lyon. Source: (Burlet 2016)

The partly deviated Mosque: this type of mosque design is the most common. It involves an integration of traditional mosque architecture with contemporary architecture that results in reproducing the traditional architectural features of the mosque in a novel way. This type of design is demonstrated in the proposed project of Marseille Grand Mosque in France (Figure 8). The proposed Mosque retains an Islamic identity but also capitalizes on contemporary construction technologies to recreate the traditional features using transparent materials to increase its visibility within the French urban context.



Figure 8: Marseille grand Mosque proposal, Form analysis. Source: ([Http://www.bamarchi.com/projets-chantiers-concours-bamarchi-p26-Grande-mosquEe-de-marseille.html](http://www.bamarchi.com/projets-chantiers-concours-bamarchi-p26-Grande-mosquEe-de-marseille.html), 2008).

Another example is the Penzburg Islamic Forum mosque in Penzburg, Germany. The mosque retains the rectangular shape of the traditional prayer zone but

differs by making the inner space transparent. Interestingly, the Qiblah Wall is fully transparent, creating a direct connection between the mosque and its surrounding space, and inherently between Muslims and their fellow citizens (figure 9).



Figure 9:

Penzberg Islamic Forum Mosque proposal. Source:(AlFozan 2019a)

The traditional Mosque: despite, or perhaps as a reaction to, the Islamophobia movements and the Mosque-phobia phenomenon, some contemporary mosques have retained the traditional physical appearance of mosques under the limitations and regulations that countries announced to limit Islamic presence in the European public sphere. As can be seen in the Al-Fateh Mosque in France, the mosque retained all the typical Islamic design features; it represents a clear and highly visible image of Islamic identity in the French context that cannot be overlooked (Figure 10).



Figure 10:

Al-Fateh Mosque. Source:(<https://alfozanaward.org/mosques/alfateh-grand-mosque/>, n.d.).

Conclusion:

In their examination of how architecture can be re-invented by “listening” to the situation without paying much attention to being part of any specific architectural movement, Lindstrom and Malpas (2021) describe the architecture of the Museum of Islamic Art in Doha as being based on:

“Resisting any quest for forms or motifs and, instead, actively ‘listening’ to the situation...with its rich and complex interrelatedness, including that of religion with culture, society, politics, and architecture; of severity with sunlight, shadow, color, and surface; of site with city, state, region, and world; and of each of these with the others and still more. The response to these bounds of place defies stylistic categorization...integrating with the larger region through a kind of separation and, thereby, becoming an unquestionably modern part of its situation without being part of its situation’s ‘modern’ sameness” (Lindstrom and Malpas 2021).

This applies to mosque architecture in the contemporary context of Islamophobia and the trials made to make architecture part of bridging the gap between Muslims and the West. The beginning of the 21st century brought a significant shift in Islam’s representation, specifically in the West; the calamity of September 11th, 2001 redefined Islam’s presence in many parts of the Western world. Although the term Islamophobia existed since WWI, September 11th marked the beginning of a different level of Islamophobia that now includes hate crimes against Muslims and mosques. The reshaping of the typical mosque architecture promotes bridging the gap between Muslims and the West. The reshaping of Islam-related architecture is required to maintain the spiritual and functional role of mosques while staying relevant to contemporary culture and the immediate built environment of which it forms a part. Literature proved that apart from the Qibla orientation, there are no specific religious requirements in mosque architecture. The physical restrictions were added through the

Mosque presentation's historical development and connected to the nostalgic experience of humanity's collective spiritual and visual perspective. This leaves room for creativity and the reinvention of mosques in contemporary contexts. With creativity, mosque architecture is expected to bridge the gap between Muslims and the West and re-establish mosques as part of the landscape and soundscape of cities worldwide.

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20 PROJECTS IN 20 YEARS: NEW MILLENNIUM MOSQUES OF RUSSIA



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Abstract

The report focuses on the largest mosques in Russia (20 projects with a capacity over 1,000 people) built between 1999 and 2019 in various regions of the country either with a predominantly Muslim population (Chechnya, Tatarstan, Bashkortostan, Dagestan, Ingushetia, Karachay-Cherkessia), or in the predominantly Russian regions (Moscow, Samara, the Rostov region). The rise of these projects was the result of the new administrative and financial capabilities of the Russian Muslims, the assertion of their religious and national identity and even some rivalry between the Islamic regions of the country. The strengthening of ties with co-religionists around the world, large historical and cultural projects supported by the Federal center were of prime importance also. The stylistic diversity of mosque architecture is the result of the history and taste preferences of the inhabitants of the respective Russian regions, as well as the results of international cooperation. The implementation of construction projects of this kind is closely connected with political processes both in Russia as a whole and in the Muslim regions of the country.

Keywords: Largest mosques in Russian Federation, 1,000 people and more, 1999—2019, Islamic architecture and the politics, Southern federal district, Volga federal district, Chechnya, Dagestan, Ingushetia, Karachay-Cherkessia, Tatarstan, Bashkortostan, Adygea, Moscow, Samara, Saratov, the Rostov region.

Islam is the second largest religion in the Russian Federation after Christianity. Followers of Islam live in almost all subjects of the country and belong to 40 different ethnic groups. 90% of Russian Muslims are Sunnis, Shiites make up 10% of their total number. Absolutely the most part of Muslims of Russia lives in nine subjects of Federation from 85 ones. These are the North Caucasus Federal district (Chechnya, Dagestan, Ingushetia, North Ossetia, Kabardino-Balkaria, Karachay-Cherkessia and Adygea) and the Volga Federal district (Tatarstan, Bashkortostan). Today, the number of Muslims is 12% of the country's population with the prospect of growth to 30% in 2030.

During the current religious revival, the number of mosques in the country has increased many times (from 870 in 1991 to 8000 in 2015). In a significant number of cases, we are talking about small quarterly mosques, but over the years, many truly monumental structures have been built. The rise of these projects was the result of the new administrative and financial capabilities of the Russian Muslims, the assertion of their religious and national identity and even some rivalry between the Islamic regions of the country. The strengthening of ties with co-religionists around the world, large historical and cultural projects supported by the Federal center were of prime importance also. We would like to analyze shortly 20 projects of the mosques with a capacity over 1,000 people built between 1999 and 2019 in various regions of the country.

The Southern federal district

The Southern federal district with a population of about 1646 thousand people (11.21 % of the population of Russia as of January 1, 2019) and an area of 448 thousand sq km (2.61 % of the territory of Russia) includes eight subjects of the Federation, different in composition of the population and the degree of industrial development. The Northern Caucasus part of it is the poorest one. It has the highest population growth in Russia. Most of the local budget funds are subsidies from the Federal center. At the same time, half of the largest architectural projects for the construction of mosques in Russia are connected with it.

The Chechen Republic which has now the population of about 1.5 million people and 71 place in Russia in gross regional product (out of 85) is the leader in the number of monumental buildings of a religious nature. The huge amounts annually allocated by the Federal budget contributed not only to the revival of Chechen villages and cities, but also created a reliable financial basis for a series of impressive construction projects in both civil and religious spheres. We are talking about five monumental mosques with a capacity of 30, 10, 5, 5 and 2 thousand people, respectively.

Among the most recent constructions of this type one can mention first of all the mosque "Pride of Muslims" named after the Prophet Muhammad, opened in the city of Shali quite recently, on August 23, 2019. According to Ramzan Kadyrov, the Head of the Chechen Republic, this mosque is currently the largest in Europe. The architectural composition of the mosque is mostly connected with the Arabic classics and a combination of Persian, Central Asian and Byzantine styles. The white mosque has four minarets 63 m high. The walls are decorated by the Thassian marble (Greece). Nearly the mosque one can find 12 fountains for ritual purification constructed in oriental style with marble arbors. The height of the dome of the mosque is 43 m. The author of the project is the Uzbek architect Abdukahar Turdiev. He was among the designers of the Hazrati Imam complex in Tashkent. The manufacture of carpet for the mosque was entrusted to a Turkish company.

Central mosque of the Republic continues to be the "Heart of Chechnya" named after Akhmad Kadyrov in Grozny, the capital of the Republic, which was opened on October 17, 2008. The Mosque is located on the picturesque banks of the river Sunzha in the mid of a huge park. It is built in the Ottoman neoclassical style. The Central hall of the mosque is covered with a huge dome (diameter — 16 m, height — 32 m). The height of four minarets is 63 m. They are ones of the highest minarets in the South of Russia. The exterior and interior walls of the mosque are decorated with travertine, and the interior is decorated with white marble. Capacity is more than ten thousand people. The same number of believers can pray in the summer gallery and square adjacent to the mosque. The mosque was painted and decorated by Turkish specialists. For the pattern painting (the patterns are made in the style of traditional Chechen ornaments "bustam"), synthetic and natural paints with special additives were used, thanks to which, according to experts, the mosque will retain the color scheme in the next 50 years. For patterns and ayat from the Qur'an the spraying of gold of the highest standard was used.

The mosque has 36 chandeliers. Their forms are reminiscent of the three shrines of Islam — 27 of them imitate the mosque Qubbat al-Sakhra in Jerusalem, eight are modeled the Mosque of the Prophet in Medina and the largest, 8-meter chandelier repeats the forms of al-Ka'bah al-Musharrafah in Mecca. Chandeliers, also decorated with Chechen ornament made of Swarovski crystals by the Turkish firm "Ustun Avize". *Mihrab* (8 m high and 4.6 m wide) is made of white marble. It creates the illusion of endless deepening intersecting spaces. Qur'anic *ayat* are skillfully woven into the overall ornament of the architectural decoration of the mosque. The vault of the main dome of the mosque is crowned with *surah* "Al-Ikhlās". The concept of the mosque lighting has three levels. The first level (the flood lighting) is providing the general illumination of the lower part of the structure and minarets. The second level is the accent lighting of architectural elements of the building. The third level is the festive lighting. This lighting solution allows visually raising the height of the minarets and making dynamic lighting on the central dome.

The mosque named after Aymani Kadyrova in the city of Argun (about

45 thousand residents) was opened on May 16, 2014. It is named after the widow of the first President of Chechnya Akhmat Kadyrov and was funded by the public fund named after Ahmat Kadyrov. The concept of the design is to symbolize and emphasize the human ability to conquer and overcome hardships. According to the Turkish architect Deniz Baykan, author of the project, the main slogan of the design was “yes, we can do everything for this country, if we believe it”. The opening ceremony was preceded by a marathon “From heart to heart”, in which more than five thousand residents of Chechnya and other republics of the North Caucasus ran 16.4 km from the mosque “Heart of Chechnya” in Grozny to the mosque named after Aymani Kadyrova in Argun. The construction began in 2011. It is created in high-tech style and it is the first mosque in Russia of this kind. During the day, depending on the weather, the arches of the mosque change shades of colors — from light gray to turquoise-blue. At night, the mosque and surrounding areas are illuminated with colorful led lights and spotlights.

The walls of the mosque are decorated with marble. The oval vaults of the main prayer hall are crowned by a dome 23 m high and 24 m in diameter. The names of the Almighty are engraved in the dome of the mosque. Illuminated murals are used in the interior decoration. Three 55 m minarets rise above the dome of the mosque. The crescent with a star is erected separately in front of the entrance to the mosque. A five-ton chandelier in the shape of a crescent measuring 31 m in diameter is suspended in the main prayer hall. The mosque consists of four floors, three of which (under an oval dome) are intended for men. The upper tier of the mosque is reserved for women and has a separate entrance. The mosque is designed for five thousand people, but together with the surrounding areas can accommodate up to 15 thousand. The mosque is adjacent to the park and has a library. Argun Mosque is surrounded by a complex of high-rise buildings called “Argun-City”. The construction of “Argun-city” started in 2011 and was designed by the same architect as the mosque as part of the large-scale reconstruction of the city¹.

The Sultan Delimkhanov mosque designed for five thousand people in Jalka village (around nine thousands residents) is the largest rural mosque in Europe. The opening of the mosque in 2011 is timed to the 60th anniversary of the first President of the Chechen Republic, Akhmat-Hadji Kadyrov. The mosque is named after a man whose sons (two of them are Heroes of Russia) play an important role in the politics and economy of the region. Adam Delimkhanov is a Deputy of the State Duma (Parliament) of the Russian Federation since December 2007. He is called in the press in different ways: “the future successor”, “a confidant of Kadyrov”. Anyhow he is one of the closest persons to the head of the Republic and perhaps the most influential person in Chechnya after Kadyrov. The mosque has four minarets and is made in Ottoman neoclassical style.

The Central mosque in the village of Alkhan-Yurt was built in 2012 and is named after a local resident, former mufti of Chechnya, theologian Magomed-Beshir-Hadji Arsanukayev who belonged to Naqshbandiyya. In 1992—1994 the village became a place of a sharp rivalry between different political forces, one of which was supported by Naqshbandiyya and the other by Qadiriya. Arsanukaev was ousted by the order of Dudayev, the first president of the self-proclaimed Chechen Republic of Ichkeria, who had launched an anti-Russian insurgency. Today, the village, which suffered greatly especially in the second

1 For details see: M. Darras. Argun Mosque. Third Cycle Short Listed Mosques Technical Report.

Chechen war, is home to about ten thousand people. According to the mosque architect Balaudi Magomadov, the Chechen businessman Adam Albakov suggested him to prepare the project of the mosque, spacious and at the same time elegant. The mosque consists of three volumes. It forms, although reminiscent of Oriental architecture, have been used since ancient times in Chechnya in the construction of large complexes. Therefore, the style in which the mosque was built Magomadov calls "purely Chechen". According to him it is impossible to find the second such mosque in the whole world. The main hall is designed for 1800 people, but in reality it can take up to 3000 believers without feeling of discomfort. In addition, the second hall can accommodate women who can see the Imam on the huge monitor. The mosque is very well equipped technically. This is due, in particular, to the fact that it will house two *madrassas* on the first floor — male and female, for 150 students each. The mosque is notable primarily for the fact that it was built not on state, but entirely on private money.

It is important that in many cases the creation of a monumental building of the mosque means the beginning of large-scale works on the renewal of urban and rural settlements. It is easy to see that the geographical locations of the new mosques as well as their names are closely related to the power structures of the Republic and its recent history. The construction of huge mosques, therefore, has primarily political and symbolic-power importance. This is especially evident in the example of the mosque named after Sultan Delimkhanov in the village of Jalka (designed for five thousand people with a population not reaching nine thousand). As we have seen, mosques in Chechnya are built in different architectural styles and by different architects. At the same time in many cases Turkish influence is visible and there is a wide involvement of Turkish firms in the construction and decoration of buildings.

In the Soviet times the Republic of Ingushetia constitutes one federation subject together with Chechnya. The Ingush are extremely close to the Chechens. From cultural and ethnographic point of view they can be considered a single people, but after the collapse of the USSR, the historical destinies of Chechnya and Ingushetia (now about half a million inhabitants) diverged. The latter escaped the deaths and destruction associated with the first and second Chechen wars, but at that time became an asylum for hundreds of thousands of refugees. Like Chechnya, Ingushetia is a subsidized region (Chechnya is 71st in Russia in terms of gross regional product, Ingushetia is 79th) and is heavily dependent on federal support.

The Central mosque of Nazran, the capital of the Republic of Ingushetia (about 120 thousand inhabitants), was built in 1996 and named in honor of Muhamad-Basir Ozdov, the first teacher of the Ingush Islamic Institute named after Imam Al-Shafi'i. Ozdov was killed during the Ossetian-Ingush conflict in 1992. In comparison to Chechen projects the Central mosque of Nazran is much more modest and accommodates about two thousand believers. It has one minaret, the dome looks like as if recessed into the roof of the building. In total, the city of Nazran has five large and about 15 small mosques.

Dagestan, neighboring Chechnya, is the largest subject of the North Caucasus Federal district (more than 3 million inhabitants, 32nd in Russia in terms of gross regional product). It has three monumental mosques built after 2000, with a total capacity, respectively, 15, 8 and 3.5 thousand worshippers.

First of all, it is, of course, the Central mosque or "Yusuf Bey Jami", located in Makhachkala, the capital of the Republic (more than 600 thousand residents in 2019). The mosque was built thanks to the help of one of the rich Turkish

families and erected by invited Turkish architects in the Ottoman neoclassical style close to Kocatepe mosque in Ankara². The mosque was built in 1997. Since 2005 it was reconstructed, and the number of believers attending the mosque at the same time increased from 8 to 15 thousand people. The whole construction consists of two minarets, each 42 m high, four small cupolas and one large main dome with a diameter of 21 m and a height of 35 m. The outer and inner walls are painted in white. It is two-storied building. The first floor is intended for men and the second for women. The male part is covered with green carpets, women pray on red ones. Temple walls, arches, vaults and columns are richly decorated (geometric patterns, stone carvings, abstract or floral ornaments, as well as Qur'anic *ayat*). Numerous chandeliers made of Damascus glass give a special beauty to the interior of the mosque.

The mosque named after Abdulhamid-Afandi from Inkho (also in Makhachkala) is associated with the name of a Sufi Sheikh who was engaged in mentoring in difficult atheistic times. He secretly opened *madrassah* in the basement of a private house in the city of Khasavyurt. It was this *madrassah* that trained many well-known Dagestan '*ulama*'. The opening of the mosque which was built on the initiative of the Dagestan mufti, Sheikh Ahmad-Hadji Abdullayev, took place on September 25, 2015. The building is decorated with two minarets. The height of the dome is 30 m. Its capacity is more than 3.5 thousand people. In architectural terms, the building combines elements typical of Cairo mosques of the 19th—20th centuries, and neo-Ottoman models.

Undoubtedly, the mosque named after Said Afandi Chirkei in the city of Kaspiysk (around 120 thousand of residents) is also of prime interest. The mosque is named after Said-Afandi of Chirkei, Naqshbandi and Shazili Sheikh and one of and one of the spiritual leaders of the Muslims of Dagestan, who along with six of his *murids* was killed by a suicide women-bomber. The mosque opening took place on February 9, 2013. Specialists from Syria were involved in the design and creation of the original interior. It is faced with local marble. The mosque capacity is around eight thousand believers. Construction has one white dome, little towers in four corners and one minaret. The building of the mosque was financed by Suleiman Kerimov, Lezgin by nationality, a Russian businessman and politician, in 1999—2007 — the Deputy of the State Duma (Parliament) of the Russian Federation, and since 2008 — the member of the Federation Council of the Federal Assembly of the Russian Federation (the Upper house of the Russian Parliament) from the Republic of Dagestan. He controls the financial and industrial group "Nafta Moscow". In 2019, Kerimov took the nineteenth position in the ranking of "Twenty richest Russian businessmen", published by the "Forbes" magazine.

It is important for us that in Dagestan, as in Chechnya, the names of the new mosques and the ideological connotations associated with them are directly refer to the recent history of the Republic. However, in contrast to Chechnya, Dagestan projects are much less financed from the federal budget.

The Central mosque of Cherkessk, the capital of the Karachay-Cherkess Republic (over 465 thousand inhabitants, 78th place in Russia in terms of gross regional product) was built in 2007—2013. Patrons of the construction were various individuals and legal entities as well as the Mayor's office of Cherkessk. The main features of the building are its size and the domes, delivered to Cherkessk from the city of Volgodonsk, where they were made at one of the

2 E. I. Kononenko. The Turkish mosques: between neoclassic and non-classic. Art studies. 2014. No. 3—4. P. 155—182 (in Russian).

enterprises of “Atomash”, Russia’s largest nuclear engineering corporation. A total of 33 domes of various heights and sizes were made. Their delivery to the administrative center of the Republic became an important event in the life of the city, as they were brought here on 20 long trucks. The Central mosque (white stone, green domes and spires of minarets) occupies a huge area, more than four thousand square meters. The building allows almost five thousand believers to pray simultaneously. The architectural style is mostly the Byzantine one, supplemented by elements of the classic Muslim architecture. However, the Circassian mosque is not like any Turkish one. It is clearly possible to distinguish in its decoration elements the features of the national Caucasian style. The height of the temple is 32 m, four minarets are 52 m high. The mosque has 220 windows, which makes the building very bright inside and visually spacious. Outside, such a number of windows give the three-floor mosque a unique appearance. The main dome has a diameter of 18 m, the other domes are placed on the galleries of the building.

The Cathedral mosque of the city of Maikop, the capital of the Republic of Adygea, is also the residence of the Spiritual administration of Muslims of the Republic of Adygea and Krasnodar region. Maikop (over 140 thousand inhabitants) is a predominantly Russian city (over 70% of the population, Adyghe people make up about 19% of its inhabitants). The Republic of Adygea (76th place in Russia by regional gross product) is a part of the Southern federal district. This is the only region of Russia located inside another region —the territory of the Republic is surrounded by the territory of the Krasnodar Kray. The mosque was built on the initiative of the Republic administration in just 18 months in 1999—2000. The construction was carried out at the personal expense of Khalid Bin Saqr al-Qassimi, Crown Prince of Ras al-Khaimah. The project of the building was prepared by Abdulakh Bersirov, the Honored artist of the Republic of Adygea. The external facade of the mosque is made of white stone. The domes and tops of the minarets are bright blue, symbolizing the sky. There are five domes, the main one is located in the center of the building and is surrounded by four smaller ones, followed by four minarets. The inner walls of the mosque are decorated with ayat from the Qur’an. The capacity of the mosque is 1000 people.

Rostov-on-Don, the largest city in the South-West of Russia, the administrative center of the Southern Federal district and the Rostov region. It is the tenth most populous city in Russia with population of more than 1133 thousand people in 2019. The city is a major administrative, economic, cultural, scientific, educational, industrial center and the most important transport hub of the South of Russia. Informally, Rostov is called the “Gateway of the Caucasus” and the southern capital of Russia. Russians make up over 90% of the city’s population, Muslims (primarily Tatars and Azerbaijanis) consist 1.1% of its population. The city has about forty Orthodox, Armenian Apostolic, Greek Catholic and Protestant churches, a synagogue, two Buddhist centers and a Cathedral mosque. The mosque was built in 2000—2003 by local architect B. K. Nogarbekov and with financial support provided by the Turkish patrons of Rostov Muslims. The project is designed in a simple and laconic style, with one 27 m minaret. It accommodates up to 1.5 thousands believers. On the ground floor of the mosque one can find a prayer hall for women, two Sunday school classes and rooms for ritual ablution. The entire second floor is occupied by a men’s prayer hall. The floors of the mosque are lined with the Turkish carpets. There is a system of heating: in winter the floor temperature rises to 37 degrees. The tall windows from floor to ceiling are looking to the four sides. They are decorated with patterned bars. A huge chandelier with 830 bulbs is the centre-piece of the interior finish. The prayer hall is lit by four side chandeliers also. An artist from Turkey was invited to paint the walls (ornaments and Qur’anic ayat).

Saratov Cathedral mosque is the main Muslim temple of Saratov was revived in 2005. Here now is also the residence of the Spiritual administration of Muslims of the Saratov region (part of the Southern federal district). The mosque has a library and *madrasah* named “Sheikh Said”. Saratov (about 900 thousand inhabitants, 91.6% of the inhabitants are Russians) is one of the leading centers of higher education, research and project activities. In addition to one of the oldest universities in Russia, there are more than two dozen universities. Mechanical engineering, oil and chemical industries are developed. Tatar settlements in the borders of modern Saratov appeared in the 17th—18th centuries. The first stone mosque was opened here in 1836. Later, a new mosque was built on the same site. It was existed until the 1930s, when the Soviet authorities began to persecute representatives of various religions. The temple was closed, and then the building was partially destroyed. Only in 1989 the mosque was returned to the Muslims. It was decided to destroy the dilapidated building and to build in its place a new one. The new mosque has two domes and a minaret with a height of 46 m. A characteristic feature of its external appearance is the alternation of red and white brick strips. The prayer hall has an area of more than 500 sq m. The mosque capacity is over 1000 people.

Volga Federal district

According to the 2002 census, the population of the Volga Federal district is 31 million people with 18.4% Muslims, primarily Tatars (over 4 million people) and Bashkirs (1.4 million people) among them. The Volga Federal district share of industrial production in the Russian economy is 23.9% — this is the highest figures. The Republic of Tatarstan is one of the technologically developed and richest regions of Russia (with the population about four million people and the eighth place in Russia in terms of gross regional product). It is not surprising that four monumental mosques with a capacity of 3, 1.5, 1.2 and 1 thousand people respectively were built on the territory of the Republic.

Since 2005, the main Cathedral mosque of the Republic of Tatarstan and the city of Kazan is the Kul-Sharif mosque, located on the territory of the Kazan Kremlin. The construction of the temple was started in 1996 by the local architects Sh. Latypov, M. Safronov, A. Sattarov and I. Sayfullin as a recreation of the image of the legendary multi-minaret mosque of the capital of the Kazan khanate. The opening of the mosque took place on June 24, 2005 and was connected with the 1000th anniversary of Kazan. In terms of the construction the Kul-Sharif presents two squares superimposed on each other at an angle of 45° and forming an important Islamic symbol of “the Blessing of Allah”. The lancet arches with Qur’anic ayat and elements of traditional Tatar ornament are the important feature of the building. In the crosshairs one can find tall stained glass windows. Four 55-meter main minarets rise at the corners of the main building. They are complemented by two small minarets and two minarets at the entrance — so many towers were at the ancient Khan’s mosque

The dome (36 m high and 17.5 m in diameter) is decorated with the forms associated with the image and decorative details of the “Kazan cap”, the gold filigree crown, one of the regalia of the Russian tsars. This crown was made for the Russian Tsar Ivan Vasilyevich immediately after the conquest and accession of the Kazan khanate to the Moscow state (1552) and the adoption of the title of “Tsar Ivan of Kazan”. There is a legend that it was made by jewelers of the conquered khanate.

The architectural multi-minaret solution of the appearance of the mosque was achieved through the development of semantic elements that bring the architecture of the mosque closer to local traditions. Granite and marble were brought from the Urals, the interior-carpet is the gift of the government of Iran, and colored crystal chandelier with a diameter of five meters and weighing almost two tons were made in the Czech Republic. The building of the mosque is faced with white marble (at sunset casting pinkish tones). The dome and spires of the minarets have a turquoise color. The facade of the main building is decorated with bronze inscriptions. Decorative paving tiles with green and red ornaments (in the colors of the flag of Tatarstan) are laid on the square-yard. The mosque has a spectacular night architectural illumination.

In 2021, Russia will widely celebrate the 1100th anniversary of the adoption of Islam by the Volga Bulgaria. Tatarstan began to prepare for this date in the early 2010s. So, the “White mosque” was built in the city of Bolgar. The snow-white and cream complex was erected in record-breaking time (2010—2012) by Sergei Shakurov, an architect from Kazan. The building of the mosque is crowned with three domes and two minarets with a height of 47 m. The inner height of the main dome is 17 m, its diameter is 9 m. The drum of the main dome is decorated with sixteen stained glass windows. The minarets of the Bolgar mosque largely repeat the style of the minarets of the Prophet’s Medina Mosque. It was the first Tatarstan President Mintimer Shaimiev who insisted on

this, saying that he wanted to create a mosque similar to the Medina one, “but cozier and less ambitious”.

On the walls of the white mosque one can see the classic Islamic decorative ornaments (arabesques, *mukarnas*, tulips, geometric shapes). Thanks to the diffused lighting, a special prayer atmosphere is created in the two-level prayer hall. The area of the hall is 180 sq m. Here one can find a massive chandelier. The diameter of the chandelier is 25 m. All entrances to the building are framed by columns with the crescents on top of which. More than twelve hundred thousand tons of marble were used in the construction. The buildings of the mosque are built in the form of a square. Between them is an open area (*musalla*) with the area of 1.5 thousand square meters and surrounded by the park. The square in front of the mosque is paved with granite. It also has a symbolic meaning. It is based on the image of Chahar Bagh, a Garden of Eden, which is divided by rivers into four parts. An artificial pond has been created in the center of the square. It is mirroring the entire mosque. The square is framed by a kind of arcade, including 88 white marble columns. An open arcade allows mosque visitors to observe the excavations of the ancient city, the capital of the Volga Bulgarians. In 2016, the Bulgarian Islamic Academy opened its doors near the mosque. It is a scientific, theological and educational center of all-Russian significance established by leading Muslim organizations of Russia.

Both mentioned above mosques built in Tatarstan became symbols of the Republic’s special position within Russia, which was virtually semi-independent during Yeltsin’s reign. Here it is necessary to pay attention to the fact that the symbolism associated with these mosques refers to the deep past of the history of the whole of Russia, and not to recent events, as in the Caucasus. Within the Russian Empire, the Tatars played an important role, for example, in the islamization of the steppes of Central Asia and Southern Siberia. It was Tatar intellectuals who played a major role in the Islamic revival, which at the turn of the 19th—20th centuries gave to the world a galaxy of outstanding Islamic thinkers. In architectural terms, the largest mosques of Tatarstan are examples of mixing, combining and heterogeneous styles. It is important that they are designed by local architects.

Nizhnekamsk Cathedral mosque is the central Muslim temple of Nizhnekamsk (238 thousand inhabitants). It was built in 1989—1996 and was opened on the eve of the thirtieth anniversary of the city (architects R. I. Makuev and F. G. Khanov, designer I. Sabitov). The temple is a religious complex, which carries out additional cultural and educational functions. It includes a culture and history center, library, hotel and other services. The Cathedral mosque is located in an open square, next to a high-rise residential building. It belongs to the modern cult buildings with unconventional spatial composition and stands out for its original appearance: when choosing an architectural solution, R. I. Makuyev and F. G. Khanov leaned towards modern forms, organic for the city in which young people live. The mosque accommodates one thousand people and has one prayer hall, a gable roof (has no dome) and a corner setting of four minarets with a height of 66 meters, which makes it one of the highest in Russia. Square in plan minarets are cut by arched openings. In general, the mosque reflects the neo-romantic trend of modern Tatar architecture. The total area of the mosque is 2.5 thousand sq m, the area of the main prayer hall is 900 m.

Here it is necessary to mention the mosque named after R. G. Galeev in Almetyevsk (about 158 thousand inhabitants). It is named after Rinat Galeev (1939—2007), former Chairman of the Board of Directors of JSC “Tatneft”, a large oil company that ranks fifth in Russia in terms of oil production. The

company's headquarters is located in Almetyevsk. Galeev made a great personal contribution to the creation of the mosque, built in 1990—1999 by the local architects A. M. Zakirov and F. M. Mavlyutov and engineers S. S. Abdullin, A.A. Gareev, V. I. Maslova. The mosque is located on a plot with a relief difference of 10 m. It belongs to the type of domed mosques with the main minaret on the roof. It is a three / four-storey brick building, in the southern half of which there is a prayer hall for 1200 persons, covered with a high dome. In the Northern half there is a conference hall and auxiliary rooms. Classrooms are located on the ground floor of both halves of the building. The main minaret with a height of 53.5 m rises above the Northern half of the building. At the building corners one can find octagonal minarets with a height of 36.2 m, and a gilded dome rises above the flat roof. In the interior of the hall, the walls, ceiling, and inner surface of the dome are ornamented with colored tiles. The second level windows on the dome drum are decorated with colourful stained glass.

Bashkortostan is one of the most developed subjects of the Russian Federation, ranks 10th in terms of gross regional product in the country and first among Russian republics in terms of population (with Bashkirs — 29.5% and Tatars — 25.4%). One of the attractions of Ufa, the capital of Bashkortostan, is the Cathedral mosque "Lala-Tulip". It was built in 1989—1998 by the local architect V. Davletshin. The building is at the same time laconic, elegant and very well inscribed in a park complex³. The construction includes the main building (21 m) in the form of a blooming Tulip and two 53-meter white minarets, similar in appearance to the buds. The building consists of three floors. At the top there is a prayer hall for 500—600 persons, and a balcony for women (it can accommodate about 200—300 persons). During major holidays it is possible to use all the space of the building giving the possibility to one thousand believers to take part in the common prayer. The entrances to the prayer halls for men and women are different. Stained glass windows are really well done. The walls of the mosque are covered with marble and serpentine. According to its architect the modern appearance of the temple should make it more attractive to young people. The original architectural form of the mosque "Lala-Tulip" is quite dynamic, but at the same time it is balanced. Especially unusual to the Eurasian view is the main volume, which gives rise to associations with the characteristic silhouette of "Finnish houses" (gable roof, starting from the ground) or bold avant-garde experiments with the form of modern Catholic churches in Europe and the United States. Some critics even saw in the plan of the building "a cross visible from the sky".

The construction of the second Cathedral mosque in Ufa continues today. The mosque named "Al-Rahim" was founded in the fall of 2007 in honor of the 450th anniversary of the entry of Bashkiria into Russia. In the summer of 2019 (after three years of downtime) construction work was resumed. The mosque is made with the use of local motifs in its design. The building is planned in the form of a huge Khan's tent with a gilded glass dome having the texture of honeycombs. Minarets symbolize spearheads or arrows. Elements of Bashkir ornament will be used in the design. The size of the building is impressive. The diameter of the dome is 23 m, its height is 46 m, the height of four minarets is almost 77 m. According to the plan the transparent gilded dome should look soaring between four minarets of impressive height, crowned with crescents. The men's hall is designed for 1200 persons, the women's — for 400. During major holidays, it is possible to use all the space: lobby, observation decks. Thus, the total capacity can reach up to five thousand believers.

3 S. M. Chervonnaya. Art and Religion: Contemporary Islamic Art of the Peoples of Russia. Moscow: Progress-Tradition, 2008. P. 253.

We have written above about mosques built in cities with predominantly Muslim populations, but huge projects of mosques have been implemented in Russian cities, such as Samara, for example. The Volga Federal district also includes the Samara region. Samara (more than 1160 thousand inhabitants in 2019, of which 90% are Russian) is one of the main scientific centers of the country (mainly in the space and aviation fields). But, in addition, the city is known for its research institutes, working both for the benefit of mechanical engineering, metalworking and the agricultural industry. Samara is a multi-confessional city. One can find in it many Orthodox, Old believer Christian, Catholic, Protestant and Armenian churches, houses of worship of Baptists and Pentecostals, mosques, as well as Jewish choral synagogue. The majority of believers in Samara are Orthodox Christians.

The first Muslims were settled in Samara at the end of the 16th century. The first mosque was built here in 1856. In 1907 the city Council decided to build a second mosque. The new Samara Cathedral mosque was opened on November 28, 1999. The project of a brick building was prepared by Rasim Valsin, the local architect. It is a parallelepiped with a minaret of 67 m high and a dome of 13.5 m in diameter. The mosque's capacity is about five thousand worshippers. First of all the mosque visitors are struck by the embodiment of the idea of its *mihrab*, which is built of white marble. If you look from the prayer hall towards the *mihrab* in the daytime, you get the impression that it is illuminated by scattered rays. This effect is achieved by stained glass windows. The entrance to the prayer hall is decorated in the same way.

The fence is a special architectural element of the mosque complex composition. Laid out of red bricks, more than 500 m long and 2.5 m high, it architecturally loops the composition of all the objects of the Cathedral mosque. The fence is decorated by patterned bars with the image of a crescent. The pillars have small domes on the top. The recreation park with the apple trees, grapes, shrub trees and flower beds was created on the mosque territory.

And finally, the Moscow Cathedral mosque, which is built on the site of the former, the creation of which dates back to 1904. The new building was erected in 2011—2015 by architect A. Kopenyev (chief artist is I. Tazhiev). It is a six-storey building in the Byzantine style with several different-sized minarets, turrets and domes. The height of the main dome covered with gold leaf is 46 m, the diameter is 27 m. The two main minarets have a height of 78 m. The small minaret which is located above the historical part of the complex is crowned by a crescent, preserved from the old building. The roof and turrets are painted in a bluish-green color, like the first Moscow mosque. The capacity can reach 10 thousand worshippers.

The unusual appearance of the mosque is the result of an original combination of techniques of Muslim and Old Russian architecture⁴: the main Golden dome of bulbous outlines introduces the mosque in a number of Moscow churches, and the main minarets at the same time resemble the Syuyumbike tower of Kazan as well as the towers of the Moscow Kremlin. This symbiosis of different forms emphasizes the modern role of Moscow as the capital of a single multinational and multi-confessional state.

Similar directions in the search for the modern path in the religious construction of the two most widespread religions of Russia are the visible embodiment of this unity. This applies not only to huge projects, but also

4 O. I. Golovanova Searching for one's own way in the temple architecture of modern Russia. Culture and art in the modern educational space. Materials of the II All-Russian scientific-practical conference. Ed. by T. V. Ludanova. Kostroma: Kostroma State University, 2018. P. 18 (in Russian).

to many small mosques built in Russia from the Far North to the Far East. Currently everywhere in the mosques construction the old and traditional local technologies proven for centuries in the construction of churches are actively used. Returning to the projects presented here, it should be noted that, in the author's opinion, the most successful of them were those in which architects received the greatest possible freedom of expression (Argun mosque and "Lala-Tulip" mosque in Ufa), and those in which the local traditions of temple architecture were used to the greatest extent (Moscow Cathedral mosque, Central mosque in Alkhan-Yurt).



IMAGINING A REGIONAL IDENTITY: CONTEMPORARY KASHMIRI MOSQUE AS A STUDY



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ABSTRACT:

The Islamic religious architecture of Kashmir is a material witness to the syncretic cultural traditions linked with Islam in this northern most part of South Asia. The architectural proclivities associated with this tradition are represented by a vast outpouring of religious buildings: khānaqāh, shrines, and, importantly, mosques. Mostly constructed of wood, these buildings are an important cultural link between native building traditions pre-dating the advent of Muslim rule in the region in the fourteenth century and cultural exchanges between Kashmir and the Turko-Persianate world thereafter. The materiality of these historical mosques is the most visible material manifestation of a transcendent Kashmiri identity which transcends the established non-native building traditions linked with the Muslim faith as seen in the rest of South Asia.

However, the march toward modernity and globalization during the last century has resulted in an erosion of this native architectural tradition. In a search for a pan-Islamic architectural form, Kashmiri mosques are being constructed in a non-native architectural idiom: with domes and minarets. These new mosques, which are alien to the historical landscape of the region are a conscious attempt to visually integrate new mosque construction with a homogenous vision of an Islamic religious architecture, ignoring the peculiarities of the region's own native architectural traditions. This paper contrasts the narrative of native identity as represented by historical Kashmiri mosques with the religious spaces under construction today. It seeks to examine the reasons for this architectural 'otherness' and what this loss means both for the region and as a part of wider architectural debate that includes change, continuity, and context.

INTRODUCTION: FORMATION OF KASHMIRI SULTANATE AND ITS SYNCRETIC CULTURE

Unlike many other regions of South Asia, the transfer of authority to a Muslim rulership in Kashmir was neither a result of invasion nor of armed conflict. The transfer of authority was the result of subtle transformations in the Kashmiri society over time. Located in the northernmost folds of the Himalayas, during much of medieval period Kashmir emerged as one of the last cultural outposts of Indic learning, before crossing the Karakoram into the vast plains of Central Asia and into Tibet. At one time during the eleventh century when northern India was under military pressure from annual military expeditions of the Ghaznavids, Kashmir self-isolated itself by closing the mountain passes that lead into the plains of South Asia¹. Still, due to its geography, Kashmir found itself on one of the branches of the Silk route leading into the plains of South Asia, and as such was never totally devoid of external influences. The land was not only a recipient of traditions from the east, of China and Tibet, but at various points of its history Kashmir also formed a part of wider non-Kashmiri empires like that of the Mauryas under Ashoka, the Kushans under Kanishka, the White Huns² or the Mughal in the medieval period. This resulted not only in the introduction of foreign elements into the overall cultural and social life of the inhabitants of the region, but it also resulted in a certain cross fertilization of ideas, rendering Kashmir a cultural melting pot. Nevertheless, such a fusion, such synthesis, always reflected a sense of continuity with the past, culturally as well as politically, reinforcing the Kashmir self-image of being unique and distinct.

The first Muslim ruler of Kashmir, Rinchana, was a Buddhist chieftain who had established himself in Kashmir because of internal divisions within the local polity. The conversion of Rinchana to Islam was a result of the preaching of a reclusive Muslim saint, Bulbul Shah (1327CE/ 727AH)³, a sayyid hailing from Ardebil in Iran, who had settled down in Kashmir. Unfortunately, the accounts of Bulbul Shah as well those of early Muslim rule in Kashmir are lost in obscurity. A study of available historical and hagiographical accounts indicates gradual inroads into Kashmir made by Muslim preachers and men of letters hailing

from the Persianate world. These preachers and men of letters emerged as catalysts for not only the conversion process but also the evolution of a new cultural ethos in Kashmir. The brief but historically significant rule of Rinchana was followed by the establishment of the Shahmiri Sultanate (1339-1555CE). During much of the fifteenth century under the Shahmiri's and then under the Chak Sultans (1555-1558CE), Kashmiri witnessed the efflorescence of its Muslim material culture rooted in native pre-Islamic traditions. This was also witnessed in the wider field of Muslim religious architecture, in the designing of mosques, khanqahs, and shrines. While this period also marked a significant borrowing of motifs, designs, and ideas from the wider Persianate world, the basic design was marked by Kashmir's native architectural predilections as seen in its Hindu and Buddhist past. Catering to the nascent Muslim community of Kashmir, the mosques invariably tended to be cuboidal in volume, surmounted by a wooden spire and pyramidal roof. The typical shape of the roof, the finale, as well as the trefoil- window openings and some of the stone detailing in plinth and entrance portico followed the same detailing as that of medieval stone temples. The only significant departure was the absence of iconography depicting human figures – this in many instances was replaced by basic epigraphic stone panels – invariably in *thuluth* or *kufic* style.

The Kashmiri Sultanate collapsed in 1558 when the region was overrun by the armies of the Mughal emperor, Akbar (1556-1605CE), resulting in the incorporation of this mountain kingdom into an empire operating from Delhi and Agra in the Indian plains. Mughal architecture, with its tradition of Timurid sensibilities, became the new *tarah* for designing mosques and shrines in Kashmir, under the imperial Mughal patronage. Built with stone and masonry, employing an arcuate system of construction, this new architectural style found little favour with the native Kashmiri community, especially in the designing of mosques and shrines. The collapse of Mughal rule in Kashmir in the 18th century marked a subtle change in the cultural landscape of the region. While the memory of a rich and munificent empire remained a forgotten experience of the past, isolated architectural elements linked with the Mughal architectural vocabulary, like the baluster column (*sarv tham*) and the so-called Shah Jehani cusped arches were beautifully rendered in wood in the design of mosques, shrines, and residences.

SHIFTS IN THE TWENTIETH CENTURY:

Within South Asia, Muslim religious architecture constructed after the decline of the Mughal Empire in the nineteenth century has largely remained on the periphery of academic research and investigation. Our understanding of mosque architecture, especially in Northern India has remained confined to the heydays of the Mughal Empire, stretching from the sixteenth to seventeenth century. The steady decline of the Mughal Empire in the nineteenth century, leading up to the collapse of the last remaining vestiges of Mughal authority in 1857, is seen not only as a period of political decay but also as one with the degeneration of art and architecture, especially in North India.

Yet, across North India from Ladakh and Kashmir in the Himalayas to the plains of Punjab bordering the imperial Mughal city of Delhi, Muslim communities continued to operate under diverse political domains. And within these communities, a range of mosques continued to be built, fulfilling the communities' religious needs. While the neighbourhood mosque (*mohalla*) remains the most ubiquitous manifestation of this demand, we also find instances of major congregational mosques being constructed. Unlike the *mohalla* mosque whose construction and maintenance were dependent upon the local community, the congregational mosques continued to be patronized

by those from the nobility as well individuals with a link to mercantile wealth. These congregational mosques were distinct from the *Jamia Masjid*s (Friday Mosques), which were linked in patronage to the political authority of the emperor and kings. Forming a unique, and so far, unexplored typology, these mosques constructed in the nineteenth century represent an interesting synthesis of monumental and vernacular, with stylistic variations representing reworking of older, established Mughal motifs in a regional idiom. Additionally, they also mark an increasing presence of a European style in decoration ranging from elements of Baroque to those associated with the hybrid Indo-Saracenic style, favoured by the British as part of their colonial outreach. Constructed at a period which marks the regions transition to colonial rule, these buildings also reflect a wide community of patronage, from the members of the surviving old noble class to newer sources of patronage derived from mercantile wealth, including merchants, traders and businessmen.

The thriving wealthy principalities which these mosques functioned would soon be rendered desolate and scarred with the violence unleashed in the aftermath of the withdrawal of the British from the subcontinent. The partitioning of the subcontinent in 1947 saw massive and violent migrations of people across the northern plains. Meanwhile, Kashmir, which escaped the horrors of the Partition, continued to build mosques in the manner they had built them for centuries. Basically, cuboidal in volume, these two to three storey structures continued to be a hybrid of brick and wooden masonry using a trabeated system of construction. Tre-foil arches were first seen in early fifteen century mosques of Kashmir.

Traditional architectural features and elements continued to be used in designing or redesigning of Muslim religious places in the post-1947 period, with a few subtle changes. The more monumental wooden construction system, such as the one employed in the construction of the *Khānaqāh-i Naqshbandī* mosque, was proving to be increasingly unsuitable given the vast amount of wood required in its construction. The wooden trabeated system had, in the initial years of the community, found favour with Muslim builders because of the ease of its construction. The same was now replaced by a more effective and economical load-bearing masonry construction involving the use of standard metric brick that had been introduced in the region by the British in the twentieth century CE. Much of the European colonial influence that had made its way into the local vernacular of Kashmir in the late nineteenth and early twentieth century CE, was also transmitted into the building of mosques and shrines. An especially fine example of this transfer of ideas can be seen in two important mosques of Srinagar: one mosque located near the shrine of Alam Sahab at Narwara and the other the *Kanil Masjid* mosque at Maharaj Gunj.

Also, in the post-Independence period, we see that within the wide field of Muslim religious architecture in Kashmir, there was a great focus on the construction of mosques. While some of this was understandable as part of the urbanization process experienced by the cities and towns of Kashmir, yet given the resources spent on the construction and embellishment of the buildings, it can also be seen as a reworking of the outpouring of Muslim religiosity. The heart of Kashmiri Muslim culture had revolved around shrines and *khanāqahs*, not mosques. This in earlier times had earned the Kashmiri Muslims the unsympathetic sobriquet of being *pir parast* (saint worshippers).

Given that many of the older surviving mosques of this period were either in a dilapidated condition or hardly differentiable from the surrounding residences, an age of experimentation began in the designing of mosques, in certain cases involving the services of qualified engineers. This involved treatment

of building façades in a new eclectic style with the juxtaposition of local as well as imported elements. The main mosques at Habba Kadal chowk and Saraf Kadal, both of which were located on prominent junctions of the city, were designed in this style. Their design included a combination of Dutch gable, arched windows, and in the case of the Habba Kadal mosque, a dome-shaped pavilion and minarets. Nevertheless, the architectural landscape of the region comprising its mosques, khanaqahs, shrines and imambadas remained mostly unchanged. Up to the time of the reconstruction of the Asar-i Sharif at Hazratbal, we can observe in the Muslim religious architecture of Kashmir a creeping spirit of innovation, although no distinct dichotomy between the past and the prevailing architectural traditions had yet taken place.

It was the reconstruction of the Hazratbal shrine in the 1970s that marked a paradigm shift in the Islamic religious architecture of Kashmir. The project was undertaken in the 1970s by Shakyh Muhammad Abdullah (d. 1984 CE) after his return from a tour of West Asian countries and completion of the Hajj pilgrimage. Aside from the political implications behind the shrine's reconstruction and its ramifications on Shaykh Abdullah's personal standing within the Kashmiri Muslim community, there is the question of architectural imagery involved in the construction of this highly revered shrine. Shaykh Abdullah had emerged in the 1930's as the spokesman for the Kashmiri Muslim community in their struggle against the Dogra regime. During this struggle for freedom, Shaykh Abdullah aligned with the Indian National Congress and was instrumental in Kashmir's accession with India in 1947. At some point between the 1930's and 1940's, he transformed from being a leader of the Muslim community to the spokesman of Kashmir, which was reflected in his party's vision for Kashmir enshrined in a document, *Naya Kashmir* (New Kashmir). As a pan-Kashmiri leader, Shaykh Abdullah and his party were representatives of a sense of Kashmiri identity – Kashmiri nationhood. Yet, in designing the Hazratbal shrine, a process that he was deeply involved with, no respect was shown for native-local architectural sensibilities. Known as *Madina-i Sani* (The Second Madina), the building design was based on a contemporary reworking of elements of Mughal architecture in a canvas which would appeal to modern architectural sensibilities given the building's clear and distinct lines. The new building at Hazratbal with its bulbous white marble dome, marble *chattris*, and slender single minaret, also showcased the appeal of a more widely recognizable Islamic building, an appeal which became more widespread with each passing decade.

Unfortunately, though the Hazratbal project was completed with public donations, no public discourse ever took place on its architectural language. What has been written about the project relates to its political importance. The architecture of the shrine itself has largely remained untouched. The redesign of the Hazratbal shrine was based on a universalist pan-Islamic inspiration that ignored centuries of what can be understood as particularist realities rooted in the experience of Islam in Kashmir.

The formulation of the shrine's new design was undertaken by the architect in consultation with the spirit behind the project – Shaykh Abdullah. Should the design be seen as an attempt by its patrons to evoke an image that they believed was more Islamic than what was being replaced? Or did it represent a notion of novelty, simply of doing something new as compared to what was there before? Or was the symbolic association between the shrine and the Prophet's shrine in al-Madina the guiding factor which weighed on the design process?

The reconstruction of the Hazratbal shrine in the 1970s in a modern and a non-Kashmiri architectural idiom did not start a public debate on what should be the 'physical' form of future Muslim religious buildings of Kashmir. But it did

offer the Kashmiri Muslim community with a new visual image – a new design pattern to employ in the construction of its religious places. The new shrine building emerged as a prototype that would, in coming years, increasingly influence the shape of mosques and shrines in Kashmir.

The pre-eminence of the Hazratbal shrine as the principal Muslim shrine of Kashmir, drawing devotees from across the region, added to wider propagation and dissemination of this new architectural style. It's worth noting that in the post-1970 period, as ever-increasing numbers of Kashmiri pilgrims started visiting the Arabian Peninsula to perform the Hajj, they became acquainted with a totally different image of what an Islamic building constitutes. These new images must have certainly made a deep impression on the minds of these pilgrims, images they carried back to the various ends of their native land. While not all of these hajjis would have been actively engaged in the building activity centered on mosques and shrines in their localities, they developed an appreciation for what they witnessed in the sacred land of Islam, which manifested itself over a period of time. And as the required technology and building materials became readily available, this trend also became more widespread. Interestingly, even before the usage of reinforced cement or concrete became prevalent in the region, wooden domes with iron sheet cladding had made their presence felt. This has to a large degree resulted in the eclipse of the indigenous building traditions of the region especially in the design or redesigning of major Muslim shrines in the area. Though largely ignored for most of its historic past in Kashmir, domes and minarets are increasingly becoming an important part of contemporary Islamic architecture of Kashmir. The form has been adopted not only by architects and engineers but also by local masons and carpenters who, for most part of the preceding century, remained the actual designers on site. The work of these masons and carpenters has resulted in the creation of an eclectic architectural style many a times at variance with the historical architectural traditions of the region.

The burning of the shrine and mosque of the Shaykh Nur-al Din, the patron saint of Kashmir, at Char in 1998 brought this debate to the forefront. The architect was asked to revisit his initial design for the gutted shrine to incorporate features such as a dome and minaret. This was certainly at variance with the life and teaching of the saint, who is generally seen as the face of the Kashmiri order of Sufism, the Reshis. The saint is also said to have resisted attempts by missionaries of Persian origin to 'Persianize' the lifestyle of native Kashmiri Muslims in the name of Islam. The building was later modified to a more Kashmiri style, though the end image is more of an architectural kitsch.

The ongoing reconstruction of the historic imambada at Zadibal can also be seen as a distinct echo of what happened almost half a century previously at Hazratbal. The original building, with its wooden columns, papier-mâché ceiling and lattice work was demolished in 1999 to make way for a modern cement concrete building which included a dome and minarets. The building design, with its Safavid dome, also makes a clear and manifest reference to its Shii'te origin, stressing the Iranian connection.

An interesting phenomenon related to both the Hazratbal as well as the Zadibal reconstruction is the association amongst the local community of the new design with holy Islamic building – an association belied by the actual building design. The generally held belief at the time of reconstruction of the Hazratbal shrine, which still lingers on, was that the building was based on the design of Masjid-i Nabvi at Medina. Similarly, widespread credence was given to the idea that the new imambada at Zadibal was based on the design of al-Aqsa mosque at Jerusalem.

The second half of the twentieth century CE also witnessed renewed public interest within the Muslim community on repair and reconstruction of various religious sites. Unfortunately, this well-intentioned philanthropic process was marred by a severe lack of understanding of the historic character of the associated built fabric of these sites. Coupled with a functional need to accommodate an increasing number of worshippers, the introduction of new building materials, and a loss of traditional building knowledge was the emergence of a new middle-class spirit, the *nouveau-riche*, which looked down upon anything old as being representative of an image that is, in essence, 'poor and backward'. Consequently, a number of old buildings were demolished, and new modern structures constructed in their place, a majority of which lack any contextual connection with their surroundings as well as the required aesthetes. Far more than any natural or manmade threat, it is this spirit which essentially verges on ignorance and lack of respect for the past that has emerged as the greatest threat to the historic built fabric of the area, a threat that is both religious as well as of a more secular nature.

Endnotes

1 Alberuni's India, vol. ii, (London: Kegan Paul, Trench, Trubbnbr & Co.,1910), 206

2 'Kashmir once had been a province of the Buddhist empire of the Mauryas, then had been subject to the successive waves of foreign conquerors coming from the Near East and Central Asia, and continued to be their outposts up to the 5th, even 7th century', H. Goetz, Studies in the history and Art of Kashmir and the Indian Himalayas.(Wiesbradan: Otto Harrasswitz pub. 1969),1.

3 His original name was Sayyid Sharif-ud din Ardebeli, see, Baharistan-i Shahi, transl. Kashi Nath Pandita (Srinagar: Gulshan books, 2018).



OTTOMAN MOSQUES IN BOSNIA AND HERZEGOVINA BETWEEN CENTRE AND PERIPHERY



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ABSTRACT

Most surveys of Ottoman mosque architecture focus on Istanbul and its surroundings, ignoring the rest of the Ottoman territories, in our case Bosnia and Herzegovina. The Ottoman mosques in Bosnia and Herzegovina, the Empire's most western province, were given the 'provincial' label and deemed to be less important. They are usually divided in two typology groups: mosques with a dome and pitched roof mosques, usually seen as mere copies of Istanbul mosques. After applying the 'centre-periphery' model to Ottoman mosques in Bosnia and Herzegovina, the complexity of the issue is obvious. The model testifies that Bosnian mosque architecture was not only inspired by Ottoman art, but also by the local heritage as well as western art. This paper strives to identify the right approach to take within the centre-periphery model, offering a new categorization of the Bosnian-Herzegovinian mosques.

Key words: Ottoman architecture, mosque, Bosnia and Herzegovina, centre-periphery theory

CENTRE-PERIPHERY MODEL IN OTTOMAN ARCHITECTURE

The 'Centre-periphery' theory theoretical framework is not new in art history – it questions the relationship between the centre of art production and its periphery. This relationship can be observed through the lens of geographical distance, or analyzed through a kaleidoscope of different social and economic progress. Whatever path is chosen - geographical, economic, social (etc ...) – the centre-periphery model helps to deconstruct the common approach in art history according to which only works created in the centre are noteworthy and considered unquestionable axioms to confirm legitimacy of works created in the artistic periphery. One of the pioneers of this approach is André Grabar who in his study *L'Art du Moyen-Age en Europe Orientale* (Grabar, 1968) pointed out that the geographical periphery can also be the centre of enviable artistic solutions. Among those who most directly questioned the West-centric and Eurocentric discourse in art history is Nicos Hadjinicolaou (best known for his sociological approach), who stated in his text *Kunstzentrum und peripheren Kunst*: "[...] namely the prevailing conviction in the United States and in Europe (here, the West and East are understood as one entity) that everything which is produced outside of these regions is simply inferior and, at best, could be viewed favorably as the artistic expression of mentally impaired adults or as "nice" folk art" (Hadjinicolaou, 1983, p. 38; Hadjinicolaou, 2020, p. 121).

If the centre-periphery model is applied to the two most popular surveys on Ottoman architecture, one by Godfrey Goodwin (Goodwin, 2003) and the other by Doğan Kuban (Kuban, 2010), the emphasis on Istanbul is obvious, where architectural production outside this corpus is almost neglected. It must not be forgotten that Kuban titled one chapter *Architecture in the Provinces (1520-1920)*, a survey of the architectural heritage of the Ottoman provinces. In the introduction to this chapter, Kuban summarizes perhaps the greatest problem of the centre-periphery model by stating, "it was in the capital that the history of Ottoman architecture was written" (Kuban, 2010, p. 571). This quote is one clear example of Istanbul-centrism in Ottoman studies, in this case architecture, where works created on the fringes of the empire are observed (almost) exclusively from the perspective of the capital. Still, it must be admitted that Doğan Kuban is right when he says that the Balkan peoples saw Constantinople as their model for centuries – which continued with the arrival of the Ottomans, but it is forgotten that the artistic production in the provinces was inspired also by aesthetics outside Istanbul.

The uniqueness and significance of the Ottoman architecture in the Balkans was recognized by Ekrem Hakki Ayverdi, author of the six-volume study *Avrupa'daki*

Osmanlı Mimârî Eserleri (Ayverdi, 2000a; Ayverdi, 2000b; Ayverdi, 2000c) in which he reviewed Ottoman architectural heritage in Romania, Hungary, Yugoslavia, Bulgaria, Greece, and Albania. Machiel Kiel made great strides in this area through his numerous works, where a collection of essays, *Studies on the Ottoman architecture of the Balkans*, should be singled out (Kiel, 1990). In his research, Kiel concluded that about 20,000 Ottoman monuments were built in the Balkans during the Ottoman period (Kiel, 2005).

The "centre-periphery" relationship in the Ottoman Balkan heritage was most directly discussed at the international conference *Centers and peripheries in Ottoman architecture: rediscovering a Balkan heritage*, held in 2010 in Sarajevo. The complexity of the issue is best reflected in the conference proceedings, in which authors approached the topic differently, with different methodologies and different views of the phenomenon of Ottoman architectural heritage in the periphery/Balkans, but with the unique conclusion that further research is needed (Hartmuth, 2011a). The proceedings begin with a text by Maximilian Hartmuth: *The history of centre-periphery relations as a history of style in Ottoman provincial architecture* in which he concludes: "Therefore, four periods emerge distinguished by the relationship between the centre and the periphery and evidenced in its impact on architectural production [...]: ¹ polycentrism (ca. 1350 to until after 1453), ² centrism (late 15th to mid-18th ct.), [...] ³ decentralization (mid-18th-mid-19th ct.), and ⁴ recentralization (mid-19th to WWI)" (Hartmuth, 2011b., p. 29). With the exception of the first period, Ottoman architecture in Bosnia and Herzegovina is almost entirely integrated into the periodization offered by Hartmuth and according to which it is very easy to follow the development of architectural activity in the westernmost Ottoman province – the former Bosnian Eyalet.

After consulting papers and monographs (Bejtić, 1953; Nametak, 1939; Pašić, 1994) dedicated to the provenance of Ottoman monuments in Bosnia and Herzegovina, it is evident that the monuments have been mainly analyzed with a focus on style and form. Of course, this is a legitimate and unquestionable methodology that determines the place of architecture of the Ottoman period of Bosnia and Herzegovina (and thus of Bosnian mosques). Truth be told, this legacy takes on a whole other dimension when the approach is not based on style and form, but on an architectural typology within the "centre-periphery" theory.

An interesting theory about art in the periphery was proposed by Ljubo Karaman (1878-1971), Croatian art historian and Viennese student. In his book *The Problems of Peripheral Art* published in 1963, Karaman defined three terms of local artistic production: provincial art, borderline art, and peripheral art (Karaman, 2001.[1963.], p. 11). According to Karaman's theory, *provincial art* is one that "receives motives, masters and works always from the same cultural centre, within its more modest and social circumstances" (Karaman, 2001.[1963.], p. 12), so that "monumentality in scope and splendour in material are not within the reach of the province's limited economic resources". On the other hand, he believes that *borderline art* is one that "stands on the border of two essentially different art circles under the influence of both those circles. In such an area, different currents touch, intersect and intertwine, thus creating something interesting and new [...]" (Karaman, 2001.[1963.], p. 13). The last is *peripheral art*, *id est* the one that "at a certain distance from the leading cultural regions receives motives from several sides, adopts and processes them, developing an independent artistic activity on its own soil" (Karaman, 2001.[1963.], p. 13).

The symbiosis of Hartmuth's periodization and Karaman's categorization creates a theoretical framework that inaugurates four typologies of Ottoman mosques in Bosnia and Herzegovina, namely: mosques of centre, edge mosques, borderline mosques, and regional mosques.

MOSQUES OF CENTRE

New aesthetic ideas emanate from the centre of artistic production, which became a canon in a certain period and for a certain region, which was Constantinople in the Ottoman period. In the Balkan provinces of the Ottoman Empire there were no buildings such as the Istanbul's Blue mosque (or Topkapı Palace) (Kiel, 1990, p. X), but architectural solutions that keep pace with the aesthetics of the centre are still recognizable. As this text focuses on mosques, it would mean that in Bosnia could be found mosques that do not lag behind the ones in Istanbul, and if they could be "transferred" to the capital by chance, they would not be different from the mosques of the capital.

Compared to other Balkan cities where the Ottomans left their mark, Sarajevo stands out as the most representative example of Ottoman architecture and urbanism (Kuban, 2010, pp. 588-589). Therefore, it is not surprising that in Sarajevo is found Gazi Husrev-bey's mosque, which "contains all the components of a large-scale complex" (Kuban, 2010, p. 589). Built in 1531 by Gazi Husrev-bey, the grandson of Sultan Bayezid II, this monumental complex contains all the elements of the Ottoman *külliya*: next to the mosque is an *imaret*, *madrassa*, *hanikah*, two *turbes*, *hamam* and *arasta* with a *han*. During the entire Ottoman period in Bosnia and Herzegovina, the grandeur of this project was never repeated, so it is not surprising why it was believed that no one other than the great Mimar Sinan was behind this building (Redžić, 1983, pp. 169-208). This hypothesis is untenable, because at the time of the construction of the Gazi Husrev-beg mosque, Mimar Sinan was not engaged in projects of sacral architecture. The floor plan of the Gazi Husrev-beg mosque is similar to early Constantinople monuments such as the Atik Ali Pasha mosque (1496/97) in Istanbul, with which it has the most in common: – with similar side rooms (*tabhanas* or *tetimas*) next to the central prayer area, half-dome on the southeast, and five domes above the porch (*sofa*). Due to the architectural complexity of the building and its decoration, researchers complain that the only architect that was capable of designing it was no one other than the chief sultan's architect, Alaüddin (Acem Esir Ali) (Sönmez, 1988; Dedeyev, B., Najafli, T., Uslu, R. 2014; Bilmiş, 2020), who also designed the Sultan Yavuz Selim mosque (Necipoglu, 2005, pp. 93-94), the palace of Pargalı Ibrahim Pasha, and the Çoban Mustafa Pasha mosque in Istanbul.

The bridge of the Grand Vizier Sokollu Mehmed Pasha in Višegrad is not the only building designed by Mimar Sinan in Bosnia and Herzegovina. The project for the Karađoz Bey mosque in Mostar, dated 1557/1558, is also attributed to this maestro of Ottoman architecture (Pašić, 1994, p. 67). After consulting several of Sinan's autobiographies (*Tezkiretül-Ebniye*, *Tezkiretül-Bünyân*, *Tuhfe'tül-Mî'mārîn*) it is truly confirmed that he designed the "honorable mosque for Sofi Mehmed Pasha in Herzegovina" (Crane, H., Akin E., 2006, pp. 67, 80, 93, 106, 355, 377). What confuses for a moment is the name of the legator, who is referred to as "Sofi Mehmed Pasha", but after a more meticulous analysis of the Sinan's autobiographies it is realized that slight omissions are nothing unusual. In addition, no other mosque was built in Mostar with more expressive features of architecture of centre and of Sinan's style than the Hajji Mehmed-beg Karađoz mosque.

Mimar Sinan marked the 16th century Ottoman architecture, but “[...] it seems biased all valuable achievements and the autochthonous existence of renaissance processes in the Orient, attribute to Sinan’s undoubted genius” (Čengić, 2008, p. 111). Court documents reveal the names of dozens of other architects who worked during the time of Mimar Sinan and who also showed remarkable talent (Dündar, 2002), like Mimar Ferhad who came to Sarajevo in 1559 to oversee the construction of Ali Pasha’s mosque (Necipoglu, 2005, pp. 562, 565-566). Historical sources provide interesting information – Mimar Ferhad was in Sarajevo just to see how the works were going, while a completely different architect was supervising the entire construction of the mosque. In fact, Mimar Ferhad wanted to be personally convinced that the mosque in the west of the empire was being built according to the aesthetics of the centre. Compared to other mosques built in Bosnia and Herzegovina, “the supreme artistic level of the classical style of Ottoman architecture was reached on the building of the Ali Pasha Mosque, one of the most beautiful, and certainly the best proportioned mosques” (Kurto, 1997, p. 38).

EDGE MOSQUES

A small number of Bosnian mosques were lucky enough to be designed by an architect from Constantinople and to be carved by the most experienced masters. There are a large number of those “other mosques” that arose within the limits of the modest possibilities of the province. Of course, these mosques also tried to imitate the artistry of the metropolis, but the discrepancy between will and possibility gave (what is often recognized as) a provincial heritage. In the humanities, the term ‘provincial’ is a legacy of the colonial narrative and unfortunately has a hint of the primitive, the backward, the less valuable. In order to avoid misinterpretation of the architectural heritage that originated far from the capital (Kiel, 1990, p. X), the name ‘edge mosque’ will be inaugurated – because it originated on the very edge of Ottoman cultural influence.

The largest number of domed mosques in Bosnia and Herzegovina have an almost standardized form, a dome above the square prayer space, a porch with three smaller domes, and a stone minaret leaning against the right side of the mosque’s cube. This, of course, includes the mosques of the centre (e.g., Ali Pasha’s mosque in Sarajevo), but also the edge mosques. Unlike the first ones, the edge mosques have a more rustic shape, poorer proportioning of the masses, but also a more stinky decoration. The number of ‘edge mosques’ is not negligible and it is not difficult to recognize them. This group includes the Buzadži Hadži Hasan (Logavina) mosque in Sarajevo (1555), the Sultan Selimova (Selimija) mosque in Knežina (1566-1992), the Lala-paša mosque in Livno (1567), etc. At first glance, it can be seen that these mosques do not have the grace of the architecture of the capital, to which they still strive. Their minarets are often low, stocky, and without stalactite decorations on the minaret gallery. The domes are either too low or too accentuated; that is, they have deviated. Their edginess is not only reflected in the architecture and architectural details, but also in the wall paintings such as the 18th century decoration on the mihrab of the Magribija mosque in Sarajevo, or the wall frescoes in the Miščinaa mosque in Sarajevo, built in 1870.

The basic feature of these mosques is “edginess”, and this term should suppress the ever-present name of ‘provincial mosques’. In the context of Bosnian edge mosques, their edginess is determined by their geographical distance from the ‘centre’, but also by their conditional distance from aesthetic norms. It can be said that the edge mosques do not have the capacity to meet the high standards of the capital’s architecture, but nonetheless they are no less Ottoman compared to the mosques of Istanbul.

BORDERLINE MOSQUES

Bosnia (Bosnian Eyalet), as the westernmost province of the Ottoman Empire, found itself on the border between the Orient and the Occident. Most often Bosnia's position is viewed as a political border, while it is forgotten that it was on the border of two different cultural phenomena. It's more fitting to say that Bosnia was a part of the Orient, but was also directly connected to the Occident. Therefore, it was to be expected that two different aesthetics would complement each other in Bosnia. When it comes to Bosnian mosques and borderline art, this means that Ottoman-era mosques have been influenced outside the main cultural circle.

From the time of the Ottoman presence in Bosnia, neighbouring countries went through various artistic and architectural periods, from the Renaissance, Baroque and Rococo to historicisms in the 19th century. After analysis of a few Bosnian mosques, deviations from Islamic-Ottoman aesthetics are obvious, and clear influences of European styles can be easily noticed.

The example of this artistic practice can be found in the mosque of Nesuh Aga Vučijaković in Mostar (around 1564), where the influence of the Dalmatian Renaissance is obvious (Hasandedić, 1990, pp. 22-24). The mosque is unconditionally Ottoman in form, but certain architectural elements and decorations are non-Ottoman. The late Gothic and early Renaissance styles are noticeable on the capitals, consoles, window frames, portal, and minbar. The presence of Dalmatian masters is confirmed not only on monuments, but also in historical sources (Zlatar, 2003).

Architects flirting with different architectural patterns can best be seen in the mosques of south-eastern Herzegovina, which Machiel Kiel sees as a, "*blend of Islamic and Christian elements in the architecture of an outlying border area of the Balkans*" (Kiel, 2011). This group includes the Sefer Aga mosque near Stolac (1611) (Kiel, 2011, pp. 65-68; Mujezinović, 1998, p. 390; Hasandedić, 1990, pp. 91-91), the Avdić mosque in Plana (Bileća) (Kiel, 2011, pp. 70-71; Hasandedić, 1990, pp. 174-175), and the mosque of Hasan Pasha Predojević in Bileća (Kiel, 2011, pp. 74-76; Hasandedić, 1990, pp. 167-171). They are characterized by a square prayer space, a four-pitched roof, and a square-based minaret. The most impressive feature of the mentioned mosques are the square stone minarets built exclusively on the territory of eastern Herzegovina. These buildings are a combination of Ottoman architecture and the architecture of Dalmatia, which in the end caused this interesting symbiosis on the border of the Islamic world. Mosques with square minarets certainly deserve a thorough study and are certainly not the only monuments worthy of attention with a noticeable direct influence of European styles. Some researchers believe that these mosques and their minarets owe their shape to *social conventions and the technological limitations of local builders* (Hartmuth, 2018, p. 189), but we are still of the opinion that they were created under the influence of Dalmatian *campaniles*, in the same way as Bosnian clock towers were influenced by Romanesque, Gothic, and Baroque styles (Kreševljaković, 1956; Čelić, 1991, p. 354; Pašić, 1994, pp. 190-192).

REGIONAL MOSQUES

It is indisputable that Bosnia, as a province of the Ottoman Empire, followed the 'instructions' for the construction of its mosques, but it also can not be overlooked that there were found new solutions which have enriched the Ottoman architectural tradition. Bosnia's contribution is reflected in the mosques with wooden minarets, which were realized "in the 'local' architectural language" (Bećirbegović, 1990, p. 11). Compared to mosques inspired by the

aesthetics of the centre, the 'regional mosques' were created thanks to local masters who "relying heavily on the tradition of folk architecture and natural conditions of the place and region [...] created indigenous forms of mosques with wooden minarets [...]"(Bećirbegović, 1990, p. 214). The prevalence of mosques with wooden minarets is best illustrated by data from 1933, when 786 mosques with wooden minarets were recorded; *id est*, they accounted for 70% of the total number of mosques in Bosnia and Herzegovina; examples include: the Ašik Memije mosque in Sarajevo (16th century) (Bećirbegović, 1990, pp. 96-98), the White mosque in Tuzla (16th century) (Bećirbegović, 1990, p. 107), the Podzvzd mosque (Velika Kladuša, 17th century) (Bećirbegović, 1990, pp. 75-77), etc. These mosques do not aspire to large dimensions or proportions, but are extremely valuable because of their authenticity (Jahić, 2019, p. 1). We cannot help but remember the words of Džemal Čelić, who wrote that "a Bosniak, at the moment when he converted to Islam and changed his earlier name to a Muslim one, did not demolish the house in which he lived until then", but adapted "self-acquired cultural heritage [...], and that heritage to itself" (Čelić, 1991, p. 348). Certainly, in Čelić's words one can appreciate the authenticity of the Bosnian mosque with a wooden minaret.

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THE BAZAAR MOSQUE PRISHTINA



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ABSTRACT

The Bazaar Mosque (Çarshi Mosque) marks the beginning of Ottoman architecture in the city of Prishtina. The foundations of this mosque were laid in 1389 by Sultan Bayezid, while its construction was completed in 1440 by Fatih Sultan Mehmet. Considered to be one of the oldest mosques in Kosovo, it is also encountered in historic documents as the 'Stone Mosque', as it was completely built by stones, including its minaret. Located on the western edge of Bazaar (destroyed after WWII), this mosque also played an important role in the shaping of the new social-urban fabric of Prishtina.

Its physical transformations started in 1902, when Sultan Abdul Hamid II added a two-level porch inspired by western classical architecture. This historic period marks the early modernization of the city: a dozen landmarks were built and many pre-existing landmarks were physically transformed. With this intervention in the mosque, the new administrative complex in Prishtina gained the representative features of the modernizing socio-urban setting.

In 2012, the Stone Mosque lost some of its architectural treasures as a result of new conservation works. The significant classical porch that heralded the modernization tendencies in the city was replaced by a new three-domed concrete porch, thus wiping out an important milestone in the urban history of the capital city, Prishtina (also the former center of the Vilayet of Kosovo). Its degradation continued through the years since not only was the mosque never fully conserved, but it was left in an abandoned state, falling prey to vandalism and neglect, covering its pristine beauty by the unpleasant scaffolding even now.

This paper aims to draw out the importance of the Bazaar Mosque, in terms of urban-social-cultural developments in the city of Prishtina, starting from its erection until its abandonment. Moreover, the paper will analyze the causes and effects of the current state of degradation of this mosque. Finally, this study will try to emphasize the importance of contextual interpretation of heritage, and its role in the adjustment of the urban narrative, which in turn impacts the active preservation and promotion of the heritage site, specifically, the site of the Bazaar Mosque in Prishtina.

Keywords: Bazaar Mosque, Prishtina, conservation, architecture, socio-urban impact

INTRODUCTION

The Ottoman period is an important stage in the study of the socio-urban history of Kosovo's settlements. Documents from the 20th century, compiled by scholars of the former Yugoslavia with a focus on future plans, do not provide substantial data on the importance of the socio-urban as well as economic development of these settlements. The historic documentation on spatial and demographic structure of the settlements has also left much room for interpretation, which has often led to speculation related to the whereabouts, socio-economic importance of, and heritage of certain settlements. One explanation can be partly based on the fact that the historical records of the European Turkish settlements between the 16th and 19th centuries were partial, and sometimes incorrect, especially data concerning location, population, and especially any data of economic or military importance for the Kosovo settlements. However, relying on both Ottoman as well as European sources, we may infer that Prishtina, as well as the nearby town of Vushtrri, were important administrative centers of the Vilayet of Kosovo, while the mining town of Artana (Novobrdó), continued to be the region's most important economic center, and "a major contributor to the Sultan's treasure." (Warrander & Knaus, 2007, p.9). However, historical records offer no overview on Prishtina's

urban growth during the period between the 15th and 16th centuries, although the historical records for this period indicate major urban, demographic, and economic devastation as a result of long wars. From the 17th century onwards, historical records indicate that in the region of Prishtina, the mining activity had ceased, agricultural land was abandoned, and trade had become the sole source of income. (Altic, 2007, p.67) The commercial character of the region and of the whole of Kosovo was strengthened in the following century.

As far as the preserved material evidence show, the most reliable evidence for Prishtina's socio-urban growth during the Ottoman era can be found in the inner city of Prishtina, along with a few sites in its surrounding settlements. In the inner city, only mosques, and more specifically, the main mosques, have survived from the Ottoman era, while many public buildings such as schools (*maktabs and madrasas*), libraries, inns, public kitchens (*imaret*es), and bazaars (*çarshi*) were demolished during the socialist rule. Given the fact that mosques constitute an important part of the register of public architecture of the early Ottoman period in Kosovo, historical interpretations and aspects of cultural heritage – including descriptions on building structures along with spatial elements, architecture, decoration, proportion, painted decorations, and other stylistic details – have been available to the public, whether through academic and commercial publications, or through various television reports. Nonetheless, narratives of singular monuments do not provide insight into their socio-urban influence, thus making it difficult to comprehend the city's built heritage as a complex organism, and monuments' urban settings as a fundamental determinant of a city's diverse values and urban identity.

In order to contribute to the contextual interpretation of heritage and its role in its active preservation, this paper focuses in the oldest mosque in Prishtina, the Bazaar Mosque, drawing attention to the social and urban role that the mosque has played in defining the historic center, and in forming the character of the city, from the past to the present.

1. THE BAZAAR AND ITS MOST PROMINENT MOSQUE

The morphological transformation of Prishtina during the Ottoman period is difficult to trace due to the limited information and paucity of resources on the subject. However, in this paper we rely on the study of our co-author, who suggests four phases in the development of Prishtina during the Ottoman period (Jerliu, 2014): Phase 1) The beginning of the Ottoman period (1389 - 1423) – the period of vassalship with the Ottomans; the establishment of the Bazaar area near the first Sultan's Mosque, and the checkpoint on the road to Novi Pazar; Phase 2) The Early Ottoman period (1460-1470 until the period 'before 1569') – 1569 is the year of population's registration, and the data analysis helps to identify the development of the 'outer ring' of mosques, respectively, mahallas (neighborhoods), which have defined the border of the Old Prishtina; this border did not change until 1878; Phase 3) The Ottoman period ('before 1569' until 1878) – a period during which the 'inner ring' of mosques was created, indicating that the urban development of Prishtina was based on the densification rather than on the expansion of the city beyond the 'ring' of mosques built before 1569; Phase 4) The Ottoman Modern period (1878 until the fall of the Empire 1912) – a period during which the city gained most of its administrative and public buildings, in the new spirit of modernization tendencies under the western influence.

Sources indicate that the foundations of the prominent Mosque of Sultan Murat I, were laid in 1389 by Sultan Bayezid, while its construction was completed in 1440 by Fatih Sultan Mehmet. This places the building within the first phase, as

specified above. Being located on the western edge of the Bazaar (destroyed after the WWII), the mosque came to be known mostly as the Bazaar Mosque (*Çarshi mosque*), thus attaining socio-spatial attributes of the destroyed Bazaar, but also playing an important role in guarding the memory of the old town, in the context of shaping the new social-urban fabric of Prishtina.

The first known physical transformation of the mosque was carried out in 1902, when Sultan Abdul Hamid II replaced an older, traditional Ottoman porch with a new two-level porch inspired by western classical architecture, which in terms of classification as per our study, puts the mosque also in phase four, respectively, within the Modern Ottoman period.

1.1 The old bazaar of Prishtina

From its beginnings, the Old Bazaar of Prishtina was the urban nucleus and the socio-economic and cultural center of the city. By the time of the visit of the well-known Ottoman traveloguer Celebi in Prishtina in 1660, the Bazaar had already established its urban features as an important trading center that served the town and its surrounding villages. The presence of bazaar shops, as well as of hammams, in terms of both number and quality, as noted by Celebi, indicates the prosperity of the place. Celebi did not include information on the existence of *bezistans* in Prishtina, which is an indication of the city's average level of growth in the 17th century. However, according to Dankoff (2006), Çelebi had a general principle when describing bazaars located in the lands of the Empire; he would assure the reader that in all bazaars, whether they had a covered part (*bezistan*) or not, the economic life was prosperous. (Dankoff, 2006, p.49-50)

Historical sources reveal that the Bazaar of Prishtina, as narrated by Celebi, was destroyed *en masse* during the 19th century by fire or arson (in the years 1859, 1863) and as a result of the war with Serbia in the years 1877-1878. (Municipality of Prishtina, 1987, p.17) Yet, as stated in Nusic's notes about 30 years later, the Bazaar had recovered, and in the early 1900s it counted within it approximately 500 shops. (Nusic, 1902)

In addition to being the main area of the city, the Bazaar was also the site of religious and other public buildings such as the Synagogue, the Bazaar Mosque, the Old Hammam (today the ruins visible in the courtyard of the Parliament) as well as inns. The area of inns occupied the eastern side of the Bazaar, and the road that ran between the inns and the Bazaar's shops defined the western perimeter of the Old Bazaar.



Plate 1.
The Bazaar of Prishtina in 1913 (Elsie, R., 2008)

During the ex-Yugoslav system, the Bazaar was demolished by urbanism, making room for new state institutions. The Bazaar Mosque was the only building that was not part of this planning scheme and was later designated a

cultural monument, as part of the so-called “Old Bazaar Mosque complex with Jashar Pasha Mosque, the Old Fountain, the Clock Tower, and the Museum of Kosovo”. Except for a few photographs showing the bazaar during its destruction in late 1940s and early 1950s, no written records about the socio-spatial and physical aspects of the bazaar were produced nor preserved by the previous socialist regime. Based on the photographs, one may identify an atmosphere of the place: the views that frame the Old Bazaar convey an image of a place with urban and architectural integrity of a scale similar to other bazaars of Kosovo. However, the physical condition of the architectural structures, which appear to be somewhat vague is rather comprehensible when having in mind the devastating context of Kosovo after World War II. The emergence of the autochromes of the Albert Khan Collection from 1913 (Elsie, 2008) enables further interpretation/observation of urban and architectural details of the Bazaar. What can be noted is that in 1913, the Prishtina Bazaar was paved with Albanian cobblestones (*Arnavut kallderm*), which were very famous throughout the Ottoman Empire, while the shop fronts had traditional timber shutters, typical of bazaars in Kosovo and in the region. Perhaps the Bazaar’s strongest point was not its architectural form and details; the atmosphere in Kahn’s photos conveys an important aspect of the city’s social dimension; that is, the poverty and post-wartime occupation, with Serb soldiers standing on one side of the road, and Albanians peering through the doors of their shops.

If preserved, the Old Bazaar, which embodied the city’s most vital socio-economic, cultural, and political aspects, could have had a great potential to shape Prishtina’s heritage and identity today.

1.3 The Bazaar Mosque

The Bazaar Mosque located at the western end of the main street of the Old Town, appears as a welcoming gate to the historic area of Prishtina. As mentioned earlier, the foundation of this mosque was laid in 1389 by the son of Sultan Murat, Bajazit, while the building itself was completed by Sultan Mehmet Fatih in 1440, who twenty years later built his mosque in the nearby area. People refer to it as Çarshi (Bazaar) Mosque, as it was located near the former Old Bazaar, and is also known as *Tash Mosque* (*‘tash’* in Turkish means stone), as it was built entirely of stones, including the minaret. In historical sources, the mosque is also named *‘Sagir Mosque’* as well as *‘Muradije Mosque’*. (Vermica, 1997, p. 50)

The building belongs to the typology of early Ottoman period, with only one space in a square floor plan of about 10m by 10m from the inside, and walls of stone block of about 1.3m in thickness. The two-level porch, built in the spirit of western classicism by Sultan Abdulhamid II in 1902, was demolished 110 years later (in 2012) and at the time of this writing the mosque continues to be abandoned and behind the restoration scaffolding. Little of what can be seen behind the scaffolding suggests a new porch made of concrete, analogous to the porch of the Great Mosque (King’s Mosque, or Sultan Fatih Mosque) in Prishtina. It should be recalled that Sultan Abdulhamid II had also ordered the interior decoration on the walls of the mosque in the *‘secco’* technique, as well as some repairs in the upper part of the minaret. This historical and stylistic period corresponds to what in this study is discussed as a period of early modernization of Prishtina in which, the stylistic intervention of 1902 became the symbol of the modernizing capital city (Jerliu, 2014). The introduction of the classical portico in the oldest mosque in the city is also a narrative on the modernization tendencies in the religious domain of the society and the state.



Plate 2.

The mosque before and after removing the classical porch
 (<https://njekomb.org/konservimi-i-xhamise-se-gurit-dhe-xhamise-se-madhe-ne-prishtine/>)



Plate 3.

The current condition of the Bazaar Mosque (By authors, 2021)

The major undertaking of the 2012 mosque conservation works consisted of the replacement by analogy of the classical portico

with the so called 'original portico' with three small domes. Unfortunately, the restoration works have undermined the aforementioned aspects of city's modernization, by focusing the restoration aim solely on the stylistic and historic-material features of the building in the pre-Sultan Abdulhamid II period. In this way, the symbolisms of societal transformation of Kosovo at the beginning of the twentieth century, as embedded in the mosque's classical portico, is partially compromised and risks further alienation, if the memory on its purpose fades with time.

2. THE MODERNIZATION(S)' PERIOD

2.1 Ottoman modernization of the mosque's setting

The period of changes brought by the 1876 Ottoman constitution also marked a new stage in the development of Prishtina as the center of the Vilayet of Kosovo (1875-1888). In this new context as a capital city, new military and central administration buildings were built in the city based on the traditional European architecture of the 19th century, in terms of both use and style.

Central functions of the reformed Ottoman Empire in Prishtina, as the center of the Vilayet of Kosovo, were mainly located in the historic center of the city. The main concentration took place near the Bazaar Mosque, opposite the eastern perimeter of the old Bazaar. The first and most prominent building erected in this period is the central military administration building, once the '*Ucumed konagi*', today the building is home to the Museum of Kosovo. The building was erected adjacent to the Bazaar Mosque and thus it contributed to its setting in particular, and to the socio-urban context of the old city in general.

The new building of the courthouse was constructed on the side of the museum. The local administration office (Beledyie) was built adjacent to the courthouse, right behind the Bazaar Mosque, and on the right side of the Museum two one-story structures were either built or adapted into public buildings which, based on Nusic's records, might have accommodated the police station, post office and telegraph, savings bank, and other services (Nusic, 1902. p.8-9). These structures, together with the building of Beledyie, were destroyed after 1912.

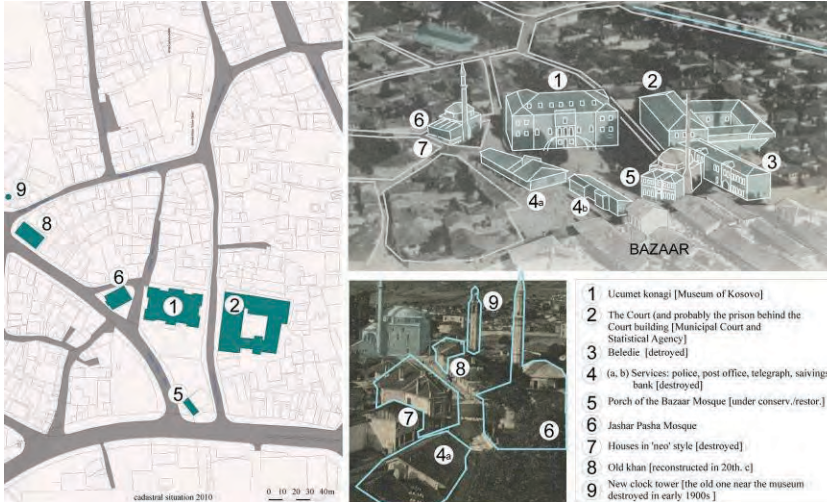


Plate 4.

In terms of urban layout, the building of the central government (now the Museum) defined the axis of this central city complex. It was positioned between two almost parallel streets in a way that its front façade would face the bazaar, and together with the courthouse on its left and the services on its right, it generated a regular shaped block. In terms of architecture, we observe the influence of western neoclassical forms, and a vocabulary of architectural detail which incorporated basic ideas of order, balance, and harmony, through regular shapes and axial symmetry.

The center of Prishtina during the modernization period under the Ottoman Empire, showing the new socio-urban setting of the Bazaar Mosque (Jerliu, 2014)

As observed in Plate 3, the Bazar Mosque had gained the classical porch, in order to establish an architectural harmony in the modernizing urban setting of Prishtina. Through this intervention in context, during this phase of development, the Bazaar Mosque and its setting was recognized as a socio-cultural and historical landmark, a representative part of the city, as well as the central political and social space of the reformed capital city.

2.2 Ex-Yugoslav modernization of the mosque's setting

With the establishment of communist rule of the former Yugoslavia in Prishtina, the centuries-old heritage of the city became subject to planned destruction. Therefore, only a dozen buildings dating back to the late Ottoman period, also the period of the early modernization of Kosovo, have survived. The heritage of the city of Prishtina continued to be destroyed under the motto 'destroy the old, to build the new', as spelled out in the first urban plan of 1950/53. The demolition of the bazaar and the construction of new residential complexes and administrative buildings began, as alleged, with great enthusiasm. (Sylejmani, 2010)

Since 1947, the Old Bazaar had been the target of modernist intervention. Initially, the *bezistan* was demolished to make room for the building of the former Regional People's Committee for Kosovo (*Oblasni Narodni Odbor za Kosovo*), today the building of the Assembly of Kosovo. Forced by the post-war regime, the shops were demolished by the shopkeepers themselves, with the assistance of their families, or more precisely, those family members who survived persecution and execution. (Jerliu and Navakazi, 2019)



Plate 5.

The demolishing of the bazaar of Prishtina, n.d. (Municipality Archive of Prishtina, retrieved in 2018)

The new modern state administration complex that was built in the location of the Old Bazaar set the scene for the new national representation of Kosovo in Yugoslavia. The

symbolic meaning of the space was transformed through the erection of a commemorative monument to "Brotherhood and Unity" at the central part of the former bazaar area. The role of the new monument was threefold: in

spatial terms, it intruded into the city's skyline dominated by tall minarets, in socio-political terms, it heralded the new political order and new national representation of Kosovo in Yugoslavia (Jerliu and Navakazi, 2019), and from an architectural perspective, it promised a modern future.

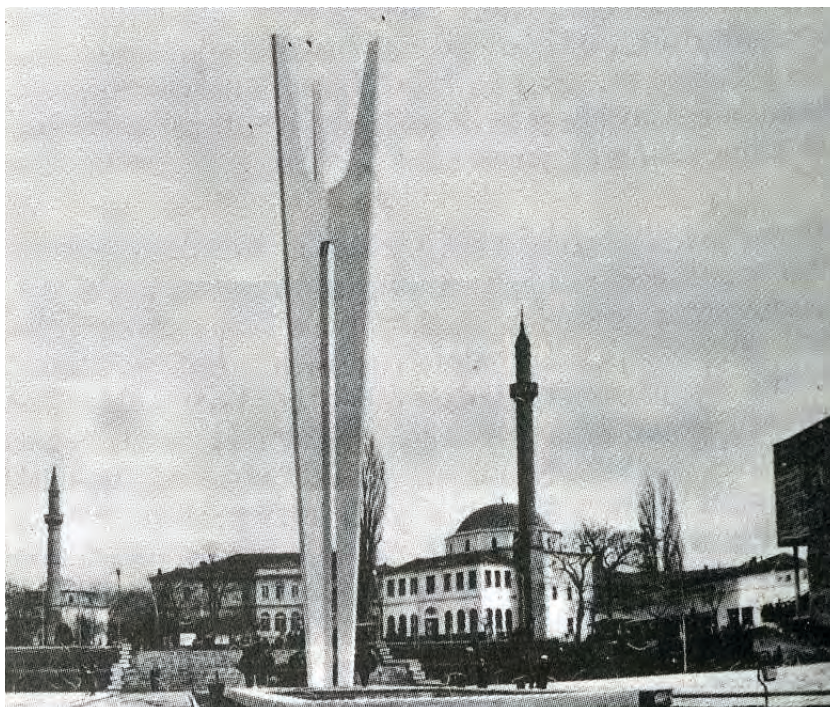


Plate 6.

The "Brotherhood and Unity" square and monument, with the Bazaar Mosque in the background (mapio.net/pi/p-53190737)

3. THE BAZAAR MOSQUE: RESTORATION AND ITS ROLE

3.1 The restoration process of the Bazaar Mosque

The initiative for the restoration of the Bazaar Mosque in 2007 by the Institute of Kosovo for the Protection of Monuments (IKPM), which was partly implemented in 2011, had as its main objective the mitigation of damages caused by the long lack of maintenance. Thus, the restoration works addressed only the technical measures of the building and consisted of: cleaning the masonry from pollution and biological colonization, repairing cracks by injection, reinforcing perimetric walls by inserting carbon rods, and covering the dome with lead. A critical moment of the 2007 restoration project was also 'the reconstruction' of the porch. According to the project, the more than 100 year old porch was to be demolished and replaced with a new one which, according to IKPM, was the original porch of the mosque. (Ec ma ndryshe, 2014)

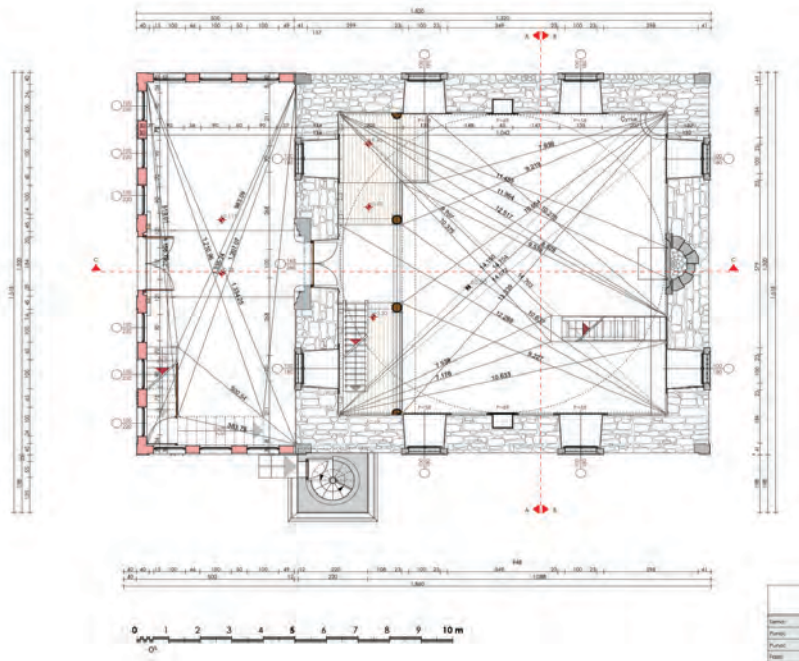


Plate 7.

The floorplan of the mosque before the last intervention (Besnik Hykolli, 2018)

The implementation of the Bazaar Mosque conservation and restoration project is described in detail in a research report conducted by the cultural heritage specialized local NGO “Ec ma Ndryshe” in 2014. According to the report, the conservation works started in 2011 after an agreement was signed between the Municipality of Prishtina, as a donor of the project, and the IKPM, as a contractor. From 2011 to 2013, the conservation works were partially completed, but with significant delays. Although the works were scheduled to be completed in 2013, they have not yet been completed (Ec ma ndryshe, 2014).

In June 2018, a memorandum was signed between the Ministry of Culture, Youth, and Sport (MCYS), the Turkish International Cooperation and Development Agency (TIKA), and the Islamic Community of Kosovo (ICK), aiming to continue the restoration works (Media Ndertimi, 2019). Ever since signing the memorandum, no initiative has been undertaken regarding the conservation of the Bazaar Mosque, and the monument still stands behind scaffolding. Left to the mercy of time, the mosque conveys a vague image and message of institutional and community will to preserve the historical and cultural, as well as the mosque’s multi-layered attributes. Moreover, the never-ending ‘conservation of the mosque’ presents a memory on the verge of extinction: the memory of the role that the mosque and it’s setting once had in the forming of the modern core of the capital city of Prishtina.

3.2 The restoration and the role of the Bazaar Mosque in the city fabric

Societies have long sought to protect and preserve their cultural heritage, for reasons ranging from education to historical research to the desire to reinforce a sense of identity. Based on this statement, the conservation works in the

Bazaar Mosque, which also include the reconstruction of the porch, create confusion regarding a significant period of the modernization of the city of Prishtina. In addition to the destruction of historic buildings during the period of the former Yugoslavia – which caused the loss of the city's Ottoman heritage – the loss of classicist features through the recent intervention is another step forward in the alienation of the city's important milestone and the interruption of its historical continuity.

Reconstruction has traditionally been criticized by heritage conservation professionals because it has the potential to distort history and generate new problems. (Cameron, 2017) Although the restoration project of the mosque ascertains that the new porch is based on the original state of the building, the destruction of the classicist porch, cannot be justified on the grounds of the alleged originality of the new porch. This significant layer, which over time had also gained an antiquarian value, is important for Prishtina because it conveyed the beginnings of modernization of the city, in line with other places in the Balkans and beyond.

Drawing from the present state of the mosque, with restoration works being unfinished, we as well as the rationale we present about its socio-urban role for the modernizing city, we argue that the continuation of works in the future should consider reinstatement of the classicist portico.

In the urban scale, the reinstated classicist portico would return the clear image and memory of an almost compact complex, designed according to an urban and architectural concept, as introduced in the period of Prishtina's modernization at the turn of the 20th century.

In order to adopt to the contemporary life of the city, we argue that the Bazaar Mosque setting should be redesigned, initially by defining the area as the first modern historic center of Prishtina and by integrating it with the rest of the city. The proposal in Plate 7 is an integrated conservation approach, which bridges the historic center of Prishtina with Mother Theresa boulevard and the modern city of the 20th century. (Jerliu, F., et al., 2013, p. 21).

The aforementioned interventions, in architectural and urban scale, would reinstate the active role of the mosque in its own spatial context, as well as in the socio-spatial and cultural context of the city fabric.



Plate 8.

The integration of monuments of the historic center of Prishtina's early modernization with the Mother Theresa Square and the modern cluster of the 20th century. (Jerliu, F., et al., 2013, p. 21)

CONCLUSION

Throughout its historic development, Prishtina and its historic zone went through various socio-political changes, which impacted the conception of the Bazaar Mosque's setting as the center of the city. This context was changed during the communist system of the former Yugoslavia; the Bazaar area was completely destroyed and the new city center emerged in its location. The Bazaar Mosque was not destroyed and as such it remained a testimony of the pre-socialist socio-economic and political nucleus of Prishtina in general, and of the Bazaar specifically, only by retaining its name: Bazaar Mosque. By guarding this popular name of the mosque, regardless of the material destruction of the area, Prishtina managed to preserve the intangible values of the Bazaar, embodied in the memory and heritage of the city and its people.

In 2012, the Stone Mosque lost some of its value as a result of conservation/reconstruction works that implied the replacement of its classical porch with a new, three-domed concrete porch, thus wiping out an important milestone in the history of the capital city Prishtina (former center of the Vilayet of Kosovo). Its degradation continued through the years, since not only was it never fully conserved/reconstructed, but it was left in an abandoned state, allowed to fall prey to vandalism and neglect, covering its pristine beauty with the unpleasant scaffolding even now.

Based on the mosque's state of affairs, its significance in the historic interpretation and presentation of the city's values, and drawing from the potential of the mosque to narrate the most important moment of the city's modernization, we suggest that no historical period of cultural heritage sites should be demolished and substituted for the sake of a sort of analogy; each period is considered important either in terms of its historical, cultural, architectural or social value. In our case, the socio-cultural set of values prevail, as they are embodied, not in the building or its close setting alone, but in the entire city as a living and developing organism.

Finally, the cultural heritage of Prishtina in general, and the Bazaar Mosque in particular, should be valued and preserved in its totality and without prioritizing one period over another or one set of values over another. These buildings narrate various social strata and architectural layers in time and place, each leaving a footprint in our history and collective memory.

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CONVERGENCE THROUGH COURTYARDS: SPATIAL IDENTITY AND MEANING IN XI'AN'S GREAT MOSQUE

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Abstract:

As one of the earliest mosques in China, the Great Mosque of Xi'an (also known as the Huajuexiang Mosque) was built in 742 AD and has undergone multiple reconstructions. It is an active place of worship for local Muslims while serving as a popular tourist site for non-Muslim visitors. Unlike mosques in other countries, this mosque has maintained strong Chinese architectural traditions such as timber frame structures, curved roofs, and wooden ornaments. The building layout, derived from courtyard-style residential architecture, consists of five courtyards along a long east-west axis. The presence of Islamic elements such as the orientation towards Mecca, Arabic calligraphies, and the prayer hall are well incorporated into the entire mosque complex. In short, the Great Mosque of Xi'an is an excellent example of combining traditional Chinese architectural forms with Islamic religious activities.

As a place of worship, mosques foster a meaningful relationship between people and God (*Allah*). Mosques can help identify and orient people's faith and beliefs through physical symbols and their meaning of social-cultural behaviors. This paper examines the spatial meanings of courtyards of the Great Mosque of Xi'an by analyzing how the courtyards, a form of traditional residential architecture, was transformed into a meaningful Islamic symbol. Specifically, this paper uses courtyards at the Great Mosque of Xi'an as a case to demonstrate how different cultural meanings were presented and converged through physical spaces by the spatial articulation of religious activities and their functions.

The findings will bring a better understanding of a unique mosque architecture that is characterized by architectural forms different from the mainstream Islamic world but still performing the same purposes and activities.

Keywords: China, mosque, courtyard, spatial identity, Islamic architecture

1. Introduction

Comprehending meanings is a basic instinct of the soul and a primal need of people living in a meaningful world. The range of existing meanings can be found in a person's daily life. Thus, a place implies the establishment of a meaningful relationship between a person and a given environment. Schulz (1985) observes that the relationship consisted of an act of identification, that is, a sense of belonging to a certain place. Human beings find themselves when they settle somewhere, and their being-in-the-world is thereby determined. As a result, humans can comprehend meanings through symbols, which give substance to and embody abstract concepts and ideas to turn the unknowable into the knowable, the intangible into the tangible, and the intricate into the simple.

Architecture can be considered a system of symbols. By the availability of certain materials and the constraints and capabilities of certain technologies, human beings can construct a space, which becomes a shelter not only for their physical needs of daily life but also for their intrapsychic peace. Architecture is more than art, because it produces the domains of human society, separating the inner from the outer by creating layers of distances. More importantly, those layers of distances are arranged by a certain order that forms a series of symbols helping users discover their social, economic, and political hierarchies and positions in the world. Through representing humans' being-in-the-world, a space becomes a human space, a meaningful place to humans' interpretations and creations. Therefore, only when someone reveals the meaning of a place through symbolic expressions, and makes other people understand it, does the space become meaningful to everyone. Rapoport (1969) argues that building forms, representing the aims and desires of a unified social or cultural group for an ideal environment, reveals the meaning of social-cultural purposes by

symbolic expression. Every social-cultural meaning in architecture is expressed by a group of special architectural languages.

Schulz (1985) also poses that the meaning of space has two fundamental aspects — identification and orientation. Through identification, humans achieve an ownership of a place, and thus create and develop their identities that are generally bonded with that place. A group of people's social identity consists of an interiorization of shared understandings on things, which consequently develop shared values and beliefs. In addition, in order to develop an identity, the group of people should expand their identifications of a place and consequently develop an ownership by constantly adjusting their surroundings with agreed symbols and forms. On the other hand, orientation refers to spatial organization, which creates an order of spatial functionality and understanding, leading actions and lives to take place. Symbolism through identifications and orientations was an intrinsic part of traditional approaches in both China and the Middle East, creating a meaningful dialogue between humans and buildings. This dialogue, in turn, instigates the growth of shared understandings and shared values, which lead to further development of the identity.

During the 7th Century to the 15th Century, both China and the Islamic world were experiencing high levels of economic and cultural development. With vibrant trading activities between the two major civilizations, ideas, knowledge, and ideologies were exchanged along with goods like spices and silk. When the Chinese taught Arab and Persian merchants and traders technological tricks, such as papermaking and use of the compass, the visitors also learned advanced astronomy, mathematics, and the beliefs of Islam. There were two main trading routes to China from the Middle East at that time: 1) sea route, sailing through the ancient sea trade route of Persian (Arabian) Gulf around the Malay peninsula, providing links with cities along the southeast coast of China such as Guangzhou, Quanzhou and Yangzhou; and 2) by land using the northwest area of China of the so called "Silk and Spice Road," a more conventional land trading route (network) that connected China to Constantinople and on to Rome in earlier centuries (Sun, 2003, p. 118).

Through those two routes, influences of Islamic principles and teachings, including the ideas of mosque architecture, were introduced to residents in different regions with different levels of cultural, social, and economic development. The sea route took a shorter travel time but accommodated smaller numbers of travelers and traders while the land route made longer trips but allowed more people and goods access to the destinations. This formed the two different styles of mosque buildings in China: one is mainly located in southeast China along the coast regions that adopt traditional Chinese planning and architecture; and the other can be found in places along the land route in northwest China that were dominated by imported styles from the Middle East, such as Arabic domes and *minarets* (tall towers used for the call to prayer).

The distribution patterns of these two architectural types reflect the interplay, negotiation, conflict, exchange, and incorporation between the two main cultural forces: between the Arabic-based Islamic and the traditional Chinese ones. The former is more prevalent in major Chinese cities where the traditional Chinese cultural identity is so strong that the imported styles need to be modified to redefine the Islamic characteristics. The latter is located around the edges of the old empire of China where the cultural battles have always taken place in history. In spite of their differences in forms, all mosques in China are located in the center of Muslim communities and follow the essential norms of mosque architecture: a prayer hall-centered layout with its orientation (*qibla*,

i.e., direction) toward the *Ka'bah* in Mecca, the bath or cleaning facility, and teaching /learning halls. Steinhardt (2015) examined about one hundred “early mosques” of China before 1900, illustrating regional and stylistic differences within local Chinese Muslim communities. Steinhardt found that all Chinese mosques virtually accommodate all Islamic functions and activities.

This paper utilizes the comparative analysis and case study methods to examine spatial identity and meaning in early China’s mosques, particularly the Great Mosque of Xi’an. A case study approach was adopted to provide an in-depth understating and detailed illustration (Alajmi & Al-Haroun, 2022). Taking the Great Mosque of Xi’an, one of the oldest mosques in the world, as a case study, demonstrate the convergence and interplay between the traditional Chinese architecture and the Islamic symbolisms by analyzing the meaning of its courtyards. The primary sources of spatial patterns studied in this paper are the authors’ own observations.

The Islamic representation in a Chinese context is a complicated architectural product. Therefore, this study does not restrict itself to the boundaries of Chinese architectural history or the history of Islamic architecture. This study does not employ a chronological or descriptive study to explain such complicated architectural product as it will only produce overly broad understandings and fail to develop meaningful arguments. Rather, this study performs social and synchronic analysis based on the building features of the Great Mosque of Xi’an, particularly its courtyard spaces, and develops critical arguments and theorization. The purpose of this study is not to describe what happened in China’s mosque architecture in the past, but to analyze the symbolic meanings of its product with social concepts and theories and interpret them to form intelligible understandings.

2. Spatial Features of the Great Mosque of Xi’an

It is not surprising to find that classical features of Islamic architecture, including domes and arches, are not part of the Chinese tradition of building in wood. The best example of early China’s mosques is its largest mosque, the Great Mosque of Xi’an (Steinhardt, 2015, p. 121). It can be dated back to 742 AD and has been destroyed and rebuilt several times in history and the most recent rebuild took place in 1764 (Zhang, 1981). Surrounded by densely-packed residences of Chinese Muslims, the mosque is located close to the landmark of the traditional city center of Xi’an, the Bell Tower. The entire complex occupies an elongated rectangular site 245m long and 47m wide, inside which a group of halls, gates, pavilions, and structures are organized within five courtyards (Fig 1). This mosque complex is considered one of the oldest and largest mosques in China. It serves as a major place of worship for over 60,000 Muslims living in its vicinity and is a tourist site today.

In contrast to all other religious temples in China, whose layouts normally adopt the south-north orientation, the Great Mosque of Xi’an is built along its east-west axis with the main entrance at the east end and the Prayer Hall at the west end, reflecting the Islamic principle of *qibla*, orienting prayer in the direction of the *Ka'bah* in Mecca which is now to the West of China. The whole complex covers an area of 12,000 square meters. The first courtyard is located right behind the main entrance and is featured by a 9m tall wooden archway highlighting the entrance, while serving as the first visual focus within the first courtyard. This courtyard contains the ‘Unmatched Pavilion’, in the center of the northern wall. This pavilion has a hipped roof and central projection and wide raised eaves. It serves as a library today. On both sides lie the two guest rooms.

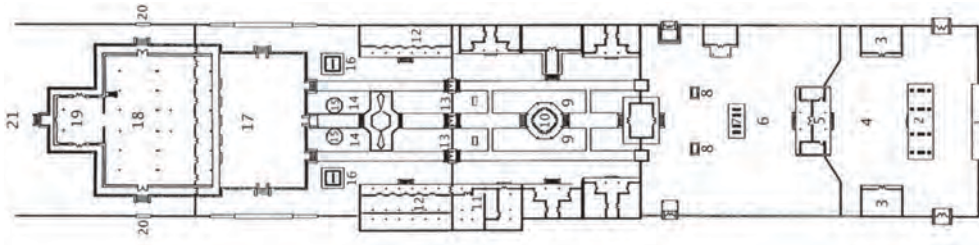


Figure 1 The layout of the Great Mosque of Xi'an. (1) screen wall (2) wooden pailou (3) side gate (4) first courtyard (5) gate (6) second courtyard (7) stone paifang (8) stele pavilion (9) third courtyard (10) Shengxinlou (11) hall for ablutions (12) lecture hall (13) conjoined stone gates (14) Yiyzhi Pavilion (15) hexagonal pond (16) stele pavilion (17) yuetai (18) prayer hall (19) yaodian (20) screen wall (21) location of screen wall. (Steinhardt, China's Early Mosques, 2015)

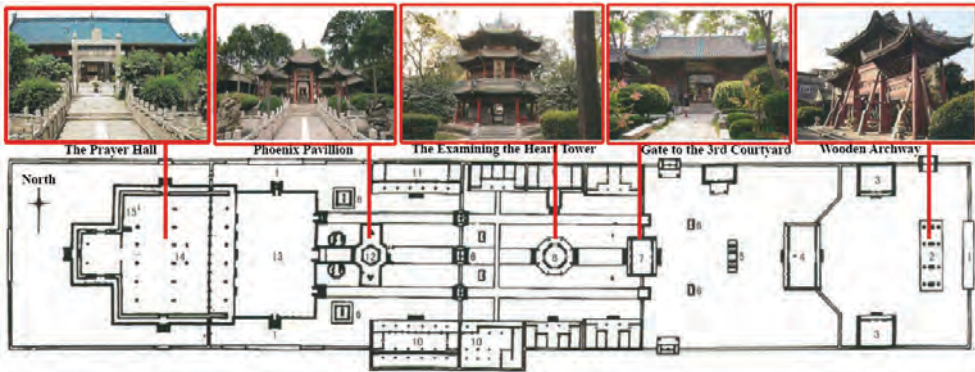


Figure 2 The layout of the Great Mosque of Xi'an and its key buildings/structures. (Fan, 2013)

The second court separates from the first by a shallow roofed pavilion. In the center of this courtyard, a rectilinear stone with three doorways is erected to resemble a wooden structure. The central doorway is higher and wider than the other two flanking ones, reinforcing the east-west axis. The most significant elements in this courtyard and, probably in the mosque, are the two freestanding vertical brick piers, each of which has a carved floral motif topped with an eave roof and dougong brackets. The most confronting representation can be found in these monumental piers, the representation of animal figures (Fig. 4). Unusual in Islamic architecture but not surprising to find them in Chinese architecture, these monuments have dragon heads crowning their hipped roofs. What is more confronting is that they look predominant and visible. Figurative sculptures and paintings are rare in Islamic architecture, and if found, they are often located in hidden surfaces or in unnoticeable areas.



Figure 3 The central gate of the three marble gates that leads to the fourth courtyard from the third one (Photo by the author).



Figure 4 Dragonheads crowning the hipped roof

The third courtyard is called the 'Place of Meditation.' The dominating octagonal structure is known as the 'Pavilion for Introspection'. It is an octagonal pagoda 10 meters tall with three eaved stories and wooden balconies featuring dragonheads carved into the ridges. A library, imam's residence, and two halls for ablutions can be found along the north and south sides of the courtyard.

The fourth courtyard is the mosque's main courtyard which brings people to the prayer hall through the 'Phoenix Pavilion' and two halls for ritual ablution that connect to the other two halls for ablutions at the third courtyard. This courtyard is separate from the third courtyard by three marble gates with wooden doors (Fig.3). The central gate leads to the 'Phoenix Pavilion,' one main pavilion with two smaller ones on both sides. All three pavilions' rooflines connect to the central one, the largest and hexagonal, extending the invisible east-west axis. The apparently Chinese pyramidal roofline of the pavilion conceals a highly carved wooden cupola that crowns the central space. Its main supporting elements are the Islamic squinch vault form which helps bridge the transition from squared corners to the circumferential perimeter of the dome's base. In this transition, a Chinese bracketing system has been subtly 'Islamicized' so that three tiers of free-standing squinches gracefully transform the hexagonal space into a hemisphere. In fact, this copula demonstrates the importance of some Islamic elements in interior space to attain spiritual identity.

The front entrance of the prayer hall marks the division between the fourth and the fifth courtyards. As the focus of this ceremonial layout of the Great Mosque of Xi'an, it is also the climax of a series of spatial sequence of the five courtyards and preceded by a large platform in the fourth courtyard. The prayer hall is comprised of a porch and a great hall with a projecting *qibla* wall and *mihrab* space that orients worshipper prayer toward the *Ka-bah* in Mecca. The prayer hall covers an open space of 1,270 square meters by a single roof with three distinct hipped roof segments (Fig.5). The hipped roof of the projecting *qibla* area is perpendicular to those of the main hall that run north-south to stress the direction of the worship space.



Figure 5 The prayer hall (photo by the author).

3. Spatial Hierarchy through Courtyards

Islamic doctrine does not directly command the form of sacred spaces where Islamic activities and events take place. As a result, the evolution of mosque architecture has not been driven by religious laws but rather by the needs of the Muslim users. In every Muslim community, a mosque not only is a place of worship but also serves for community gatherings, teachings, cultural practices, and sometimes, markets. The built forms of a mosque reflect various environmental and cultural contexts. However, every single mosque serves as a worship place for all Muslims according to the laws of Islam, which implies that the forms of mosques should indicate the shared values and identities of all Muslims throughout the ages and across regions (Hillenbrand, 2000).

The first mosque was originated from Prophet Muhammad's Mosque where a large rectangular courtyard was defined by a hypostyle hall, structures, and walls (Fig.6). In this humble place, there was no special architectural style or symbolic form that could be used to deliver the shared values or identities. But the open courtyard allowed Muslim believers gathered to stand behind the imam to complete their prayers and other religious activities. It was the group activities that facilitated the formation and development of shared values and identities. Hence, the sacred quality of a mosque could be achieved by offering a spatial function through an open courtyard to fulfill prayers' needs.

Mosques are places of encounter, where people exchange ideas, products, and sentiments. Meeting other people and conducting group prayer implied togetherness, which referred not only to physically being together, but also to mentally being together to shape shared identities. The form of a mosque was the logical consequence of the needs of a Muslim community and served as a symbol to describe and spread the idea of 'community.'



Figure 6 Drawing of Prophet Muhammad's house (Leacroft & Leacroft, 1976)

Since then, mosques across the world employ open courtyards as a fundamental form that is simple, legible, and easily replicated into different forms. Most mosques in the Middle East adopt the single courtyard pattern where the prayer hall, hypostyle halls, and walls enclose an open courtyard in the center with four minarets located at the four corners of the courtyard.

Although the Great Mosque of Xi'an shows a different courtyard pattern – there are five courtyards, one leading to another along the central axis – it attempts to create a sense of community in a different way. In the Middle East, most residents are Muslim. Hence, mosques' forms aim to create an inclusive community where everyone is welcome. Courtyards become a symbol of community inclusiveness, turning mosques in the region into places for worshipping Allah for sure, but also serving as public spaces, markets, and community centers. The focus of courtyards in mosques in the Middle East is to define "togetherness." However, this does not apply to the context in China, where most residents are non-Muslim. As a result, mosques in China cannot become public places for everyone, but only belong to the Islamic groups. Particularly, in a non-Islamic context, it is critical to foster the sense of community among Muslims through place-making that highlights the differences between Muslims and non-Muslims while promoting the similarity and shared values among Muslims.

In the Great Mosque of Xi'an, multiple courtyards create multiple gates through which users move between different courtyards. Spatially, those multiple gates and courtyards create more physical layers of distance. The open courtyards are occupied by gardens and vertical structures in the middle, blocking views to see through all courtyards, which also creates more mental layers of distance. Those enlarged physical and mental distances further isolate the interior religious spaces from the outside streets and surrounding communities, defining clear boundaries between the non-Islamic places and the Islamic ones. In addition, the gradually reinforced spatial divisions provide an improved privacy and an enhanced security: non-Muslims are kept outside, and the Muslims are protected inside. This practice has been critical in China's history when the Muslims were always the minority and there has always been political or social chaos from time to time.

Along the longitudinal east-west axis, a series of courtyard and building compositions are clustered together in the Xi'an Mosque. Every composition

is separated and connected by defined spatial boundaries — courtyards. From the inside out, the prayer hall, the courtyards, the gates, and the main entrance yard formed one sequence of descending order in religious status and spatial positioning: it becomes more non-Islamic when moving from the prayer hall to the entrance of the mosque. In this dispersion of space from the innermost to the periphery, there is a clear hierarchy in religious terms. On the one hand, the prayer hall is in the inner central courtyard, and therefore claimed a higher social and religious status. On the other hand, with the superior scaling of inner space, there is a relative height differential and therefore a relative domination of an inner and more central space over outer and more distant areas (Zhu, 2004).

Courtyards not only encircled the entire complex, down to smaller spatial units, but also further dissected, internalized, and deepened spaces (Fig. 7). At the spatial level, courtyards are the only material and constitutive element that defined the overall concentric, hierarchical position. In the Great Mosque of Xi'an, the five courtyards form five spatial units, each of which is relatively independent – all of them have designated functions and spatial centers. In the meantime, this composition also creates five layers of boundaries between the east side of the complex (the entrance) and the west one (the place behind the prayer hall).

A hierarchical order in a concentric layout of enclosures is imposed either from the center to the periphery or from the innermost to the outermost. Typical mosques in the Middle East prefer to employ the former while Chinese mosques adopt the latter. In the Great Mosque of Xi'an, the multiple courtyard layout imposes a social hierarchy by placing the activity of praying and its place, the prayer hall, with the highest status at the innermost locations while other non-prayer activities and spaces at less significant locations. The hierarchy of the prayer hall can also be evidenced by the large, erected platform leading people to the prayer hall from the 4th courtyard which makes the prayer hall spatially higher than all other buildings in the complex, literally *requiring* believers to step up to it, a place in which they are about to speak to Allah, through their prayers, and in which Allah is about to speak to them, through recitations of the holy Qur'an in the prayer hall.

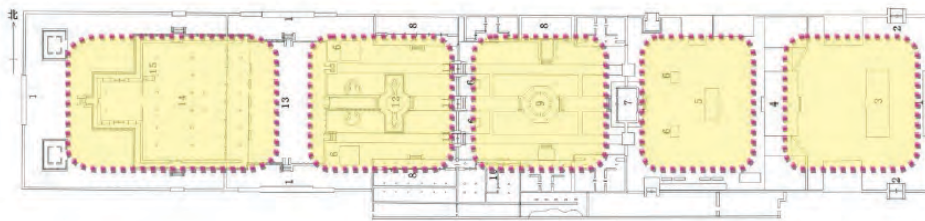


Figure 7 Courtyards encircled the whole complex down to smaller spatial units.

Located at the inner center, the prayer hall of the Xi'an case assumed the higher status and claimed the best spatial resources. Hence, the prayer hall was the biggest, highest, and most exquisitely decorated built form of the entire complex of the Great Mosque of Xi'an. Other activities such as teaching or ablution are usually conducted in the outer compounds, such as the 2nd or the 3rd courtyard, which represent a lower position, implying less religious significance. The spatial segregation formed by courtyards creates a spatial-hierarchical framework of a higher inside and a lower outside just like a higher central and a lower periphery in cases of mosques in the Middle East. Naturally, as more courtyards are inserted, more hierarchies are created, and, as a result, the inner takes on more significance.

There is a dialectic relationship between the courtyards in the Great Mosque of Xi'an. The courtyards dissect space into fragments, while the openings connect and integrate the spatial fragments. The openings, in the form of gates and archways in the Xi'an case, have critical effects in the exercise of connection between the two sides of the courtyards. Although openings are the locations where space and human activities move across or overcome the courtyard, they are also the points where the control and defense are reinforced. Only through the openings can the inside and outside space establish an asymmetry. This demonstrates the different religious hierarchies: the inside is more religious while the outside is less religious. Going to the prayer hall from the entrance is an experience of religious ascension from the outside to the inside (Fig. 8). Through the boundaries – defined by courtyards, doors, and archways – the Xi'an Mosque's designers have successfully created a spatial sequence, which strongly demonstrates the differences of the inside prayer hall and the outside streets – this reflects the difference between an Islamic place and a non-Islamic place.

When a Muslim worshipper goes through different courtyards from the street to the prayer hall, he passes through various distances, experiencing alternate spatial changes between the interior and exterior. He is also undergoing a spatial promotion from the lower to the higher step-by-step, with increasing religious significance. The perception of space reaches its peak when he arrives at the prayer hall, the climax of the spatial progression and sequence. In addition, this spatial sequence stimulates a strong desire to continue the discovery of the inner space that is concealed by courtyards, which increases the fascination of the innermost space.

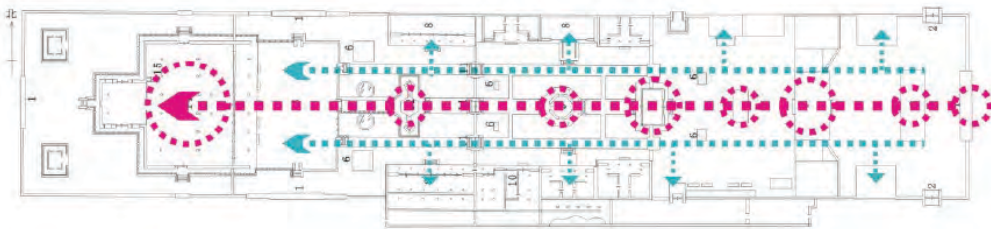


Figure 8 the axis-based spatial sequence promotes an experience of religious ascension.

4. A Cross-Cultural Convergence

It is obvious that religious functionality is the top priority of all mosque buildings worldwide. However, the transmission and development of Islam in China showcases a different path compared to its counterparts in the Middle East. Islam had to face China's long cultural traditions of "Buddhist, Daoist, Confucian and imperial monuments in the cities and countryside for nearly 1,400 years." (Steinhardt, 2015, p. xix). This leads to the fact that many Chinese mosques tend to employ the language of Chinese architecture for the purpose of Islamic representation.

In the Great Mosque of Xi'an, the entire complex followed the traditional axuality of Chinese urbanity, but instead of the ubiquitous south-north axis, the Xi'an Mosque is oriented toward the west, with the main prayer hall at the west end of the axis. Furthermore, entering the five courtyard arrangement with its main entrance behind a freestanding screen wall, or the *yingbi*, resembles a Buddhist or Daoist monastery more than a mosque (Steinhardt, 2015, p. 147). Shengxinlou, the Chinese-style three-story octagonal tower in the third courtyard, serves as a stout minaret in the Xi'an Mosque (Fig 9). The most obvious non-Chinese features in the Xi'an Mosque are the Arabic calligraphy

inscriptions placed in the stone gateways and the prayer hall. The prayer hall interior decoration, with its vegetal and floral scheme, bears a strong resemblance to decoration found in early mosques of the Middle East.



Figure 9 Shengxinlou, Xi'an Mosque's minaret (Steinhardt, 2008, p. 347)

5. Conclusion

An essential difference between the design patterns of mosques in the Middle East and the mosques of China can be traced back to differences in building materials. In the Middle East, local building techniques that made use of brick and stone, which later incorporated building techniques from ancient Rome brought by Alexander's conquests, enabled the development of a set of complex architectural vocabularies that were later adapted to mosques. Meanwhile, the Chinese had a long history of making wooden buildings for all purposes of life. This fundamental difference led to a different understanding of spaces and a different application of forms and compositions. However, mosques in China attempt to combine elements from both cultures to produce symbols that can trigger in worshippers the recollection of a larger scale of shared values and identities, Islamic values and identities. The Great Mosque of Xi'an provides solid evidence of this approach – it clearly demonstrates that buildings are carriers of culture and tradition.

Another essential difference lies in the context – in China, Muslims have always been a minority group, which naturally makes them possess a stronger desire for internal cohesion by highlighting their unique shared identity. This identity should be obviously different from the mainstream society. As a result, the Great Mosque of Xi'an clearly displays the social differences through spatial boundaries defined by a series of courtyards. In addition, the religious significance is expressed in a hierarchical order – the inside hosts more important Islamic activities while the outside is associated with more non-Islamic activities. Hence, the courtyards in the Xi'an Mosque contribute to separating spaces to dissect human activities in order to distinguish Muslims from non-Muslims.

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THE VERNACULAR MOSQUES OF AL-KHABRA (KSA): INVESTIGATING URBAN ARCHITECTURAL AND SOCIAL DIMENSIONS

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INTRODUCTION

Vernacular mosque architecture in the Islamic world is a growing research field, but few studies have explored this in the Kingdom of Saudi Arabia (KSA), and the Arabian Peninsula in general. Vernacular mosques have never been considered from point of view of their previous users. This paper presents for the first time the vernacular architecture of the two mosques in Al-Khabra heritage settlement in Al-Qassim region and analyses their urban role and associated social and cultural practices.

A sample of eight previous residents from the older generation of Al-Khabra Settlement (who lived in the settlement before its population moved out in the 1991) were interviewed in the summer of 2020. The semi-structured interviews were aimed at collecting valuable data about their experiences and memories of spatial practices of the two mosques.

The mosque is considered as a strong link between dwellings and between people inside and outside settlements. In addition to its primary purpose of accommodating worshippers for religious practice, the mosque served various social, cultural and environmental community needs. Given its religious importance and function, it plays an important role in the Islamic settlements. It is important to study the characteristics of the mosque in relation to the local socio-cultural, environmental and economic context.

Aside from early description of vernacular mosques in Saudi Arabia were provided by Western travellers (King 1978, 1980). However, very few studies have been conducted since then on the vernacular mosques of Saudi Arabia, indicating a historical lack of interest among local scholars concerning their indigenous culture and traditions. However, there has been a recent renewal of interest in such heritage as indicated by the published studies of El-Johary (2008); Schiettecatte et al. (2019); Mahmoud (2021). The most recent initiative in that of Al-Fouzan Award established in 2014 (see Historical Mosques in the Kingdom of Saudi Arabia: Investigating Architectural Styles Typology | Abdullatif Al Fouzan Award for Mosque Architecture (2019) via: alfozanaward.org).

Various studies have been conducted on the architectural typology of mud brick buildings in vernacular settlements in Saudi Arabia. This is particularly the case of the Central Region (Shamekah, 1975; Aldusari 1995; Eben Saleh, 2001, 2002; Al-Hemaidi 2001; Al-Hathloul, 2002, 2018; Mubarak 2004; Al-Nowaiser, 2010; Alsheliby, 2015 Bin Sulaiman 2017 Alnaim 2020). However, these studies do not provide any descriptions or analysis of the mosques in the studied settlements.

Only two PhD theses could be found directly related to the mosque architecture and vernacular settlements of the Central region of Saudi Arabia known as the Najd region (Shamekah, 1975 and Alnaim, 2020).

The initiative of Al Fouzan is therefore addressing a real gap. No studies have been found on the social and cultural practices associated with the vernacular mosques. This paper addresses this gap as it investigates the lived experience of vernacular mosques in Saudi Arabia based on the memories of previous residents who used to live in heritage settlements where these mosques are located in the previous local residents of Al-Khabra, who are still alive and have been contacted by the researcher with the assistance of the Municipality of Al-Khabra. These considerations raise the following questions: what are the specificities of the vernacular mosque architecture of Al-Khabra as compared to other mosques in other mud brick settlements in centre KSA? How can the mosque inform future plans for the rehabilitation and restoration of historical mosques in the region or even new mosques by reproducing certain specific elements that are specific to the region? What was the historical role of the

structures in local society, and what is their contemporary relevance? What are the contemporary challenges facing the reconstruction or rehabilitation of existing mosques in the KSA?

This research studies the architectural typology and history of two mosques of Al-Khabra village, looking at behavioural aspects which have not been considered in terms of the role of the mosque as a kind of thermal comfort refuge during extreme heat. Closer familiarity of researchers with researched issues concerning local environments generally yields more in depth results to understand complicated perceptions and performance under certain circumstances, especially with regard to occupant behaviours and other socio-cultural, physical and environmental attributes.

CONTEXTUALISING AL-KHABRA MOSQUES

Studies on Al-Khabra are very rare. Only one study was identified and dealt with the urban scale of Al-Khabra settlement without any information about the mosques (Al-Nowaiser, 2010). Furthermore, vernacular mosques have never been considered from the point of view of their previous users. The Central region of KSA comprising Riyadh, Al-Qassim and Hail known as the "Najdi style" has distinctive properties based on clay as the main construction material.

This paper aims to fill the knowledge gap about investigating residents' perceptions, behaviours, and cultural meanings of mosque spaces and investigates the particular characteristics of mosque architecture in Al-Khabra, in comparison with those of other mud vernacular settlements in the same region such as Al-Tannomah, Al-Diriyh and Ushaiger (Figure 1).

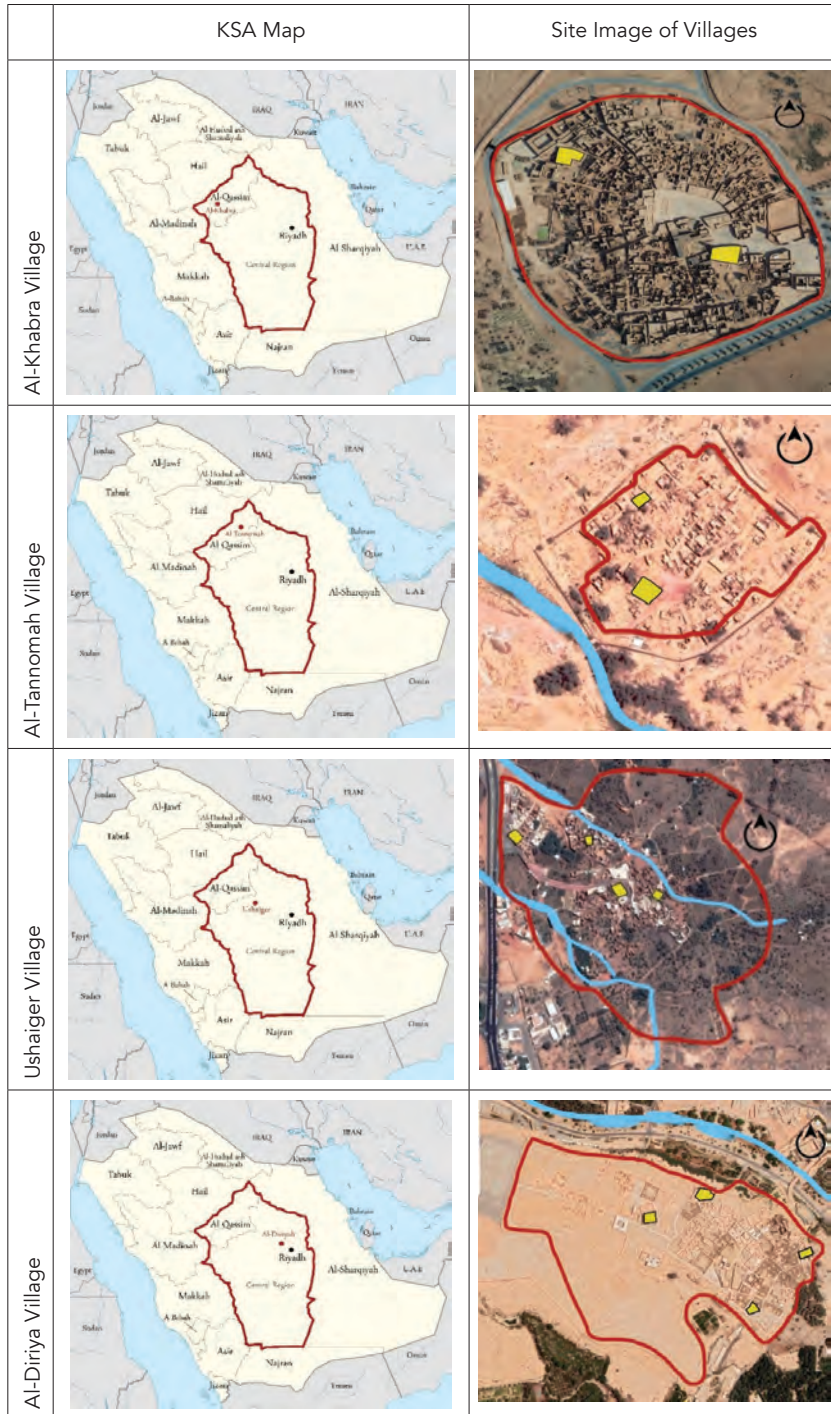


Figure 1. Location of Mosques in four mud brick vernacular settlements in KSA Central Region. Source: Adapted from Google maps

Al-Khabra, as with the other settlements, has two types of mosques, the large congregational mosque for Friday prayers and small neighborhood mosque for the five daily prayers. The other villages have one or two large mosques and several small mosques as is the case in Ushaiger and Al-Diriya (see figure 1). However, Al-Khabra and Al-Tanommah which are both located in Al-Qassim region have one mosque of each type.

The examination of the mosques in each of the four mud vernacular villages of Al-Diriya, Ushiager, Al-Tannomah and al-Khabra, reveals that mosques have many purposes, beyond the rituals of prayer. The two mosque types in villages represent an important observation that increase understanding of the concept of mosques, explicitly and implicitly, indicated by physical shape and areas served by the structures. This was illustrated in the following participant's observation:

"many activities were held in the large mosques, such as Friday prayer, a learning space for the community, general meetings and hospitality places for the guests to sleep". (Ali Alsalamh)

As illustrated in maps shown in Figure 2, the large mosques where the Friday prayer is held are mostly located in the central areas of the settlements and close to the market "Souq", at the intersection of the main streets linking the main gates of these walled vernacular villages. On the other hand, the small mosques are placed in semi-public and private realm of residential neighborhood.

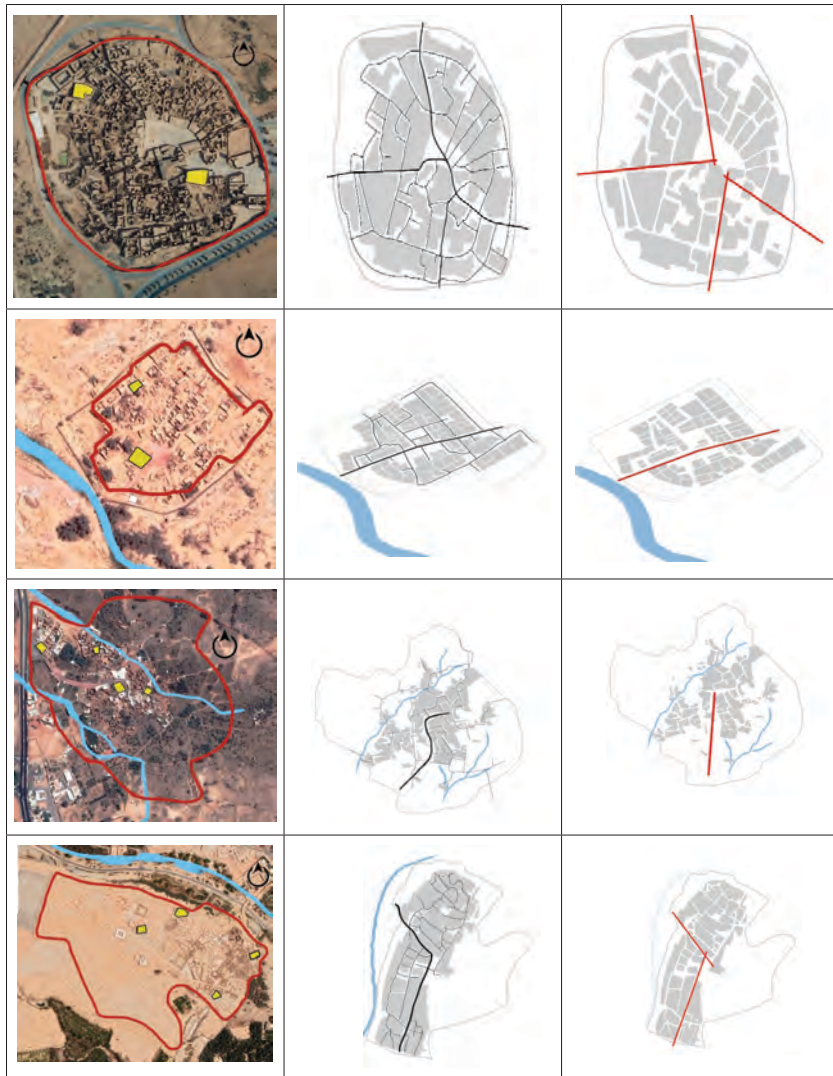


Figure 2. Maps showing mosques in relation to main public streets.

The large Friday mosques are located in proximity to the large market areas or souqs, allowing both local people and visitors to use the mosque. This was observed by Doughty (1888:412):

“Their mosque stands by the mejlis, and is a low clay building. Neraby I saw a brackish well—only a fathom deep, where they wash before prayers... Mejlis is held in the Friday market when the nomads, come also to pray at noon in the masjid bringing camels, small cattle and samn (a form of butter)”.

The Friday prayer as a weekly event brings together all members of the community, with an associated Friday market that would attract traders from the surrounding regions and provides the inhabitants of the settlement and its adjacent region with trade opportunities. Conversely, small mosques are devoid of connections to commercial functions, and are simply for the local people to perform their daily prayers in their neighbourhood.

MINARETS

Minarets in the Central Region have a distinctive cylindrical funnel shape, reminiscent of the minaret of the Great Mosque of Samarra, with a raised head atop a bevelled or square base. The minaret is often located above the prayer hall with a staircase leading to it. Some minarets are very large with rooms used for additional prayer space during Ramadan, as is the case in the Unaizah Mosque in Al-Qassim (Al-Naim 2019) (Figure 3).



Figure 3. Unaizah Mosque in Al-Qassim was built in 1940. Source: (Al-Naim 2019)

The minaret may be one of the main features that distinguish the Najdi mosque in particular. The region illustrates some observations and provide an interesting area of research for the scientific knowledge of those mosques. The latter have sometimes been mentioned in several studies but have not been the subject of intensive, detailed fieldwork analysis so far.

STUDY AREA PRESENTATION: AL-KHABRA VILLAGE



Figure 4. Image of Al-Khabra. Source: (Saleh Al-Hathlol 2015)

Al-Khabra is a village located in the west of Al-Qassim region in central KSA. Surrounded by the Najdi desert, it sits atop massive aquifers, and it is a fertile land capable of producing abundant vegetation and crops. It is commonly called the “bread basket” of KSA due to the availability of wheat. There are several valleys running through the region, the most important of which is Wadi Al-Rummah, where the settlement is found (Figure 5). The village is bordered on the south and east by the valley and mounds of sand and on the north and north-west by numerous farms.

Al-Khabra was described by Doughty (1888:411) in his book *Travels in Arabia Deserta* as:

“an ancient name of a principal oasis in the desert Al-Qassim. It is a naked clay bottom in the desert where shallow water is pounded after heavy rain surrounded by mud-brick fence. It has some butchers stalls and a smith’s forge”.



Figure 5. Wadi Al-Rummah beside the settlement of Al-Khabra. Source: Abdullah

The standard of living of village residents continued for centuries to be based on agricultural prosperity with a rich urban fabric, manifest in safe walls, farms, spatial system, local resources, building orientations and inhabitant skills forming a liveable and interdependent local ecosystem with a sustainable economy.

The vernacular village of Al-Khabra has been standing in the Central Region of KSA for hundreds of years as an ideal example of sustainability. Al-Khabra is inclusive, protective, environmentally friendly, self-sustaining and embedded in its local context; its urban fabric and spatial system show exemplary integration, interacting with various inhabitant activities and the surrounding natural features (Alnowaiser 2010). The system spatially and behaviourally intermingles to facilitate different human activities within their corresponding domains in their local built environment. The spatial systems are based on an inclusive sustainability to achieve a living comfort zone and well-being. The level of sustainability has been expressed through supporting and maintaining inhabitants over many centuries and generations. The village organization and its farms, streets, adjacent buildings, courtyards, local materials and water wells contributed to the sustenance of human life, culture and community.

There were three spatial phases manifest in housing styles, representing three remarkable developments of the settlement (Alnowaiser 2010). Firstly, the centre of the village with initial inhabits and closest houses to the central place. Secondly the middle area with first immigrants and medium houses. Thirdly, the external area was inhabited by late settlers with the biggest houses in 1950 (Figure 6).



Figure 6. Three spatial phases of Al-Khabra development

The settlement is formed of many neighbourhoods, typically separated by streets. The neighbourhoods were directed inward to public plazas and dwellings were similarly focused around a central courtyard. This urban and domestic model provided residents with their needs for privacy, safety, security, social bonds, climate resistance and ecological protection.

The concept of urban fabric relates to the expression of spatial justice for everyone in the village from children to the elderly; consequently, the village is shaped by integrating spatial, behavioural and ecological systems (Al-Nowaiser, 2010). It exhibits many sustainable systems for social interactions, self-supporting services and economic activities. Al-Khabra was described by Doughty (1888:411) thus:

“ The house-building of Al-Khabra is unplanned and the place is not unlike certain village towns of upland Syria”.



Figure 7. Urban planning of Al-Khabra

It had numerous defensive systems, including a perimeter fence around each side, with a number of watch towers and continues external blocks with limited accesses points. The watch towers were often located surveying empty areas of open desert, with some towers placed to secure farms and overlook sand dunes positioned to the south and west. Sustainable protection from the environment was reflected in Al-Khabra's orientation and the design of buildings, streets, roads and neighborhoods, with continuous blocks from the south and south-east limiting the encroachment of sand dunes in these sides (Figure 8). Therefore, it is clear that long blocks help to block sand dune expansion from those directions.



Figure 8. Continuous blocks to the south and south-east limit sand from dune encroachment

The long blocks, closely clustered houses and the usage of mud as the major construction material reduced the indoor temperature of houses. Dwellings in the village shaded open spaces, streets and buildings most of the time, creating less sun exposure and direct solar heat gain.

Al-Khabra has four gates supported by long blocks to control outer access to settlements. Three main roads were built oriented externally to outside adjacent farms (Figure 8). These roads lead to the central area of Al-Khabra (called Al-Majles in Arabic), which was the main area for residents and visitors to exchange goods (mainly farm products produced locally exchanged with visiting merchants' wares). Traders arrived by camel as described by Doughty (1888:412) in the extract quoted above.

On the other hand, houses, plazas, streets and neighbourhoods were oriented inward in direction and each house was directed inward focusing around its central courtyard with monitored accesses and very few windows. In addition, houses had secure access to the inside, controlled via long blocks of housing with few outside openings, whereas the large openings were directed to the inside courtyards of houses. Cool air circulation was improved via narrow openings as illustrated in the following participant's observation:

“Windows in some places were at a high level of the external wall, whereas large openings were located in low level of the walls towards central courtyards for smoke extraction in winter and air circulation in summer” (Al-Hudaythi)

In mosques, small windows were typically placed in the upper level, while open central courtyards with no walls inside mosques facilitated air circulate on. These methods enhanced cool air infiltration in summer and warmer air inflow in winter. As a result, these urban fabrics enhanced the spatial arrangements to be sustainable and secure.

DATA COLLECTION AND METHODS

This study was split to two (2) main phases, data collection followed by analysis. The first phase of the investigation attempted to collect data about the position of the two mosques in Al-Khabra. However, in the case of dilapidation or reconstruction of mosques structures, the study analysis was carried out based on fieldwork including observation. The history of the mosques was reviewed to inform the reconstruction of both mosques in Al-Khabra (the large and small Mosques described below) as collected from fieldwork calibrated with available historical sources. The data collection also relied on the oral memory of previous residents who are now elderly to give their voice on the memory of these places and to fill gaps in respect to the mosques. Consequently, the current study interviewed a sample of eight elderly local residents in depth who had experience of living in Al-Khabra vernacular houses. Therefore, fieldwork was carried out in July 2020. It is important to consider what people with lived experience have to say about vernacular architecture, because this can inform future practices, and avoid mistakes associated with academic abstractions and sheer ignorance of traditional ways of life.

The second phase of the investigation concentrated on urban fabric. Al-Khabra was compared with other mud-brick villages and mosques in the KSA such as Al-Tanomah, Al-Diriya and Ushiger, to combine the findings on all of these sites to draw some lessons for sustainability. The studied cases were purposively selected due to their manifestation of historical Najdi style of the 18th century, before the establishment of the KSA in 1932.

ABOUT THE MOSQUES: HISTORY, POSITION AND SCALE

The vernacular settlement of Al-Khabra was vacated in 1981 when the government bought all houses on the site and relocated people into contemporary houses. This left the houses empty, and the settlement was considered as a heritage site being rehabilitated for internal tourism. This was illustrated by a participant's comment:

“All the residents of the village left after the relocation of people into contemporary houses located nearby settlement, except some elderly people who refused to get out and stayed for a few years” (Ali Al-Salamh)

As these houses were vacated, the study relied on the oral memory of previous residents who are now elderly gathered via recorded phone and online interviews. The aim of the interviews was to investigate mosques, giving the voice of the elder generation who used to live in the vernacular houses before they moved to contemporary houses.

Fieldwork investigation of the chosen mosques is a beneficial method to fulfil the research objectives about investigating the characteristics of the two mosques

(Figure 9) which are significant in the development of vernacular mosques in the current search for a sustainable paradigm. Based on the available cases in Al-Khabra, two mosques were selected for the study. The "Large Mosque" is a larger complex near the centre of the village close to the Mejlis open space; the "Small Mosque" is a smaller structure close to the north gate in the north-west side of the village. The large Mosque has a basement known as the "Khalwa" means seclusion, and both have open central courtyards. The large Mosque and its surroundings were observed by Doughty (1888) in Al-Khabra, as described previously.

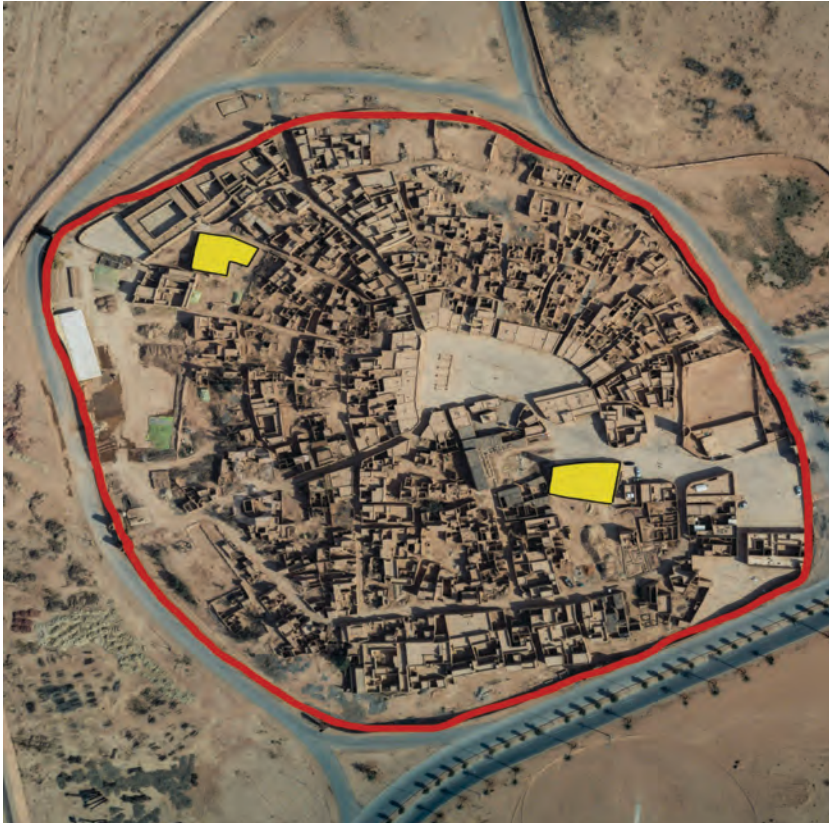


Figure 9. The location of the two studied mosques

Prior to restoration efforts, the large mosque was in a bad condition, while the small mosque was still essentially intact, but it was not in use (Figure 10). Consequently, Al-Khabra Council in cooperation with the Tourism Ministry worked on the large central mosque and it has been rehabilitated, but not with its original features. A covered courtyard and single glazed windows have been introduced which are inefficient for energy because hot air is trapped inside (the vernacular open courtyard benefitted from air movement). These modern solutions will turn the space into an oven, with intensive heat gain and it is essential to allow hot escape, to achieve some ventilation and convection cooling. According to the local Council, the rationale for this system was to keep the carpet clean, which is counterproductive as the carpet and the mosque itself are instituted for worshipper comfort and it is not for building users to suffer in the interests of the carpet. The carpet material is also wool

which is warm when praying directly on the floor. The carpets could be kept clean with a different mosque design that is more environmentally friendly and thermally comfortable.



Figure 10. Picture taken in 2004, showing the bad condition of the Big Mosque (left) and the intact but unused Small Mosque (right). Source: Google map

Sometimes the design might create problems, particularly in very hot arid climates, with the large area of the roof of the Large Mosque being exposed to maximum solar heat gain particularly during the summer. This mosque needs to be saved, rehabilitated and protected within its original features. The original characteristics of the Large Mosque may have been irretrievably lost in reconstruction (Figure 11) while the Small Mosque retains some of its original features, which can inform future practices, so that some mistakes in reconstruction or rehabilitation are not repeated again.



Figure 11. Picture taken in 2018, showing the reconstructed Big Mosque (left) and the intact unused Small Mosque (right). Source: Google map

The following subsections examine these two cases to identify their characteristics in relation to the local socio-cultural, environmental and economic context.

The Large Friday Mosque (Central):

The large Mosque is located close to the open central market space in the central part of the village, constructed in 1700 AD. The main prayer hall is supported by stone circular columns, using vernacular construction materials. The mosque is a distinctive local vernacular heritage structure with an exceptional basement that makes the building unique. The total area of the mosque is approximately (560 m²). It has a tall minaret narrowing upward to a cone with a height of 10 more than double the height of the mosque's rectangular prayer hall (3.60 m). Local building materials used in construction include wood and adobe bricks (manufactured using sun-dried mud, water and straw or grass). These distinctive building materials are characteristic of local vernacular techniques, with implications for passive cooling to achieve thermal comfort, as explored by qualitative interviews with local residents. Figure 12

shows the basic layout of the large mosque. Here (M) refers to the front covered pray space “Almisbah”, (C) means the open courtyard “Alsarha”, (A) indicates the ablution space, (S) refers to the storage area; (B) indicates the basement “Al-Khalwa” and (E) means outdoor Alesha and indoor women’s prayer space.

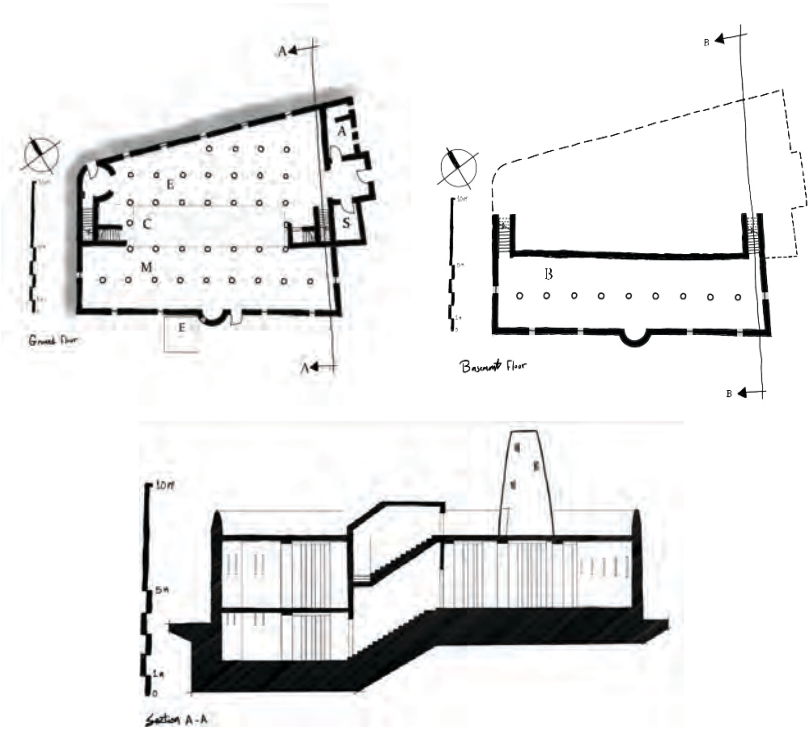


Figure 12. Architectural plans (top) and section (bottom)

The original features of the mosque were lost after the covering of ‘Alsarha’ described previously. The modern retrofitted roof prevents air movement and overheats the space. Figure 13 illustrates the mosque before and after reconstructing, showing covered courtyard with single glazed windows.



Figure 13. “Alsarha” the open courtyard as it was (left), and covered after rehabilitation in 2015 (right)

People retired to Al-Khalwa during extreme heat to enjoy the cool basement space of the large Mosque which is an example of vernacular behavioural adaptations. The architecture and the construction of the basements was important and it was used without any air conditioning into the late 20th

century because of its basement passive cooling and heating system (utilizing the underground temperature). In the summer season during peak high temperatures, users went at noon to rest in the Al-Khalwa basement space which remained relatively cold, while it was used at night in the winter due to its relative warmth, as indicated by an interviewee:

"Al-Khalwa was used in extreme hot and cold seasons " (Ibrahim Al-Omem).

People mostly prayed in the ground floor, but in summer basements were used in the day to avoid the extreme heat, while roofs were used at night. The open courtyard space Alsarha was avoided in summer at noon when the sun was high, but in winter at mid-day people could sit this open ventilated place.

In terms of ablution, devotees used to take water from the well next to the mosque and carry it to the "Gero" (stone basin) (Figure 14) in an ablution area as recalled by an interviewee:

"There used to be a garo close to the entrance which was full of water to be used in Wudu (ceremonial washing before prayer) .. water was taken from the well of Jama'at Almasjed (the habitual congregants), surrounded by a fence and there was a tamarisk tree" (Ali Alsalamah)

As recalled by interviewee, the well of Jama'at was located close to the ablution area, as shown in Figure 14, but the local Council removed it from the site as a part of its botched rehabilitation efforts. It should have been preserved, possibly as a working well or at least as an artefact (perhaps with a transparent cover for safety). Perhaps it can be restored as a core part of the heritage of the mosque.



Figure 14. Left picture shows the well in circular dots, (right) an example of a stone basin (garo) traditionally used for wudu

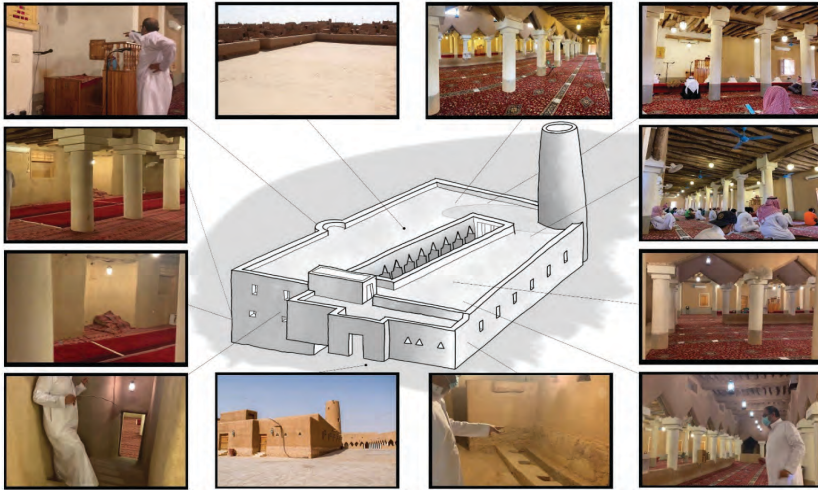


Figure 15. The large Mosque with real images.

The Small Mosque (North-West Side):

The Small Mosque is situated at the north-west gate of the village, constructed in the late third spatial phase of settlement development in 1950. The total area of the mosque is about (415 m²) and it has three separated spaces, each of which is used at a particular time, exhibiting behavioural adaptations where people move around the mosque to find suitable indoor environment. The prayer area is separated to two spaces. The front one is opened partly from north side used in summer called "Almisbah". The rear one is totally closed in the winter time, performing the same functions as Al-Khalwa when used in the winter, but it is above the ground. Both spaces are supported by some stone circular columns. Figure 16 below shows the basic layout of the mosque. Here (M) refers the front covered prayer space opened from north side "Almisbah", (C) means the open courtyard "Alsarha", (B) indicates the rear covered pray space, and (S) refers to the storage area.

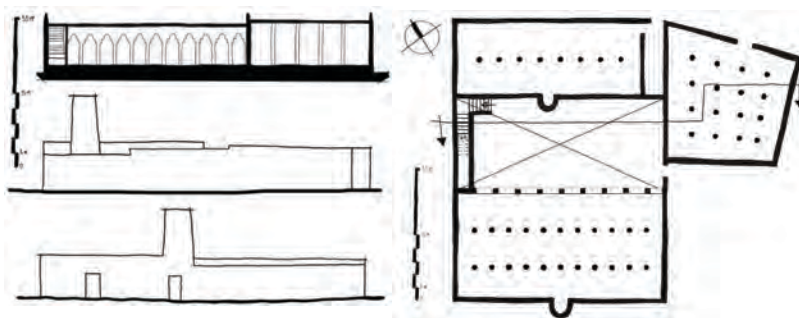


Figure 16. Architectural plans (left) and cross section and elevation (right)

The mosque is described with reference to the labels used in Figure 17: "Al-Makzan" the storage space (S), "Al-Misbah" the main front prayer space that opens in north side (M), and the rear closed prayer space (B) (from the highest to lowest levels respectively). Al-Misbah front spaces is 3.30 m high, while the rear prayer space is 2.70 m.

It is clear that the front space is higher than the rear, but people moved spaces according to seasonal adaptation strategies. For instance, people used the front covered space in summer which opens in the north to allow air circulation during the summer time, while they used the lower back space in winter time to maintain a warm space warm, sheltered from the winds. Al-Sarha, the open courtyard was mostly used in spring season, whereas "Al-Sath" was used in autumn as recalled by participants.

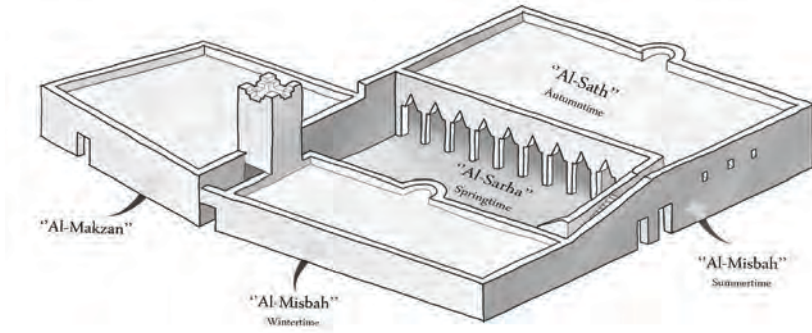


Figure 17. Three different levels in the Small Mosque

The surviving form of this mosque and its original feature can inform future practices, and help avoiding some mistakes in future reconstruction or rehabilitation projects in contrast to the lost characteristics of the large Mosque. Figure 18 below shows some real pictures of the Small Mosque interior and exterior.

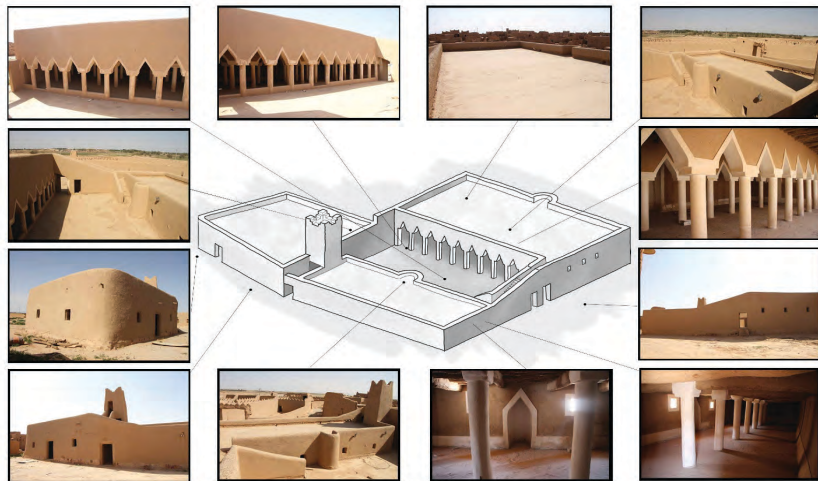


Figure 18. The Small Mosque

COMPARING AL-KHABRA AND OTHER CENTRAL REGION SETTLEMENTS

In general, there is some similarity between the settlements in the Central Region, alongside some differences in urban planning on a large scale or in the design of buildings on a small scale. This section compares Al-Khabra village with some other settlement types of the Central Region.

Four city gates in Al-Khabra lead directly to the large Mosque and central “souq”, where the market was held each Friday (Figure 19). The urban fabric is a distinctive feature with an exceptional circular form, which makes the settlement unique with eight towers distributed around the village as city gates. Other villages have one or multiple gates leading toward the center, as at Al-Dereyah, Oshegr and Al-Tanomah.



Figure 19. An example of open central “Souq” in Al-Qassim Region (left) Shamekh (1975), and the Souq in 2020 (right)

These mosques have various physical shapes and heights according to the context of achieving privacy and not visually harming the surrounding houses. For example, mosque roofs were similar to the surrounding roofs of dwellings, while minarets were slightly higher. The concept of the minarets enhances differentiation between large mosques which have higher minarets, and the smaller Mosques which have lower minarets (Figure 20).



Figure20a. Al-Khabra small mosque



Figure20.b Al-Khabra Friday mosque

However, the mosque spaces in both architectural scales reflect how people dealt with the local climate and their lifestyles, and residents used both the large and small mosques to achieve their requirements. The physical differences between the mosque types were observed in relation to their spaces used and organized (Figure 21).


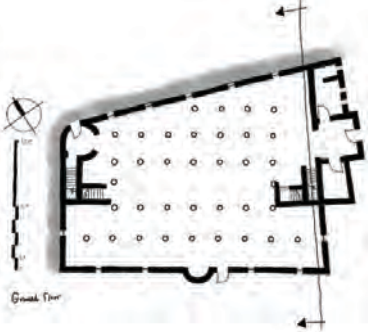

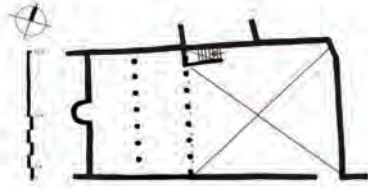

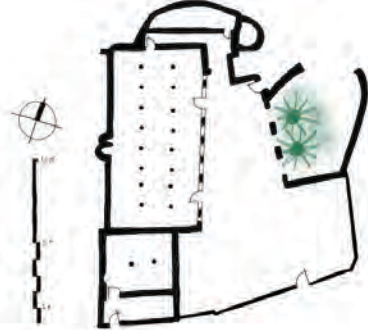


	Mosque Location	Mosque Plan
Al-Khabra Village		
Al-Tannomah Village		
Ushatiger Village		
Al-Diriya Village		

Figure 21 Architectural plans in 4 studied settlements

The small mosques consist of one or two to three closed spaces while the large mosques consist of five distinct spaces, consistently found in the large mosques of Al-Khabra and the other three presented settlements of KSA central region (see figure 21). These spaces are as follows:

1. Al-Misbah, consisting of a front covered main prayer hall
2. Al-Sarha, consisting of an open courtyard separating the front and back prayer hall
3. Al-Esha, consisting of a space for women
4. Al-Sath, consisting of an accessible roof space.
5. Al-Khalwa, consisting of an accessible basement praying space

The large Friday mosques accomplish additional functions such as a community space, a shelter, and a social and cultural hub for the local residents.

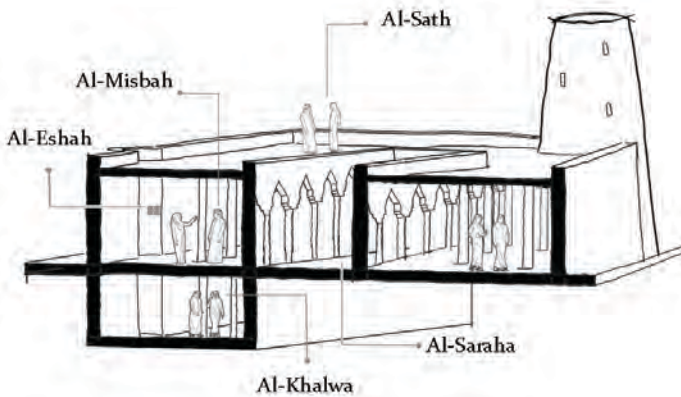


Figure 22 The five components of the large mosque in Al-Khabra

Al-Misbah Space (Main Prayer Hall)

This is the main front prayer hall of the Friday mosque, used in most of the year, but more in summer as the main space. Its local Arabic name means the lantern. This is where lanterns are placed for lighting the mosque. Windows are at a high level of walls for natural lighting and ventilation as well.

Al-Saraha space (an open courtyard)

This is the Arabic local name of the mosque open courtyard. It is used for prayers during the summer nights, when the indoor spaces are warmer than the outdoor ones due to the release of heat accumulated during the day in the thick mud brick walls, especially in Ramadan. The courtyard also acts as a sink of cool air during the night, allowing the indoor spaces to lose their heat during the night and remain cool during the day. The use of Al-Saraha space is however avoided in the summer noon time when the sun is high in the sky and heats directly the courtyard.

Al-Eshah (Women's Prayer Space)

There are two spaces, the first space tends to be located at the front of the mosque. During the Friday's prayer, the small window located on the qibla wall next to the "mihrab" (niche in the wall of a mosque indicating the direction of Mecca) is opened so that women could hear the Imam's preach (see Figure 24). Named Al-Eshah, meaning nest in Arabic. The second indoor space typically located at the back of the mosque used temporarily as Ramadan begins, indication that the number of women worshipers visiting the mosque is rather limited as women tend to pray at home.

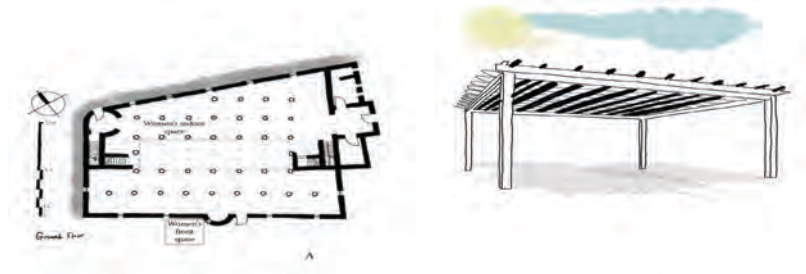


Figure 23. Architectural plans of Friday mosque (left); women's front space "Al-Eshah" (right)



Figure 24. Participant pointing out the window left open during the Friday sermon for women

Al-Khalwa Space (Basement Praying Space)

Al-Khalwa is the name given to the basement praying space in the Friday mosque. It is an Arabic word meaning "retreat". Being an underground space, Al-Khalwa provides a thermally comfortable environment, particularly in the hot summer days and the cold winter nights when temperatures reach extremes.

Vernacular mosques in the Central Region had different usages depending on the climate changes over the year. Local people recalled using the spaces in the large mosques in many ways according to the time of the season, particularly Al-Khalwa being used in extreme winter and summer temperature. This was mentioned by one of the interviewees as follows:

"In the summer, Al-Khalwa is the best place and a very comfortable environment, it is like having an air conditioning, while it becomes warm in extreme winter time.. sometimes we slept in Al-Khalwa during the extreme heat noon time". (Ali Al-Salamah)

Al-Khalwa is both a social and learning space as well as a thermal comfort spatial adaptation of the mosque architecture. In the extreme of the summer

heats, worshippers choose to stay in the cool space of al-Khalwa between afternoon prayers to read the Quran or have a nap. This practice of staying in the mosque to avoid extreme summer heat is found today in the mosque air-conditioned prayer halls during the Hajj and Umrah pilgrimage, when worshippers often choose to stay inside the mosques and even sleep in them between prayers as they are cooler than any other spaces.

Al-Sath (roof space).

Additional cool spaces for summer night praying are also available on the accessible roof of the mosque which is named Al-Sath, meaning the flat roof. Due to generally low yearly rainfall, buildings in the Middle East have flat roofs, which traditionally served multiple functions as a cool praying space in mosques and a cool sleeping space for the houses during the hot summer season.

A modern concrete roof, conversely, serves to radiate heat throughout the night. This was reflected in the following participant's observation:

"In the summer, we sleep in an open place, such as courtyards or roofs ... we do not sleep in rooms at all and its advantage if dawn comes people are awake and we hear the call of prayer, but now the air conditioning is over your head and your feet are numb and there is no one who will wake you up except for the alarm and you wake up lazy this is the differences". (Abdullah Al-Oremah)

Information gathered from interviewees provides a better understanding of the many ways mosque spaces were used in different seasons and times of the day. The role of the mosque as a community space has been clearly emphasised in the accounts of the previous residents of al Khabra who have been interviewed in this study. They recalled that the village did not have a school until 1950 in the third spatial phase of the village developments and mentioned that the large Friday mosque served as the place of education, with lessons being provided to children between prayer times. Another participant recalled the deeply cohesive nature of the local community who came together in the mosque at prayer times:

"There was someone who looked after people and looked at attendance for those in the mosque who came to pray ... naming worshippers, Ibrahim Saleh, Ali etc ... and people would respond present!" (Ali Al-Salamh)

Another interesting spatial practice revealed by the interviewee is the gathering of worshippers at "Al-Mishraq" means the East. It is a mud bench located at the exterior of the East facing wall of the mosque, allowing men to gather outside to enjoy the sunrise after the al- Fadjr prayer at dawn prayer (Figure 24). Aside from its social role, Al-Mishraq was important in adaptive strategies for the winter, enabling people to enjoy solar warmth in the morning in an open space receiving direct solar exposure often next to or within the Central market (souq). Usually public meetings and appointments would occur there after prayers.



Figure 24. Al-Mishraq with east-facing bench

In addition to its social and environmental role, Al-Mishraq plays an important role for both the physical and psychological wellbeing of the worshippers, allowing daily exposure to early sun rays hence setting the physiological clock and providing vitamin "D" necessary physical and mental wellbeing.

The current excessive use of indoor environments that are artificially lit and ventilated has led to the spread of major deficiencies in vitamin D in the contemporary Saudi population as indicated by various studies (see Kaddam et al., 2017). Al-Mishraq was used next to the mosque as illustrated by participants:

"men used to sit outside the mosque after the sunrise prayer, they called it "warm Mishraq" ... Al-Mishraq time is a place where the sunshine shines, until it rises (perpendicular) at noon" (Abdullah Al-Tasan)

It is clear that residents of these vernacular settlements met regularly after prayer, as mentioned by an interviewee:

"we were always seeing each other in the past, helping and standing together as one community" (Abo-Waleed)

The mosque played an important social and was used to meeting the diverse need of the local community. The data gathered through interviews indicate that the architecture of Al-Khabra mosques provide a versatile environment that is thermally comfortable at different times of the day and seasons flexible in use allowing many functions to be performed. The large Friday mosques accommodated a larger number of worshippers praying to Allah, but moreover served as an educational, social and cultural space for the local inhabitants. The mosques are also climatically resilient as they provide an underground gathering space that is comfortable in extreme high or low temperatures. The use of Al-Mishraq as a waiting space between the dawn and the sunrise prayers in the winter, allows for an enjoyable start of the day and exposure to sunlight that is beneficial to the physical and psychological wellbeing of the worshippers.

CONCLUSION

Mosque architecture is a central element in Muslim communities used to facilitate daily prayers and numerous other functions. With many shapes, styles and characters, the mosque architecture has become a lively and growing research field, but few studies have explored these subjects in the Arabian Peninsula, despite it being the cradle of Islam. This research has focused on the vernacular architecture of the two mosques in Al-Khabra heritage settlement in Al-Qassim region and analyses their urban role and associated social and cultural practices. It has aimed to explore residents' perceptions, behaviours, and cultural meanings of mosque spaces and investigates the particular characteristics of mosque architecture in Al-Khabra, in comparison with those of other mud vernacular settlements in the same region such as Al-Tannomah, Al-Diriyh and Ushaiger.

A comparative analysis was undertaken to Al-Khabra mosques compared to other settlement mosques in the region, illustrating the specificities of five key components of large vernacular mosques' architecture: Al-Khalwa (basement), Al-Misbah (front covered prayer space), Al-Saraha (open courtyard), Al-Eshah (woman's area), and Al-Sath (roof space). The findings also reveal that people moved around the mosque to find suitable indoor environments in response to temperatures, exhibiting adaptive strategies. Nevertheless, mosques served local needs including social, cultural and environmental requirements.

The mosque is a gathering space in extreme heat; it is a space of resilience where people can go and congregate together in a cool space improvising social life in the basement "Khalwa" instead of staying in very uncomfortable environments on their own. It is a social space that can be a learning space as explored by qualitative interviews with previous local residents. This is a behavioural aspect that has not been considered previously about the role of the mosque as kind of thermal comfort refuge in extreme heat indicating a role in urban resilience.

The paper has also shown that the mosques had various physical shapes and height, achieving privacy and not visually harming the surroundings. The minarets enhanced differentiation between large and small mosques. The large mosques across the settlements were on main arterial roads, close to the central market "Souq", while the small mosques were located in less connected residential areas. Al-Khabra is the only village that had several public streets from the main gates, rendering it unique accessibility features not found in the other studied settlements.

This research can be extended to include the vernacular mosque architecture of the KSA as a whole, taking into consideration the fact that, some of these vernacular mosques have been restored by the "*Mohammed bin Salman Project for Historical Mosques Renovation Program*" which renovated 30 vernacular mosques out of 130 mosques in 10 different regions of KSA at a cost of \$13.3m.

Future studies can explore newly recognized historic mosques and highlight certain specific elements associated with particular regions, particularly in terms of thermal comfort adaptations and ways in which building users move around mosques to find suitable indoor environment. In addition, the height of minarets should be considered in new mosques. In North Africa, for instance, square minarets had proportional height-width dimensions (the height was five times the width), with municipal authorities having clear regulations about these aspects within regions, but there appears to be no historical knowledge

of similar phenomena in Najd and other parts of KSA. Many opportunities have been found to restore Muslim religious heritage and reproduce architectural cultural heritage to connect the past and present, and learn from the former to increase climate resilience and sustainability for future generations.

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AN OVERVIEW OF ARCHITECTURAL DESIGN, CONSTRUCTION, AND FUNCTION OF THE JAWATHA MOSQUE

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Abstract

A number of historic mosques spread throughout the Eastern Province of the Kingdom of Saudi Arabia serve the affluent architectural culture. It is important to recognise and appreciate the significance of preserving architectural legacy because it reflects socio-cultural situations of the local people. Therefore, conserving and reconstructing architectural heritage in their original state is important, because it may inspire future generations to respect and follow their culture. This paper has adopted Jawatha Mosque as a case study and analysed its construction techniques, architectural elements, design, and function. The mosque is located at Al-Hofuf and is considered to be the earliest in eastern Saudi Arabia. It was constructed during seventh Hijri and is the first mosque to hold Jumaa prayer after the Masjid Al-Nawabi in Al-Madina. Most of its initial architecture collapsed and was buried in the sand. The remaining structure was at risk of disintegration but continued to be used for daily prayers. This led to the decision of conserving the mosque and currently, the newly constructed mosque is being used for prayers besides being a popular tourist attraction. People are not sure if the reconstructed Jawatha Mosque represents its initial construction material, technique, function, architectural elements and design. Therefore, this study is aiming to examine and analyse its construction techniques, architectural elements, design and function in relation to local culture. To achieve the aim of this paper, the author adopted Case Study Methodology with several research methods employed, such as, review of the literature, in-depth interviews, sketches and photography. According to the in-depth interview carried out in this study, the construction technique, function, geometry, architectural elements and design adopted in the reconstructed Jawatha Mosque were based on local authorities' best judgment and imagination. However, socio-cultural influence is evident on the current image, architectural elements, design and function of the mosque.

Key words: architectural design, culture, heritage, construction, function, Jawatha Mosque

1. Introduction

According to Heritage Canada Foundation (1983), physical interference to prevent deterioration in a building, safeguarding its structural strength, cleaning of wallpaper, plastering, repointing and consolidation of masonry, stabilising existing foundation, are all included in the architectural conservation work (Heritage BC, 2013). Heritage conservation is a process that is linked with the definition of culture which gives importance to customs, traditions, lifestyles, urban, heritage management and construction (Al-Naim, 2011). Saudi Arabia is prominent for compassing diversified architectural styles amongst all the countries in the Arabian Peninsula. The Saudi Arabian architecture in the seaside, hilly and plain areas is very distinctive and influenced by the traditional architectural characteristics (King, 1998). Vernacular architectural styles and practice of Saudi Arabia did not change for the past few hundred years before the economy was fully dependent on oil. However, discovery of the oil triggered a lot of changes in built environment in the form of development and expansion of urban areas causing minimalizing vernacular construction and architecture (King, 1998). Therefore, it is important to understand the requirements of completing successful conservation work as it is related to the achievement of the aim of this study. According to Gharaibeh and Kabir (2011), traditional architecture, cultural history, heritage, natural landscape of the eastern Province of Saudi Arabia should be precisely documented and preserved because cultural heritage is one of the major determinants of identifying nationality (Al-Saud, 2011). It is a challenge to quantify the long term benefits of preservation and restoration of tradition, architecture, cultural practices of Saudi Arabia and their effects on the development of sustainable communities. There is a relationship between the rate of conservation of urban heritage and the rate of appreciating cultural identity by the future generations of Saudi Arabia. The

more the local heritage is restored, the more it will be preferred (Nouf, 2011). However, according to Nouf (2011), restoring and preserving architecture and vernacular culture in the long run will positively influence national and regional development significantly creating employment, community participation, investment opportunities, as well as boosting the tourism industry.

According to up-to-date literature, the local administration in the Arab subcontinents are blamed for neglecting urban heritages of their urban areas (Alkhamis, 2011; Boussaa, 2010; Sutton and Fahmy, 2002; Williams, 2002; Steinberg, 1996). As cities are expanding and developing in most of the Arabian land, old traditional settlements are being demolished, vernacular architectural design elements are rapidly fading away from the Arab continent's skylines, and traditional construction materials (such as, mud, brick, coral) are disappearing with traditional construction technology skillsets. As a result of this rapid urbanisation, land prices are skyrocketing and therefore old houses with valuable heritage are being destroyed, which led to Saudi Arabia losing a considerable amount of heritage mainly during the 1970s and 1980s. However, city authorities had insignificant trials and efforts to document old urban areas and residences before they were replaced and reconstructed (King, 1998). It is evident from the sources of literature on conservation requirements that cultural practices of construction must be examined and studied to carry out successful conservation work. Therefore, authenticity is important in any restoration, preservation project and be considered while conserving any heritage of Saudi Arabia. The aim of this paper is to examine and analyse construction techniques, architectural elements, design and function of Jawatha Mosque in relation to local cultural context.

2. Historical background of earth construction in Al-Hofuf culture

The Eastern Province of Saudi Arabia dwells on a long seaside, many arable wellspring, marshy land and heavy silty areas, highlands, canyons and sand dunes. The calcareous sedimentary layers capped most of the eastern region and this geological structure hold huge volumes of belowground water and oil reservoirs (Al-Rashid, 1999). Al-Hofuf is a city in eastern Saudi Arabia and it is treated as one of the largest oasis in Saudi Arabia. Al-Hofuf is located about 170 km south-west direction of Dammam and 330 km east of Riyadh (Figure 1). The greater Al-Hofuf area has been inhabited for the last thousands of years and archaeological evidences prove that many civilizations have established their settlements in this oasis because of availability of water and suitable soil. Water was the key driver for food production and soil for the construction of shelters of the civilizations. However, one of the oldest land features in Al-Hofuf is Jabal (mountain) Al-Qarah Caves (Figure 2). They are situated roughly 13 km east of Al-Hofuf, whereby sophisticated cave system has been formed in the calcareous sandstone, marl and clay of the Upper Miocene to Lower Pliocene Hofuf Formation. This area consists of well-preserved palygorskite type clay minerals because it was submerged in the mudflat that dominated the coastal location (Hussain et al, 2006). Al-Qarah Mountain is the place for pottery manufacturing whereby weathered rock is used as a major ingredient for this famous pottery works (Figure 3). Standing on the top of this mountain, one will be able to view Al-Ahsa's largest palm oasis in the world (Figure 2). The mountain caves are well known for their extraordinary rock formations and is naturally cold during summer and warm during winter.

According to Wood (1975), Al-Hofuf of eastern Saudi Arabia was specifically renowned for the establishment of Jawatha Mosque during early Islamic time (i.e. 635 AD), and the mosque was known to be the first mosque built in this

region. Jawatha Mosque is situated twelve kilometre northeast of Hofuf, Al-Hassa, in the Al-Kilabiyah Village (Nabataea.net, 2020). The mosque is open for daily prayer (Lawton, 1991). It is believed that the second Jumaa congregation in Islamic history was held in this mosque and the tribe of Bani Abdul Qais constructed it (Wood, 1975; Al-Rashid, 1999; Al-Hussein, 2020). Most of the major portion of the original earth structure of this important mosque collapsed and disappeared in the sand, however, according to Nabataea.net (2020), its remaining small portions were about to collapse (Figure 4) before its recent reconstruction. The visible ruins of this earth mosque in Figure 4 perhaps date back from the 9th century CE (Al-Moghanam, 2006; Al-Hussein, 2020; Nabataea.net, 2020).



Figure 1.
Location of Al-Hofuf in Saudi Arabia
Source: Gharaibeh et al, 2011



Figure 2.
Al-Qarah Mountain and Part of the Al-Hsa oasis
Source: Saudi Friendship Committee, 2020.



Figure 3.
Al-Hofuf pottery shop situated in Al-Qarah Mountain
Source: Lionnel Aricayos Blog, 2020



Figure 4.
The earth walls of Jawatha Mosque ruin before restoration.
Source: Al-Moghanam, 2006.

In 1871 the Ottomans invaded the eastern region of Saudi Arabia and since then the Ibrahim Palace of Al-Hofuf was used as headquarter of the Ottoman government. However, it was reclaimed by the local Muslims in 1913 under the leadership of Ibn Saud. Al-Hofuf endured under his leadership thereafter and it became one of the province of the newly formed Kingdom of Saudi Arabia in 1932 (Encyclopaedia Britannica, 2020). Ibrahim palace complex (Figure 5)

covers an area of 16500 m² (Al-Rashid, 1999) with high boundary wall, bastions, mosque, bath, army quarter, etc. Locally available earth and sandstones were used in the construction of this palace complex. However, Al-Hofuf was the major business hub in the eastern Arabian Peninsula and Souq (traditional market) Al-Qaisariya (Figure 6) was the place where all the trading used to take place. Figure 6 shows Souq Al-Qaisariya with Al-Hofuf city wall constructed out of locally available earth and sandstone. In addition to Ibrahim palace, there are a number of palaces that were constructed during 1790-1806 AD in Al-Hofuf. Sahoud and Khozam Palaces are amongst the most notable ones. These palaces were used as headquarters to defend the city and managing agricultural lands, as a watchdog for the Bedouins and seasonal camps; however, they were constructed using local earth materials and construction technique.



Figure 5.
Ibrahim Palace in the Al Koot district of Al-Hofuf
Source: Aramco expats (2018).



Figure 6.
Souq Al-Qaisariya with Al-Hofuf city earth wall in 1937
Source: Saudi Friendship Committee, 2020.

According to King (1996), Saudi Arabian cities have been rejuvenated since the 1990s and many of the ancient structures with the detailed work of the indigenous Arabian architectural heritage have disappeared. The construction materials of these traditional buildings were such that regular care was essential, and this is absolutely true for the traditional structures constructed out of earth, coral, sandstone and gypsum. However, it is evident from this section that earthen settlement, buildings, and construction are encapsulated in the culture of the Al-Hassa people for the last thousand years. It is the claim of this article that there is a paucity of research on the cultural practices of Al-Hofuf earth construction. Therefore, the aim of this research is to examine the function, construction techniques, and architectural elements and design of the restored Jawatha Mosque in the context of local culture.

3. Archaeological study on Jawatha Mosque

By the end of 2006, Ali bin Saleh Al-Moghanam had written his PhD thesis focused on archaeological study of the Jawatha Mosque. According to Al-Moghanam (2006), this mosque is one of the finest examples of earthen buildings. It is accurately constructed and is a result of homogenous planning and measurement. Al-Moghanam (2006) described the Jawatha mosque as follows: -

“The archaeological clues support that this mosque was constructed by people with professional experience. The early structural walls of this mosque were constructed on a stone foundation and the entire mosque was originally built on a high ground (Figure 7). However, the

bottom part of some of the initial structural walls were still intact when found during the excavation work and these walls were 30-50cm high. The cracks found on the collapsed wall proved that the mosque had fallen down several times and was reconstructed on its initial foundation following the original design. The width of the interior and exterior walls of this mosque ranges 50-90cm with different construction techniques (Figure 8). To increase the stiffness of the exterior walls, additional layers of walls were added. This was proved as gaps developed vertically between the layers of the walls."



Figure 7.

Original stone foundation of the mosque.
Source: Al-Moghanam, 2006.



Figure 8.

Original lower part wall in the foundation is thicker than the upper wall.
Source: Al-Moghanam, 2006.

Archways in the interior of this mosque were constructed out of locally available stone with mud mortar and plaster. The archways were adequately wide to pass through (Figure 9). The northern part of the mosque had Mihrabs and it is assumed that this was an expansion of the Jawatha cemetery whereby a number of Sahabas (companions of the Prophet Mohammad) were buried. An old clay pot was found with ashes and many graves were discovered there. In the main prayer hall, many circular holes were found on the floor. It is assumed that palm tree trunks, or some other type of tree trunk, were placed in these holes as columns to hold up the ceiling of the mosque in the early days of construction. Indeed, the west side of the internal wall was discovered with disintegrated palm fibres that is most probably the remains of the palm trunk columns. Its original mihrabs were slightly recessed in the wall as shown in Figure 10, and their function was only to mark the Qibla orientation on the wall. Furthermore, they were not fully recessed in the way of contemporary mosque mihrabs with semi-circular projected spaces; therefore, the mihrabs could not be seen from the exterior.

Gypsum stock was discovered in the mosque galleries; therefore, it is assumed that the mosque roof was constructed with vaulting as shown in the Figure 11. However, there are other explanations to support the assumption of the mosque having a vaulted roof. The distance between the mosque's interior walls was wide. It was difficult at the time of construction to find long palm tree trunks or wood joists to cover the wide distance. Therefore, a timber roof structure was impossible to construct. The mosque had Thelat Al-Qibla

with the main internal prayer area divided into three separate arcades. These partition walls with arches were constructed out of earth and a layer of gypsum. However, initially the mosque's Thelat Al-Qibla consisted of one arcade which had a Qibla wall constructed out of local stones, clay mortar, and plaster. This initial gallery roof was supported by a series of palm tree trunks and the Qibla wall. Archaeological excavation work discovered and observed that there were three construction phases whereby three prayer galleries developed. The discovery of the rock foundations underneath suggest that there was a fortress or castle built on the rock foundation and at some point demolished, even before the many phases of the mosque were constructed (Figure 12). There was an additional chamber discovered in this mosque that was used for storage of dates (Jessah), which is a common space that existed as a part of the mosque complex design in the Al-Hassa and Najd areas.

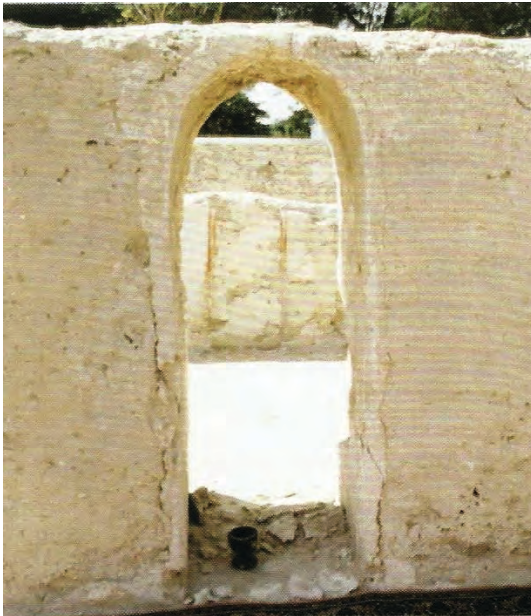


Figure 9.
Typical archway to connect galleries.
Source: Al-Moghanam, 2006.



Figure 10.
Partially recessed Mihrab in the second gallery.
Source: Al-Moghanam, 2006.

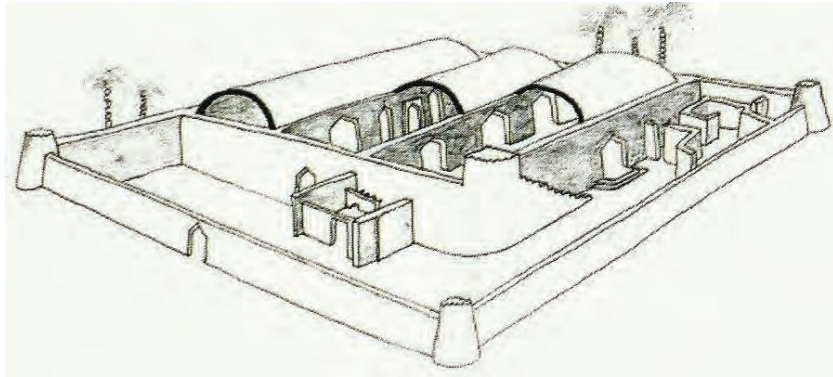


Figure 11.

Archaeological evidence indicates that the prayer galleries of this mosque may have been covered by vaults. Source: Al-Moghanam, 2006; Zami, 2013

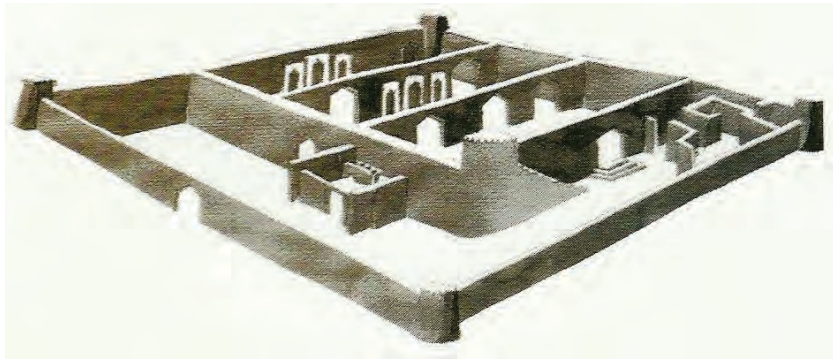


Figure 12.

Archaeological evidence suggests that this mosque complex may have been used as a fortress. Source: Al-Moghanam, 2006; Zami, 2013.

The description of the old Jawatha Mosque backed by the archaeological excavation and study proved that the Jawatha Mosque building

was not only a place for prayer alone but was associated with socio-cultural and political activities and there were facilities related to commerce, education, security, and defence. Therefore, this mosque complex crossed cultures in the past. One of the claims of this paper is that mosque complexes not only serve a function of prayer but also support cultural activities. The following section is intended to describe existing condition of this mosque after undergoing conservation and reconstruction.

4. Current state of the Jawatha Mosque after conservation

The reconstructed floor space of the Jawatha Mosque is approximately 120 m². At present about 130 people can manage to pray together in the galleries. Figure 13 shows the South West exterior view of the reconstructed Jawatha Mosque. The internal main gallery area is divided into three arcades for prayer as originally designed. There were courtyards found in the early mosque complexes in Al-Madinah, such as in Masjid Al-Quba and Masjid Al-Nawabi. However, a courtyard area is not part of this Jawatha Mosque complex and is considered an exception in early Islamic period mosques. There are two

major entrances to access the main prayer spaces, one from the eastern side and another from the western side of the mosque (Zami, 2013). The west side (Figure 14) entrance is normally used by the Imam (leader of prayer) to access the mosque without disturbing the public, while the east side (Figure 15) entrance is commonly used by the public.



Figure 13.
South West view of the Jawatha Mosque. Source: Author.



Figure 14.
Exterior of the west entrance.
Source: Author

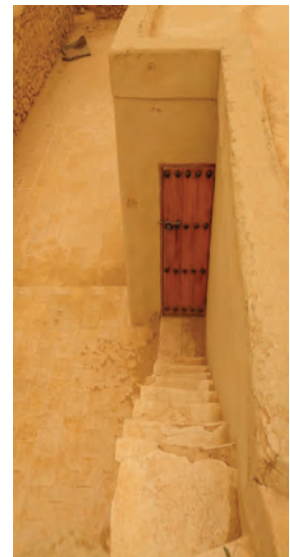


Figure 15.
Exterior of the east entrance.
Source: Author.

According to Zami (2013), reinforced concrete, blocks, and cement mortar were used as the primary building materials in this mosque conservation and reconstruction. The roof slab was originally made of reinforced concrete. Locally available un-stabilized earth was only used as a plastering material making the mosque look like a mud building from the exterior. The original earthen Mihrab was also replaced by a concrete Mihrab as shown in Figure 16. There are two timber windows (Figure 17) used in the north and south exterior walls of the

second prayer gallery. The window and door design bear a resemblance to the windows and doors used in the nearby Ibrahim Palace and similar designs of many old, local houses in Al-Hassa.



Figure 16.
Renovated Mihrab of the mosque.
Source: Author



Figure 17.
Window design of the mosque.
Source: Author.



Figure 18.
The southern bastion accessed by steps.
Source: Author

Minarets are not found in this mosque which is a clear exception of ancient Turkish or newer mosque complexes. The calling of Muslims for prayers by the muezzins (people who perform the call to prayer) originated the idea of minarets. Four round foundations were discovered in each corner during the excavation of the Jawatha Mosque remains. Archaeologists were not able to determine if they were foundations of minarets or of bastions. As they were circular, the local authorities concluded that they make them the similar to bastions (Figure 18). The southern bastion top can be accessed by steps and the parapet wall of the bastions is designed in a way that resembles the battlement of the nearby Ibrahim Palace (Figure 19). Tree branches and reeds from the interior (Figure 20) cover the reinforced concrete roof of the mosque complex while mud plasters the roof top (Figure 21).



Figure 19.
Parapet wall of the bastion of Jawatha Mosque.
Source: Author.



Figure 20.
False Ceiling made out of tree branches and reeds.



Figure 21.
Roof slab is covered with earth plaster.
Source: Author.

There is no evidence that shows that Jawatha Mosque originally had gutters fitted in the parapet wall. But in the reconstruction exercise, gutters were designed as a copy of the palm tree trunk and made out of wood (Figure 22). The design of these gutters is similar in appearance to the gutters of

the nearby Ibrahim Palace. There are concerns regarding the quality of the reconstruction work of the Jawatha Mosque. A number of areas on the external plaster came away from the wall surface as the mud plaster did not bond well with the concrete surface (Figure 23). Also, cracks were noted on the rooftop as illustrated in Figure 24.



Figure 22.
Gutter made out of wood in the newly renovated Jawatha Mosque.
Source: Author



Figure 23.
Earth plaster falls out.
Source: Author



Figure 24.
Cracks on the roof earth plaster.
Source: Author.

5. Methodology

After a thorough literature search on the Jawatha Mosque, it appeared that the number of studies carried out to examine the construction technology, architectural design and function of the Jawatha Mosque is sparse. In addition, the architectural design (especially the description of the mosque's functional space) described by a number of professionals and authors mentioned in the literature lack justification, verification and validation through a typical research methodology. The information found in the literature are written in light of each researcher's perceptions. In contrast, the research technique adopted in this paper includes in-depth interviews which adequately collect data from the

interviewees that worked on the conservation of this project and compares this study's information with the information gathered from literature.

In order to understand the architectural design and construction technology of Jawatha Mosque, the in-depth interview method was appropriate and successfully gathered data by unlocking vital experiences of the professionals engaged in the in-depth interviews. This study employed in-depth interviews with two professionals who were involved in the conservation exercise of the Jawatha Mosque. The accumulation of the information (data) permits the author to build a more robust foundation of knowledge and to validate the information gathered from the literature search. According to the Wallace Foundation (2020), there are two traditional ways of analysing data gathered from the transcription of in-depth interviews. They are: 1) arranging by question, and 2) arranging by theme. Data and analysis could be organised and presented following both forms of arrangement. However, both ways can be followed simultaneously. Discussion and analysis may start by using the 'arranging by question' approach, but then move to a 'thematic' approach as themes come up during the process of interviews. Both strategies were taken and followed in this study simultaneously by the author.

Validating information (data) gathered from the literature search was the major aim of the in-depth interviews. The information validated by the in-depth interviews is based on the opinion of the Saudi Arabian professionals and lead to a scientific base of the critique on the renovated and reconstructed Jawatha Mosque. It is worth mentioning here that there are very few Saudi Arabian experts who have worked with the conservation issues of Jawatha Mosque. Therefore, in fact, data was gathered via face-to-face interviews from only two Saudi professionals. The interviewees were archaeologists working in the Al-Hassa local authority. They have been engaged in various conservation activities of the eastern province for the last 30 years. However, the identity of the interviewees are kept anonymous in this research. In choosing interviewees for the in-depth interviews, a set of criteria/guidelines were followed, such as, the interviewees had to be Saudi Arabian born, locally trained professionals, they should be aware of the conservation issues of the eastern province of Saudi Arabia and the interviewees should be professionals who are involved in the conservation activities of Saudi Arabian local authorities.

6. Findings from the in-depth interviews

Following informing the aim of this study to the interviewees, the author asked a series of leading questions to gather information on the Jawatha Mosque's architectural elements, design, construction techniques, and function relating to the local socio-cultural context. The findings are analysed and presented in the following subsections:

6.1 Architectural elements and design

Responding to the question on the accuracy of the dimensions of the reconstructed Jawatha Mosque, the interviewees confirmed that the dimensions of the mosque are exactly according to what they found from the excavation work. However, they found three (3) roofs: first for a room to store dates (called Jessah); second for a guest room; and third for a storeroom. The interviewees did not carry out any interviews amongst the local people to find out whether there is any old painting or sketch of the Jawatha Mosque that may show the original image of this mosque before the conservation work. The reasons for not carrying out interviews were explained by the interviewees and it was because of the fact that Al-Hassa has a perennial problem of moving

sands from the North side which cover the northern gardens every year with 3 or 4 meters deep of sand. It is for this reason that the government decided to implement a project to stabilize the sand on the North side of Al-Hassa. Jawatha city is located in the North, and according to its history, Jawatha city underwent a siege for two or three months, and it had high walls and gates. Therefore, the original Jawatha city that once existed is now buried under the sand. A similar situation of such a problem was faced by the area called Al-Kelabiyah, which is an approximately 150 year-old settlement, and now it is completely covered with sand. In the case of Jawatha Mosque, it is more than 1,400 years old, it was covered in sand for a long time. As a matter of fact, according to historical events, Jawatha Mosque was built in the 7th year of the migration after the second delegation from the sons of Abdul Qais. Because of the rapid and frequent sand movement, the people of Jawatha city abandoned it and settled in the Southern side of the Al-Hassa Gardens. The year the Jawatha Mosque site was excavated by the archaeologists, the excavation site was buried 2 meters under the sand at that time. Therefore, one could not see the Jawatha settlement or its mosque for a long period of time.

In answering the question of why there are no minarets in the restored mosque, the interviewees stated that there were no minarets in a mosque complex during the early stage of Islam. The minarets were introduced at a later stage with the introduction of domes, but one can see in the corners of Jawatha Mosque there are towers. They were common in castles and palaces, and it may be that the towers became part of Jawatha Mosque at a later stage. These towers were not copied from nearby castles such as, Qasr Ibrahim as the archaeologists discovered the circular foundations at the four (4) corners of the mosque which they believe go back to an old time, the time of early Islamic civilization. However, according to the interviewees, the minarets had originally developed from the concept of the bell towers in Christian churches that were used to call people to church by ringing a bell. Likewise, the minarets were used by the muezzins (Callers to Prayers) to call Muslims to prayers. The interviewees confirmed that the battlement of the tower design of the current mosque may have been influenced by the nearby Qasr Ibrahim battlement design. The interviewees were asked why the Jawatha Mosque's mihrab was not similar to the mihrab's that exist in contemporary mosques. They replied that, they are two of them, they are flat, and between them there is enough prayer space for two rows. So, was it supposed to be one mihrab or two? The respondents stated that if one makes a visit to any mosque in Riyadh or Al-Hassa, one will notice that there are two mihrabs in the mosques, one permanent and one temporary (which is usually placed in the middle of the mosque and used when there are a small number of people praying). In Al-Hassa, a mosque called Al-Battaleyah has two mihrabs in the front wall (the Qiblah Wall). In the old days, Muslims followed different schools of thought (Hanbali, Hanafi, Shafee, and Maliki), and each group would pray with its Imam behind the mihrab that belonged to their school of thought. In Qasr Ibrahim Mosque, there are four (4) mihrabs, each mihrab representing one of the four Islamic schools of thought. Similarly, in the Makkah Al-Haram, there are four corners for the four (4) schools of thought. Therefore, it is not a new discovery, and it is not difficult to understand why Jawatha Mosque had two mihrabs.

The interviewees also stated that the Mihrab, as a component of a mosque's structure, started coming into use about the time of the Umayyad period. Even the Prophet's Mosque in Al-Madinah had no Mihrab, and the prophet Mohammad (PBUH) used to pray in the beginning toward Al-Aqsa mosque in Jerusalem. He was instructed to change the direction of prayers toward Makkah. After the spread of Islam and conquering lands outside the Arabian

Peninsula, the Muslims started to see different civilizations and witnessed different architecture, including worship places, i.e., churches. Around that time, Muslims started using the mihrab in the wall facing Makkah to differentiate mosques and churches, and to help travellers easily recognise the Qibla direction by seeing the mihrab on the Qiblah Wall of the mosque. It is noted from the interviewees' statements that the mihrab was added later in Jawatha Mosque. The reason for adding a mihrab in the earliest mosques was to show the worshiper the direction of prayer (Qiblah) and was visible only from the interior as evident in the Jawatha Mosque. Later this mihrab was added as a semi-circular additional element easily visible from the exterior too, so that one can identify the structure as a mosque distinguishing it from church buildings. Furthermore, the interviewees believed that the concept of the minaret originated from the bell tower of a church.

6.2 Construction technique

The interviewees were asked to explain how they conserved the Jawatha Mosque to honor its original design, especially given that they found different geometries and shapes on the level upon finishing the excavation and digging process of the entire site. According to the interviewees, the contractors provided trained labour in earth construction, but the challenge was to instruct and supervise them in the exact design and construction technique that they had to follow to construct the mosque. There was a lack of knowledge on durability of contemporary earth construction techniques such as stabilised rammed earth, compressed stabilised earth blocks, and precast earth construction methods. It is noted from the interviewees responses that the knowledge of traditional local earth construction techniques is not held by the local construction labour force. As a result, local construction labour was not considered for the conservation work of Jawatha Mosque.

According to the interviewees, mosques in early Islam were simple. Typically, the construction method involved simple materials such as mud and palm tree trunks. Later, when Muslims took over other lands, they used the pre-existing church buildings and repurposed them as mosques with minimal changes, such as is the case of the current mosques in the lands of Sham and Turkey. The interviewees were asked why the current roof is made of concrete, while the roof of the Jawatha Mosque was originally made out of the trunks of palm trees, earth, and palm reeds. Furthermore, two flights of stairs that are part of the reconstruction take people to the roof perhaps did not exist in the original mosque; if they did, what was the function on the roof? The responses confirmed that it was the issue of maintenance and durability of the earth-based vernacular materials that forced the conservation team to select concrete material for the reconstruction exercise. The interviewees stated that using palm trees would create problems because they must be replaced every three or four years, and that's why it was decided to go with the concrete structure which is protected against water. For the stairs, the excavation team actually found stairs during the excavation process of Jawatha Mosque. They stated that in the nearby Qasr (palace/castle) Ibrahim, there were similar stairs found, they were used to go to the roof level and made out of palm trees. However, the conservation team guessed there was no function on the Jawatha Mosque roof and nobody has seen it.

6.3 Function of the Jawatha Mosque

At the beginning of the interview both the interviewees were asked open ended questions to describe the conservation and reconstruction process of

Jawatha Mosque in general. The interviewees stated that historically, Jawatha Mosque was raised by four or five steps. The mosque had originally two arcades: a Qibla arcade which had three arches, and the other arcade which had only two arches. They were not convinced that Jawatha Mosque was just a mosque not a Jamee' (a Jamee' is a mosque that qualifies for Jumaa prayer, meaning it is a bigger mosque) because historical sources indicate that it was a Jamee', and according to an authenticated Hadith (found in Al-Bukhari & Muslim) by Ibn Abbas who said: the first Jumaa' prayer made after the Jumaa' prayer in the prophet's mosque was in a mosque of the sons of Abdul Qais in Jawatha. All historical evidence refers to Jawatha Mosque as a Masjid Jamee. Therefore, when the interviewees wanted to reconstruct the mosque, and because they are archaeologists, they thought that they had to reinforce the foundations that the walls are setting on. They disassembled the existing tiling around the walls and dug down to trace the walls to their foundations. As they were moving down, they first found out that the walls were setting on a sandy ground, so they were not convinced about it. Thereafter they continued digging down until old foundations of the old original mosque were found. They also found something like an arch, therefore, they had to secure the whole area until the excavation and exploration was completed. They then found evidence of the old mosque with two Mihrabs, one of which was just a groove in the dry wall with a semi-circular in shape. However, it is noted from the interviewees' statements that Jawatha Mosque was not a Jamee mosque though much of the literature considered it as a Jamee mosque. Furthermore, the mosque was originally constructed on a lower ground with respect to the current ground level and archaeological study proved that sand covered the original mosque foundation level. This may have been repeated many times as each time the mosque structure may have fallen, been buried under the sand, and subsequently reconstructed.

According to both interviewees, mosques in the early Islamic era were built within the castle complex, and had two Minarets usually on the Northern side. They did not know why two Minarets and not some other number. When they discovered Jawatha Mosque, circular foundations of four (4) towers were found, one in each corner. However, when they discovered the foundations of the Minarets in Jawatha Mosque, they were circular, and thus they decided to build two and preserve the other two for future construction. Therefore, the reconstructed Jawatha Mosque design was based on the archaeologist's best intuition and thoughts. Furthermore, the number of rows of prayers beside the shape of the mihrab confirmed that Jawatha Mosque was built at an early stage of Islam. This is because they discovered certain artifacts during the excavation work that may suggest that Jawatha Mosque passed through a period of improper worship, such as the presence of idols. It is similar to the Makkah Al-Haram that was full of idols until the prophet Mohammad (PBUH) removed them when he conquered Makkah at a later stage in his life. It is noted from the interviewees that Jawatha Mosques may have been used as castles too. Minarets, a prominent element of contemporary mosques, might be replacing the towers in a castle. The Jawatha Mosque is surely not restored to its original state, but according to the interviewees, the restoration work was completed with their best judgment.

Conclusions

This paper investigated and analysed Jawatha Mosque's construction techniques, function, architectural elements, and design in relation to its local socio-cultural context. However, emphasizing the importance of good conservation practice of architectural heritage in respect to local socio-cultural context is also highlighted. According to this study, Jawatha Mosque in earlier

days not only served as a mosque but as a castle too. It contributed to the spread of Islamic learning and culture. It is one of the earliest examples of a mosque. Jawatha Mosque gives us indications of how some of the design elements of mosque architecture originated, such as, the minarets and the mihrab, or even in some mosques, mihrabs. According to the in depth interviews carried out in this study the architectural style of the reconstructed Jawatha Mosque was determined by the local authorities' best intuition and thought. The minarets had basically originated from the concept of the bell towers of churches and may have been inspired from castle towers as well. Similarly, the contemporary shape of the mihrab went through a series of changes for socio-cultural and political reasons. Therefore, it is important to recognize and appreciate the importance of conserving mosque heritage because a mosque building goes beyond just functioning as a building or structure for prayer. There is a need to save local mosque architecture and foster a generation that recognises and acknowledges a sense of pride for their own history and culture in the future. One must acknowledge the need to formulate a clear-cut plan at the national level to prepare a list of the early mosques of the Eastern Province and take necessary steps to properly document various mosques that were already demolished. However, it is understood that one cannot rebuild all those valuable heritages even if the local authorities will be willing to reconstruct them. A proper action plan could be devised to prepare accurate documentation of the destroyed mosques before initiating conservation work. Involvement of appropriate professionals such as Architect, surveyors, historians, planners and engineers in the conservation process is essential. In addition, as some of the mosques may be covered in sand, newer satellite technologies that can peer into the sand¹ may be able to identify the locations of heretofore lost heritage mosques in the Kingdom and elsewhere in Ummah.

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1 Such as satellites (or even plane-based devices) that use longer wavelengths of light, like microwaves, and possibly even p-band microwaves, that can see what's located under sand. See <https://www.newscientist.com/article/dn3923-satellites-hunt-for-buried-treasure/#:~:text=In%20a%20first%20for%20radar,locate%20and%20identify%20buried%20objects>.

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THE CRAFT OF MIHRAB CARVING IN OMANI MOSQUES BETWEEN THE 13TH AND 17TH CENTURIES



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Abstract:

In spite of its richness, the corpus of published research about Islamic architecture presents some gaps of knowledge about the architecture of the peoples who lived in the lands ruled by Muslims. Similarly, the dynamics of influence that might have operated between the “monumental” architecture in these lands and their popular architectures are insufficiently addressed. Furthermore, the material culture related to Islamic civilization suffers from some geographic and chronologic gaps. The present research aims to contribute to the closing of this gap by providing new knowledge about the traditional mosque architecture in Oman. More specifically, it will formulate interpretations regarding the origins and development process of the practice of Mihrab decoration in Oman between the 13th and 17th centuries. A total of twenty-two such Mihrabs have been identified to have been the only remaining examples of this tradition in Oman. The paper presents the outcomes of a systematic survey and analysis of the architecture and artistic features of these Mihrabs and the mosques where they are located. The mosques and their Mihrabs are presented within their historic and geographic contexts, before discussing the emergence of the craft of Mihrab carving in Oman, its origins, sources of influence and the main artisans known to have practiced the craft. Ultimately, the discussion will address the uniqueness of this craft in a context like Oman in the 13th to 17th century and its parallels with similar crafts in the Muslim lands in the same periods.

1. Introduction

The Sultanate of Oman is among the few countries where it is still possible to find mosques built following the Ibadi school of thought [1]. They are also present in some regions of Algeria (Wadi M'zab), Tunisia (Djerba Island), and Libya (Jabal Nafusa). In the sultanate, they are distributed geographically following the areas of influence of this Madhab (literally “way to act”, or Islamic school of thought). Previous studies have detailed the main characteristics of these mosques [1], [2] and some others have even interpreted these characteristics following the precepts of the Ibadi doctrine and linked them to other samples of this religious architecture in other regions where this Madhab was or still is predominant [2], [3]. The main specificities of the Ibadi mosques consist in their pure volumes, the modesty of their architecture, and simplicity of their spaces' architecture. They do not present any minarets or domes as it is common to see in the mosques of other madhabs. The only prominent volume at the building consists of a couplet punctuating one of the corners opposite to the Qibla. It's called a *buma*, a unique feature characterizing the Mosques of Oman [4, p. 80]. Furthermore, and in the case of the Ibadi mosques in Oman, these mosques are differentiated from the others by their flat Mihrabs, occurring as a recess within the Qibla wall and with no protrusion in the outer side of the wall [5, p. 232], a particularity that is not shared by other Ibadi Mosques in the Maghreb. If it was not for the elevated platform where they have been erected, and the *buma* characterizing one of their roof corners, the mosques in the Ibadi regions of Oman cannot be distinguished from the rest of the dwellings in the settlements.

It is probably due to this humble character that the Ibadi architecture of Oman did not attract much of the published research about Islamic architecture until the end of the 20th century. As stated by Costa, the published research, in English, about the architecture in Oman and the Arabian Peninsula in general was relatively late to emerge. In the case of Oman, it was even later, with

the first published works being those of E. Galdieri and D. S. Whitcomb in the late 1970's in the Journal of Omani studies [6]. In the Arabic records, however, Oman has been in the spotlight since the 10th century, such as in the descriptions of the Sohar Friday mosque by al-Maqdisi and the 13th century descriptions of the Friday mosque of Qalhat by Ibn Battuta [7]. The journal of Oman studies

was a key source for the publication of the archeological surveys in Oman. In addition to the two mentioned works, Le Cour Grandmaison, Bonnenfant, and Al Harthy have covered the traditional architecture and social organization in Ibra and al Mudhairib [8], [9]. Kervran studied the traditional houses of Sohar [10], [11], d'Errico focused on the military architecture [12], while Paulo Maria Costa was the most prominent author, with his multiple contributions related to the traditional settlements and architecture in Oman [13]–[17].

An interest in religious architecture in Oman was sparked in the last years of the 20th century, with the work of the Arabist E. Baldissera [18] as well as Archeologist and Art historian M. Kervran [19] focusing on the carved Mihrabs in Oman. These initial works were followed by more comprehensive documentation and descriptive study by Costa [20], [21], then a comparative investigation by Benkari [2]. The focus on stucco-carved Mihrabs has been continued with the research of Bandyopadhyay [22], [23], Goffriller [24], Kanaan [5] and a few amateur Omani writers on the local architecture, such as al-Hadhrami [25]. However, none of these studies performed any research on the stucco-carved Mihrabs in order to identify either their formal composition, their stylistic typology and origins, or their production process. Similarly, these Mihrabs have never been analyzed from the point of view of their chronology or their geographic distribution or the school of thought to which they belong. The present research aims to examine this craft of Mihrab carving in Oman by shedding light on its main formal characteristics and their origins, in addition to the socio-economic context that accompanied the emergence and development of this craft. More specifically, this research will address the following questions:

1. How did the craft of Mihrab stucco-carving evolve in Oman?
2. What are the formal and aesthetic characteristics of this craft? And how was its practice organized?
3. How does this “Omani style” of Mihrab carving relate to the larger context of Islamic art and architecture?

The main contribution of the present study consists of providing a holistic understanding of this phenomenon by examining all Mihrabs still standing today. An analysis of their physical components will identify the main formal and aesthetic characteristics of this style of Mihrab decoration. Finally, this research formulates the historic evolution of this craft, its geographic expansion, and the social organization of the artisans and other participants in the production of these pieces of art. Ultimately, it will provide a corpus of themes and design options that could be adapted to and implemented in contemporary mosques in Oman to imbue in them a local character.

2. Methodology

To address the formulated questions, the present study relied essentially on extensive primary data collected through exhaustive architectural and photographic surveys of all the decorated

Mihrabs and the mosques that contain them extant in Oman. Twenty-three (23) buildings, with their Mihrabs, have been documented. The first documentation campaign took place during the winter of 2017. It targeted all the concerned mosques in a-Dakhiliya region. It was then followed by multiple short missions to the rest of the mosques in al-Batinah and A-Sharquiya governorates. The primary data collected was also checked against the findings of previous research about these mosques, especially in the work of Costa [21] and Baldissera [18], as well as the recent book of Al Hadhrami [25]. The present

research owes a lot to the meticulous work of the Arabist Baldissera who deciphered the inscriptions embedded in the carvings of twenty-two of the twenty-four Mihrabs studied here.

A comparative analysis between the studied Mihrabs allowed the researchers to characterize their style and components, as well as identify the evolution of this craft. The exploration of the available literature about the history of Oman and its architecture helped understand the socio-political conditions in which the craft of Mihrab carving has emerged and developed in Oman. This exploration along with the interpretative analysis of the primary texts gleaned from the text inscribed in the studied Mihrabs enabled the formulation of a possible work organization for this craft. Finally, and in order to locate the sources of influence and propagation of the Omani Art of Mihrab carving, a comparative and interpretative approach was used to examine the Omani stucco-carved Mihrabs within the wider context of Islamic Art and Mihrab decoration.

3. Results and discussion

3.1 The circumstances of the emergence and development of the stucco-carved Mihrabs in Oman

a. The art of stucco-carved Mihrabs in the socio-political context of Oman, 13th -17th centuries CE (7th-13th H)

The corpus of decorated Mihrabs studied in this research were produced over a period of more than three centuries and under three different dynasties. The earliest decorated Mihrab in the studied collection is still standing in Jama` So'al (in the city of Nizwa, Interior governorate) with the date of 650H/1252 CE¹ carved in its frame [4, p. 97], [18, p. 23], [26, p. 187]. In this period, Oman was ruled by the "laic" leaders of al-Nabahina dynasty, with the exception of the coastal regions, which were under the intermittent control of the king of Hormuz, who built the city of Qalhat [27, p. 24]. During al-Nabahina rule, Oman went through a few tumultuous political circumstances, but most of the time, Omanis enjoyed stability and their commerce with India, South-east Asia and East Africa flourished. The different artefacts found in the constructions, dated from this period, reveal the extent of this maritime exchange. The same circumstances were behind the flourishing of the Craft of Mihrab carving in the country, probably under the influence of the neighboring regions on both shores of the Arabian Gulf, in spite of the general opposition of the Ibadi doctrine to such practices [3], [28]. This idea is even more evidenced by the presence in the frames of many Mihrabs from this period, of porcelain plates and bowls, probably of Chinese origin, used as colorful decorative elements [5], [19], [24]. Such decorative technique could also be found in other buildings in later periods, such as the mansions of Ibra, built by wealthy merchants of Sharqiya in the 17th century and earlier, when this region was among the richest in the country [29].

Nevertheless, the core of the Omani decorated Mihrabs, still standing today, were produced during the 10th century Hijra (between 909-1029H/1503-1619 CE) Figure 3. In this period, Oman was ruled by elected Imams (such as Mohamed b. Ismail 907-943H), then the resurgent Nabahina dynasty, towards the end of the 10th century of Hijra. A certain number of the later Mihrabs studied here were carved during the al-Ya`ariba dynasty, which started in

¹ The Gregorian year of completion of the Mihrabs are presented here as mentioned in the reference book of Baldissera which provided all the primary information which was carved in the Mihrabs [18, p. 23] and from where Paulo Costa also took the dates of the Mihrabs he addressed in his book [4, p. 97].

1034H/1624 CE. The name of the second Ya`rubi Imam (Sultan b. Seif) is still visible in the Mihrab of masjid al-Burashid (al- Brashid) (1068H/1658) [18, p. 132], [26, p. 245]. Similarly, based on the remaining words inscribed in the Mihrab of Jama` Nakhal (994 H/1586 CE), the calligrapher seems to refer to the "Greatest Sultan" (??) b. Malik (??) b. Bilarab (??) [18, pp. 111–113], [26, p. 32]. Was he referring to the latest Nabahina ruler, or was his reference to the father of the founder of al-Ya`riba Imamate: Murshid b. Malik b. Bil`arab? As for the latest specimens of Mihrabs (al-Masjid al-Qadim in al-Qabil (Northern Sharqiya governorate), 1171 H/1758 CE [18, pp. 134–139], [26, p. 243], and Jama` al-Aghbari in Samail, 1252H/ 1829 CE), were carved during al-Busaidi dynasty (1157H-present), as stated in the frame of Mihrab al-Aghbari [18, pp. 95–99], [26, p. 191]. Some of the previous studies that holistically described the decorated Mihrabs in Oman agree that we are in the presence of a "decorative style" that is specific to this region (Baldissera 1994, 146; Kanaan 2014, 257). The question is: where did this style come from and to what extent it is possible to identify it as an "Omani style" within the large repertoire of Islamic decorative arts?

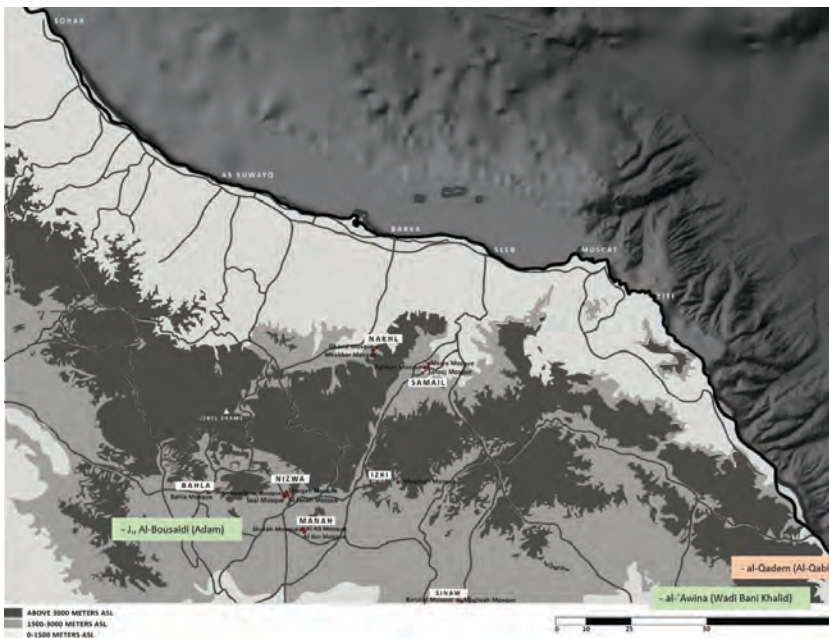


Figure 1.
Location of the mosques cited in this research

b. The Omani Stucco-carved Mihrabs and their geographic context

The classification and analysis of the collected data informed the development of a holistic understanding about the geographic distribution of the studied Mihrabs and how this three centuries long phenomenon had evolved in the geography of Oman. Figure 2 shows that the earliest still standing evidence of such Mihrabs was accomplished in 650 H, and is located in Jama` So'al in the city of Nizwa [18, p. 23], [20, p. 20], [26, p. 187]. The following Mihrab in date was achieved some three hundred years later. It is located in the city of Manah, also in the interior region (20 kilometers south of Nizwa), Figure 1. As shall be discussed in the following sections, Manah can be considered as the epicenter of the Mihrab stucco-carving craft, since the 10th century Hijri. It was also the city of origin of the most influential and prolific Mihrab decorators in the 300 year period that this practice seems to have lasted. Indeed, the earliest

surviving Mihrabs of the 10th century Hijri are mainly in the city of Manah, especially in Harat al-Bilad which counts four of them. It is worth noting that for the two first decades of the 10th century Hijri, only one Craftsman (Abdullah B. Qasim b. Mohamed B. Humaymi (Humaimi) al-Manahi) will be remembered today through the Mihrabs he finely carved in Harat al-Bilad in Manah first (Mosques of al-Ali in 909H and al-Ayn 911H/1505CE) [18, pp. 69–71], [26, pp. 199–200], then in the Fort of Bahla, 45 Kilometers, North-West of Manah, where he carved the impressive Mihrab of fort's Jama` (917H/1511CE) [18, pp. 57–61], [26, pp. 193–194] Figure 6.

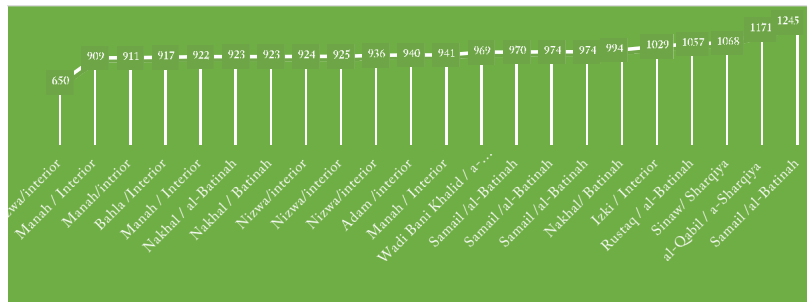


Figure 2.
Chronologic distribution of Decorated Mihrabs Per region

With the turn of the third decade of the 10th century Hijri, a new master (Mushmil b. Omar b. Mohamed Al Manahi), also from Manah, starts sharing the “Mihrab carving market” with Abdullah B. Qasim al-Humaymi. In this period, the practice expands to reach some Mihrabs of Nizwa mosques, after having been confined to Manah and Nakhal Figure 2. In the next decades, other masters will join this expanding profession. Among those are Mushmil’s son (Talib), followed by his grandsons (Ali b. Talib), as well as four other craftsmen, who will participate, with the Mushmil family and the pioneer Abdullah B. Qasim al-Humaymi, in producing the impressive ensemble of Omani decorated Mihrabs of the 10 Century of Hijra Figure 4. Their works are found in other cities of the Dakhiliya region such as Izki (Masjid Muqazah

1029H/1619 CE) [18, pp. 89–93], [26, p. 202] or Adam (Jama` Harat Al Bousaid: 941 H / 1534)², as well as in al-Batinah (Samail mosques: Sarooj 970H/1562CE; Mzar`a 974H/1567 CE) [18, pp. 101–104; 105–108], [26, p. 31], and reach as far as a-Sharqiya governorate (Masjid al-`Awina in wadi Bani Khalid, 969H / 1561C³, and al-Burashid in Sinaw 1068H / 1658CE) Figure 1. The surviving Mihrabs are confined within these geographic limits (in the expansion area of the Ibadhi Madhab in Oman), and the practice will eventually fade away by the turn of the 11th century Hegir. A couple of mosques: al Masjid al-Qadim in al-Qabil:

² The date is assumed by Al-Hadhrami following Baldissera. It was difficult to decipher the date of completion of this Mihrab and the name of the craftsman who did it. Baldissera makes the assumption that the artist is the same *Abdullah B. Masoud B. Seif Al Bahlawi* who also carved the Mihrab of the great mosque of Manah. He builds his assumption on the fact that the two Mihrabs are very similar in the decoration around the calligraphy [18, pp. 74–77], [25, pp. 137–139]. He also mentions that the artist of A-Shawadhna mosque, who has also a similar name: *Issa B Abdullah b. Yusuf*. As a result, Baldissera suggests the interval 936-940 H as the probable date of completion of this Mihrab. In fact, both Mihrabs are indeed similar. However, the one of Adam and A-Shawadhna don't have Quranic verses inscribed, unlike the one of Manah. Our suggestion is that the craftsman could rather be Issa b. Abdullah b. Yousef.

³ The date of 969H is assumed by the author based on the remaining words reported by Baldissera from this Mihrab [18, pp. 141–144]. Al-Hadhrami gives it the date of 970H / 1562 CE without referring to any source for this date [25, pp. 145–148]. The repertoire compiled by the Ministry of Endowment and Islamic Affairs, does not mention any date [26, p. 256].

1171H / 1758CE and Masjid Al-Aghbari in Sama'il1245H / 1829CE, from the 12th and 13th centuries Hijri will have their Mihrabs carved to reach our era, along with those of the 10th century, though with an altered aesthetic composition and execution quality Figure 3. In summary, the timeline represented by the Mihrab studied in this research spans a period of more than three centuries (From 650H with Jama` So'al until 1245H with Masjid Al Aghbari). It covers the territory of three regions/governorates in Oman: a-Dakhiliya, al-Batinah, and Northern Shariqiyah. However, the core of the carved Mihrab production at its quintessence, covers the 10th century Hijri only, and the territories of a few cities, predominantly in the a-Dakhiliya (interior) region (such as Manah, Adam, Nizwa, Bahla and Izki), then in al- Batinah (Sama'il and Nakhal) and, more recently in a-Sharqiya (al-Qabil, Sinaw and Wadi Bani Khalid) Figure 3. It is worth mentioning that this geographic and chronologic contextualization is only based on the still standing Mihrabs that the author could locate and reach. It is highly probable that some mosques have disappeared with their Mihrabs, either destroyed, to later be rebuilt as "new" (Mihrab al Masjid al-Kabeer in Nakhal) [18, pp. 111–113], or simply decayed due to weathering, or demolished to make way for urban expansion. Therefore, it is also probable that this craft had a much longer period of expansion geographically and the chronologically than what can be deduced from the remaining Mihrabs studied in the present research [25, p. 14].



Figure 3.
Studied Mihrabs per year of Completion (in Hijri)

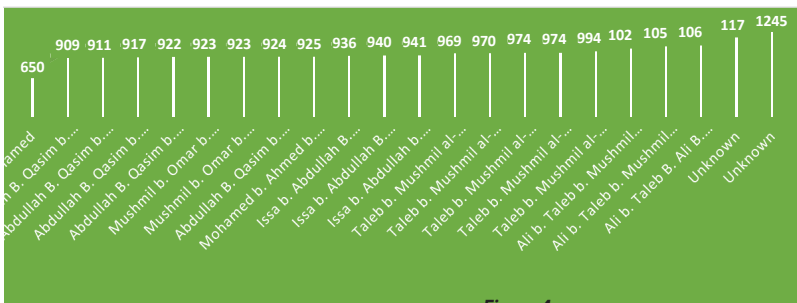


Figure 4.
Mihrab Craftsmen and year of Completion

3.2 The Omani School of Decorated Mihrabs

From the examination of the number of early tenth century Mihrabs and their dates of construction, it seems as that Manah was the epicenter of a real "school of Mihrab decoration", and harat al-Bilad precisely was the first "workshop", where Abdullah b. Qasim al-Humaymi al-Manahi, the first craftsman known to us, refined his craft and strengthened his technique, in the mosques of al-`Ali (909H / 1503CE) [18, pp. 79–82], [26, p. 31], al-`Ain (911H / 1505CE), a-Shurah (922H / 1516CE) [18, pp. 75–78] in harat al-Bilad, before applying it elsewhere: in Bahla (al-Jama` al-Qadim, 917H / 1511), then in Nizwa where his art reached its quintessence in the Mihrab of masjid a-Shargah (924H / 1518) [18, pp. 45–49], [26, p. 188] Figure 4. In spite of the high caliber of this artist, he has never signed his Mihrabs by a title other than only his name (in Jama` Bahla and the mosques of a-Shargah and a-Shurah) or: "*The humble, poor servant of Allah...*"⁴ (in the mosques of al-`Ali, and al-`Ain). Similar expressions were also found in Mihrabs carved by other artists, such as Issa b. Abdullah B. Yousuf in Mihrab Jama` al-Bousaidi in Adam (941H / 1534CE)⁵. They might be related to the state of mind in which the artist finds himself while performing his craft, in the mosque, at the Mihrab. He is doing a work on which he is probably paid, but he is also in a state of "worship" `Ibada, which he expresses through carving words of devotion, invocation, or Quranic verses (see section about the Quranic verses transcribed in the studied Mihrabs).

Mushmil b. Omar b. Mohamad al-Manahi, is the second Mihrab craftsman, also from Manah, whose name was found in two Mihrabs in Nakhal. He was the first to sign with the title of "Ustadh" (Master), in one of his oeuvres in Jama` Mukabrah in harat al-Gharidh (923H / 1517CE)⁶, we can read: "*this is the work of the skillful master Mushmil b. Omar b. Mohamed b. ... al-Manahi and his son the master Talib*"⁷. This title of Master will be present in other Mihrabs that have on them the names of those who decorated them. The craftsman `Issa b. Abdullah b. Masoud, signed the Mihrab he decorated in Jama` Manah al-kabir (941H) by his name preceded by the title "al-Ustad al-Hakim" (the wise master) [18, p. 67]. Talib b. Mushmil also signed his final oeuvre in the grand mosque of Nakhal (994H) by "the clever skillful" (al-fatin al-Mahir) [18, p. 112]. Similarly, the verb "Sana'a" "عَنَّص" (Manufactured or crafted) is systematically used to describe the work of a craftsman. The emergence of such titles and words related to this craft might reflect the presence of an established "craft school of Mihrab stucco-carving" in Oman and the progress, on the social scale, of those who practice this profession.

The family of Mushmil al-Manahi was involved in this craft for over a century and through three generations Figure 4. The initiators of this craft, Abdullah b. Qasim Al-Humaymi and Talib b. Mushmil are the most prolific craftsmen, whose names reached us through the Mihrabs they carved (five Mihrabs each). Talib's son, Ali b. Talib and Talib's father, Mushmil, have carved 2 Mihrabs each. The Mushmil family, on its own, has decorated nearly half of the Mihrabs discussed in this paper (9 Mihrabs out of 22). It is therefore possible to declare that this practice of decorating the Mihrabs is not only a craft, but it is a craft that is

⁴ "عمل هذا المحراب العبد الفقير الراجي رحمة ربه و غفرانه عبد هلالا بن قاسم بن محمد بن هيمي المنحي وكتب خطه بيده" [70,82] p. 18

[84] p. 18 "و الصانع العبد الرهوب ال(ك)ثير الذنوب عيسى بن عبد هلالا " ⁵

⁶ The Mihrab of Jama` al-Mukabrah did not have any date carved in it referring to its completion. Baldissera formulated the assumption that it must have been finished in the same period as the Mihrab of Jama` Bahla since they are both the oeuvres of Mushmil b. Omar [18, pp. 125–127]⁷ [18] "

طالب الأستاذ وولده المنحي بن محمد بن عمر بن مشمل الماهر الأستاذ عمل"

transmitted from a Master to the next and sometimes within the same family, from father to son, as it was the case in the family of the master Mushmil. This procedure of transmission is not unique to Oman; rather, it is a character of skills and technics transmission within the tradition of the Islamic Arts and crafts, of which Oman is an illustration in this instance.

3.3 The Mihrabs as a resource for sociological historiography in Oman.

Analysis of the information gleaned from the documented Mihrabs shows the existence of a work organization in this "industry". Indeed, the testimonies carved in these Mihrabs refer to three categories of people involved in Mihrab decoration (and mosque) construction, besides the ruler of the time (Imam or Sultan). The first category is represented by the Patron(s) (دجسملانومناؤلا ىلع). Usually they are listed first in the text dedicated to this information on the surface of the Mihrab. The name of the Mihrab decorator usually comes next, and sometimes it is followed by the name of the calligrapher, if different from the decorator. Sometimes, the calligrapher mentions the community of the mosque as part of the patrons. This nearly systematic order of names allows us to formulate the hypothesis that the Mihrab decoration activity was in fact an industry with specific actors having clear status and roles in the operation. Based on the indication he left on the Mihrab of Jama` Bahla, al-Humaymi seems to be the calligrapher of all the Mihrabs he decorated. It is worth mentioning that the date of the Mihrab's completion and the name of its decorator are almost systematically carved in the frame dedicated to that information, with the exception of al-Jama` al-Qadeem in Manal, masjid al-Aghbari in Samail (which did not have any indication about their craftsmen) and Mukabbar in Nakhal, which did not contain any date of construction. Furthermore, only four of the studied Mihrabs contained the names of their calligraphers (Masjid al-jannah, Mzar`a, a-shaadhna and Sarooj), in addition to those carved by al-Humaymi who was also their calligrapher. Finally, with all the information curated and written in these Mihrabs, only the Mihrab of masjid al-'Ali provides us with the year of construction of the mosque (876H / 1470CE) besides its Mihrab completion (909H / 1503CE) [18, p. 82].

3.4 The characteristics of the decorated Mihrab in Oman 13-17th centuries:

The comparative analysis of the aesthetic, constructive and, architectural properties of the Mihrabs and the mosque where they are hosted generated a set of common characteristics specific to these Mihrabs, and which can be summarized in the following points:

a- The status and location of the mosques containing stucco-carved Mihrabs

It is worth noting that there are no formal or architectural features that distinguish the mosques with decorated Mihrabs in Oman. In fact, the mosques hosting the stucco carved Mihrabs have the same physical and aesthetic characteristics as any other traditional Ibadi mosque in Oman. With their refined carvings, these Mihrabs are located in mosques with no specific distinction in their location, volume, size, form, or architectural details. This peculiar trait could be explained by the fact that the mosque's construction usually precedes Mihrab decoration by several years. This fact has been reported to us in writings of Al Humaymi in *the Mihrab of Masjid al-'Ali*, where he mentions the date of construction of the mosque and the date when the Mihrab was finished, with an interval of 25 years between them.

Similarly, there is no correlation between the status of a mosque, whether a Friday mosque (Jama` or a daily prayers mosque (Masjid), and the presence of a decorated Mihrab within its prayer hall. Indeed, decorated Mihrabs are found in mosques of both types (Jama` and Masjid), although there is a clear predominance of masjids (15 masjids) over Jama` (8 Jama`), even if the earliest carved Mihrab is extant in a Jama` (So`al, in Nizwa). Furthermore, the mosques containing decorated Mihrabs are mainly found within settlements (10 Masjids and 5 Jama`). A limited number of them stand isolated, either surrounded by a cemetery (masjid a-Shargahin Nizwa and al-Qasr in Manal (974H / 1568CE) [25, pp. 153–156], [26, p. 33]) or on an island not far from the adjoining settlements (Jama` al-kabir in Manah, or Jama` Bahla). Finally, a few other mosques can be found within the meanders of the oases (3 mosques in Samail and Jama`al-`Alaya in Rustaq (1075H / 1651CE) [25, pp. 111–113]).

It is worth mentioning that, with the exception of Jama` al-`Alaya, all the Friday mosques with carved Mihrabs are located in the interior region (a-Dakhiliya). This confirms the idea, discussed above, that the interior region is the main land of propagation of the craft of Mihrab carving in Oman, with the city of Manah as its epicenter. Finally, although this practice was initiated in the Mihrab of a Friday mosque (Jama` So`al 650H), it has nonetheless continued to ornate the Mihrabs of Masjids for almost 200 years (Masjid al-Aghbari, 1245H / 1829CE) after the carving of the last Mihrab in a Friday mosque (Jama` al-`Alaya, 1057H/ 1651CE).

AL SHURAH MOSQUE, MANAH

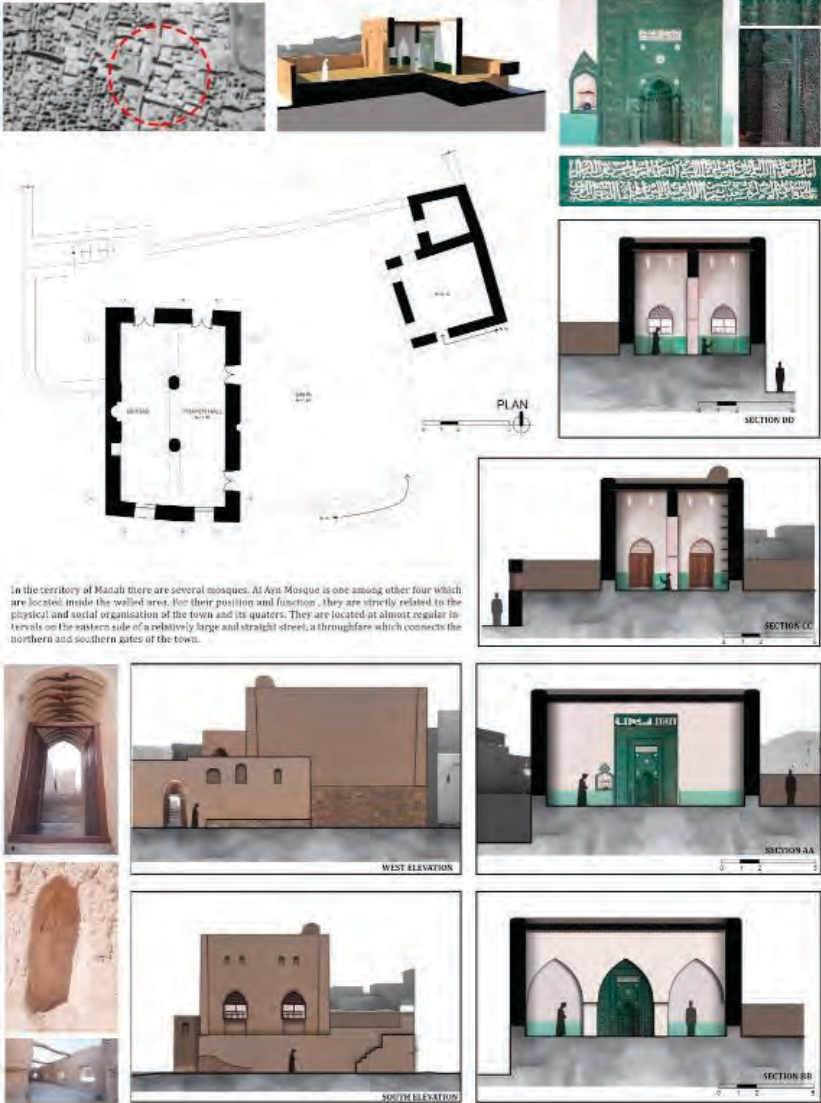


Figure 5.

Illustration of the setting of a-Shurah Mosques containing a 16th century carved Mihrab

b. The common features:

As stated in previous research, the 10th century (16th CE) stucco-carved Mihrabs in Oman are part of a larger and older corpus of Mihrabs that evolved, in the Ibadhi areas, independently from the carving tradition [5, p. 232], [18]. Such Mihrabs share some common formal features which consist of:

- Receding concentric arches within a flat framing band
- Pronounced frieze with a sort of crenellation
- A small, arched Qibla niche, sometimes doubled or tripled in a telescopic succession of decreasing niches
- The receding arches are at times supported by short round engaged columns.
- The entire surface of the Mihrab is filled with stucco-carved patterns

- The stucco-carved panel protrudes 50 to 80 cm. from the Qibla wall
- The technique used in the knife carved stucco, with the exception of the Mihrabs of J. Bahla and al-`Ali mosque in Manah, where the technique of molded panels was used in addition to the common knife carving method.



a- Mihrab al-`Ali mosque in harat al-Bilad, Manah

b- Mihrab j. Bahla (Bahla fort)

Figure 6.
Mihrabs of J. Bahla and Masjid al-`Ain

The corpus of Mihrabs analyzed in this study reproduce this same scheme with some variations and the addition of other elements as described below:

The documented Mihrabs show an average size of 4 m in height and 3 m in width, which is common to most of those measured in this study. The Mihrabs of Friday mosques however, can be much taller (6 m, or a little less, in the Mihrabs of Jama` Bahla, al-Jama` al-Kabir in Manah and J. al- Gharidh (923H / 1517CE) in Nakhal [18, pp. 119–123], [26, p. 94]) or a little shorter (3 m in the Mihrabs of Jama` So`al, and Nakhal).

b.1 The carved frieze

The top of the Mihrab is usually marked with a sort of frieze that is finely carved with floral patterns (al- Jannah, a-Shargah, Muqazah, a-Sarooj, Bahla, a-Shawadhna, al-Brashid, al-Ghari, etc.) or, more rarely, with a series of crenellations (J. Manah al-Kabir, J. al-Aghbari). A few Mihrabs do not have a frieze at all (J. So`al, Mukabbrah, al-`Ali, J. al-Bousaid, al-`Awina), although it is possible that the frieze had disappeared for some Mihrabs due to multiple decay and restoration cycles Figure 7.



a- Frieze of Mihrab al-Jannah Mosque (harat So'al – Nizwa ??? H)



b- Carved crenellation at the top of Masjid al-Aghbari (Samail - ???H)



c- The top frame of Mihrab j. So'al (harat So'al – Nizwa 650 H)

Figure 7.
The Mihrab frieze

b.2 Shahada Banner

In addition to the frieze, the top of the Mihrab is usually marked by a horizontal, sometimes imposing, rectangular band where the Shahada is carved in a beautiful Kufic script with floral and geometric dynamic patterns covering the spaces between the flat geometric letters. Some Mihrabs present slight differences with this common image. In the case of Mihrab J. Bahla, the Shahada is coupled with a Quranic verse (part of verse 16 of Surat Ghafir), and in al-'Ali mosque, half of the horizontal band is occupied by a text in Naskhi script relating to the date of foundation of the Mihrab and its patrons Figure 6. It is worth mentioning that both Mihrabs were carved by al-Humaymi. This confirms our hypothesis, that this artist was exploring the possibilities of design and even the materials and techniques in his three first Mihrabs. Such an approach allows us to claim that, even if the Omani craftsman of the 16th century had models of carved Mihrabs from the generation of Mihrab J. So'al's Mihrab (13th century), he was in the mindset of a researcher searching for the optimal design and best technique. Finally, the latest Mihrabs in the studied corpus did not have the Shahada on the top of their Mihrabs, instead, they have a Quranic inscription in Naskhi script (as is the case of the Mihrab of al-Aghbari mosque in Samail), or no inscription at all (for example, Mihrab Masjid al-Aqbil al-Qadim in a-Sharquiya) Figure 14.



a- Horizontal Band showing the shahada in Kufic script filled with floral and geometric patterns (Mihrab al-Jannah Mosque)



b- Inscription of Quranic verses in Naskhi script at the top of Mihrab Masjid al-Aghbari (Sama'il)



c- Horizontal Band with only floral and geometric patterns (Mihrab al-Masjid al Qadeem (al Qabil)

Figure 8.

Samples of the upper horizontal bands in some of the studied Mihrabs

b.3 The outer frame

The most dominant feature in the studied selection of Mihrabs is the “Outer frame”, composed of a succession of stamp-like tangential circles (Figure 6, Figure 8, Figure 9). Sometimes, the frame is composed of alternating circles with two different diameters, where the larger circles present a wider, plain circumference (Figure 10, Figure 6). All circles are filled with a variety of carved geometric and floral patterns, or incrustated with blue or green ceramic plates and bowls, creating an interesting diversity within the overall unity of the repetitive circles. In some Mihrabs the wider

circles are flanked with even smaller ones on both lateral sides (such as Mihrabs of the Friday mosques of So`al, Adam, and Manah, or the mosques of al-Jannah, a-Shargah, and a-Shawadhna) Figure 10. This ‘outer frame’ continues to the floor, and provides a structure for the whole Mihrab. This feature can be considered a unifying trait in all stucco-carved Mihrabs of the 16th (10th H) century [5, p. 233]. It is present in the earliest version of the Mihrabs (in So`al), in the mosques of the 16th century, and also adorns the later Mihrabs of the 18th century (M. Al Aghbari). It can also be observed as a more ‘abstract’ version in the mosques of a-Sharqiya region and this could be explained by the fact that they are part of the ‘later’ generation of carved Mihrabs, with their remote location in relation to the epicenter of the Manahi/a-Dakhiliya school of Mihrab carving Figure 11. It is worth mentioning that this element, although absent from most of the post 18th century Mihrabs, has made some reappearance in some of today’s mosques (Jama` Mizoon in al-Khouth in the Muscat Governorate).



a- Mihrab Masjid a-Shargah (Nizwa)



b- Mihrab Masjid a-Shawadhna (Nizwa)



c- Part of the interlaced strap work forming the outer frame of Mihrab J. So'Al

Figure 9.
Samples of outer frames



a- Al masjid al-Qadeem, al-Qabil (a-Sharqiya)



b- Masjid al-Moghrah, Sinaw ((a-Sharqiya)

Figure 10.

Samples of Mihrabs with "abstract" versions of the outer frame

b.4 The intermediary, interlacing strap-work

The intermediary frame is decorated with a unified pattern of interlacing strap-work and surrounds the rectangle containing the Mihrab niche. It either continues, equally ornate until

reaching the floor (Mihrab al-`Awina, and al-Mzar`a in Sama`il after restoration) Figure 11, or the intermediary frame rests on short engaged colonnettes with a lozenge capital (Masjid al-Jannah, J. Adam, J. Nakhal), or it is seen with a lozenge base in addition to the capital (J. So`al, J. Bahla, Masjid a-Shargah, and a-Shawadhna, al-`Ali), Figure 6, Figure 9. Colonnettes, bases, and capitals are also covered with carved floral and geometric patterns.



a- Masjid al-Mzar`a in Sama`il



b- Decorated engaged colonnettes with lozenge capital and base (a-Shargah Mosque)

Figure 11.

Intermediary frame (continuous until the floor / engaged colonnettes)

b.5 The central rectangle and Mihrab niche

The smaller niche of the Mihrab is carved within the width of the Qibla wall and could be framed by two other, smaller, engaged colonnettes, with lozenge or bulb capital. It is surmounted with a ribbed hood, sometimes composed of one or two rows of small Muqarnas (a-Shargah: Figure 11). The center of the smallest niche in the Mihrab is slightly concave, divided into vertical panels and extensively carved with geometric and floral patterns (A-Shargah, a-Shawadhna). Sometimes some Kufic designed letters spell the name of Allah and Mohamed (PBUH) in the heart of this niche.

The Mihrab niche constitutes the lower concave half of the Mihrab's central rectangle. Its upper half is occupied by the lunette/tympanum inscribed within an outer keel arch and the whole plane is covered with a profusion of floral and geometric interlaced carved patterns. The lunette presents a specific register of ornamentation, usually divided in concentric petals around a circle. The latter is emphasized with a specific decorative pattern (J. So'al and Bahla) or incrustated with a beautiful porcelain plate, most commonly of Chinese provenance (Masjid al-'Ali and al-Jannah) Figure 12. The upper part of the central rectangle and right above the keel arch framing the lunette, lies the rectangular band where more information about the Mihrab, its decorator and patron, as well as the date of achievement are transcribed in *Naskhi* or *Thuluth* script Figure 12.



Figure 12.

Samples of central rectangles in the Omani stucco carved Mihrabs

It is worth mentioning that in later Mihrabs, the keel arch transformed into a triangular one, as it is the case in Mihrab al-'Awina (Wadi Bani Khalid, a-Sharqiya) and al-Mukabbrah in al-Ghraidh(Nakhal), or became segmented like in Masjid al-Burashid (Sinaw) Figure 13. The center of the triangular arch is also incrustated with a large porcelain plate, while the sides are punctuated with smaller bowls, in the case of Masjid al-Burashid, or are filled with *Naskhi* or *Thuluth* script reporting the information about the Mihrab.

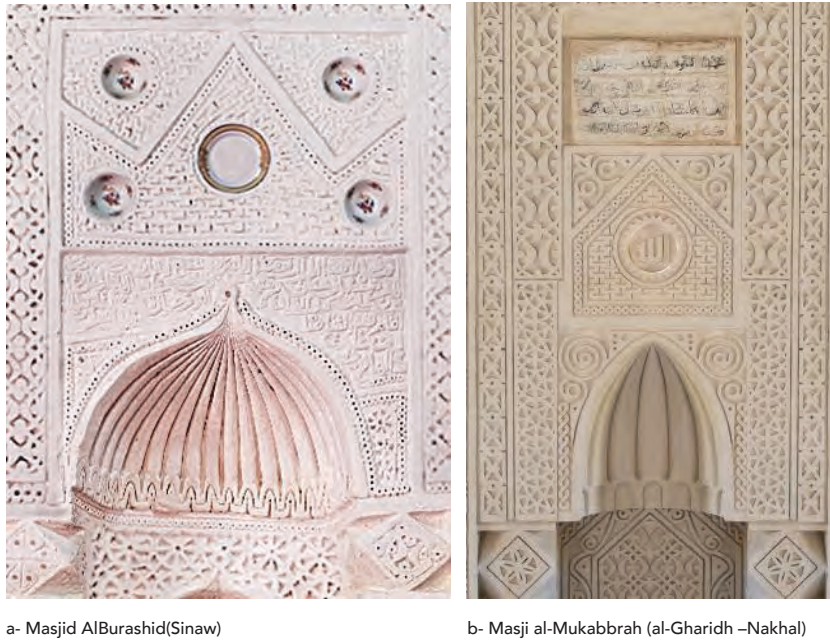


Figure 13.

The transformation of the Keel arch atop the ribbed hood into a triangular or segmented shape

b.6 The decorative elements:

Calligraphic texts

The omnipresence of the banner of Shahada in Kufic script at the top of most of the studied Mihrabs is a particularity that distinguishes the Omani style of stucco-carved Mihrabs from any other style in the region [5, p. 251]. It seems that the text of Shahada and Quranic verses, carved in the Qibla wall of Jama`a So`al (13th century CE) in large bold Kufic script, has inspired the craftsmen of the 16th century, led by the creative Abdullah al Humaymi. Since his first oeuvres in Manah and Bahla, the Kufic Shahada has not left the top of the Omani stucco-carved Mihrabs, until the second half of the 18th century (Mihrab Masjid al-Qadeem in Manal) and first half of 19th century (Mihrab Masjid al-Aghbari in Sama`il) (Figure 8, Figure 10, Figure 14). It is worth mentioning that in Jama` So`al, the calligraphy was not in the Mihrab, but the iconic, 1 m wide strip occupies the lateral sides of the Mihrab, in the Qibla wall Figure 9 and Figure 14. Therefore, the Shahada at the top of the Mihrab is a pure innovation of Abdullah b. Qassim and Humaymi, which has been followed by the Mushmil family and the rest of the craftsmen (Figure 6, Figure 9).



a-Interior of the Friday Mosque of So'al, and the band of extra large Kufic script running on the Qibla wall



b- Mihrab al-Aghbari

Figure 14.

Figure 14. Mihrabs of J. So'al and Masjid al-Aghbari: The older and the later mosque in the studied corpus

The presence of detailed information related to the Mihrab decorator, the patrons, and the date of completion is also another characteristic of this unique Omani tradition. It is usually in the small rectangle atop the lunette that we can find this important text about the history of the Mihrab decoration, the artisan who did it and the socio-political situation during the time it was created Figure 12. As stated above, these texts were the unquestionable source for much of the information presented in this paper [18].

The insertion of Quranic texts within the ornamental register of the Omani stucco-carved Mihrabs is not a distinctive feature in itself. It is common to find, in other Islamic regions, Quranic verses adorning a mosque's walls, but the exclusive presence of these texts in the *Mihrab* is an Omani particularity in this matter. If the Shahada written in Kufic script is almost systematically present in the vast majority of the Mihrabs studies in this paper, the Quranic verses, in Naskhi or Thuluthscripts are only present in ten mosques out of the twenty-three studied. Six (6) of these mosques are Jama` (al-Gharidh, So'al, Bahla, Manah, Nakhal and Muqazzah) and four (4) are Masjid (al-Mukabrah, al-Mzar'ah, a-Sarooj and al-Aghbari). Two (2) Jama` (al-Qasr and al-Bousaidi) and eleven (11) masjid don't contain any Quranic verses in their Mihrabs or in any other place in the building.



by Written the poorest creatures of Allah's Mohamed b. Ahmd b. Seif

كتبه أفقر خلق هلالا محمد بن أحمد بن سيف

Figure 15.

Calligraphy in Thuluth script in Masjid al-Jannah (Harat So'al – Nizwa)

In addition, the number of verses varies from one mosque to the other. Six (6) of the ten (10) mosques do have only one verse written in their Mihrabs: two masjids (al-Mzar`ah and al-Mukabbrah) and four Jama` (Bahla, Manah, Nakhal and Muqazzah). Jama` al-Gharidh is the only mosque containing two Quranic verses, while three others contain more than three verses: M. al-Aghbari and M. a-Sarooj contain four verses, and Jama` So`al presents six verses in its Mihrab. While we don't know the craftsmen who carved two of the mosques with more than three Quranic Verses (J. So`al and M. al- Aghbari), it is worth mentioning that Masjid a-Sarooj was carved in 970H by Talib b. Mushmil al-Manahi and the calligrapher who carved four Verses in Naskhi script, did also leave his full name, his Madhab and his tribal affiliation⁸, Figure 15. It is the only instance where the calligrapher spends so much space mentioning his name and Madhab. It is possible to assume that it could be one of the scholars of that time, which would also explain the relatively large number of verses carved in this Mihrab. Further research is needed to study this assumption.

Table 1. The distribution of Quranic verses inscribed in the Omani stucco-carved Mihrabs

Quranic Verse	Jama`	Masjid
Verse 39 of Sourat Ali`Imran: Quran [3:39]	Al-Gharidh	al-Mukabbrah
	Nakhal	a-Sarooj
	Muqazzah	
Verses 1, 2 and 3 from Sourat al-Fath: Quran [48:1,2,3]	al-Gharidh	al-Mzar`ah
	Bahla	al-Aghbari
Verse 18 of Sourat at-Tawba: Quran [9:18]	So`al	
	Manah	
Verse 16 of Sourat Ghafir Quran [40:16]	- So`al	
Verse 45 of Sourat Ali`Imran: Quran [3:45]		- a-Sarooj
Verse 90 of sourat An-Nahl: Quran [16:90]		- a-Sarooj
Verse 53 of Sourat az-Zumar: Quran [39: 53]		- a-Sarooj
Verses 36-37 of Sourat an-Noor: Quran [24: 36,37]		- al-Aghbari
Verse 255 of Sourat al-Baqara (Verse of the throne): Quran [2:255]		- al-Aghbari
Verse 10 from Sourat Yunus: Quran [10:10]		- al-Aghbari
The 6 first Verses of Sourat al-Mu`minun: Quran [23:6]	- So`al	
Verses 78 and 79 of Sourat al-Isra': Quran [17:78,79]	- So`al	
Verse 137 of Sourat al-Baqara: Quran [2:137]	- So`al	
Verse 103 of Sourat a-Nisa': Quran [4:103]	- So`al	

[18]⁸ عمر بن رجب بن فارس بن سليمان بن رجب بن سليمان بن سعد بن عبد هلال بن ... بن سليمان بن سعد بن ابي... بن محمد بن مصلح البوشري الطائي نسبا و الإباضي مذهبا

From Table 1, it appears that Quran [3:39] is the most commonly carved Quranic verse in the Omani Mihrabs, as it appears in three Friday mosques and two Masjid. Then come the verses Quran [48:1,2,3], in two Jama` and two Masjid. As for Quran [9:18], it is carved in the Mihrabs of two Jama` only. All the other verses appear in singular mosques such as J. So`al, with five verses and Masjid al-Aghbari anda-Sarooj with three verses each. It is worth mentioning that two of the verses commonly used as "Talisman" are carved in the Mihrabs of al-Aghbari (the verse of the Throne Quran [2:255]), and Jam` So`al (Quran [2:137] with the longest word in the holy Quran: "Allah will suffice you against them" ("فسيكفيهم").

It is therefore possible to state that the presence of the Quranic verses in the Omani stucco-carved Mihrabs is not a recurrent characteristic, and when it occurs, it is systematically carved in the Mihrab and is more likely to be found in Jama` rather than in Masjid. Similarly, Quranic verses were carved in the earliest decorated Mihrab (J. So`al, 650 H) and the latest one studied in this research (M. al-Aghbari, 1245H). Furthermore, it is worth mentioning that three (3) of the four Masjids' Mihrabs containing Quranic verses are those carved by Mushmil al-Manahi and his son Talib b. Mushmil. The Fourth one is the Mihrab of Masjid al-Aghbari, of which we don't know the decorator or calligrapher.

The decoration with embedded "Chinese" ceramic plates

As part of their decorative register, twenty Mihrabs out of the twenty-three studied here, present a variable number of ceramic plates and bowls embedded in different places of their surface. The only Mihrabs that were originally carved without the use of ceramic plates in their adornment are:

J. So`al (650H / 1252CE), the 'predecessor' of all 16th century Omani carved Mihrabs (Figure 14), J. Bahla (917H / 1511CE), one of the masterpieces of Adbullah Al Humaymi (Figure 6), and al-Aghbari mosque from the early 19th century CE, (1245 H) and the latest carved Mihrab in the corpus studied in this research (Figure 14). Some of the other Mihrabs have 'lost' their ceramic plates as a result of their advanced decay, or have been damaged and then either cladded over (Mihrab Masjid a-Shurah in Manah) or, more recently replaced by a carved inscription of the name of Allah (Masjid, al-Mukabbarah (Nakhal) and J. al-Bousaidi (Adam))⁹. These ceramic dishware, some of which have been introduced in Oman in the 15th century or even earlier through trading with Ming China [18], [24, pp. 8, 10] are a recurrent feature in the decoration of Mihrabs and other spaces such as in Suhar fort or some merchant houses of Ibra for instance [4, pp. 63, figure 30], [9], [29], [30, p. 218]. The center of the lunette/ tympanum is the most common area in the Mihrab where the ceramic plates are found. This central element could be the only one in the central frame or even in the whole Mihrab to be adorned with a ceramic plate (Masji al-Ain, al-Ali, J. al-Bousaidi, J. al-Gharidh or J. Nakhal). The most common situation, however, is the presence of four smaller bowls forming a rectangle framing the central plate (Mihrab Masjid a- Shawadhna, a-Shargah, a-Shurah, a-Sarooj, Mzar'a, J. Manah, J. Muqazah, al-Qasr and al-Brashid). In a few other instances, the central plate, which is usually the largest and most beautiful, is emphasized with two smaller bowls forming a triangle pointed to the top of the Mihrab (Mihrab M. al Jannah, al-Awina) (Figure 16). It is worth mentioning that in the triangular arched tympanum, the ceramic bowls are given similar distribution as those in the Keel arched ones though the layout seems more dynamic due to the sharp angles of the triangle (M. al-Mzar'a), the lozenge (M. al-Qasr), or

⁹ A blue ceramic plate was clearly apparent in a picture of Mihrab J. al-Bousaidi before its restoration, published by Baldisseri in his book [18, p. 87]

the segmented line (M. al-Burashid) (Figure 17). As mentioned above, and in addition to their presence in the tympanum, the porcelain plates may be embedded in the Mihrab's outer frame, where they occupy every other round stamp (J. Muqazzah in Izki). Moreover, they may be present in the small lateral circles (M. a-Shawadhna) (Figure 9), giving the impression of small satellites orbiting around a larger planet. Bandyopadhyay saw in such layout a mystic symbolism in the Islamic tradition related to the hyperbolic reference to Allah's light in Quran (Surah 24, Verse 35 and Surah 6 verse 97) [24, p. 14]. While such assertion needs further scrutiny in the Ibadhi mystic texts, from what is available to us through the studied corpus, this hypothesis is unlikely to be true. In fact, as discussed above, the Omani artisans had also used Quranic texts in these Mihrabs, and such verses referring to light were not among the common ones, especially not in the main corpus of the 16th century Mihrabs. Verse 35 of Surah 24 (an-Nour = the light) was carved only once, and it was in the latest Mihrab of al-Aghbari from the 19th century. However, one can argue that if there was an intentional reference to the stars in the decoration of the Mihrabs in Oman, this would be more related to the interest the Omanis, and Muslims in general, have to star gazing for the determination of their holy months, finding their way in the deserts and the seas, or defining the time by night for falaj (irrigation) water management [31]. In the latest decorated Mihrabs, due to weaker carving skills, the porcelain plates became the main "attraction" in the aesthetic of the Mihrab. Their distribution became freer in the different frames, their size as well as their quality became as much common (M. al-Qadeem in al-Qabil and M. al-Moghrah in Sinaw) (Figure 11). With all these frames and stamps, bands and porcelain dishware, with the profusion of various patterns knife-carved in the thick layer of Sarooj, the creative composition and the systematic filling of any plain surface, the Mihrab incarnates an important aspect of Islamic art: diversity within unity. It resembles a refined embroidery, as Baldissera remarked about Mihrab a-Shargah [18, p. 49].



a. M. al-Ain
(Manah)

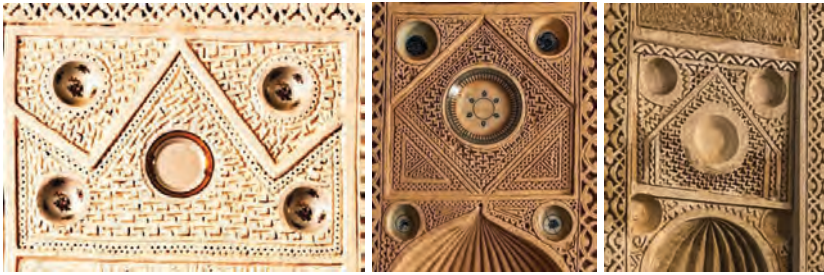
b. M. al-Jannah (So'al)

c. M. al-'Awina (Wadi Bani
Khalid [5, p. 236])

d. Masjid a-Shawadhna
(Nizwa)

Figure 16.

The different number and layout of Ceramic plates in the central rectangle of the Mihrab.



M. Al Burashid(Sinaw)

M. Al Qasr (Manal)

M. al-Mzar'a (Sama'il)

Figure 17.

The distribution of ceramic plates in the less common form of tympanum

It is worth mentioning that the themes of the designs within the porcelain plates are varied even within the same region or within the repertoire of the same craftsman. Most of the time, they depict abstract flowers, plants, or fruit. Some plates contain imaginary animals, fish, and birds such as the phoenix. The latter made appearances in the center of the tympanum of the Mihrabs of al-'Ain, a- Shurah, and Muqazzah at last. Even if the two first Mihrabs were made by the pioneer Abdullah b. Qasim al Humaymi, it is less probable that the theme of the phoenix was chosen purposely. Rather, it is more likely that his choice was related to the finesse of the designs in these bowls and their aesthetic in conjunction with the overall design of the Mihrab, or simply they were the most available to him at the time. From the scrutiny of the works of this craftsman, it became clear how much his taste is refined and his work is not. As mentioned in earlier research, this whole practice of Mihrab decoration is not "encouraged" in the Ibadhi jurisprudence related to mosque architecture [1, p. 178], [2], [3, p. 60]. Rather, Ibadhi teaching recommends the observation of modesty and austerity when it comes to the complementary details of construction. Furthermore, the decoration of Mihrabs was not encouraged by the Ibadhi scholars to avoid the risk of distracting the worshippers in their prayer. But it seems that during the Nabahina period, such practices were tolerated [3] in some regions of Oman. However, this tolerance was not the same everywhere and always. Certainly, the drawings in the porcelain plates might have been disapproved after creation of the Mihrab, and as a result had to be broken or taken away from the mosque. This explains the plates erased in their center in some of the mosques, or those which bowls and plates were simply removed from a Mihrab. In other places (such as al- Qabil), the local community was so keen to perfectly restore their mosque, that they bought a set of vessels from the local market and used them to ornate the Mihrab of their mosque, as a replacement of the old ones that disappeared or simply broke. In some other instances (J. al- Bousaid in Adam or al-Mukabrah in al-Gharidh (Nakhal)) where the Mihrab is restored by the ministry, the plates are replaced with recent but more appropriate ones, or the plate is replaced by the calligraphy of the word "Allah". We are less in agreement with this last option as it alters tremendously the stylistic composition of the Mihrab as there has never been such calligraphy in the center of the tympanum before. At this stage of the discussion, it is legitimate to question the origin of this practice of inserting the porcelain plates in the walls as a mean of decoration. Bandyopadhyay stated that it has been observed elsewhere without mentioning any example [24]. Our investigations about this question led us to one case in the eastern and

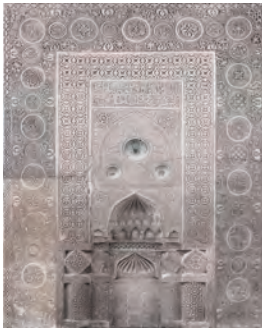
western minarets of Jama` al-Rawdha in San`a Yemen⁸ and which was dated from the Ottoman period [32]. However, to the best of our knowledge there was no evidence to establish an affiliation between the case of al-Rawdha mosque and the Mihrabs studied here. The number and almost systematic use of this technique in the Omani Mihrabs make of it a specificity to those Mihrabs even if it did not originate in Oman.

3.4. The Omani Mihrab in the wider context of decorated Mihrab in the Islamic world

If Kervran came to the conclusion that the art of Mihrab decoration in Oman is a "survival" of the Safavid stucco art [19], Kanaan links its origins to the Egyptian Mameluke tradition, transmitted to Oman through Yemen [5, pp. 239–240]. Bandyopadhyay on the other hand, articulates a construct following which the art of Mihrab stucco-carving arrived to Oman from Persia through the Buyids in the 13th century. Then, this craft evolved under several other influences especially from the shores of the South-East Indian ocean [22]. Other researchers came to the conclusion that this craft arrived to Oman through confluences from Persia, Yemen, or Egypt, but evolved to become a full-fledged Omani style in the 10th century Hijra [4, pp. 234–248], [5, pp. 238–242], [18, p. 146], [25, pp. 45–53].

If the earliest publication about the carved Mihrabs of Oman has described this style as being "*A curious example of conservatism of the Iranian art of stucco carving of the Seljuk and Mongol periods*" [19], the consecutive works have discussed other possible sources of influences and even finished by recognizing a certain Omani identity to this art [5, p. 257], [18, p. 146], [25, p. 14]. In her article about the stucco-carved Mihrabs in Oman, Kervran focused her discussion on Jama` So`al and Jama` Bahla to found her claim that the art of Mihrab decoration in Oman was a reminiscence of the Iranian Seljuks Art of stucco carving [19]. However, she could not explain why the Omanis of the 16th century were referring to an almost two centuries older decorative art. When he thoroughly commented on the decorated Mihrabs of the same mosques, and without refuting the claims of Kervran, Costa alluded to the possible presence of other sources of influence that might have participated in the formation of what he claimed to be a Omani style of Mihrab carving of the 16th century AD. [21]. However, he argues that Kervran's theory was only true for a few decorative features and technics in these two mosques. Most importantly, as later demonstrated by Kanaan, Kervran's argument fails when it is extended to the remaining majority of the decorated Mihrabs in Oman [5, pp. 235–236, 238, 240–241].

¹⁰ Our deep appreciation goes to Abdullah Mousa, Director of Programs at Alhudhud Center for Archeological Studies and Prof. Ghilan Hmood Ghilan from the University of San`a, for the information they provided regarding the decoration with incusted ceramic plates in the eastern and western minarets of the Friday mosque of al-Rawdha in San`a. Communication through whatsapp on May 14th and 15th 2021.



Mihrab of Masjid al-Jannah (Harat So'al - Nizwa) early 16th century CE



Mihrab of the Friday mosque of Zabid (Yemen) Late 15th century CE [33, p. 47]



Mihrab Masjid al-Mzar'ah (Sama'il). Late 16th century CE

Figure 18.

Mihrabs from Oman and Yemen

Mihrabs present several features that were unique and unprecedented in other regions in the past. Bandyopadhyay, goes also in the same line of a dominantly Iranian origin of the Mihrab stucco carving in Oman [23]. However, refuting the hypothesis of Kervran, he claims that the Omanis did not inherit this practice from the Persian Seljuks. Rather, they received it earlier, in the 10th century AD, when the country was under the Nabahina dynasty, through the multiple incursions of the Buyids in Sohar then further inland, in Nizwa and Bahla [22, p. 374]. In the same context, this author asserts that the tradition of patronage of artworks, such as carved Mihrabs, was also introduced in the Oman under al-Nabahina rulers with a Persian influence. On the other hand, Kanaan shares Baldissera's opinion and claims that we are in presence of an Omani school of stucco carving that emanated from a local adaptation and application of several influences, from the Buyids and Seljuks, but also from Mamluk Egypt through Yemen, and even the Rustemid Sedrata [5, pp. 230, 238, 240].

Based on what has been discussed thus far, while sharing this last conclusion, the present research has showed, by the multiple examples it discussed, the extent to which the local craftsmen, especially the pioneers (al-Humaymi), were in a state of exploration and trial, testing different techniques of carving and multiple forms and means of ornamentation. Such attitude is not uncommon. The Omani builders of the forts and other military structures of the 16th century, had a similar approach of forming a local typology of buildings from the techniques learnt from the Portuguese in the coasts¹¹. In light of what has been found, it is possible to claim that, even if the Buyids and Seljuk style had an influence on the early decorated Mihrabs such as the one of So'al, it is not accurate to reduce the origin and the development of this art in Oman to this sole source of influence. In the same period of the 13th century CE, Oman was also open to other forms of decorative arts, such as those coming from Iraq, which is most likely the origin of the Kufic calligraphy that became a ubiquitous feature in the Omani Mihrabs since the one of J. So'al. When the art of Mihrab carving witnessed its revival in the 16th century CE (10th H), the Omani artists employed the artistic repertoire inherited from the earlier Mihrabs. But, they also integrated, in a very creative manner, the artistic trends of their time, which also came from Yemen, Egypt and North Africa. The 15th century Mihrab of the Friday mosque of Zabid presents similar organizational and aesthetic sensibility in the stucco work as those of the first Mihrab of Oman's 16th century CE. As

¹¹ Benkari Naima: The formation and influences of military architecture in Oman during Al-Ya'ariba period (1034 - 1162 AH / 1624 - 1749AD). Forthcoming.

demonstrated in the present research, the art of carving Mihrabs in Oman was indeed the result of the conflation of all these trends and styles merged and reinvented within a pronounced Omani local language.

Conclusion

The present research is an historic and stylistic study of the stucco-carved Mihrabs in the traditional mosques of Oman. Through the study of architectural documentation and analysis of a large number of the still standing Mihrabs in different regions in Oman, along with the analysis collected from primary and secondary sources, this study revealed the following conclusions:

- The corpus of the traditional stucco-carved Mihrabs of Oman was produced in a timeframe that spans a period of more than six centuries (from the Mid-13th century until the early 19th century). The Mihrabs produced during the 16th century are the most important in number and the most developed in quality of execution and rich in the aesthetic register. Similarly, it has been found that the Dakhiliya region with the city of Manah is the epicenter of the development of this art, especially after its revival in the early 16th century, with the main pioneering and skillful artisans being originally from Manah and their first oeuvres being in that city.
- The content analysis of the inscriptions, deciphered by Baldissera in this book [18] about most of the Mihrabs studied here, has highlighted the character of the stucco-carved Mihrabs in Oman as sources for the sociopolitical historiography of the country and the region where they have been erected. It has revealed the organization of work in such projects and identified its main actors: the patrons, the Craftsmen, and the calligraphers. The content analysis has also showed that the Mihrab stucco-carving practice was organized in a form of "Craftsmanship School", where the most skilled are called masters and they transmit their know-how to their apprentices, who typically happen to be their children and grandchildren, as was the case in the family of Mushmil al-Manahi. Furthermore, the systematic repletion of certain features, and elements or techniques in the studied Mihrabs consolidate the idea of the existence of a 'stylistic school' led by masters such as al Humaymi or Mushmil and who even signed their works with the title of "Master".
- The comparative and stylistic analysis has helped in the identification of the different components of the stucco-carved Mihrabs in Oman with their common features and their disparities. In this context, the present study has highlighted the features that are unique in the Omani Mihrabs, their possible origins, and their process of evolution until they reached their final forms. Finally, this research has demonstrated that we are in the presence of a full-fledged Omani stylistic school of Mihrab stucco-carving which started around the 13th century and reached its peak in the 16th century before fading away around the early 19th century of our era. Even if this culminating style was the result of the conflation of several influences from the styles of Buyids and Seljuk in Persia, The Ayyubid in Yemen and Egypt, and the Rustemid in Algeria, or the Abbasid in Iraq. The Omani craftsmen have succeeded in integrating all these influences within their local taste and know-how. Such integration has generated a peculiar Omani art of Mihrab Stucco-carving with unique and unprecedented features and compositions.
- This study presents certain limitations in the corpus analyzed, where some Mihrabs could not be located and a few others could not be dated nor their artisans identified. Based on previous research, some assumptions had to be made based on careful comparison and analysis. Furthermore, due to

the limitation of the publication length, it was not possible to further develop the understanding of the social and professional networks that prevailed in the production of these Mihrabs and whether those networks were limited to Oman or went beyond the country's borders through tribal alliances. Further research is also needed to discuss the practice of Mihrab decoration with refined carving, even with figurative images in light of the Ibadi jurisprudence which clearly prohibits any kind of ornamentation in the construction, especially in the Qibla wall. Finally, this research also opens the opportunity to further explore the practical integration of the style and typology identified in the contemporary and future projects of Mihrab decoration in Oman or the region.

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لا اله الا الله محمد رسول الله

فواشهد ان لا اله الا الله محمد رسول الله

بسم الله الرحمن الرحيم

الحمد لله رب العالمين

والصلاة والسلام على سيدنا محمد وآله

الطيبين الطاهرين

وآله الطيبين الطاهرين

الذين اتوا بالحق والهدى

والنور والهدى والهدى

والهدى والهدى والهدى

لا اله الا الله محمد رسول الله

UNIVERSAL ART? THE QURANIC INSCRIPTIONS OF CAMBRIDGE CENTRAL MOSQUE



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What is meant by 'Universal art'?

The word *universal* etymologically comes from the Latin word *universus*, meaning "all together, whole, entire". In today's Cambridge dictionary, the word still refers to "... everywhere or ... everyone". Looking into the word in Arabic, one can find further connotations related to Islamic art. In the Oxford English-Arabic dictionary, for example, the word *universal* means (جامع، كليّ). In the Islamic tradition, the word جامع or *Jami'*, is one of the ninety-nine names of God, known as the beautiful names of Allah or '*Asma' Allah al-Husna*'. Abu Hamid Al-Ghazali, an 11th century Muslim philosopher, explained God's name *Jami'* as "the compiler of the similarities, the inequalities and the antonyms" (Al-Ghazali, 1999). *Jami'* in Arabic also refers to "great/ congregational mosque" where, beside the daily prayers, a noon congregational gathering, called *Jum'a*, takes place that includes a speech given to a group of Muslim prayers or *Jama'a* (*group*) takes place every Friday. Islam, in the wider sense, is defined as the closing and completing chapter of a single and consistent message of monotheism. According to Arafa, as a divinely revealed religion, it "had to be imbued with an integral quality of universality" (Arafa, 2015). Its universal message, i.e. the Qur'an, came as a communiqué to all humankind (Al-Ansary, 2009b). It is not limited to a specific time, place, nation, generation, or social class. It is universal in the way that it is directed to humanity as a whole, not only to the mind, soul, body or heart alone. It addresses humanity in all phases and fields of human life (Ishak and Solihin, 2012).

Looking into the universal principles of Islamic art, Azzam argues that Islamic art transcends time and place through its universal language that echoes the message of Islam (Azzam, 2002). Beside unity, or *Tawhid*, universality is considered the most significant feature of Islamic art, embodied in the beauty of its Islamic calligraphy (Hanash, 2017). Reading Arabic poetry to a non-Arabic speaker, for example, is different from showing him a piece of Arabic calligraphy. Even after translation, poetry is bound by its contextual and local connotations. However, calligraphy is universally admired and respected while needing no mediation to understand its aesthetics (Matoq, 2017). Consequently, Quranic epigraphy compiles accumulated layers of universal aspects embodied in its form, message, and relation to mosques, which symbolize Islam worldwide. The real value of this universality, according to Azzam, is not that it is simply an art that is understood by everyone, but the principle that "allows everyone a direct access to the Truth" (Azzam, 2002).

In Islamic tradition, the very end of God's message to humanity is to know the Truth or *Haqq*, another name attributed to God. Al-Ansary argued that one can't know God unless he knows Qur'an, the words of God (Al-Ansary, 2009b). The word Qur'an is derived from the word *qara'a* which means to read or to recite (Ringgren and Sinai, 2020). *Al-Quran al-Tadwini* or the Recorded Qur'an is considered the first source of Truth in Islam's worldview, also known as *Kitab Allah al-Massttur* (The Revealed 'Written' Book). The second source of truth is *al-Quran al-Takwini* (The Qur'an of Creation) which is the Cosmos, similarly known as *Kitab Allah al-Mandhur* (The Created 'Sensed' Book) (Arafa, 2015) (Jalabi, 2002). According to Al-Ansary these two sources are not only sources of Truth, but also of Beauty; a further name attributed to God. The revealed Qur'an, with what it contains of truths, connects the person to the source of true beauty and the source of supreme light. While the cosmos, with its creatures and supernatural spiritual manifestations, reflects the affairs of the supreme deism, and the lights of the beautiful names of God. All this is meant only for the person to live his aesthetic experience on the conscience level, and express it through various types of beautiful expressions (Al-Ansary, 2009a).

Human expressions, according to Dale Jacquette, appear similarly in both art

and language. He emphasized the essential presence of perception, intention, and expression as inter-related factors in art (Jacquette, 2014). He described artworks as neither mere abstract entities, since they exist in time and place, nor as mere physical entities. Instead, he entitled them as cultural entities, which are "physical entities embodying or manifesting certain special types of abstract properties, ideas, concepts, formal relations or the like" (ibid.). Regarding the nature of Islamic art, especially Quranic epigraphy and its universality, the following questions might be asked: Is Quranic epigraphy considered a cultural entity? Then how is it still considered universal? According to Islamic tradition, Quran is divine. Epigraphy on the other hand is not. Nonetheless, Quranic epigraphy contains a divine message, humanely expressed through calligraphic art. It is both spatiotemporal and non-spatiotemporal. It encompasses timeless and spaceless truths that are able to exist in and express certain time and space. It is universal in the sense expressed through the word *Jami'* explained above by Al-Ghazali as "the compiler of the similarities, the inequalities and the antonyms". It is inspired by both physical and metaphysical order, and expresses truths that are perceived on both individual and collective levels, at the time of its inscription and hundreds of years later.

Islamic art, according to Matoq, belongs to the idea of global societies which Émile Durkheim, a French sociologist, referred to in his writings. In his social account of 'world culture', Durkheim promoted the existence of a cultural order that is globe-spanning in reach, yet centered around basic, general, and universally applicable moral principles that apply to all its participants. Those participants, who act much like the interdependent but differentiated organs of a living body, have somehow contributed specific elements to this culture. In this order, ethical configurations are applied by all states "yet with specific national colourings" (Inglis, 2011). They share similar production techniques and are included in the same civilization. This order can be witnessed in the "Islamic" civilization (*ummah*) across the world, which was built upon the synergy between immutable principles and essence, and the variable conditions of space and time (Arafa, 2015). All this highlights the global and holistic dimensions of Islamic art, expressed through the words عالمي or 'almy and كلي *kly* as Matoq calls it, which are mentioned above as translations of the word 'universal'.

In the light of this previous attempt to introduce the universality of Quranic epigraphy in mosques, and through the following section, the researcher will try to investigate a case study of a contemporary example. To understand the contemporary phenomenon of a long history of using Quranic epigraphy in mosques, and pose the questions of "how" and "why", a case study strategy is followed and applied to Cambridge Central Mosque in the United Kingdom. This research strategy is not being chosen with the objective of "generalizing" a set of findings, as typical case studies allow. It is rather chosen to facilitate reflection and understand how Quranic epigraphy and its role in mosque architecture is applied and perceived as universal art in one of today's mosques.

The Cambridge Central Mosque Project

In 2008, the Muslim Academic Trust decided to put a bid on land at Mill Road, as a key step forward for the Cambridge Muslim community to have their first purpose-built mosque within the city of Cambridge (AlAnsaar, 2017). The trustees of the Muslim Academic Trust charity, behind this project, are two English converts to Islam, Yusuf Islam (a British singer-songwriter previously known as Cat Stevens) and Abdul Hakim Murad (an academic, theologian, and Islamic scholar also known as Timothy Winter) (Saleem, 2013). Both, with a third trustee Tijani Gahbiche, were also behind the idea of founding Cambridge

Muslim College, a college for training Muslims in the classical Islamic sciences in the city of Cambridge.

In his early lecture in 1997 and through his writings about the Muslim culture, Murad always had a defined perception, yet not a specific image, about mosques in Islamic culture. In a long essay entitled “*What is a mosque?*” on Cambridge Central Mosque’s website, which is meant to reflect the mosque’s vision, Murad presented his thoughts about a mosque’s nature and function. Starting from the Arabic name for a mosque as a *Jam’i* which he translated as ‘that which includes’, Murad presented the mosque’s aspects of inclusivity as well as diversity. He elaborated on those two points through the interview, stating:

“Islam has a strong Abrahamic and primordial dimension, emerging in a place with no architectural culture, so mosques have historically varied to suit local cultures’ manner of perceiving the sacred. So it is a universalism expressed in diversity, which nonetheless points back to the principle that diversity indicates its divine source.” (A.H. Murad, Email interview, January 31, 2021).

According to Murad, any mosque is an extension of the *Ka’ba* (the sanctuary built by Abraham), and its *mihrab* is Marian (relating to Virgin Mary). The *mihrab* is often “surmounted by a Quranic verse (Q 3:37) evoking the Virgin Mary’s devotion in her own niche “*mihrab*”, Murad explained. He also highlighted a matrix of relations between the Qur’an and mosque architecture, describing a mosque as “a sanctuary of the Qur’an”; as well as the relationships between the Qur’an and nature, and between nature and mosque architecture. According to Murad, all three recall the presence of God, the Divine Maker (AbdulHakim Murad, no date). Their relation is “a collocation of the two discourses: *Qur’an Takwini* and *Qur’an Tadwini*, both composed of ‘signs’” (A.H. Murad, Email interview, January 31, 2021).

As an English Muslim convert, who long suffered from sectarianism and ethnically specific mosques in Britain, Murad wanted a mosque that is *Jam’i* or universal in the literal sense of the word, that welcomes and brings together every Muslim and non-Muslim, men and women of all ages and ethnicities. According to Murad, in a meeting held with members of the Cambridge Muslim community in 2017, Cambridge mosque intends to respect the right to good neighborliness (*Haqq Al Jewar*), which is a prophetic commandment in Islam to respect nearby neighbors, *Al Jar Al Janb*, as the Qur’an describes them. It intends to make a very positive, grand statement about Islam among non-Muslims in a city like Cambridge with its magnificent architecture, like St Mary’s church, Trinity College, and King’s College Chapel. He also emphasized the intention (*niyyah*) upon which the mosque is built, which includes sincerity, piety, and reliance on *Allah* (God). According to Murad, this is “the unshakable rock on which this building will be built” (Millroadtv, 2017).

In 2010, an international design competition was held and eleven design proposals were submitted for Cambridge Central Mosque. A jury was created, and four designs were chosen for a later meeting, where the Muslim community, as well as local residents, were consulted. Marks Barfield Architects’ design won the competition. According to Murad, it was “the design that everybody liked the most” (ibid.). Marks Barfield Architects, led by the prominent architect David Marks and his wife Julia Barfield, two Jewish architects who designed such ‘avant-garde’ structures as the London Eye, and previously designed an Islamic school (Islamia School) for Yusuf Islam in London (Saleem, 2013).

The mosque design brief called for a mosque that would accommodate 1,000 congregants, of both men and women, announcing Islam's presence in Cambridge as both a spiritual and cultural asset for the wider community, including Muslims. Embracing universal principles, the mosque should be sustainable, socially and architecturally integrated into the wider local community, and respectful of the surrounding built environment (Skadberg, 2019). Murad insisted that they didn't want a "barn with a dome", but a piece of contemporary yet sacred architecture, which the brief described that it "may require a totally different appreciation from that of modern architecture, one that is not necessarily centered on architecture as the work of the individual, but ... on the architect's particular expression of a universal principle" (Wilson, 2019).

While trying to "work out what it means to have an English mosque" based on universal principles, the architect tried to synthesize the application of geometry, nature and forms inspired from both English and Islamic heritage in the mosque design. The Gothic fan vaulting in King's College Chapel in Cambridge, the transition from column to roof in the Chapter House at Westminster Abbey England, the early Islamic mosque of Juma Khiva in Uzbekistan and the Cordoba mosque in Spain have all inspired a mosque design of a calm oasis or grove of trees made of timber columns. The link between the local and the Islamic, according to Marks Barfield Architects, was expressed through the natural world, as its point of connection (Skadberg, 2019).

An expert in sacred architecture and Islamic geometry, Keith Critchlow, was contacted at a very early stage of the design. He worked closely with the design team, proposing a guiding geometric pattern known as 'the breath of the compassionate', based on octagons and symbolising the rhythm of life. These developed patterns provided an abstract sacred ordering device for the architecture, reworked for a contemporary context" (Wilson, 2019). Emma Clark, a garden designer specializing in the design and symbolism of Islamic Gardens, was also part of the team, working with landscape designer Urquhart & Hunt. They designed an Islamic garden with a water fountain, referencing Paradise in Islamic tradition. It is publicly accessible for contemplation and rest, providing a welcoming environment "encouraging community engagement and involvement" (Skadberg, 2019).

The mosque is located in a traditionally working-class neighbourhood of Cambridge. It is primarily residential with two to two-and-a-half story buildings. The character appraisal showed few typical building features and details of mainly 19th and 20th century Terrace housing with façades of polychromatic brickwork, mainly yellow or white quartz brick enlivened with a distinctive use of red bricks (Skadberg, 2019). This inspired the design of the mosque's external walls, which are made of cross-laminated timber, clad in brick tiles of these traditional Cambridge Gault and red brick colours, that intend to "reflect the residential architecture of the surrounding[s]" (ibid.). The brick pattern forms *Kufic* calligraphy inscriptions, which are also incorporated in the mosque's portico and atrium, shown in figures 3 & 4.



Figure 3.
The exterior façade of Cambridge Central Mosque source: Morley von Sternberg.



Figure 4.
The atrium of Cambridge Central Mosque with Brick Kufic calligraphy. source: (Wilson, 2019)

The layout of the mosque starts with a small community garden that sits at the front of the mosque site facing Mill Road. The site extends northward, creating a series of spaces from the main south entrance to the prayer hall. Passing through the railings beyond the community garden and through the “Islamic” garden designed by Clarks, one reaches the “lofty” entrance to the mosque with a rectangular calligraphic panel. This leads to a portico with a glazed wall which fronts a square-set atrium before the lobby leading to the prayer hall of the mosque. The prayer hall is also square-set, but twisted on plan to face Mecca on its eastern side (Wilson, 2019) figure 5.



Figure 5.
Ground floor plan of Cambridge Central Mosque. source: <https://marksbarfield.com/projects/cambridge-mosque/>

Quranic Epigraphy of Cambridge Central Mosque

There are three types of Quranic epigraphy in Cambridge Central Mosque. Based on their location and calligraphic script, these are:

1. The exterior, portico and atrium simple (*Kufic*) inscriptions,
2. The fascia (*monumental Kufic*) inscription,
3. and the prayer hall (*Jeli Thuluth*) inscriptions.

Through the following section, these inscriptions are described, translated, and explained in light of the interviews with the calligrapher and Abdel Hakim Murad, the mosque chair, followed by researcher's analysis, interpretation, and reflection. When Quranic verses are mentioned, they are presented in *Italic*, followed by the number of the chapter where the verse is located in the Quran and the number of the verse.

The Exterior, Portico, and Atrium Simple Inscriptions

When the mosque was first opened in 2019, the only calligraphy present in the mosque was the *Kufic* inscriptions set out by the brickwork on the mosque's exterior façade, portico, and atrium. The architects worked with Critchlow, as well as the Mosque committee, on the design, creating geometric modules (A & B), within a diamond-like pattern. The main module (A) constitutes 4 submodules each spelling out the Quranic verse "Say, 'He is God the One (Q 112:1), grouped and rotated creating a central diamond with the word "Allah" in simple *Kufic* rotating 4 times around its center. The submodules are also used separately in areas on the wall that are too small for module (A). The second module (B), is a simple pattern which has "no meaning" and "used everywhere else". *Kufic* (angular) script is the oldest type of script that prevailed in the mosques of early Islamic centuries. It played a significant role in buildings of the Eastern Islamic world, especially in Central Asia (Shbl, 2014), where brick *Kufic* inscriptions were a specific feature in different types of buildings. Inspirations for the *Kufic* bricks in Cambridge Central Mosque can be seen in the Gar minaret and mosque in Iran. The method for installing this brickwork was inspired by a historic construction method used widely in East Anglia in the United Kingdom, in the 18th and 19th centuries, where mathematical tiles were installed on timber-frame buildings (Skadberg, 2019). The choice of the verse indicated "the Divine unity, being the essential principle of a Muslim sacred structure" (A.H. Murad, Email interview, January 31, 2021).

The Fascia Inscriptions:

The fascia, as well as prayer hall, inscriptions were installed almost a year after the mosque opening in 2019. The Quranic verse on the fascia was rendered in gold over a brown background, visible to passers-by. The choice of the verse and the type of script of the fascia inscription were made by Abdul Hakim Murad himself. He wanted "something that would suit a major building but maintain a certain discretion about the building's Islamic identity to casual passers-by" (A.H. Murad, Email interview, February 05, 2021). According to Murad, the Quranic epigraphy on the fascia should reference a theme that is also present in the Bible. Explaining his choice, Murad added:

"The text is God's words to Moses spoken from the 'Burning Bush'. 'Truly I, I am God, there is no deity but Me, so establish the Prayer to remember Me.' The text was chosen because (1) the mosque is informally known as 'Masjid al-Tawhid', (2) the monotheistic principle is common to Cambridge's 3 Abrahamic religions, and is not divisive, (3) the verse indicates the presence of a holy place in virgin nature, (4) it references Moses, again a figure recognised by the 3 Abrahamic religions. So the

verse is welcoming to local people, is uncontroversial, and indicates Islam's belongingness to the monotheistic narrative which already exists in the UK." (A.H. Murad, Email interview, February 05, 2021).

The inscription was transcribed by the Turkish calligrapher Hüseyin Kutlu, who is based in Turkey (FM, 2020). Kutlu was chosen for the project by the trustees for "his extensive track-record in working in mosques" (A.H. Murad, Email interview, January 31, 2021). He transcribed Quranic verses for several mosques around the world, such as the United States, Japan, Chechnya, Germany, Russia, as well as Turkey (Cappellari, 2017).

The choices of the Mosque's Quranic Epigraphy: The Process, Meaning, and Objectives

The intention of Cambridge Central Mosque committee was to include everyone. In response to that, the committee decided to exclude anything on the walls that might give a sense of exclusion to any group. This especially included, what Murad described as, "certain sectarian symbols" which announce an ethnic specific identity, that deliberately made some Muslims feel uncomfortable (FM, 2020). Alternatively, the committee wanted an inclusive, as well as a beautiful Islamic identity of the building that will "be sufficiently evident" (A.H. Murad, Email interview, January 31, 2021). This meant that only Arabic copies of the Quran were made present in the mosque shelves, and only Quranic calligraphy was inscribed on its walls.

As mentioned earlier, Hüseyin Kutlu was the calligrapher behind Cambridge mosque's Quranic inscriptions (except for the brickwork inscriptions). Kutlu isn't just a calligrapher, he is an intellectual and an idealist clergyman who studied philosophy and worked as an *imam* or preacher for nearly thirty years in the Hekimoğlu Ali Pasha Mosque in Istanbul, one of the latest mosques of the classical period (Özcan, 2006). Kutlu holds deep philosophical and spiritual views about calligraphy and its relation to mosque architecture based on his long experience in the field, as well as his early and keen interest, writings, and projects about the Muslim civilization. Through the previous mosques in which he inscribed its calligraphy, Kutlu worked with the mosque architects from the early stages of the design. Decisions about mosque calligraphy were considered in advance and architecture developed accordingly (H. Kutlu, Videocall interview, January 24, 2021). This didn't seem to be the case in Cambridge Central Mosque. Unlike Critchlow, Kutlu was contacted at a late stage of the mosque design and construction.

The interview with Kutlu revealed that the current calligraphic program of the mosque came after several previous proposals and suggestions by himself, which were turned down by the team. In spite of the circumstances around which Kutlu had to work for the project, which he didn't appear willing to highlight, he tried to establish an integration between the inscriptions and mosque architecture based on the perception he developed over the years.

Kutlu believes that calligraphy's main role in mosque architecture is to express or announce some of the divine messages, to those who come to the mosque, in accordance with its location in the mosque. He described this integration between space and meaning as *Muqtada Al-Hal*, which is an expression for a classical Arabic rhetorical theory that stresses the principle of "the requirement of the circumstances". He went on illustrating this role while saying:

"Let's consider that architecture is a rough outline of the human face. Calligraphy is the small details of the face. For example, imagine a

portrait, of a sad face, or when [a face] looks as if it just woke up, the face is the same face, but it is the lines (as well as the calligraphy) that draws the expressions.” (H. Kutlu, Videocall interview, January 24, 2021).

Beside its communicative aspect, Kutlu also believes in calligraphy's decorative aspect, which must be very tuned to give character to the mosque. However, it should not be placed in a location that might distract worshippers. According to Kutlu, it is like an orchestra with various instruments. In order for the architecture, calligraphy, and even patterns to be in harmony, they have to play the same note (ibid.).

Kutlu's perception of calligraphy starts from his perception of art, based on the Qur'an, which he believes is the source of Islamic arts. He emphasized the spiritual aspect of calligraphy and the connection between the calligrapher and God. He explained:

“...the more you can establish a connection between you and Allah the Almighty, the more spirituality you write. Let's say there are two calligraphy pieces, both are very nice. But when you look at one of them, you feel something different, you like it very much. Do you know why? There is spirit there. Where does that spirit come from? The relation between you and Allah. The other one is very nice too but tasteless.”

According to Kutlu, in order for a calligrapher to write for an architectural work, he must be able to “read” architecture well and observe its lines. Since he didn't visit the mosque, Kutlu was sent 3D footage of Cambridge mosque, which he also used for “praying in the mosque for days” before writing. (H. Kutlu, Videocall interview, February 02, 2021). To soften Cambridge mosque's architecturally sharp lines, Kutlu designed most of its Quranic inscriptions in round circular panels. He used *Jeli Thuluth* as a script type for a similar reason. *Jeli Thuluth* is characterized by its flexibility and “clear”-ness (from the translation of the word *Jeli* meaning clear). Regarding the colors and distribution of calligraphy, Kutlu used golden rendered inscriptions on blue panels (see figure 6), symmetrically distributed over the walls of the mosque. He considered what he described as “the stain effect”, which is the effect of the design on the eyes of the contemplator (ibid.).

As for the usual design process, Kutlu starts designing mosque calligraphy from the upper mosque elements, like the dome, integrating meaning downwards towards the lower elements. In the case of Cambridge mosque, Kutlu designed a linear calligraphy around the interior of the dome, where he wrote *Ayat Al-Kursi* (the verse of the Throne Q 2:255). God describes Himself in *Ayat Al-Kursi*, His oneness and attributes, which Islam's message aimed to deliver. A mosque with a similar message aims to teach people about God and the essence of His religion. That is why *Ayat Al-Kursi*, according to Kutlu, is used in mosques in general and is chosen for special elements like the dome specifically. However, the calligraphy Kutlu designed for the dome, wasn't installed in Cambridge mosque, for a reason he didn't seem to know.

Regarding the choice of the rest of the verses in the mosque, Murad stated that:

“We wanted to choose some of the ayahs (verses) that are ... about creation, and about care for the creation. One of the beautiful things about the Qur'an is that it is the book of creation and inferring the reality and the power, ... the mercy of the Creator from the signs of Allah in creation.” (FM, 2020).

Accordingly, the verses were selected by the calligrapher and samples of inscriptions, from previous mosque projects, were sent for a final selection. Chosen verses were then adjusted according to mosque architecture in terms of ratio and design. As Cambridge city is known for its university, a verse (Q35:28) about knowledge and scholars was included and repeated in a smaller sized panel in the women's prayer area. The other verses included themes about benevolence, piety, *Tawheed* (God's unity) and remembrance of God.

The *mihrab* and the calligraphy on the *qiblah* wall were the elements Kutlu seemed most proud of, see figure 7. As mentioned earlier by Murad, a *mihrab* commonly held the verse (Q 3:37) that mentions Virgin Mary in her sanctuary or *mihrab*. However, Kutlu chose a different verse, that is still commonly used in mosque *mihrabs*, where a shorter verse is required for a smaller space. The verse commands the prophet to turn his face to the direction of the *Ka'ba*, the direction of the *qiblah*. This makes this verse suitable in the mosque *mihrab* wall which is always oriented towards the *Ka'ba* and commands the congregants to turn towards it. Kutlu inscribed *Surat Al-Fatiha* (The Opening Chapter of the Qur'an) divided into two panels on the right and left of the *mihrab*. He wanted to it to look like the first pages of the Qur'an when it is opened, where *Surat Al-Fatiha* and the first page of *Surah al-Baqara* (the chapter of the Cow) appear on the right and left pages of the opened Qur'an. *Ayat- Al Nur* (The verse of Light) was also inscribed around the border of the *mihrab* for a similar reason to that of *Ayat-Al Kursi* that was mentioned earlier.

Kutlu described a number of factors and considerations that the design of inscriptions in the mosque included. These included the square area of the mosque, the space-tip size of the pen ratio, the golden ratio, the emptiness-fullness ratio, the distance between the eye and the location of inscription, the sense of depth and pressure due to the size of calligraphy, the gaps which are filled with design patterns, border line proportions, and the relationships between all the calligraphic panels in the mosque.



Figure 6.
Calligraphic panel being installed in the prayer hall.
source: <https://cambridgecentralmosque.org/>



Figure 7.
The Qiblah wall showing the mihrab inscriptions, the minbar and the two panels on their right and left encompassing Surat Al Fatiha, source: Cambridge Central Mosque Facebook page.

Readings, Reflections, and Interpretations

Reading through the Quranic epigraphy of Cambridge Central Mosque, especially those that were chosen deliberately, i.e., the brick *Kufic* inscriptions, the fascia inscriptions, and the inscriptions on the *qiblah* wall including those of the *mihrab*, within the above context, one can suggest a number of reflections and interpretations.

According to Farid Al-Ansary, the utmost objective of the message of Islam is knowing God and believing in His Oneness. The Qur'an is considered the first step towards this knowledge, as it communicates the knowledge of God as its message's premier objective (Al-Ansary, 2009b). For that reason, calligraphy is considered the highest form of visual art in Islam, as it expresses this Divine message; and the mosque as its sanctuary, since it encompasses these Quranic verses through its epigraphy.

The Quranic epigraphy of Cambridge Central Mosque expresses a number of perceptions based not merely on the intentions of the artist, calligrapher, or the community behind the project, but also on the meanings embedded in the Quranic verses themselves, in terms of their form, content and their location within the mosque architecture. Calligraphy on the exterior of 'Islamic' architecture, for example, has been analyzed by Irene Bierman through the concept of 'Public text'. Bierman defined 'Public text' within the historical socio-political and urban context of the Fatimids in Cairo as "a particular mode of writing in Arabic in a public setting which because of its striking calligraphic form or because of the way in which it is displayed, or both, came to have important connotations of its own" (Bierman, 1989).

Accordingly, the message of Divine unity or *Tawhid*: "Say, 'He is God the One'"¹ was chosen and inscribed through brickwork on the mosque exterior façades, in order to be conveyed as a public message of Cambridge Central Mosque, or 'Masjid al-Tawhid' as it is informally known to be. Murad and the architect tried to choose a mode of writing relatively familiar to the urban context to include every group of audience, either through the content of its message (for the Arabic-speaking audience), or through its familiar "British" form (for the local residents). Similarly, the fascia inscription, visible from the public community garden and semi-public Islamic garden, emphasizes the message of Divine unity: "I am God; there is no god but Me". It also addresses practical implications of Divine unity related to the function of the mosque, which is worship, remembrance, and prayer to the Only God: "So worship Me and keep up the prayer so that you remember Me". Written in what looks like Fatimid *Kufic*, the public message is inclusive, not merely to Muslims who would understand and relate to it, but also to non-Muslims who would contemplate its familiar form. This is because the form of the fascia's *Kufic* inscription is also similar to scripts known as pseudo-*Kufic*, which were used for decorative purposes in Western Christendom during the Middle Ages² (Napolitano, 2018). The verse presents God's words to Moses, which recalls the story of Moses who is an important figure in all three Abrahamic religions, Islam (*Mūsā*), Judaism

1 It is the first verse of Surat Al-Iklas, which is also called Surat al-Tawhid in some Tunisian Qur'ans (Ibn-Ashur, 1984).

2 Pseudo-Kufic or Kufesque or pseudo-inscription was a result of the interaction between the Islamic world and Latin West during the Middle Ages during cross-cultural exchange, which became significant during the Abbasid period. "Precious objects and fabrics began to arrive through the Mediterranean basin from eastern Islamic countries, and soon circulated over most of the Italian peninsula. This fact favoured the development of the taste for the elegant Arabic lettering more or less clearly identifiable as Arabic script, among the decorative elements of many Italian artists. Such epigraphic patterns have been labelled with the general term of 'pseudo-inscriptions', that is, inscriptions deemed unreadable." (Napolitano, 2018).

(*Moshe*), and Christianity (*Moses*). As both a Quranic and biblical character, Moses is considered a prophet in the succession of messengers sent by God (Wolf, 1959). This reflects Murad's wish to include Christian neighbors from the outset and to show them, as he described, that Islam is the inclusive religion which is part of the same Abrahamic family, and that Muslims believe in their prophets who share the same commandments (FM, 2020).

Looking into the epigraphy of the prayer hall, especially of the *qiblah* wall, further perceptions and their expressions can be observed. The two circular panels at the sides of the mihrab encompass a significant chapter in the Qur'an, which is "*Surat Al-Fatiha*", translated 'The Opening' or 'The Opener' chapter. According to Abdel Haleem, this chapter is "very important in Islamic worship", since it is a pillar and an obligatory part of the daily prayer, which is repeated several times during the day (Haleem, 2008). There is a vast amount of literature about this chapter – its meanings, significance, and objectives – in Islamic scholarship. It is entitled several names including 'the Foundation', 'the Adequate', 'the Praise', 'the Supplication', 'the Educator', 'the Curative' and 'the Prayer' chapter. It is also called *Umm Al-Quran*³ (the mother of the Qur'an) and *Umm Al-Kitab* (the mother of the book), a name also given to the Preserved Tablet⁴, which is considered the origin of all creatures ('Imadi, 1999).

Moving to the *mihrab*, the middle circular panel contains the "*shahada*", also described as the Islamic creed or the Islamic confession of faith: "*There is no god but Allah, Mohammed is the Messenger of Allah*". In Islamic tradition, it is also known as *Al-Kalima Al-Tayyiba* (The good/virtuous word), for it is the formulation of *Tawhid* or Divine Unity (Musahadi, 2017). It is considered the first pillar of Islam, and another expression of its core message, emphasized through the mosque calligraphic program. Underneath it, lies a rectangular panel, located in the middle of the *mihrab*, holding part of verse 144. The verse is located in the second chapter of the Qur'an, known as *Surat Al-Baqarah* (The Chapter of the Cow). According to Qadora, there are countless objectives of this chapter; however, some scholars have highlighted its main aim, which is to establish evidence that the Qur'an is a guide, followed in every status. According to Beqa'y, cited by Qadora, the greatest fact the Qur'an guides to is the belief in the unseen, which the story of The Cow expresses (Qadora, 2014). Verse 144 which contains the part inscribed in the *mihrab*: "*Turn your face in the direction of the Sacred Mosque*", itself has its own objectives. This includes commanding the prophet, as well as the believers, to change the direction of the *qiblah* from Jerusalem to the Ka'ba, which is located in the middle of the Sacred Mosque (the first House of God built by Abraham) in Makkah. Commenting on this verse, Ibn Ashur recalls Fakhr Eldin Al-Razi's words about the human rational and imaginative powers. If a person wants to evoke a rational abstract entity, he will have to assign a sensible image that would help him perceive those rational meanings. In the case of prayer, where a man faces the *qiblah*, according to Al-Razi, it resembles a servant in the presence of his King, where the servant faces his Lord (i.e., through facing the *qiblah*), praises Him (through reciting the Qur'an) and serves Him (through

3 As mentioned in the Hadith about the importance of Surat Al-Fatiha in the Book of Prayers by Sahih Muslim where the Prophet said: "If anyone observes prayer in which he does not recite Umm al-Qur'an, It is deficient [he said this three times] and not complete." The Messenger of Allah also declared that Allah the Exalted had said: "I have divided the prayer into two halves between Me and My servant, and My servant will receive what he asks.". The Hadith continues reciting first verses of Surat Al-Fatiha and God's reply to each.

4 In the Qur'an, it is the Tablet preserved in heaven, meaning the original Qur'an. It is where all the divine predestination from the beginning of the world to the Hereafter is recorded (Nakamura, 1994).

prayer)⁵ (Ibn-Ashur, 1984).

Around the borders of the *mihrab*, two verses from chapter 24 in the Qur'an are inscribed: verses 35 and 36. Verse 35 is widely known as the Light verse (*Ayat Al-Nur*), taking its name from its chapter, *Surat Al-Nur*. The entire chapter focuses principally on the domestic legislation and rules for proper Muslim conduct. According to Böwering, the Light verse itself is considered "one of the most evocative of all Medinan verses". It is a simile that has remarkable imagery conveyed through its keywords which include: the light, the niche, the lamp, the glass, the glittering star, the blessed olive tree, the light lit by itself without fire touching it, light upon light, and the similes of Divine illumination (Böwering, 2001). The main lines about this verse in traditional Muslim exegesis of the Qur'an, noted by Al Tabari, describe God as the light of the heavens and the earth in three ways. First as a guide for the inhabitants of heaven and earth, second as the world's ruler who adorns the cosmos with light by day and night, and third as the one who illuminates the hearts of believers (ibid). After comparing the believer's heart to a lamp lit with good oil shining in a clear glass, the next verse 36 goes on to mention where it belongs, which is in the mosques, Allah's most beloved places on earth. According to Ibn-Kathir, these are God's houses where He is worshiped, remembered, and glorified in the mornings and evenings (Ibn-Kathir, no date). The verses' association with the knowledge of God and their relation to mosques has made them a common verse inscribed in mosques' architectural elements, including the *mihrab* which, according to R. Hillenbrand, has been repeatedly listed in relation to several historical mosques (Hillenbrand, 1989).

Concluding Remarks

Understanding Quranic epigraphy of mosque architecture, through the case of Cambridge Central Mosque, has given noteworthy insights into a number of issues related to mosque architecture, its perception, role and context. It re-opens discussions about the nature of Islamic art and architecture, and their relation in contemporary mosques. It also highlights one of the most prominent features of Islamic art, i.e., universality, and its relevant perceptions which have helped shape Cambridge Central Mosque. Through the above study, the following can be noted:

Understanding the deliberate choices of the verses and their physical characteristics in relation to the mosque's architecture and the urban context of the mosque has revealed some deep connotations and further insights for the meanings of Quranic epigraphy and mosque architecture as a whole.

Examining the verses selected for Cambridge Central Mosque and their Quranic commentaries has identified additional relationships between the Qur'an and the mosque's architecture and its architectural elements. It provides evidence that there are endless perceptions that are able to regenerate meanings and forms of Islamic art and architecture in contemporary and future contexts.

Although it has been emphasized that the Cambridge Central Mosque design presents a 21st century "British" mosque, the mosque committee couldn't exclude the idea of incorporating Quranic epigraphy, even if it was included at a late stage of the design process. In fact, incorporating

5 This matches the Hadith of the prophet about benevolence in Islam, where benevolence is described as: "worshipping God as if you see Him, and if you do not see Him, then He will see you" (Ibn-Ashur, 1984).

only Quranic epigraphy (Arabic calligraphy) has seemed to be the way to include everyone and avoid giving a sense of exclusion to any group. It is a universal Islamic identity that continues to appear in mosques over long centuries and geographical distances.

The role of Quranic epigraphy in mosque architecture isn't merely decorative. Quranic epigraphy also has a communicative, contemplative, and complementary role in mosque architecture, especially in a Non-Muslim majority context, where the role of the mosque also includes the construction of Muslim identity.

The process of choosing Quranic epigraphy involves a number of factors and parties which affect the design decisions on different levels. The interviews have revealed the institutions (shown in the map below) which have affected the decisions made regarding Quranic epigraphy in Cambridge Central Mosque. It also showed some of the interrelationships between these institutes related to the design and choice of Quranic epigraphy. Further interviews are needed to reveal the level of authority and power of each institution (including their perceptions of Islamic art and architecture) and how they shape the choices and production of Quranic epigraphy specifically, and mosque architecture as a whole.

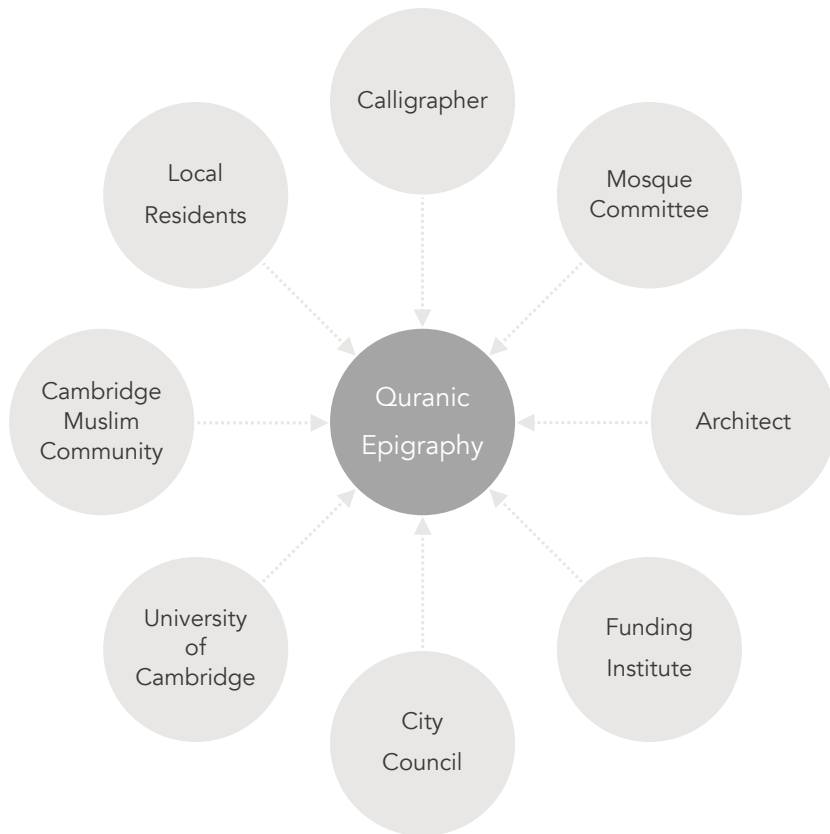


Figure 8.
Institutional map. By the author

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A HISTORY OF THE BOSNIAN MINARET(S)



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I. Introduction: mosque architecture, minaret, and Bosnia and Herzegovina

(I.1) Generalities on the minaret

Over the centuries, the minaret has become a highly – if not the most – recognizable feature of mosques all around the world. It alone has come to embody the presence of a mosque – and therefore, of Islam and Muslims – in any given location and socio-spatial context, both visually and symbolically. This widespread religious, architectural, and semiotic consensus is counterbalanced by many controversies and debates surrounding the origins, the purpose, and the symbolism of the minaret through time and space, maybe like no other mosque component.

One must remind that the minaret, from the very first decades of Islamic architecture, has been far from being a mandatory feature for the mosque (Golvin, 1970, pp. 47 & 49) as it was neither born out of architectonic requirements (such as the pillar or the arch) nor liturgical reasons (such as the minbar) (Hillenbrand, 1985, p. 40), but rather out of practical and ritual considerations, namely establishing an adequate structure to perform the call to prayer, the *adhān* (Bos. *ezan*) (Kuban, 1974, p. 3; Ardalan, 1980, p. 21). Nonetheless, various other platforms were used – and still are – to perform the call to prayer (notably rooftops or staircase minarets) (Kuban in Frishman & Khan, 1997, p. 78) before the introduction of the minaret.

This commonly accepted quintessence of the minaret, as well as its fragile sacred consistency, is perfectly summarized by Martin Frishman: “The minaret, if separated from the mosque and thus divorced from its accepted function as the place from which the call to prayer is made, becomes simply another tower.” (Frishman in Frishman & Khan, 1997, p. 32).

Per contra, this practical nature of the minaret has also been interestingly and extensively questioned by Jonathan Bloom in his excellent study (Bloom, 2018, notably pp. XVII & XIX), whose main thesis is that the visual and spatial (Islamic) symbolism, that has become progressively connected to the minaret, was, in fact, intrinsically and purposely attached to it from the very beginnings of its implementation, rather than function.

The optional nature of the minaret has been – and still is – largely acknowledged by the fact that many mosques do not possess any, and, nonetheless, are considered full-fledged Islamic places of worship. Indeed, the minaret has been far from systematic in many parts of the Islamic world (notably Western, North and Eastern Africa, the Indian and Arabic Peninsulas, Southeast Asia, China), and some regions have been or still are reluctant to adopt it, while others have begun to do so only recently (notably Arabia, Southeast Asia, China, or Eastern Africa) (Petersen, 1996, pp. 188-190; Ardalan, 1980, pp. 23-36; Bloom, 2018, pp. 8, 324-325 & 336-338; Horton in Frishman & Khan, 1997, p. 197).

Moreover, sources tell us that many early mosques did not have a minaret – among them is the prototypical Mosque of the Prophet in Medina (622/623) (Johns in Johns, 1999, p. 88), reconstructed (for the third time) with minarets in the first decade of the 700s (Johns in Johns, 1999, p. 59; Redžić, 1983, pp. 60-61). The minaret was (only) introduced under the Umayyads (Bloom, 2018, p. 8), while it became (progressively) widespread and recognized as such under the (late) Abbasids, from the 9th century onwards, although, once again, not generalized (Bloom, 2018, page 71; Petersen, 1996, p. 187). Furthermore, scholars tend to disagree on the date of construction of the first minaret, especially given the fact that many of the early minarets and mosques have since disappeared. Hence, Kuban and others give 673, marking the reconstruction of the Amr mosque in Fustat (Egypt), with four minarets (Kuban in Frishman & Khan, 1997, p. 89); on the other hand, while acknowledging the elaboration and presence of earlier experimental mosque “towers,” Bloom

gives the turn of the 8th to 9th century as the period which saw the emergence of the first minarets in their mature liturgical understanding and form (Bloom, 2018, pp. XVII & 72-73). Still, as of 2021, it is believed that the oldest minaret still standing is the one of the Great Mosque of Kairouan (Tunisia), dating from 836 (Kuban in Frishman & Khan, 1997, p. 96; Petersen, 1996, p. 188).

Lastly, neither the location nor the number of (the) minaret(s) became immediately canonized (Kuban, 1974, page 7) – provided that it has ever been the case (Hillenbrand, 1985, pp. 41-42) – as witnessed, for instance, with several early 9th-century minarets which were placed in the wall facing the mihrab (Petersen, 1996, pp. 187-188 ; Bloom, 2018, pp. 18 & 73) or Fez Umayyad minarets that were randomly placed in the mosque compound (Bloom, 2018, pp. 151 & 153).

As different regional and local styles of mosques began to emerge all around the world, a parallel phenomenon took place for the minaret, to which was progressively added decorative details and (in some instances) scriptures, and granted aesthetic values, as a vertical structural element proportionately counter-balancing the weight of the building and its dome (when provided with one), as well as spatially complementing it (Kuban, 1997, p. 231; Saniei, 2012, p. 138

Bosnia and Herzegovina, as I shall show in the present article, perfectly illustrates the fascinating multiple semantics and tortuous architectural and stylistic history of the minaret.

(1.2) Emergence and spreading of the minaret in Bosnia and Herzegovina

Islamic culture and architecture emerged and spread in Bosnia and Herzegovina throughout the Ottoman conquest and occupation, which began at the end of the 14th century with sporadic raids, culminated in the fall of Bosnia (understood here as the regional entity) in 1463, and its Herzegovinian counterpart in 1482, and can be considered achieved at the end of the 16th century with the fall of Bihać (1592), in the far-northwestern part of the country. The concomitant progressive Islamization of a large part of the population was naturally accompanied by the construction of mosques, as early as the 1440s-1450s. In this context of a rather “late” introduction of Islamic mosque architecture in the region – as put in perspective with the wider scope of Islamic history and civilization – the minaret thus emerged in Bosnia and Herzegovina while carrying almost eight centuries of history and successive developments. Indeed, the Bosnian minaret was from its inception modeled on the well-established and mature pencil-shaped and conical-roofed Ottoman stone standard, although a local typical wooden form of minaret became largely predominant. In the subsequent decades and centuries, mosques with minarets have been built in Bosnia and Herzegovina alongside mosques without minarets, and thus without interruption or variation in frequency until now.

Unfortunately, as only an offshoot of the prestigious Ottoman model, the Bosnian minaret – and the same goes for Bosnian mosques – has been very rarely studied by non-Bosnian scholars or in collective books dealing with Islamic or mosque architecture in general. Indeed, the latter have focused almost exclusively, when addressing the features of the Ottoman mosque, on Anatolian and Thracian examples. Although less monumental than their Turkish counterparts, Bosnian minarets have nonetheless acquired specific features and shapes, that make them highly worthy of study, preservation, and promotion, as they combine Ottoman idioms and standards with local materials, skills,

techniques and patterns, born out of climatic conditions, vernacular building traditions, and pragmatism.

In Bosnia and Herzegovina, mosques have been divided, from the very first steps of the introduction of Islam and Islamic architecture in the region, between two main categories: džamije (Bos. sg. džamija) and mesdžidi (Bos. sg. mesdžid). And indeed, in the region, the minaret has generally been the core and symbolic (exterior) element distinguishing visually and functionally a džamija from a mesdžid, whereas liturgically speaking, the presence/absence of a minbar (chair for the khutba), is the main feature differentiating one from the other.

Accordingly, a džamija is a central mosque, where the daily and Friday prayers are performed, and thus provided, externally, with a minaret for the call to prayer, and, internally, with a minbar. The mesdžid is usually smaller, deprived of a minaret and a minbar, and used only for the daily prayers. This denomination has been the norm in Bosnia and Herzegovina (Čaušević Dž., 1935, pp. 17-18).

Addressing the semantical subtleties of the word mesdžid is beyond the scope of this study. However, for the sake of clarity, let me mention that several mosques, although being architecturally categorized as mesdžidi – that is, without a minaret – are sometimes designated as džamije. Such examples can be found, for instance, in Foča, where five (now disappeared) mosques, while all possessing a minaret, are both designed as džamije or mesdžidi, depending on the sources (indeed, Faruk Muftić uses alternatively džamija and mesdžid in the same source for the Hadži Seferov(a) (1588), Hamza-begov(a) (1470/1471), Hadži Mustafin(a)/Pilavski/a (16th century) and Šejh Pirijin(a)/Tabački/a (before 1664) mosques, Muftić, 2014, pp. 78-79, 85 & 93). Last but not least, the traditional (Arabic) semantic use of the word mesdžid (Arabic, a place of prostration) (Ayyad, 2019, pp. 298-299; Johns in Johns, 1999, page 89; Hillenbrand, 1985, p. 35; Rizvi, 2015, p. 10) is also employed (orally) to designate any Muslim place of worship, whether it is (architecturally) a džamija or a mesdžid. Eventually, it can become even more puzzling when it comes to addressing the sources in Bosnian, as the word « džamija » is often used indifferently to designate any mosque, in the general sense of the term (as in the sense it has in the English “mosque”).

In Bosnia and Herzegovina, as regards to the usual repartition of džamije and mesdžidi, the most frequent patterns have been the following:

- *in cities* → one or several central and monumental džamije (depending on the size and population of the town), alongside several smaller džamije and mesdžidi in the various neighborhoods (Bos. pl. mahale, sg. mahala)
- *in villages/rural communities* → one central džamija in the main village, several mesdžidi in the remaining hamlets

II. The minaret in Bosnia and Herzegovina: characteristics, types, specificities

(II.1) General features and composition

Materials

In the case of Bosnia and Herzegovina, the availability of materials and the climate have both played a major role in regionally shaping the minaret – as well as, naturally, the mosque building and roofing system. As wood was by far, already in the 15th century, the most readily available material in the region, it

is not surprising that it became the main one employed for minarets. The other one, as we shall see below, was stone.

The only known – and most likely ever compiled – national and highly detailed census of mosques in Bosnia and Herzegovina dates from 1933, as published in the official journal (*Glasnik*) of the Islamic authorities of the then Kingdom of Yugoslavia (reproduced in Bećirbegović, 1999, pp. 20-22). Not only does it list the exact numbers of mosques per administrative circumscription (*srez*) but it also informs us – among other things – of the presence or absence of a minaret, and of the materials in which these were built (either stone or wood). Thus, out of 1,120 mosques present at the time in Bosnia and Herzegovina, 786 (roughly 70%) had wooden minarets – out of which 770 in Bosnia and 16 in Herzegovina – and only 259 had stone minarets, while the remaining 75 did not have any. Although they are not mentioned as such, the latter can thus be considered – at least for the vast majority – as *mesdžidi*.

The table of 1933 clearly shows the predominance of wood as a building material for minarets in regions such as Krajina, central Bosnia, Sarajevo, eastern, and northeastern Bosnia, while stone was used four times more than wood in the southern region of Herzegovina. Nonetheless, the use of stone was also widespread in the above-mentioned other regions.

These figures, although accurate as of 1933, would obviously be different if the census would be made in 2021. Almost a century later, one just has to take a field trip to any Bosnian region or city to notice that mosques with wooden minarets are rather scarce, as various materials have been progressively supplanting timber as a building material – both for mosques and minarets – since the Austro-Hungarian period (and the introduction of brick) and the Yugoslav Socialist era (and the advent of concrete). Furthermore, destructive wars and repeated natural or accidental disasters seem to have got the better of the wooden minarets, as local Muslim communities (Bos. *džemati*, sg. *džemat*) tended more and more to (re)construct the minarets of their mosques with hard-built materials, more resistant, and easier to assemble.

Basic components

The vast majority of Bosnian minarets, wooden and stone alike, are constituted of five basic structural, functional, and stylistic components, in which size, form, and design can vary according to the materials that are being used and, naturally, to the corresponding palette of available aesthetics. These can be found in all of the various categories of Bosnian minarets presented below in II.2 (types A to D), as well as in the particular cases of II.3 (types E to J), although with slight differences and variations (notably the absence of one or more of the five basic components).

Hence, from the bottom to the top, we can find:

- 1- The base (Bos. *ćup*), that can be cylindrical, square, or octagonal.
- 2- The core shaft (Bos. *kaca*), either cylindrical, octagonal, or, more rarely, square, which links the *ćup* to the top of the minaret. It contains spiral interior stairs (Bos. *stepenice*), that contribute to the stability and strength of the structure (Lewcock in Mitchell, 1987, p. 143; Čaušević A. et al., 2019, p. 3), and is often pierced with thin elongated loopholes (Bos. pl. *mazgali/mazgale*, sg. *mazgal/mazgala*) that let the sunlight filter inside (Sokolović, 1973, p. 404).
- 3- The *šerefef*/*šerefef*/*šerefef* (Bos. pl. *šerefeta/šerefef/šerefeta*) is the balcony from which the muezzin calls the faithful to prayer (Bejtić, 1952, page 245).



Figure 1 :

Minaret of the Ibrahim-age Šarića mosque (Mostar, central Herzegovina) and its different components.

Its base (Bos. *čanak*) is sometimes decorated with *muqarnas* or stalactites, as well as various patterns. The balcony itself is usually surrounded with multiple rows of light bulbs (Bos. pl. *kandilji*, sg. *kandilj*), that are lit for evening calls to prayers, during the month of Ramadan or religious feasts (Sokolović, 1973, pp. 404-405; Udovičić, 1973, pp. 105-106).

4- The roof (Bos. *krov*) of the minaret may be conical, pyramidal, flattened, or – rarely – bulbous. It is usually covered with sheets (Bos. pl. *limovi/plahte*, sg. *lim/plahta*) of lead (Bos. *olovo*) or copper (Bos. *bakar*) (Zuhrić, 1931, pp. 330-331; Bejtić, 1952, p. 245), and, more rarely, with slate (Kiel, 2011, page 75).

5- The finial, composed of three (or more) little copper balls (hence their Bosnian name as *jabuke*, sg. *jabuka*, “apple”) and the *alem*, also in copper, which is either a calligraphed flame which writes “Allah”, or, otherwise, a crescent and star.

Placement

In Bosnia and Herzegovina, the qibla indicating Mecca is facing south-east. Accordingly, and in compliance with Ottoman standards (Hillenbrand, 1994, p. 164), the vast majority of Bosnian minarets – both freestanding and emerging from the roof – are placed on the north-west side of the building, which is at the right of the entrance.

One noticeable exception in terms of placement is the minaret of the *Čekrekčijina* (1526) in Sarajevo, which is the sole domed mosque in Bosnia and Herzegovina which has its minaret inserted on the side of the building, instead of being freestanding, thus affecting the layout of the mosque windows (Kreševljaković, 1938, p. 20).

Furthermore, a few minarets are located on the north-east corner that is at the left entrance. Such examples include the minarets of the *Hadži Idrizova* (1931) in the Hrasno district of Sarajevo, the *Sviračka* (18th century) of Gradačac, or the now disappeared *Kadi Osman-efendija/Šehova* (1593/1594) of Foča. For the most part, architectonic and practical reasons have motivated such a placement:

- Bad terrain, as in the cases of the *Repovačka* of Konjic (Begtašević & Kassalo, 2003, p. 32), and the *Ćamilija* of Travnik (1757, reconstructed in 1816 as the *Sulejmanija/Šarena*; on that occasion, the minaret was kept on the left) (Buljina, 1984, pp. 309-310).

- Acoustic considerations, as in the case of the *Čejvan čehajina/Čejvan Kethoda* of Mostar (1552/1553), so that the voice of the muezzin could better reach the city center (Bos. *čaršija*) (Hasandedić, 1986a, p. 396).

Scripture

Contrary to other regions (notably Iran, Afghanistan, or Egypt, Bloom, 2018, pp. 236 & 260), where calligraphy is highly praised as an ornamental feature adorning minarets, the script is quite rare on Bosnian ones, and when it is found, it certainly bears neither a decorative nor a scriptural function and feature, but rather an informative one.

The *Fethija* of Bihać emerged as a mosque after the conversion of the Church *Svetog Ante Padovanskog*, right after the conquest of Bihać in 1592 (see above). The church steeple was at first kept, and, eventually, only after it was destroyed was it later replaced by a "proper" minaret. On that occasion, two inscriptions (Bos. pl. *natpisi* sg. *natpis*) in Turkish, bearing the date 1863/1864, were carved in the *čup* of the minaret (Lopašić, 1890, pp. 33-34). In Zenica, another case is the minaret of the *Sejmenska* mosque (16th century), where a curious inscription (now disappeared) mentioned the renovation of another mosque of the town, namely the central *Sultan Ahmedova/Čaršijska* (1506) (Aslani, 2015, citing Mehmed Mujezinović, p. 37). On the minaret of the mosque of Lizoperci (municipality of – hereafter "m." – Prozor), which was reconstructed in 1961, an inscription (later removed and placed above the door entrance) indicated 1530 as the possible date of original construction (Hasandedić, 1988, pp. 201-202).



Figure 2 : Minaret of the Čekrekčijina mosque (Sarajevo), with the base of its *kaca* nested within the cupola.

(II.2) Typology proposal and presentation

The two main types of minarets initially found in Bosnia and Herzegovina are rather clearly defined, as previously shown, according to the materials employed to build them, that have conditioned, in the vast majority of cases, their shape:

- the wooden minarets
- the stone minarets

Indeed, these two types of minarets have been used by many Bosnian scholars and architects (Bećirbegović, 1999, pp. 8-9 & 18-19; Hudović, 2010, p. 282; Akšamija, 2010, p. 321) as one of the two key elements (alongside the roofing system, namely either a quadrangular tiled-roof or a dome) that define more broadly the three various types of mosques constructed in the region. These three main categories could be summarized as follows:

- domed mosques with a stone minaret
- mosques with a quadrangular tiled-roof and a wooden minaret



Figure 3 :

Limestone minaret of the Lučevica mosque (Sarajevo).



Figure 4 :

Greenish minaret of the Musa-pašina mosque of Nova Kasaba (m. Vlasenica, Eastern Bosnia). The rest of the building and the graves in the vicinity are made of the same andesite green tuf stone.

- mosques with a quadrangular tiled-roof and a stone minaret

Eventually – putting aside the roofing system and the mosque categorization – these two main types of minarets can be further divided into four sub-groups, although, of course, variations and exceptions are far from excluded, as I shall illustrate later with several “atypical” types of minarets (II.3). Hence, combining material and shape, as well as taking into account spatial and regional repartition, here is the typology I propose for the Bosnian minarets:

A→ the stone minaret

B→ the combined stone-plaster minaret

C→ the wooden minaret

D→ the concrete minaret

(II.2A) The stone minaret

Stone minarets are composed of apparent cut stones or blocks that constitute the main cylindrical shaft of the structure. These minarets are characterized by the use of dimension stone (Bos. *tesani kamen*) and are framed according to the typical form of “pencil-shaped” Ottoman models, capped by a conical slender roof. They can be found in mahala mosques, in their medium variant, as well as in imperial mosques (commissioned by sultans), or those sponsored by high-ranking notables, in their most accomplished and majestic form. It is most likely that the higher was the status of the founder, the better was the quality of the stone used (thus more expensive).

Stone minarets can be further divided into two sub-types:

- Those built in the common dimension stone called *sedra*, a solid and porous limestone (Bos. *krečnjak*) typical of karstic regions such as Bosnia and Herzegovina (Galić & Prskalo, 2013, p. 93) that gives these minarets an apparent rough and artisanal but beautifully cut surface. Elegant examples can be found notably in Sarajevo with the minarets of the *Čobanija* (before 1562, Skenderija district), *Ferhadija* and *Baščaršijska* (respectively 1562 and 1528, both in the Baščaršija district), or the *Lučevica* (before 1560, Medrese district) mosques.

- Finely cut dimension stones are used all over the country, and, as opposed to *sedra*, visually reflect smooth and pure surfaces. Regional variants have been used locally, such as the *bihacit* in the Bihać region (Mahmutović, 2008, p. 323), used for instance for the minaret of the Fethija mosque of Bihać. Its southern equivalents are the beige *tenelija* and *miljevina* limestones (sometimes assimilated as two variants of the same type), typical of Herzegovina, as illustrated in the beautiful minarets of the Hadži Alijina mosque (1563) of Počitelj (m. Čapljina), of several mosques of Mostar such as the Koski Mehmed-pašina (1617) (Nametak A., 1939b, p. 8), and, further east, of the famous Turhan Emin-begova mosque of Ustikolina (m. Foča-Ustikolina) (Zuhrić, 1931, p. 330), believed to be the oldest mosque constructed in Bosnia and Herzegovina (ca. 1448), before its destruction in 1992. These slender minarets

have their lower and thicker counterparts in Eastern Herzegovina and the southwestern Tropolje regions, with the light greyish minarets of the Osman-

pašina (1726) and Sultan Ahmedova (1719) mosques of Trebinje and Mehmed-spahije Zvizdića (18th century) of Gacko (in Eastern Herzegovina) and several minarets of Livno (in the Tropolje). The shape of these minarets is explained by local climatic conditions, characterized by violent winds (Orman, 1999, p. 12; Buljina, 1985, p. 415). As a matter of fact, many Herzegovinian mosques also have – or rather had – an extended roof covering the entrance hall (Bos. *trijem*), to protect it from harsh winds. Finally, one splendid and unique local example is the minaret of the Musa-pašina (1643) of Nova Kasaba (m. Vlasenica), built with andesite green tuf (Bos. *pršnac/tuf*).

Dimension stones are renowned for the ease with which they can be carved and decorated (Čaušević A. et al., 2019, pp. 5-6; Nametak A., 1939b, p. 8), either:

- at the base of the *šerefe*, with stalactites and *muqarnas* (marvelous examples are found in the Careva (1565) of Sarajevo and the Ferhadija (1579) of Banja Luka)

- on the *šerefe* itself, with various motives carved inside or on the surface of the balcony (the *šerefe* of the Sultan Ahmedova of Zenica is a magnificent example, with unique floral and geometric patterns) (Aslani, 2015, pp. 27-28)

- on the *thečup* (such as in the Sultan Selimova/Careva (1519) of Stolac or the Hadži Alijina of Počitelj) (Jalimam & Mičijević, 2005, pp. 178-179)

(II.2B) The combined stone-plaster minaret

These minarets are almost identical in shape to the dimension stone minarets, although generally of lesser dimensions. The main difference is that they are plastered, thus hiding the stone blocks.

Besides its protective role, this plaster layer offers the possibility of painting motives on the surface of the minaret (although these can sometimes be found on non-plastered stone minarets). The main occurrences are colored diamond-shaped rafters painted and/or carved, under the base of the *šerefe*, on each face of the octagonal shaft, and pointing towards the bottom, sometimes responding to similar rafters placed at the bottom of the *kaca*, this time pointing towards the top. Other possible motives include stars, crescents, semicircles, and other geometric shapes.

(II.2C) The wooden minaret

In her extensive and fascinating study on Bosnian wooden minarets, Madžida Bećirbegović showed the variety and scope of skills and techniques elaborated by Bosnian carpenters and craftsmen, whose knowledge and expertise in the use of timber as a traditional and common building material in the region gave birth to a local category of minaret that became typical of Bosnia and Herzegovina.

Wooden minarets are generally built out of various types of vertical boards (Bos. pl. *daščice*, *tarabe*) or slats (Bos. pl. *letvice*, *šašavci*), joined to each other through various traditional systems of assembly (Jahić, 2019, p. 10).

As opposed to all the other types of Bosnian minarets, the vast majority of the



Figure 5 :

Minaret of the Hadži Alijina mosque (Počitelj, m. Čapljina, western Herzegovina), made of beautiful, cut dimension stone.

wooden ones are directly integrated into the roofing system, either emerging from the ceiling (Bos. *potkrovlje*) (Čaušević A. et al., 2019, p. 3) or the *mahfil* (upstairs prayer gallery adjacent to the entrance wall), from which the muezzin has access to the minaret. Wooden minarets are rarely built alongside the building, as a freestanding structure, although a few exceptions do exist (Bećirbegović, 1999, pp. 132 & 134). As for types A and B, they can be adorned as well, with carved motives.

Visually and architecturally speaking, the various types of wooden minarets are mostly distinguished by the shape of their *šerefe*, which is in fact an enclosed balcony directly connected to the roofing of the minaret, thus forming a niche (Bos. *galerija*) at the top of the shaft. These niches are either slightly or much larger than the *kaca*, and sometimes even of the same width, thus appearing, respectively, either as a nest perched at the top of the minaret, as a pinnacle capping the structure, or as a prolongation of the *kaca* only differentiated from it by the openings of the balcony.

Further, the various types of openings are used to differentiate various sub-types of wooden minarets (Bećirbegović, 1999, pp. 126, 175-176 & 179-180):

- either narrow, in the Krajina region, with the so-called "hidden" or "blind" minarets (Bos. pl. *pokrivene/slijepo munare*)
- medium, notably in northeastern Bosnia
- or wide, as in Sarajevo and central Bosnia.

Finally, roofs of wooden minarets can be distinguished by their shape:

- some look like a kind of "witch hat"
- others are flattened and surmounted by a slender cylinder or needle
- and even more are capped by a conical pyramidal roof

All three types are surmounted by the *jabuke* and the *alem*.

(II.2D) The concrete minaret Concrete emerged as a major building material in Bosnia and Herzegovina, both for mosques and minarets, during the second half of the 20th century. Already common before the war of 1992-1995, it became widespread since, as a solid and affordable material that does not require much work and time, thus making it ideal – especially for war-shattered and -impoverished local Muslim communities – as the process of reconstruction of hundreds of mosques and minarets destroyed or heavily damaged during



Figures 6-8 :

Several examples of wooden minarets. From left to right : Zavra mosque (Livno, southwestern Bosnia), Mimar Sinanova-Golobrdica and Hadži Sejidin Huremuša mosques (both in Sarajevo).

the war was beginning to unfold from 1996 onwards, and as the necessity of (re)building places of worship was becoming crucial.

Local builders and firms have been specializing in the construction of prefabricated blocks or ready-made minarets (Akšamija, 2011, pp. 77-78 & 171), thus at the same time perpetuating the tradition of minaret craftsmanship, but also altering and depreciating it, as these concrete minarets require much less work and technique than their stone or wooden counterparts.

Concrete minarets have been by far the ones in which most “modernist” experimentations have been made, arousing either reprobation or emulation, but most certainly dramatically changing the urban and rural landscapes and blurring the traditional mosque architectural codes (see III.2).



Figures 9-10 :

Two examples of concrete minarets (notice the patterns on the kaca). Left : Rakovčani mosque (m. Prijedor, northwestern Bosnia). Right : Donja mosque of Ahmići (m. Vitez, central Bosnia). Both mosques and minarets had been destroyed during the war of 1992-1995.

As far as concrete minarets are concerned, we can visually distinguish several shapes and styles that have been spreading, especially since the end of the war, but the predominant one seems to be what I would call the “checkered-and-ribbed” minaret. Such minarets have a shaft that is either adorned with long vertical ribs or with a chessboard layer, depending on the display of the concrete blocks, and sometimes both patterns are even combined on a single minaret.

(II.3) Exceptions

(II.3E) The campanile minaret

The campanile minarets (Bos. pl. četvrtaste munare) are probably the most famous unusual local form of minaret that can be found in Bosnia and Herzegovina. As shown by Machiel Kiel, these minarets were localized in a rather restricted perimeter of Herzegovina, in the municipalities of Mostar,

Konjic, Stolac, Bileća, Nevesinje, and Gacko (Kiel, 2011, p. 64). Other authors mention a few more, namely in the town of Stolac itself, Vitina (m. Ljubuški) and Opličići (m. Čapljina) (Hasandedić, 1971, p. 274; Hasandedić, 1976, pp. 18-19; Hasandedić, 1986a, pp. 395-396; Nametak A., 1978, p. 393; Čelić, 1991, p. 354).

Their shape is obviously deriving from Christian architectural influences, brought about by Dalmatian craftsmen, who knew how to work stone and only construct square church steeples. Square and of reasonable height, these minarets were usually built out of ashlar blocks of local stone and capped by a pyramidal roof covered with slates (Kiel, 2011, pp. 70, 72 & 75).

Out of the fourteen such minarets recenssed by Kiel, only three are still standing, and were reconstructed after their destruction in the late war, namely in Dabrica (m. Stolac), Kruševljani and Donja Bijenja (m. Nevesinje), while the remaining eleven have either stayed in ruins (since 1992 or earlier destructions) or been replaced by cylindrical minarets. Besides the fourteen minarets mentioned, others have simply disappeared.

(II.3F) The wooden minaret in form of a stone minaret

In the Krajina region, a traditional stronghold of wooden minarets, a specific form of minaret has emerged, probably during the 19th century, for a number of



Figure 11 :

Wooden minaret shaped as a stone minaret (Čaršijska mosque, Prijedor, northwestern Bosnia).

mosques, which could be basically defined as a wooden replica of the pencil-shaped stone or stone-plaster minaret (Bećirbegović, 1999, pp. 127-129, 131 & 181). Interestingly enough, these minarets are a true combination of both stone and wooden minarets features, as they borrow the form and the opened šerefe but not the placement of the former, since they are usually (but not all) emerging from the roof, which is typical of the latter, to which they also borrow, obviously, the material, but not the enclosed šerefe. These minarets are usually very thin, appearing as projecting wooden needles, as in the exquisite example still found in the Čaršijska mosque (1750s) of Prijedor.

(II.3EG) The brick minaret

Brick (Bos. *cigla*) spread in Bosnia and Herzegovina as a building material during the Austro-Hungarian period, when it became locally produced. Although not as common as wood and stone, it can be found in several minarets. A representative example is the town of Bijeljina, in northeastern Bosnia and Herzegovina, where the Austro-Hungarian influence in terms of brick construction is obvious for four of the then five mosques of the town (a sixth one has been built since) – the

Sultan Sulejmanova/Atik (16th century), the *Krpić Ahmed-age* (18th century), the *Mehmed Salih Vedžih paše* (1839/1840) and the *Ahmed-bega Salihbegovića* (1875/1876) – which wooden minarets were all reconstructed in brick between 1893 and WWI (Grapčanović, 1983, pp. 716-719).

(II.3H) The “hybrid” minaret

Some minarets could be labeled as “hybrid”, as they combine two materials. Indeed, before its reconstruction in brick in 1893, the minaret of the *Sultan Sulejmanova/Atik* of Bijeljina had a *ćup* in stone and a *kaca* in wood (Gračanović, 1983, pp. 716-717). Another case of “hybrid” minaret is found with the *Donjomahalska* mosque in Seonica (m. Konjic) (1662/1663), whose minaret illustrates an interesting material path: originally in wood, it was changed in 1936 (when the mosque was reconstructed) for a “hybrid” minaret in stone and concrete, and finally replaced in 1965 with a stone one (Hasandedić, 1987a, p. 218). Another example is the “hybrid” minaret of the (now disappeared) *Hadži Osmanova/Čečova* of Foča (1613), whose *ćup* and *kaca* were made out of stone, while the *šeref*e and the top of the minaret were in wood (Muftić, 2014, p. 84).

(II.3I) The munarica

A few Bosnian mosques used to have little independent stone minarets (Bos. pl. *munarice*, sg. *munarica*), notably in Mostar, where these were found in four *mesdžidi* (*Kanberagin* (before 1633), *Baježid hodžin* (unknown date), *Hadži Velijin* (unknown date) and *Husein Kotle* (before 1765) – only the latter still exists). These were built a few meters away from the mosque building, and were meant to shelter the muezzin from the wind and the rain (Hasandedić, 1972a, p. 27; Nametak H., 1937, p. 271; Nametak H., 1941, pp. 117-118), and could be interpreted as a local reminiscence and variant of the early Islamic small “staircase minarets” (although these were usually placed on mosque roofs) (Bloom, 2018, pp. 23 & 35).

Another rather unique example is found in Banja Luka, where the same type of munarica, in stone, opened on four sides and capped by a conical roof, was built in complement of the classical pencil-shaped minaret of the Arnaudija mosque (1595). It had the special

purpose of sheltering the muezzin when he performed the call for the Maghrib late afternoon/early evening prayer (Bos. *akšam namaz*), hence its name as *akšam taš/akšamluk* (platform for the *akšam* call to prayer) (Sokolović, 1973, pp. 404 & 406).

These munarice resemble in size and shape to another one found in the Starica mosque of Ključ (m. Gacko) (1560), which is not standing as an independent structure, but, instead, is placed on a stone *ćup*, integrated in the right entrance corner of the mosque building.

(II.3J) Individual exceptions

Besides the above-mentioned collective exceptions, a few unusual and unique minarets also deserve to be mentioned. I will only address three cases.



Figure 12 :
Reconstructed munarica standing in front of the Arnaudija mosque of Banja Luka (northwestern Bosnia).



Figure 13 :

Figure 13 : Neo-moorish minaret of the Behram-begova mosque of Tuzla (northeastern Bosnia).

- The first one is the Neo-Moorish minaret of the *Behram-begova* mosque in Tuzla (originally built ca. 1553, reconstructed in the present form in 1888), highly reminiscent of some Cairene minarets, to which it borrows the square base and cylindrical shaft, as well as the specific finial in the form of a censer called *mabkhāra* (Creswell, 1926, p. 257).

- The minaret of the *Šerefuddin* mosque in Visoko is also an interesting case, as the whole mosque was conceived as the first modernist experimentation in terms of mosque architecture in Bosnia and Herzegovina, when it was reconstructed by Zlatko Ugljen in 1969-1980 (Durajlić, 2012, pp. 19-20). Its minaret is in concrete, has a cylindrical shape, and is adorned at the top with an interlaced green pipe shaped as abstract calligraphy (Rizvi, 2015, p. 209; Holod & Khan, 1997, pp. 196-197).

- Finally, a very unusual minaret is the one of the mosque of Umoljani (17th century, m. Trnovo), which has a low square *ćup* and a tapering *kaca* without any *šerefe* (with only a small opening at the top), both in stone, and the usual conical roofing and *alem*. I came across its Eastern African equivalent,

in terms of shape, in a mosque in Shela on Lamu Island (Kenya) (Horton in Frishman & Khan, 1997, p. 203).

III. The minaret in Bosnia and Herzegovina : historical path, novelties, symbolics

(III.1) A troubled path

Minarets remain very fragile structures (Lory, 2015, p. 85) and, as such, and perhaps more than wars, they have been endangered by the pangs of time, the harsh Bosnian climate as well as the vagaries of the Balkan terrain. Fire and lightning have obviously been major threats, especially for wooden minarets, and numerous accidental or war-related fires have punctuated the Ottoman and Austro-Hungarian urban Bosnian lives, not only burning mosques and minarets, but many other buildings, often built in timber before the 20th century (houses, shops, etc.). As discussed earlier, stormwinds have also represented a danger for Bosnian minarets and mosques alike. In some instances, one custom was to plant big trees next to minarets to protect them from the wind, such as lindens (Bos. pl. *lipe*, sg. *lipa*) or cypresses (Bos. pl. *čempresi*, sg. *čempres*) (Suljkić, 1999, pp. 129-130, Hasandedić, 1972b, pp. 418-419), as in the case of the *Nesuh-aga Vučijakovića* mosque (before 1564) of Mostar, indeed nicknamed "*džamija pod lipom*" ("the mosque under the linden") (Nametak H., 1941, p. 68). One must remind that the region is also subjected to regular floods and earthquakes, which is obviously not optimal for tower-like structures such as minarets. All of these factors combined have certainly, in part, explained the growing tendency of (re)constructing minarets in harder and more solid materials such as stone or concrete.

Finally, time itself has been a main issue, as perishable materials such as wood need to be consolidated, renovated, or even replaced on a regular basis. Stone and plaster are also exposed to time and weather damages, subjected as they are to cracks and rifts resulting from successive architectural, atmospheric, and climatic pressures, hence the importance of quality dimension stone, as well as suitable cut and assembly techniques and junctures.

Besides these natural threats, human jeopardies have obviously contributed to further endanger Bosnian minarets through history. As the minaret has come, all around the world, to embody the presence of Islam and Muslims (see introduction), especially in a religiously-shared countryside like Bosnia and Herzegovina, where it also represents, in the eyes of some non-Muslim Bosnians, Ottoman (Muslim) "oppression" and "domination", it is sadly no surprise that they have been constantly targeted during wars, military raids, and insurrections.

This was evidently the case during the last war of 1992-1995, during which minarets in "conquered territories" were dynamited or burnt, sometimes in order to make them fall on the mosque building, thus destroying the all-structure at once (Riedlmayer, 2002, p. 11). In the besieged or frontline regions, minarets, as elevated towers, easily visible as they were, were subjected to shelling and gunfire on a regular basis. An interesting and noticeable pattern is the fact that many of the mosques spared by the aggressors were *džamije* under (re)construction or *mesdžidi* (Riedlmayer, 2002, pp. 9-10; Kaiser, 2002, p. 4), hence both lacking a minaret, and most likely not having been identified or perceived as a mosque by the aggressors (according to the data I collected, around a dozen such mosques are concerned).

(III.2) Modernization, novelties, fantasies

The most striking changes affecting minaret architecture are definitely those of the last decades. Indeed, the 20th century- and especially post-war Bosnia and Herzegovina has witnessed several new trends in the matter, that not only tend to go against traditional symbolic canons and customs but also greatly disturb proportional and aesthetic values of mosque architecture in the region. Moreover, in the specific Bosnian post-war landscape and society, it tends to confuse and blur even more the few benchmarks the Bosnian population still has as a whole, but also inside the Bosnian Muslim community itself, as discrepancies, polemics, and debates have regularly aroused as regards to the (re) construction of mosques and minarets, and the stylistic and architectural features that are being chosen.

The height is an evident and striking change in minaret architecture in Bosnia and Herzegovina, as perfectly illustrated with the case of the previously mentioned Turhan Emin-begova mosque of Ustikolina. Azra Akšamija perfectly showed how the height of the reconstructed minaret (which was doubled, to reach 60 meters) divided the local community, architects, heritage experts, and religious officials, in a highly sensitive context, as the town is situated on the IEBL (Inter-Entity Boundary Line) demarcating the Republika Srpska (RS) from



Figure 14 :
Reconstructed Turhan Emin-begova mosque and its 60 m-high minaret (Ustikolina, m. Foča, Eastern Bosnia).

the Federation of Bosnia and Herzegovina (FBiH) (Akšamija, 2010, pp. 327-332). Increasing the verticality of the minaret can also disrupt the proportion and harmony of the mosque as a whole, as its role as a balancing and articulating element thus tends to be lost (Čaušević et al., 2019, p. 2; Al-Asad in Frishman & Khan, 1997, p. 60).

The advent of the loudspeaker in Bosnia and Herzegovina – as well as in other countries – certainly has also had a big impact on the minarets, not only as a practical and liturgical structure but, obviously, visually and auditorily speaking (Grabar in Frishman & Khan, 1997, pp. 242 & 245). What becomes of the role of the minaret if the *adhān* is now pre-recorded and broadcast from a loudspeaker as a “stereo-*adhān*” (Akšamija, 2011, p. 244)? In that matter, one must remember the acoustic feature of the minaret, as a balance between height and space used to enable the voice of the muezzin to cover a determined area (i.e., the *mahala* in cities, the village in rural settings). If the loudspeaker comes into play, then, as the volume can be adjusted in advance and not according to the needs but to the will of the local Muslim *džemat*, this acoustic purpose becomes biased, as both the (sometimes increased) height of the minaret (Dickie in Mitchell, 1987, p. 34) and the loudspeaker(s) extend the perimeter covered by the voice of the muezzin. Furthermore, this can even contribute to making the *adhān* disturbing for some inhabitants (Hacic-Vlahovic, 2008, pp. 53-54), not to forget that from now on, various *adhāns* displayed in an urban context can overlap and cover between each other, thus disrupting the former melodious harmony of muezzins’ voices. Last but not least, the use of loudspeakers also poses the question of the muezzin function itself, which has been now tending to become obsolete, or only confined to *adhāns* performed for great Muslim events and holidays, or inside the mosque itself during the Friday prayers. It is still to be assessed, in Bosnia and Herzegovina as well as in *ummah*, the entire Muslim world, if this recent evolution would have a negative impact on the role and even the existence of the muezzin himself. It becomes even sadly ironic, when a press article praises the fact that the loudspeakers installed on the *Mišćina* mosque (before 1557) of Sarajevo can cover a (useless) span of ten kilometers, indeed for a mosque that was named after its talented muezzin Ibrahim Mišća, renowned for his beautiful and powerful voice (Collective, 1951, p. 161).

This loss of functionality certainly explains, in part, the multiplication of minarets and *šerefeta* found in many Bosnian mosques. As minarets now tend to become more and more liturgically discarded, their decorative and symbolic potentials are then emphasized, through the use of what could be labeled as “architectural transgressions”. Until the 20th century, Bosnian *džamije* all had one minaret, in accordance with the Ottoman precepts, which only allowed imperial mosques to have more than one (up to four or six in Istanbul) (Hillenbrand, 1994, p. 164; Kuban, 1974, p. 7), as well as more than one *šerefe* (Lory, 2015, p. 84). As illustrated with Bosnia and Herzegovina, that practice was even far from being applied in the Ottoman provinces. Indeed, none of the imperial mosques constructed in the country ever had more than one minaret. Since 1996, double minarets have been now spreading in the country, even for mosques of lesser importance. The same goes with the *šerefe*, as the first minaret to which a second *šerefe* was added is the one of the *Sultan Sulejmanova/Atik* (indeed imperial) mosque of Bijeljina, in 1912. It was only many decades later that the same was done for other mosques (Begić, 2010, pp. 119-120; Sokolović, 1973, p. 404), before the practice became widespread and sometimes out of proportion (as in the case of the *Beš-šerefe* mosque (2011) of Buci (m. Visoko), which has no less than five *šerefeta* (Durajlić, 2012, p. 49).

(III.3) Symbolics

To the 1992-1995 war destruction of minarets has been answering a correlated post-war memorialization. The symbolics of the minaret have been further emphasized, this time as a visual embodiment of both the destruction of Bosnian Islamic heritage and the suffering of the Bosnian Muslims. Indeed, some minarets now act as spatial reminders, as they are either kept standing in situ (that is, not repaired) – as in the cases of the “half-beheaded” minaret of the Vardačka mosque (before 1664) of Konjic and the bullet- and shell-riddled minaret of the stara džamija of Bešići-Bosanska Otoka (unknown date, m. Bosanska Krupa) – or transformed into a memorial structure, as illustrated with the ćup of the destroyed minaret of Ćela (1966, m. Prijedor), now standing next to the reconstructed mosque and new minaret, bearing a plaque listing the names of local martyrs (Bos. pl. šehidi, sg. šehid) and capped with an alem (most probably the one of the destroyed mosque). The most representative example, however, is the almost entire (destroyed) shaft of the minaret of the mosque of Memići (16th century, m. Kalesija), kept inside the memorial museum commemorating the destroyed and damaged mosques of the municipality, constructed right next to the reconstructed mosque.

The martyrdom association between šehidi and minarets, and, more broadly, with mosques, is a topic that would deserve further investigation, which goes beyond the scope of the present paper. As a matter of example, one can just mention the spectacular case of the four-minarets of the reconstructed Hamza-begova mosque (ca. 1557) of Sanski Most (which only had one before its destruction in 1992), two of which represent, as I have been told, the sons of a local notable, both killed in a concentration camp, who financed their construction after the war.

Besides its commemorative role, the minaret has come to embody resilience and, sometimes, defiance, in a post-war Bosnian landscape sometimes sharply contested. Indeed, notable differences can be seen between (enclaved) RS territories – where Bosniaks are now often in the minority, and where a vast majority of mosques and minarets were destroyed during the war – and regions belonging to the FBiH – where a large majority of Bosniaks cohabit mostly with Croats, and where many mosques and minarets, as situated in the then Bosniak-controlled territories, remained intact or “only” damaged. It is interestingly



Figure 15 : Minaret of the Vardačka mosque of Konjic (central Herzegovina), with its upper part and roof still missing, since they were destroyed by shelling.



Figure 16 : Destroyed minaret of the mosque of Memići (m. Kalesija, northeastern Bosnia), kept in a small museum near the reconstructed mosque, commemorating the destruction of the mosques of the municipality.

noticeable and symptomatic that in RS towns and regions where the minarets have been literally erased, and given the difficult conditions for returns and reconstruction – especially of religious buildings – Bosnian Muslim returnees (Bos. pl. *povratnici*) have in most cases reconstructed sober minarets (and mosques), while at the same time, many parts of FBiH have witnessed the vast majority of architectural novelties, and sometimes fantasies, in terms of minaret – as well as mosque – architecture.

Conclusion

The minaret, which strong religious and spatial symbolics have been mentioned earlier, has become, alongside the dome, an integral part of what Ismail Serageldin calls the *“mosque’s traditional architectural vocabulary”* (Serageldin, 1990, p. 16), as spread and adapted regionally and locally in contemporary mosque architecture all around the Islamic world (Khan in Frishman & Khan, 1997, p. 267). It is thus no surprise that both the minaret and the dome have become largely popular in Bosnia and Herzegovina in the last three decades, not only as (world widely) acknowledged idioms of (Ottoman) Islamic architectural and cultural heritage but also – as shown with the martyrdom association – as ethno-religious visual and territorial markers (what Azra Akšamija calls *“flags made of stone”*, Akšamija, 2011, p. 199). More broadly, they are carriers of the transcending belonging to the Ummah, the Muslim world, its architectural and cultural codes, values, and standards. The phenomenon is not at all circumscribed to Bosnia and Herzegovina, but in the specific post-war, post-Socialist, religiously-shared, sensitive Bosnian context, where the long-lasting quest of a Bosnian Muslim ethno-religious identity has been dramatically accelerated and partially resolved during and since the war, it takes a much more striking and amplified dimension.

NOTE ON PICTURES

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"MOSQUE IN URBAN ENVIRONMENT: IMPACT OF MOSQUE IN UNPLANNED SETTLEMENT OF SHAHEEN BAGH, DELHI, INDIA"



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Abstract

Evolving since the medieval times and taking up the most strategic location within the settlement, the Mosque has defined the location, layout, grain and movement patterns of the city and its component. The current developments of contemporary mosque can be very well understood at two scales, 1. The existences of the mosque as a building typology 2. Its role and influence on the urban environment (the social and physical structure of the city). The developments of mosque and its existence in India has taken a new path in the 21st century, depending on their location and context, designed in planned settlements and constructed in unplanned settlements. The case of unplanned settlements dominated by Muslim population is even more interesting considering its dependency on its community. One such settlement being *Shaheen Bagh*, has undergone tremendous changes in the past decades and has been proven a strong hold for the community where the mosque impacts its neighbourhood in several ways.

The aim of the paper is to analyse the impact of the mosque in the urban environment of *Shaheen Bagh*, its development and making of its social and physical structure. Different cases of the mosque and its existence are studied to understand its impact on the urban environment of *Shaheen Bagh*, leading to understanding of Mosque typologies and their character. In addition, the paper explores the changing emphasis of the mosque relating to places of worship, as these have shifted from solely religious structures to multifunctional building typology. The intent of this research is to look at Mosque as building typology, an integral component of urban layout, which impacts the spatiality, form and function of a precinct and its neighbourhood. Through a discussion on the existence of *Shaheen Bagh* Mosque, the research aspires to explore a path for the development of mosque in unplanned settlements and explore the possibilities embedded within its complexities. Grounded Theory approach is used for the assessment of the case study of *Shaheen Bagh*.

Keywords: Mosque Building Typology, Muslim Neighbourhood, Urban Environment, Social and physical structure.

1. Introduction: The Mosque and its urban environment

Religious transformations in modern societies are not merely a discursive or demographic phenomenon, they also relate to religious architecture in urban space and affect the built environment at its core (De Wildt et al., 2019). The role of contemporary religious architecture in its relation to building typology and urban space is changing and evolving. The imperative questions that arises in the discussion, range from what meanings religious buildings convey, how are they positioned, and how do they structure urban spaces. Religious buildings, including temples, churches, synagogues and mosques have always been one of the integral components of the urban layout (Ayhan and Mert Cubukcu, 2010). And these religious structures have impacted the spatial layout, form and function of an urban environment. Beginning from the medieval times and taking up the most strategic location within the settlement, the religious structures have defined the location, layout, grain and movement patterns of the city and its component. Churches dominated the medieval Christian settlement while mosque and temple dominated the making of Islamic and Hindu settlement in its physical and social form across the globe.

Mosque being an integral component of a Muslim neighbourhood forms a certain kind of culture within its scale of influence. Mosque as a building typology has provided the community with its dynamic usage and functions in different periods of time. Mosque in the past have governed cities and neighbourhood, being a central entity radiating the spines and embedding the neighbourhood within its vicinity. After the creation of Islam's place of worship, issues and problems of its continuous establishment stemming from complexity of modern

living has forced urban planners and architecture to reconsider its planning and implementation, deviating from the usual architectural conventions and faced with the challenge of retaining the integrity of its fundamental functionality, purpose and appropriateness (Arman Sarram, 2019).

It is understandable that religious architecture in the contemporary times has a larger role to play which is not just sacred and religious but functional to the demand of present generation and time. While, the contemporary world is more of a heterogeneous culture which imbibes multiple culture with the integration of a common ground, incorporating multiple building typologies. It is resulting into a newly developed urban fabric and to find relevance of religious structures especially mosque has been a difficult task. The new culture hides several layers of cultural and social being of a society which has to be understood for mosque development in the contemporary times. These complexities of a contemporary society is often ignored in the process of mosque development and the mosque in today's context are merely responding to other needs apart from religious needs. Today, mosques primarily function as places where aspects of worship are performed and only occasional educational activities take place. Compared to the past, the social and administrative roles of mosques are severely abbreviated (Abdel-Hady, 2011).

In Indian context where we have heterogenous communities, we can find examples where the Muslim communities have settled in various sub urban extensions and developed their own urban fabric including the mosque within. One such settlement is *Shaheen Bagh* which was developed in 1980's as a sub urban Muslim neighbourhood in the vicinity of Jamia Milia Islamia University in Delhi. *Shaheen Bagh* in the present times demonstrates the complexity of Muslim neighbourhood in a non-Islamic state, striving to mark its identity and place in a heterogeneous culture. The mosques of *Shaheen Bagh* play a vital role in the formation of its neighbourhood both in its physical and social structure. These mosques vary in multiple aspects of form, function and its influence on the urban fabric.

In the contemporary world where settlements such as *Shaheen Bagh* are witnessing environmental, physical and sociological changes, Mosques the places of socio-cultural significance have huge potential to provide a support system for the city. Mosque being a socio-cultural centre, can be incorporated with principles and philosophies as religious, social, cultural institute responding to the needs of the community. Settlements such as *Shaheen Bagh* are associated with the usual issues of congestion, space constraints and socio-economic problems which makes planning and design a vital aspect in developing compact urban areas. Although the Mosque currently is not the core of the modern Islamic city planning, it is still a significant area of the Islamic city, including many functions that are related to the public.(Radwan, 2021).

During the research attempts are made to address the following enquiries and their relationship with the mosque.

- How a mosque defines the path(connectivity)
- How a mosque is a landmark for a settlement
- How a mosque defines the edges
- How a mosque becomes a node for activities
- And how a mosque outlines district (neighbourhood)

2. Shaheen Bagh: A neighbourhood in making

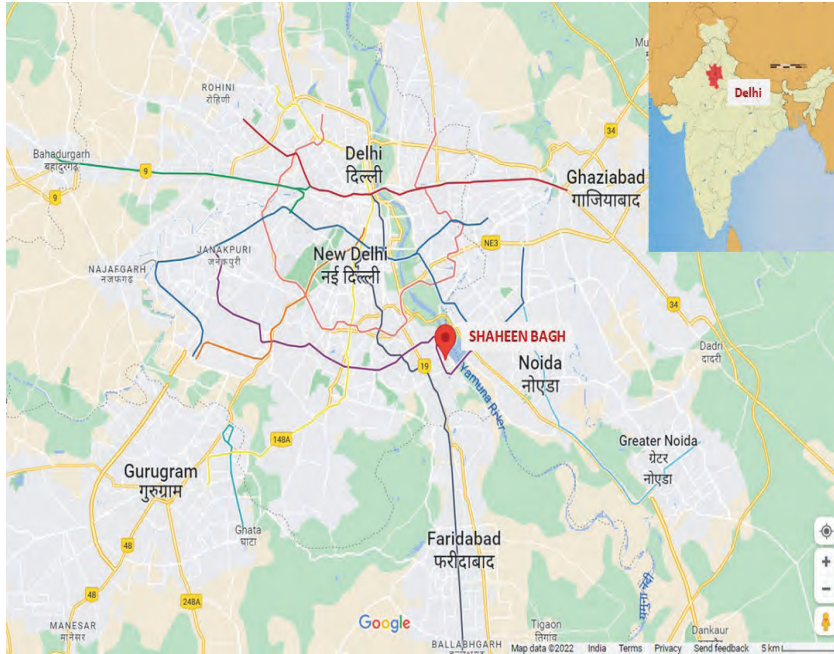


Figure 1 Location of Shaheen Bagh in Delhi, India by https://commons.wikimedia.org/wiki/File:India_NCR_locator_map.svg

Shaheen Bagh (Abul Fazl Enclave Part – 2) is a Muslim neighbourhood in the South Delhi district of Delhi, India (Figure 1). It is located at the edge of Delhi-Uttar Pradesh state border and is the southernmost region of the Okhla (Jamia Nagar) area. *Shaheen Bagh* and its associated areas are situated along the banks of the River Yamuna.

The area *Shaheen Bagh* is famously known for its 101 days long protest against the Citizenship Amendment Act (CAA) and the National Register of Citizens (NRC). It has gathered attention from not just fellow Indians but is also applauded for its women protestors who were the spine of the protest.

Shaheen Bagh is an interesting case of Muslim neighbourhood that was developed in 1980's and represent Muslim communities from across India. The mosques in *Shaheen Bagh* have developed overtime along with the organic development of the settlement. Within the settlement there are typologies of mosque which have developed in different neighbourhoods and serves various social and religious needs of a Muslim society.



Figure 2 The vicinity of Jamia Millia Islamia with Muslim settlements such as Batla House, Zakir Nagar, Ghaffar Manzil, Noor Nagar etc along with Shaheen bagh

There are multiple Muslim majority areas in the vicinity of Jamia Millia Islamia such as Batla House, Zakir Nagar, Ghaffar Manzil, Noor Nagar etc, *Shaheen Bagh* is comparatively the most recent settlement towards the south (Figure 2). The development of areas around Jamia Millia Islamia is a large concentration of unplanned settlement which has now grown into a huge suburb of Delhi. Though, there are no text stating the development of Shaheen bagh, it is mentioned by an older resident that he bought 80 bigha (.2 sq km) land in Jasola village in 1984, where the colony first came up, he also said that he chose the name of the area “Shaheen Bagh” from a famous poem of Allama Iqbal, Shaheen a Persian word means falcon.(Iftikhar, no date).

Many of its residents also recall that the area was an agricultural field (Bagh is literally translated into orchard), some even say that the area was known for its rose plantation and was developed as an affordable housing site for the Muslims of Delhi and Muslims from different states such as Uttar Pradesh, Haryana and Bihar. Until 1990, there were kacha lanes, or dirt roads, no sewer lines and no electricity, and just about fifty to sixty houses. After the demolition of the Babri Masjid in Uttar Pradesh in 1992, the population of this area increased exponentially. Members of the Muslim community, residing until then in mixed localities, began to migrate to this area for the sake of security. (Iftikhar, no date).

Presently, *Shaheen Bagh* is a densely populated settlement with majoritarian Muslims of all classes and sects including the elite Muslim class and the service class. It is dominated by narrow lanes, low rise buildings ranging from 25 to 400 square meters. The population density is 32,402/sq km whereas the overall population density of Delhi is 10,000/sq km.

2.1 *Shaheen Bagh* and its Urban formation

"Nothing is experienced by itself, but always in relation to its surroundings, the sequences of events leading up to it, the memory of past experiences." (Lynch, 1960)

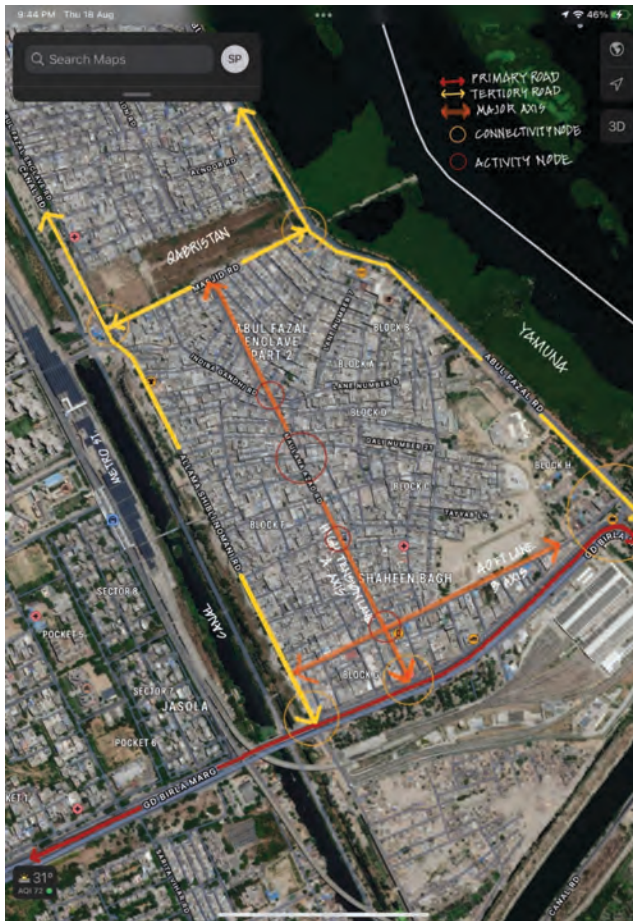


Figure 3 The Urban structuring of Shaheen Bagh

Shaheen Bagh area comes under Abul Fazal Enclave, which is divided into two parts Part 1 and Part 2, *Shaheen Bagh* is officially delineated as Abul Fazal Enclave Part 2. The total area of Abul Fazal Enclave is 0.96 km², whereas *Shaheen Bagh* is .55 km² of the total area. The settlement is well connected through three major Metro Stations namely- Jasola Apollo Metro Station, *Shaheen Bagh* Metro Station and Kalindi Kunj Metro station and it is also connected to major bus routes and multiple bus stops are present at various junctions.

As per the official map of Delhi Development Authority 1962 (Figure 4), the settlement was delineated as green zone. Since, it was developed by local residents in an unplanned manner, the present map of Delhi Development Authority delineates it as unauthorised colony.(Figure 18)

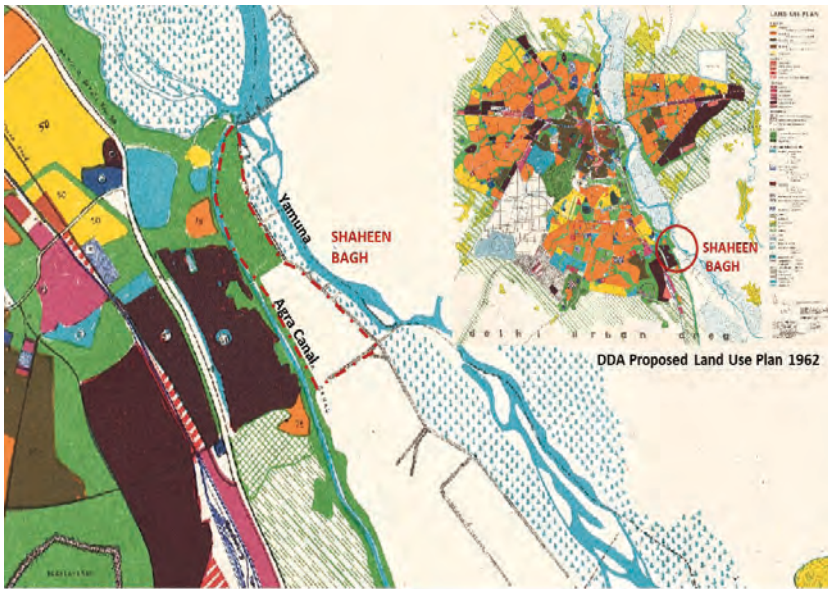


Figure 4 Shaheen Bagh designated as open green area of the Yamuna river by Delhi Development Authority Proposed land use plan 1962

The layout of *Shaheen Bagh* has grown organically into a layout plan which draws parallel from an Islamic settlement. The periphery forms the road, with cemetery at its edge and the major axis connected to the Mosques. The recent development of a large Friday Mosque (Sanabil Complex) dominates the present layout of *Shaheen Bagh*. The Western edge of the settlement is the Agra Canal parallel to which passes the Allama Shibli Nomani Road. As irrigation was the prime objective of the canal, navigation on the canal was stopped in 1904. Thus, this particular region was used profusely for agriculture until the land was sold and plotted, there are still some patches of farm land on the western edge. The Eastern Edge is marked by Yamuna River front, which has been regenerated for public use as an open space. Even though the edge condition is visually restrictive, it has the potential for development of a visual axis. The Abul Fazal Road runs along the river edge which connects Noida passing through Okhla Bird Sanctuary. The Okhla Barrage is the site for Okhla Bird Sanctuary which dominates the Eastern Node of the settlement. (Figure 3)

The southern Edge is G. D Birla Marg which divides *Shaheen Bagh* from Sarita Vihar Residential colony and Madanpur Khadar. The GD Birla Marg on the southern edge joins the Abul Fazal Road through the Kalindi Kunj road.

2.2 Zone, Density and Mosques

Shaheen Bagh has a high density, dense fabric layout (Figure 5) with 17 mosques distributed in different neighbourhoods. There are two major open spaces, the Jamia Islamia Sanabil on the north, and cemetery on the Western edge. Apart from these open spaces, the street of *Shaheen Bagh* acts as major open and recreational spaces for the neighbourhood which are of different hierarchy. A part of Yamuna River front has been converted into an open park, which is used by the community for leisure purposes. The Okhla Bird sanctuary and the Kalindi park are other two large open spaces in the vicinity of *Shaheen Bagh*.

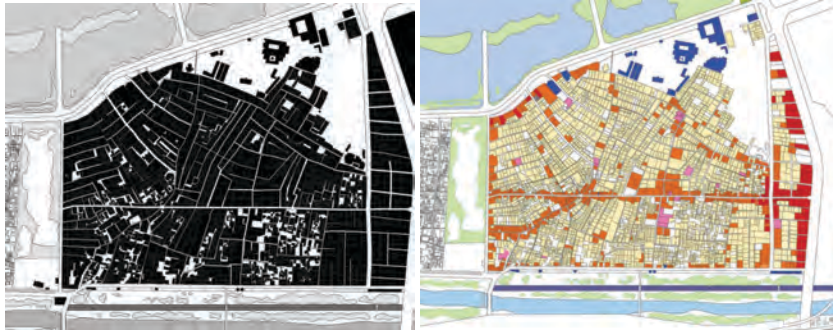


Figure 5 (a) Nolly Map for Shaheen Bagh,, (Anas et al., 2020), (b) Land use development

The neighborhood in *Shaheen Bagh* started to grow from its center due to easy access and natural topography. The central areas were naturally on the higher grounds as compared to the edge because of the Agra Canal and Yamuna River Belt. *Shaheen Bagh* can be divided into different zones due to different settlement patterns which developed during different time periods (Figure 9). Each zone responds to different typology of Mosque and has evolved during the course of time. The mosque concentration varies in different zones and responds accordingly.



Figure 6 Activities outside the Faiza Ghausia Mosque in Zone 1, the central zone of Shaheen Bagh

Zone 1 is the highest density zone, and is considered to be the oldest development within *Shaheen Bagh*. The zone comprises of highest number of Mosque, which are the oldest and were considered major landmark mosque. The mosques in this Zone are the center of multiple activities. These mosques lie on the major streets forming larger scale of influence among the community, they have been used for a longer period of time and are also associated with religious institutions such as Madrasas. Due to its centrality and direct access

of the mosque, major amenities are located within this zone and revolve around the major axis. The central market (Mandi) which is the core of *Shaheen Bagh* is also located in this zone within the vicinity of the mosques.

Zone 2 is an extension of Zone 1, and is similar in multiple aspects. It is a dense fabric interlocked between two access roads, where the edges are majorly commercial and mixed use. The earliest Friday Mosque (Jama Masjid) is located in this Zone, it had a huge footfall and was considered a major landmark mosque. Majority of mosque in these zones are inclined towards commercial activities and depict a mixed-use street character due to its proximity to the central core.

Zone 3 is a formation of lateral development pattern which started developing when the lands in Zone 1 and Zone 2 were exhausted and people started moving towards the periphery, away from the congested centre. The mosques in this zone lie away from the central axis and are strategically located in residential neighbourhood. These mosques have a residential street character and acts as magnets of activities and congregation for social and religious gatherings. The plot sizes and arrangement vary from Zone 1 and 2, this zone has been formally plotted as compared to the organic development of Zone 1 and zone 2. It is divided through the central axis, has wider access roads and large plot size as compared to Zone 1 and Zone 2



Figure 7 View of Zone 4 40ft street developed as commercial and mixed-use, the Habib Mosque in the background

Zone 4 and Zone 5 are the latest development in *Shaheen Bagh* which are located on the southern and eastern edges. Zone 4 is a plotted development zone between two wide roads, one is an external G.D Birla Road which is commercial and does not have any mosque. The other is the internal 40ft street which has major mosque and they have acted as catalyst for commercial and mixed-use development. Zone 5 comprises of the large Friday Mosque (Sanabil Complex) and in the present times acts the main landmark of *Shaheen Bagh*.



Figure 8 Zone 5 with Friday Mosque (Sanabil Complex) forming the landmark of Shaheen Bagh



Figure 9 Different zones of Shaheen Bagh based on Chronology, Density and planning layout, with the purple blocks as Mosque.

2.3 Axis, Node, Accessibility and Mosques

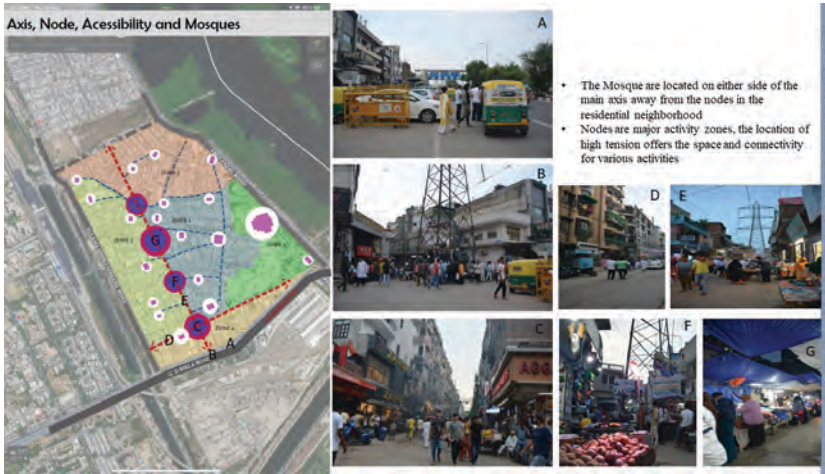


Figure 10 The location of central axis, its nodes and the corresponding Mosques

Shaheen Bagh as a settlement is divided longitudinally through the High-tension line, which is the major axis of the settlement. It starts from the GD Birla Marg and ends at Masjid Road. The axis is dotted with 4 nodes (Marked in Blue, Figure 10) which are the location of high-tension electrical tower, they act as major activity zone including food outlets, groceries shops and vegetable hawkers. Through the entire 900m stretch, and 5m wide street is an open street market, the nodes are concentration points of transverse lanes and streets. The axis is dominated by commercial shops, temporary sheds, hawkers, and vendors. The Central Zone (Point G, Figure 10) of the axis is a central market (Mandi) which was a large open square but has diminished in size and scale due to densification and construction activities. The Mosques are located on either side of the main axis, in the residential neighborhood which are in proximity to the nodes. Interestingly the mosques in Zone 1 are in direct vicinity of the central node i.e. the market. As one moves north and south of the central axis the mosque departs from the axis and forms magnets in the residential neighborhoods. Nodes are major activity zones which offers the space and connectivity for various primary needs such as shopping, leisure, clinics etc. in the current times, whereas the social and religious needs are fulfilled at the neighborhood mosques.

The transverse Axis is falls towards the south and is famously known as 40ft road by the local residents because of its width. The axis was a residential street which moves West to East, with G+3 housing apartments on both sides. Mosque on this axis has been a catalyst to encourage multiple social and religious activities, which has led to further developments. It is also worthy of mention that the width of the street (40 ft), which is wider than any other internal street, has supported the mosque to act as magnet for social and religious activities. In the past decade the lane which was all residential has converted to mixed use because of the mosque and the street, being a congregation point for the community.

It is interesting to note that the inception of an urban settlement in an Islamic city begins from the inception of a mosque. The settlement of *Shaheen Bagh* acts in a dynamic relation, where the mosque and the settlement both are responding to the present physical and social fabric. The medieval Islamic cities were planned as an along the very existence of a mosque, which played

the central role. Taking examples from different Islamic cities around the world, whether radially planning, linearly or quadrilateral laid out, mosque of varied scales and typologies formed centres and regions of influence. These mosques intersect and converge to provide main functions to each community within the city which can be elaborated. In the case of Shaheen Bagh, the central axis acts as a support system for these mosques, the mosques are strategically located between different neighbourhoods and lie on either side of the central axis. The branching effect from the central axis ensures the easy usability, accessibility and function of each mosque in a subordinate placement pattern. The mosques help to reduce the congestion from the central axis and forms secondary magnets for people to congregate, socialise and offer their prayers away from the commotions of the central axis.



Figure 11 The Neighbourhood Jama Masjid (Shaheen Mosque) and the neighbourhood Mosque (Nisar Mosque), both on the right of central axis



Figure 12 The Activities around the Neighbourhood Jama Mosque (Habib Mosque)

2.4 Influence Zone, Walkability and Scale of the Mosques

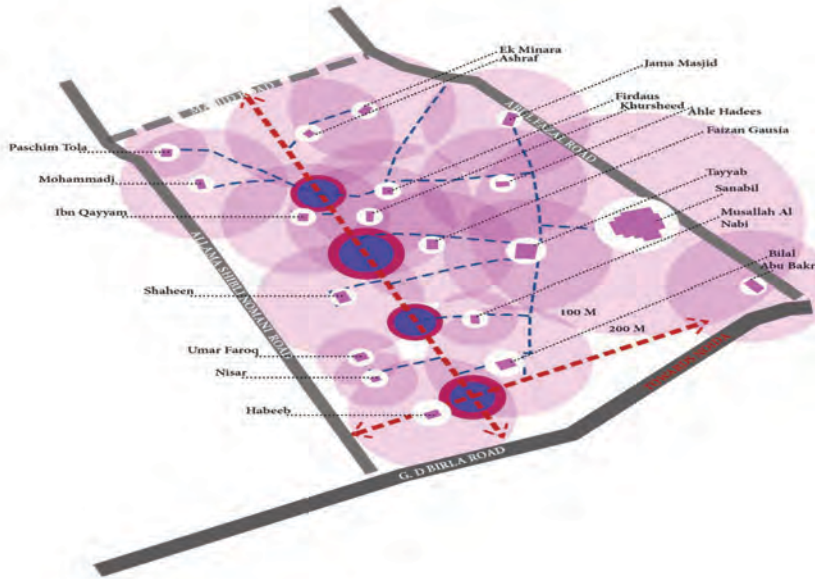


Figure 13 Walkable distance and influence Zone of the Mosque

The term influence zone, walkability and scale are very dynamic and interrelated determinants of the functions of mosques. In *Shaheen Bagh* these terms overlap each other and work in correspondence to each other. The circles in demarcates three dimensions i.e., 200m,100m and 50m for each mosque (Figure 13). According to their location and performance in the city, mosques have different relationships with their surroundings and the various passages, accesses and gates in the city, region, district and county, with equestrian and pedestrian access depending on the scope of their functions (Talebi, 2001).

The large Friday Mosque (Sanabil Mosque) has a walkable distance of more than 200m and an influence zone of similar size and is also the largest mosque in *Shaheen Bagh* with associated open space. It is alluring to know that the Sanabil mosque has accommodation for females which is accessible only on Fridays. Women with their children visit the mosque from an influence zone and walkable distance of 200m on Fridays. Though the mosque has been attracting Muslims from Noida, it still hasn't been able to attract people from all of *Shaheen Bagh*. The reasons lie in connectivity and accessibility issues and therefore compared to mosque in the central core, it has less influence over the community despite being the largest mosque with open space. The mosques (Firdaus, Khursheed and Ibn Qayyam Mosque) near the central core are placed in a closed proximity to each other and have a walkable distance of less than 50m, whereas their influence zone is found to be 100m and they serve a larger community and are frequently visited. Though, these mosques are neighborhood level mosque which are of medium size and not as large as the Friday Mosque (Sanabil Complex). The mosque away from the central zone (Habib, Bilal and Tayyab Mosque) are sparsely located with an influence zone of 100m and average walkable distance between them also is 100m. These mosques are larger than the mosque in the central zone (Firdaus, Khursheed and Ibn Qayyam Mosque) in capacity and scale. Both typologies serve as the Neighborhood Jama Mosque and attract a larger community. There are

few mosques (Umar Farooq, Nisar, Paschim Tola Mosque) which have a small influence zone of 50m with the same walkable distance, and are also small in scale. These mosques serve the purpose of neighborhood mosque serving the immediate community within their range. Lastly, small prayer rooms called Musallah are present within the neighborhood which have an influence zone of 50m and less and are used by local shop owners, vendors, visitors etc.

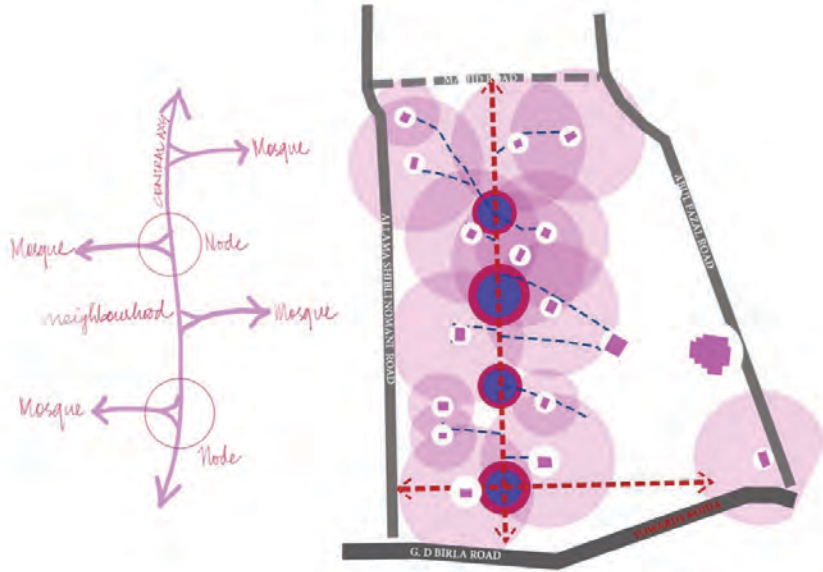


Figure 14 Layout Plan of Mosques in Shaheen Bagh

Looking at the layout pattern it is understood that the mosque forms an interlinking teething pattern which integrates the neighborhood (Figure 14). Unlike the traditional setting of mosque on the central axis, the mosque in *Shaheen Bagh* does not directly lie on the central axis and is strategically located on the either side of the central axis. The intersection point of the mosque and the central axis forms the major node and activity zone, separating the mosque social and religious congregation from the other secondary activities. This layout of mosques helps to reduce the congestion on the central axis which is a very busy access and on the other hand provides unrestricted entry to the mosque from different neighbourhoods.

2.4 Social Cohesion, Religious Traffic and Mosques

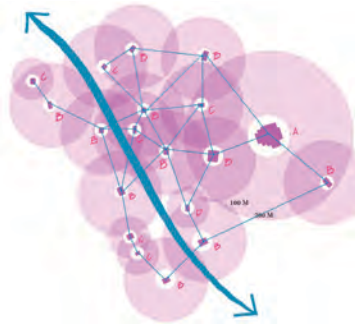


Figure 15 Social cohesion and Religious traffic among the mosque of Shaheen Bagh

Mapping the social cohesion and religious traffic of the mosque of *Shaheen Bagh* it is analyzed that the mosques on the right and Left of central axis acts differently, except for the Central Zone Mosques which are interconnected. The Central Zone has the highest religious traffic with major mosques madrasa and schools. As explained above the Friday Mosque (Sanabil Complex) is least connected due to peripheral road and no direct accessibility from the neighborhood, therefore it has the least social cohesion and religious traffic. it is to be understood despite the present scenario, the Sanabil complex has huge potential to act as a larger congregation space for both religious and social needs of the society.



Figure 16 Social cohesion and religious traffic on the Neighbourhood Jama Mosque (Habib Masjid) and the Friday Mosque (Sanabil Complex)

2.5 Mosque typologies in *Shaheen Bagh*

There are 17 mosque that are mapped in the neighbourhood of *Shaheen Bagh*, which comprises of different scales, functions and location. The typologies are derived after the understanding of the urban environment rather than just applying the qualitative factors such as occupancy and area. The prominent typologies that can be grouped are of four kinds which has parallels with the Abu-Dhabi Mosque Development Regulations -Volume 1 (Dhabi and Development, 2009).

Type A. The Friday Mosque

Type B. The Neighbourhood Jama Mosque

Type C. The Neighbourhood Mosque

Type D. The Prayer Halls/ Musallah

Type A. The Friday Mosque_ Sanabil Mosque

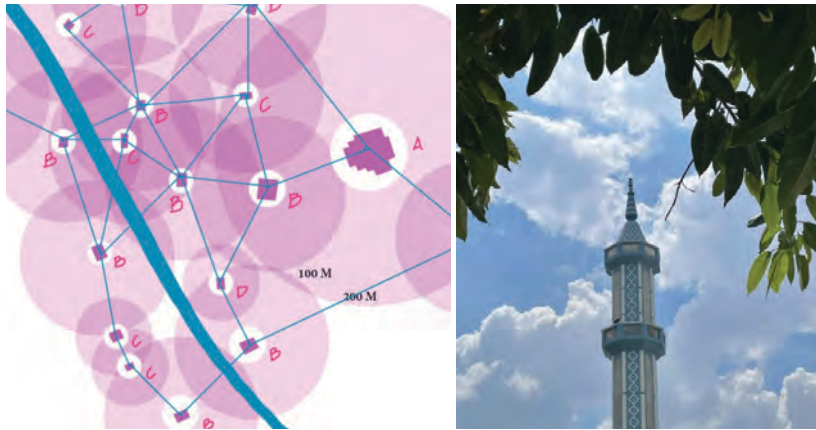


Figure 17 a. The location of Sanabil Complex. **b.** The Minaret with blue glazed tile work of Sanabil Mosque in Shaheen Bagh

The mosque is a part of university complex which is run for the Islamic Education such as Maulwi (Middle), Ilmiyat (Secondary) and Fadil (Graduation). The campus is an extension of Primary and Secondary education which was started in 1980 in Joga Bai (Batla House). Presently the campus has been shifted to *Shaheen Bagh* and is being used as a major Friday Mosque.

Location- Edge of the neighbourhood

A. Physical Structure

1. Building Level

- Construction began in 2009
- Horizontal Development
- Large dome and Minaret marks the identity of the structure with its blue glazed tile
- Façade treatment using arches for doors and windows (Major façade area is left untreated)
- Double height double Floor
- 1st floor for females

2. Urban Level

- Spread across a large area responding to a low-density urban structure
- Forms the Visual axis
- Comprises of University amenities such as classrooms, library and residential facilities
- Large open space devoid of any treatment
- Acts as an edge
- Acts as a landmark
- Front entry has less traffic as compared to the rear entry (despite having a large entrance on the front and very small service entry at the rear end
- Neighborhood activity zone on the rear end
- Main entrance is usually used by car and bike owners
- Service entry used by pedestrians
- Connectivity node between Noida and Delhi
- In close proximity to Yamuna River bed

B. Social Structure

- Association Value
- Forms a landmark and image for the community
- Mosque for Friday, Eid and major festivities
- Acts as a Third Place
- Recreation (outing) for females and children
- Shopping amenities in the vicinity
- To be elaborated after the questionnaire survey

Type B. The Neighbourhood Jama Mosque_ Habib Mosque
Location- 40 ft Street, Minor Axis

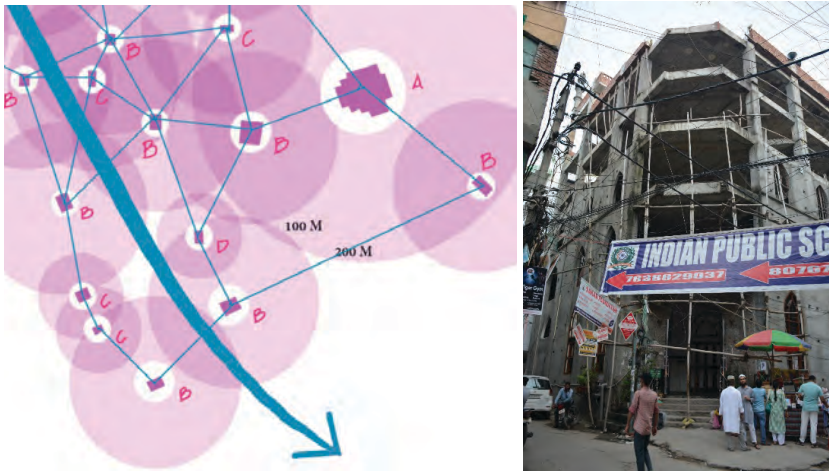


Figure 18 a. Location of Habib Mosque. b. Exterior views of the mosque



A. Physical Structure

1. Building Level

- Vertical Development
- No dome and small Minaret at the terrace level
- Façade treatment using pointed arches for doors and windows (Major façade area is left untreated)
- Five Floors
- No accommodation for females
- Framed structural systems

2. Urban Level

- High density urban structure with a change from residential to mixed use
- Located the Major axis (40 ft road)
- Forms the main spine for the community

- Street acts the open space
- Acts as a landmark for Zone 4
- Major hawker and vendor zone

B. Social Structure

- Association Value
- Forms an activity node with major development in the last decade
- Mosque for daily prayers and Friday prayers at neighbourhood level
- Acts as a Third Place
- Major Shopping amenities in the vicinity
- To be elaborated after the questionnaire survey

Type C. The Neighbourhood Mosque_ Umar Farooq Mosque

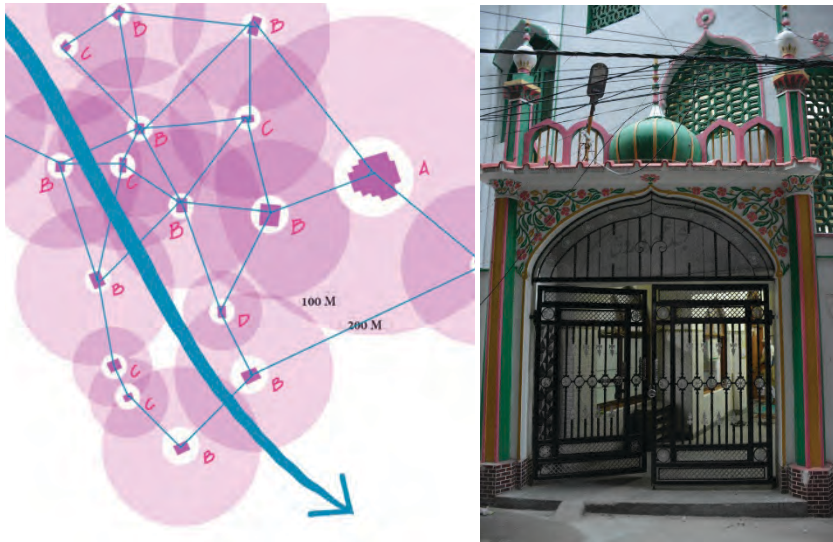


Figure 19 a. Location of Umar Farooq Mosque. b. The front facade of the mosque



Physical Structure

1. Building Level

- Vertical Development
- Arched Gated entrance
- Dome and a Minaret present
- Façade treatment using pointed arches and jali for doors and windows
- Five Floors structure
- No accommodation for females
- Framed structural systems

Urban Level

- Lies within the residential neighbourhood
- Narrow Street width
- No commercial activity

Social Structure

- Private zone
- Serving the immediate community

Type D. The Prayer Halls/ Musallah

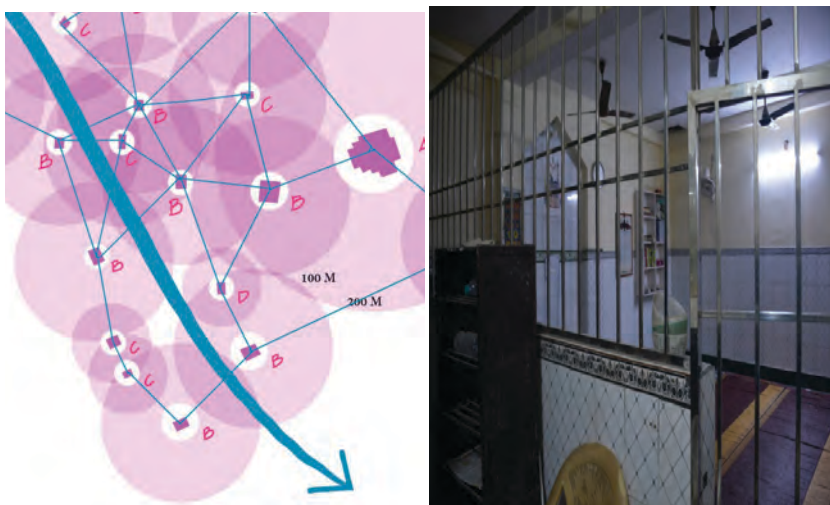


Figure 20 Location of Musallah and interior view

3. Conclusion: The way forward

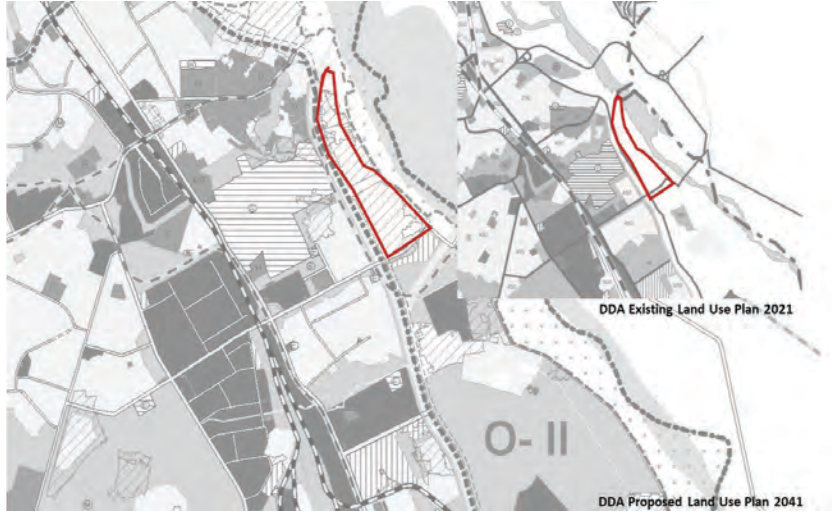


Figure 21 Shaheen Bagh marked as unauthorized colony in the proposed Delhi Development Authority Land Use Plan 2041

According to (Asoka, Thuo and Bunyasi, 2013), the urban city suffers from rapid population growth, infrastructural development, environmental degradation, economical concerns, socio political conditioning. The neighbourhood of *Shaheen Bagh* suffers similar concerns and the effects are visible on the mosque development. In the contemporary world where the communities are witnessing environmental, physical and sociological changes, Mosques which are places of socio-cultural significance have huge potential to provide a support system for the city.

During the study it was found that the mosques of *Shaheen Bagh* are acting as isolated religious entity devoid of creativity in terms of Design or Use. It is noticed that there is a considerable limitation in the role and function(s) of mosques nowadays, comparing that to the remarkable role(s) that mosques have played throughout history, the Majority of mosques of Today (Mosque & Collective Mosque), are primarily functioning as places of worship, with some occasional educational activities that take place. Comparing that to the past, the social and administrative roles of the mosques have been clearly limited (Abdel-Hady, 2011). It can be argued that historically mosque were the only urban entity that provided support system to the community and any and every activity in a settlement would radiate through the mosque. For example, in any Islamic city planning the core would be the mosque, from which originates the streets, the sub nodes, bazaars and the neighbourhood. But in the current times, and a process of development multiple new entities have been introduced within the community as urban entities such as schools, banks, libraries, hospitals etc which earlier were the part of a mosque. In case of *Shaheen Bagh* there are multiple instances that the mosque is only related to religious actives. Few mosques are associated to school and university complex, but a large section of these mosque are not being used to its potential. It is interesting to note that, despite of having multiple new urban entities, the mosque in *Shaheen Bagh* still finds its relevance as a public space. Interestingly at the same time it is understood that the mosques of *Shaheen Bagh* have confined themselves to being a religious structure which are not as versatile as the historic mosque would be.

It is also interesting to note that in the proposed land use plan 2041 of DDA, *Shaheen Bagh* is still designated as unauthorized colony, which makes it vulnerable in terms of development and the only public institutes in the area would be the Mosques. The colony would be serving an overwhelming population by 2041, which would be much denser than what it is today, devoid of any new public space or open space. Therefore, the mosques of *Shaheen Bagh* have a huge potential and can play multiple roles within the community incorporating multiple functions.

The following key discussions arise from the study of mosques and neighbourhood of *Shaheen Bagh*

- The influence of a mosque is independent of its scale
- The walkable distance affects the influence of a Mosque
- The scale and location of a mosque is directly related to the identity of the neighborhood
- The Mosques are functional in nature and less attention is paid to the architecture of the mosque
- The mosque and its neighbourhood are in a dynamic relationship
- It demonstrates the complexity of a Muslim neighbourhood, and multiple layers of Muslim neighbourhood
- It provides opportunity to establish mosque as one unit for multiple activities. Mosque can act as social infrastructure for the community such as reading rooms, libraries, computer labs, community halls etc
- Mosque can be used to organise annual, monthly or weekly exhibitions and workshops for the community especially the kids
- Can be centre for learning specialized building crafts which can be utilised for the construction of the mosque

Many a times the mosque design are often tackled by improvised solutions due to multiple socio-economic and political reasons, they lack the qualities of specialized architectural intervention to deal with these issues, which stands very true for the case of *Shaheen Bagh*. However, architects need to approach mosque design with deep and multi-layered levels of thinking that focus on the expression of its rich functionality to reflect the value of mosques in Islam. Mosque needs to respond better in these neighbourhood, for the kind of complexities that exists in the society, their needs and aspiration for a better future.

Contemporary religious architecture often renounces traditional and dominant characteristics and is no longer positioned at prominent places such as town squares, on elevations, or in visual axes, and abstains from its function as a main focal point of orientation in the cities. Building regulations, such as building codes and zoning laws, contribute to the distribution of religious architecture in urban space and spatialize religious differences. The urban infrastructures, consisting of policies, administration, resources, normative ideas, ideal subject formations, and so on, shape the space, as well as the practices of the people occupying the space and vice versa. (De Wildt *et al.*, 2019). Though in the case of *Shaheen Bagh* and similar such settlements, there are no guidelines, building regulations etc for development, there are multiple other factors such as availability of land, location, density, width of street, availability of funds that define the space and its vocabulary. Majorly these mosques are built within the developed urban fabric as an unplanned building appropriating itself and its context with the needs and demand of the society.

There are multiple studies on medieval city planning centering around the

mosque and its role within the urban fabric, but fewer research has been done on the role of a mosque in defining the physical and social structure of a city in the present times. Since the mosque itself has evolved with the structure of the city, it is imperative to understand and evaluate the present role of contemporary mosque in building up a city at different scales. Urban enclaves are prime examples that display the modern transformation in mosques, showing its adaptation with the environment, consideration of urban lifestyle changes, innovation of use of space, optimizing functionality and maintaining overall aesthetic presentation of the structure. The urban mosque is a fairly new concept, it is described as “a new type of institution that presents a particular image of urban design, spatial diversity and the use of public space” (Akel Ismail Kahera, 2002).

Though *Shaheen Bagh* mosques have developed overtime in response to their socio, political, economic and cultural backgrounds and are serving the religious needs of the community. It is to understand that the mosques have to be dynamic in nature and fulfil other basic needs of the society apart from the religious needs. Since there are multiple markers within a contemporary settlement such as *Shaheen Bagh*, the mosque as a building typology has varied functions in the making of a neighbourhood, these roles and functions are left unexplored in the present times. Mosque can play multiple dynamic role in the present times and operate at different scales and has much more potential to develop in the coming times. From being religious spaces to community spaces and refuge spaces in crisis, mosque can play a vital role, these roles can be further explored by studying various agents and patterns of change in the neighbourhood and understand their social and cultural needs. As per (Sakr, 1987) a contemporary mosque should be an Intrinsic cultural production with fundamental belonging and an understanding of its context. such design sensitivity is missing in the mosques of *Shaheen Bagh*.

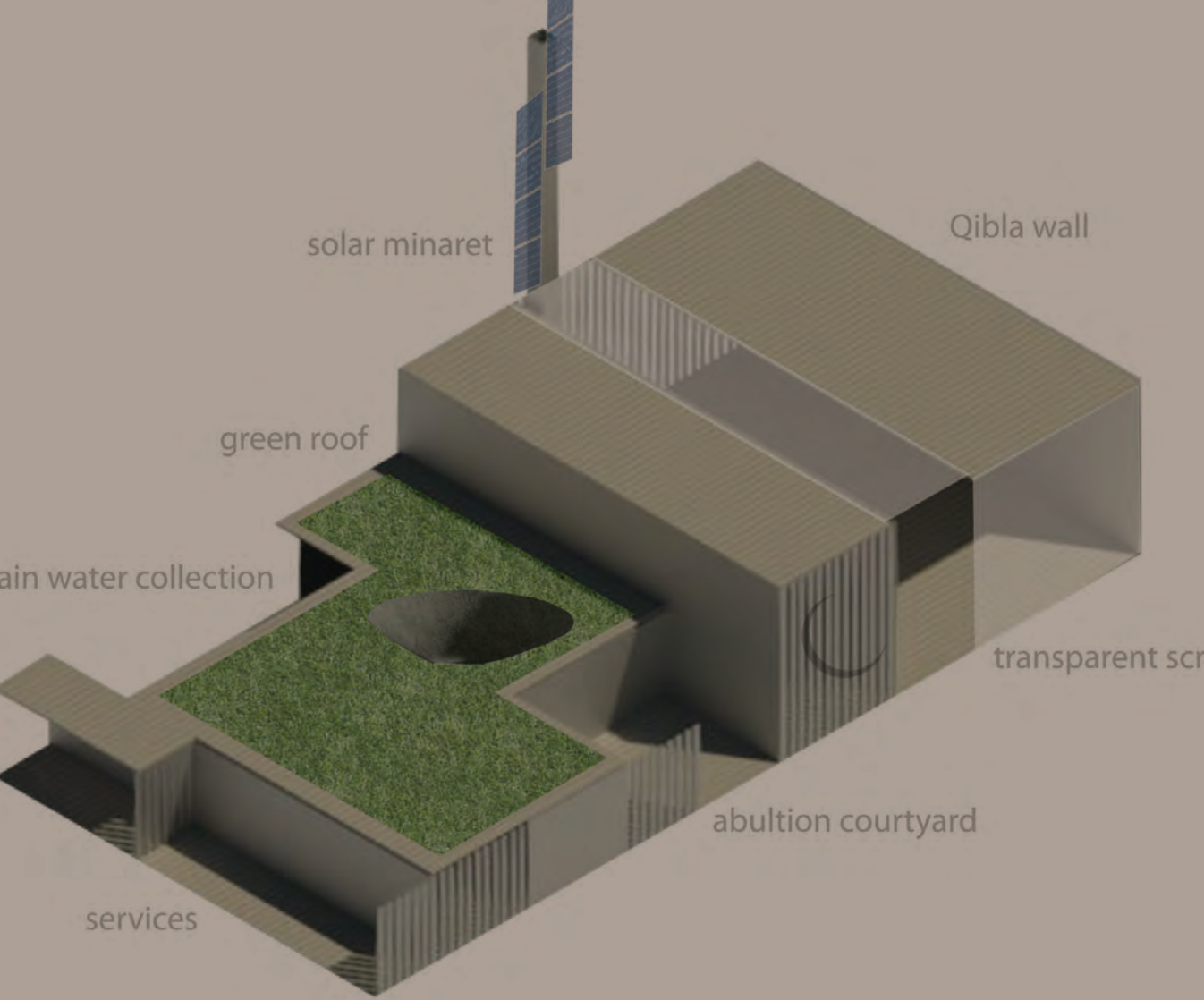
Therefore, it can be stated that “The urban Mosque are built and made up to serve the fundamental purpose of mosque, however, because of the other essential needs of the community it also serves other purposes which demonstrates the flexibility of mosque in serving the community socially, economically and even politically. It shows the relevance of urban mosque where space constraint is an on-going issue.”(Asif et al., 2018)

There are few questions that needs to be addressed with respect to unplanned Muslim settlements for future research and contemplation.

- Should unplanned neighbourhoods such as *Shaheen Bagh* have design guidelines for mosque development
- Should the architecture of these mosque have creative freedom in design and use (the focus in *Shaheen Bagh* is on accommodation of more numbers of occupants, not on quality of space or the design)
- Can mosque perform multiple functions or they should be confined to prayers in such unplanned settlements (Most of the mosque in *Shaheen Bagh* are solely used for religious purposes)
- Areas around the mosque may be treated different in terms of design and use
- Should the Mosque be for all (caste/ gender/ religion)

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axonometric view



East Elevation view

MODULAR MOBILE MOSQUE (3M) PROTOTYPE AS SOCIO- CULTURAL INCUBATOR



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Abstract

This study explores an under-researched part of contemporary Islamic architecture. It presents a new approach to design mosques allowing a multi-faceted space that brings people together to enable prayer, unity, community collaboration, innovation, and social connections. It may serve any groups giving particular attention to people impacted from environmental disasters, displaced from wars, and other unforeseen events. A Mosque is a place of worship, of hope, of transition as people reflect upon the world around them. The method employed for this study is 'research through design', which is a process of design that allows new insights, knowledge, practices, and final product to come into being. The proposed '3M' (Modular Mobile Mosque) prototype design is a simple rectangle with small-subdivided courtyard spaces. It is inspired by the Prophet Muhammed's (PBUH) Mosque in Al-Madinah that allows for multiple spatial variations. Customized, modular container-like units are placed together like a puzzle. It is a self-sustaining entity that employs every element with a sustainable function; for example, a solar minaret uses solar panels for energy and an inverse tent structure collects rainwater. Moreover, local attributes are assimilated into the design as needed to reflect regional identity and foster social relationships and community bonds. This research contributes to knowledge by advancing the current state of mosque designs for various relief areas and stands as a prospective model for universal applications to elevate the quality of places of worship where they're needed most.

Keywords: Mosque, Mobile, Modular, Multi-functional, Sustainability, Socio-cultural, Research through Design.

Introduction

The word 'mosque' is derived from the Arabic term 'masjid', which means 'a place of prostration' and is a sign of submission to the will of God. Although, the primary role of a mosque is for Muslims to pray their five daily prayers as well as Friday prayers, the Mosque is not only a house of worship. It is the center of all Muslim life. In fact, the Prophet Muhammed's (PBUH) Mosque in Al-Madinah was a genuine community center for many religious, social, political, administrative, and cultural functions becoming a catalyst and headquarters for early Muslim civilization and expansion across the continents. Mosques were at the heart of Islamic cities, as focal points, landmarks, and centers dominating the skyline, while in part directing the city's organic intricate urban form. Mosques served as community centers and within mosques or within their vicinity important matters were discussed, serious intellectual discourse took place, and Muslim's gathered to break their fasts in the holy month of Ramadan. Early Islamic schools and universities trace their roots to major mosques such as Al-Aazhar Mosque in Egypt. The first hospitals also evolved from early care facilities adjacent to mosque's in Baghdad. Therefore, the mosque played a significant role in many social and cultural facets of life in Muslim societies.

Despite the multiple uses of early mosques, including the Prophet's Mosque (PBUH), today many Muslim countries have preferred the mosque to function only as a house of worship. Some have attributed this simply to politics: a desire on the part of some to reduce the impact mosques have on people and how they relate to their governments. This may be true; however, it also limits the mosque's multi-functional role as the heart of the community. As a result, many mosques today are only open during prayers and, sometimes, Quranic study groups. This approach also supports a separation between the mosque and Muslim life, which contradicts Islamic teachings that call for harmony, balance, and integration between religious practices and daily life.

This paper intends to revisit the adjacent functions of the mosque by examining the potential to design and build a mosque prototype for different communities

and especially for humanitarian relief areas. Such areas are in dire need for support and aid to regroup and build back their communities. Therefore, the mosque becomes of paramount importance and is pivotal in these efforts, not only as a place of worship, but also to revive its role as a leader and center of all parts of Muslim life. It does this by employing a 'research through design' methodology as a means to better understanding, developing, and introducing a new mosque design for refugee camps, natural disaster zones, and other areas and people who may need it. The mosque being reimagined here serves as a place of worship, a place of peace, tranquility, a much-needed safe-haven to bring hope and inspiration for a better future. The new mosque design also serves as a community relief center to lead humanitarian efforts in food, medicine, etc. It promotes social programs and local cultural practices to foster better understanding. The proposed mosque design intends to work as a social and cultural incubator. The first stage of this study explores the design, while the second stage builds the prototype. Outlined and discussed in this paper is the first stage.

Background Literature

Islamic artistic philosophy

It is essential to understand Islam in order to understand Islamic civilizations and their cities. The foundation of a Muslim's faith is the belief of '**La illaha illa Allah Muhamed rasool Allah**'; that is, 'there is no God but God and Muhammed is his prophet'. The Holy Scripture of Islam is The Holy Qur'an, the final revelation from God to humanity, intended to reteach the doctrine of monotheism, a message conveyed to numerous Semitic prophets of earlier times. The basic principles in the Qur'an provide the creation of a whole culture and civilization ranging from lifestyle to architecture and the arts. Allah is described in the Quran as a transcendent Being of Whom no visual or sensory experience is possible. "No vision can grasp Him... He is above all comprehension (The Holy Quran:6:103)... Nothing is like unto Him" (The Holy Quran:42:11). He is beyond exhaustive description, and incapable of being represented by any anthropomorphic or zoomorphic image. In fact, "Allah is that which defies answers to the questions of who, how, where, and when? It is this idea of ultimate oneness and transcendence of Allah that is known as *tawhid*" (Al-Faruqi:1982:163).

Islamic art, architecture, and aesthetic creativity was and is intended to fulfil the declaration of faith of '**La illaha illa Allah**', that 'there is no God but God and He is completely other than human and other than nature'. The goal of Islamic art can not be achieved through the depiction of man or nature. "It could be realized only through the contemplation of artistic creations that would lead the percipient to an intuition of the truth itself that Allah is so other than His creation as to be unrepresentable and inexpressible" (AlFaruqi:1982:163). Lois Al-Faruqi, professor of Islamic studies, eloquently describes Islamic artistic philosophy:

"The aspect of Transcendent which the Islamic doctrine taught was that God is infinite in every aspect – in justice, in mercy, in knowledge, in love. However, [if] one might try to enumerate His many attributes, or describe any one of those attributes as applied to Him, the attempt would end in failure. His qualities are always beyond human comprehension and description. The pattern, which has no beginning and no end, which gives an impression of infinity, is therefore the best way to express in art the doctrine of tawhid. It is the structures created for this purpose that characterize all the arts of the Muslim peoples. It

is these infinite patterns, in all their ingenious variety, that provide the positive aesthetic breakthrough of the Muslims in the history of artistic expression. It is through these infinite patterns that the subtle content of the Islamic message can be experienced” (Ibid:163).

The Islamic city has usually been seen as a maze by visitors who do not comprehend its internal logic. However, this intricate pattern of the Islamic city is like any other Islamic infinite pattern (Ibid:431). The cities grew semi-concentrically around the major mosques, rivers, or the sea. As they expanded, courtyard houses started to follow, stopping only for the protective walls. This was their beauty, their internal logic, an urban pattern expressing the ‘concept of infinity’ that made Islamic cities different than the world’s cities outside *Ummah*, the Muslim worldwide community.

The Mosque

The first Mosque in Islam was the Prophet Muhammed’s (PBUH) Mosque in the sacred city of Al-Madinah and served as a model for early Islamic Mosque architecture. It was made of a mud brick structure enclosed in a rectangular courtyard, and a porch covered by palm branches. The architectural plan is an *aisled* or *hypostyle* hall where internal design modules exist without pronounced disjunction (AlFaruqi:1982). This plan has been favored for mosque construction throughout the Muslim world. It also provided the foundational architectural elements for all mosques that followed. Figure (1) illustrates these elements while the most important architectural Mosque elements are listed below:

1. The *Qibla* (literally ‘direction’) wall identifies the direction of the *Ka’bah* (literally ‘the cube’) within *Masjid al-Haram* in the Holy city of Mecca, describing the direction of prayer for worshippers.
2. The *Mihrab* is a niche in the *Qibla* wall and usually is the most ornate part of a mosque with Quranic inscriptions. *It identifies which interior wall is the Qibla wall, provides space for the Imam to lead prayer if it is recessed, and can naturally enhance the projection of the Imam’s voice.*
3. The *Minbar* is a pulpit in the form of a staircase where the Imam gives the sermon for Friday prayer.
4. The *Minaret* is a tall structure attached to the Mosque and is used by a muezzin to call people to prayer, typically singing a capella. Some mosques have more than one.
5. The *Sahn* is a courtyard where usually fountains are placed for worshippers to preform ablution (ritual washing) before prayer.

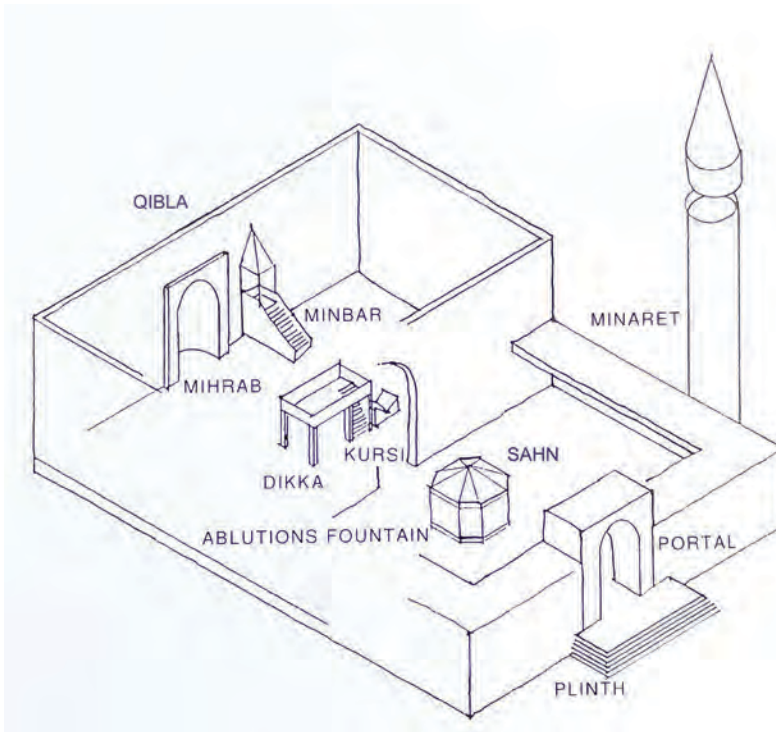


Figure 1.
Representation of a Mosque's architectural elements.
Source: (Frishman and Khan: 1994)

Together these elements remain universal in all mosques of the Islamic world. The differences reflect the diversity of Muslim cultures, which span the continents, making use of different materials, patterns, colors, and form to reflect local cultures and environments. For example, the courtyard mosques of Arabia were meant to create a microclimate and provide a sanctuary of peace from the outside world. They used local materials and were made of mud brick. Similarly, the Great Mosque in Mali is made of sun-baked earthen bricks and coated with plaster suited for African culture and the hot arid desert while a mosque in China uses traditional Chinese architectural form, gardens, and colors. These ingenious mosque design's all reflect how Islam has accommodated the innovation of Muslims to customize their places of worship, giving importance to the local culture and environment.

The mosque as a multi-functional community center

The Prophet Muhammed's (PBUH) Mosque was a model for Islamic Mosque architecture in its support for diverse functions, use of architectural elements, and spatial arrangement. It was also the heart of early Muslim rule and played a significant role as the focal point for the community. Many scholars have researched and highlighted the importance of the Mosque in this regard (AlFaruqi:1982) (Frishman and Khan: 1994) (Omer:2010).

The mosque is accommodative of every beneficial activity concerning worship, education, politics, the economy, security, and social relations, which enabled the nascent and ambitious society to make civilizational headway (Omer: 2010). Similarly, Wardak stresses that while the social organization of the mosque is, in some important ways, a response to and shaped by exclusionary practices in

the wider society, it plays a central role in the maintenance of order within the Muslim community (Wardak: 2002). Utaberta and Asif assert that the, “mosque is the nucleus of a Muslim community all over the world. And this institution is not only known for the religious rituals practiced inside it, but also for the social and communal activities that take place within its premise.” (Utaberta and Asif: 2017).

Most literature covering this topic focus on how existing mosques serve the above mentioned goals. However, there is little evidence of any efforts to design or develop new mosque prototypes to fulfill the needs of people in emergency zones, with support needs that may last from weeks to months and, sometimes, even years. Instead, people have mostly used existing mosques as places of shelter during disaster recovery. In their paper “Mosques as Emergency Shelters in Disaster Prone Regions” Utaberta and Asif discuss how Mosques may be used as a gathering point for the community and an evacuation center that serves as a transition facility before those adversely affected by disaster, crisis, war, or other calamity, return home (Utaberta and Asif: 2017). Other researchers have focused on performing spatial analysis on the utilization of mosques for tsunami disaster mitigation (Azhari et al.:2019). Meanwhile, still other researchers explored the role of the mosque in disaster management by documenting and analyzing its role in rural settings in the aftermath of the 2005 earthquake in Pakistan (Cheema et al.:2014).

Sometimes mosques are overwhelmed when used as an “emergency shelter,” and therefore, alternative and more effective mosque prototypes designed specifically for humanitarian relief zones become an important solution. There is a gap in the literature: a gap not only in recognizing the importance of mosques in emergency zones, but also in the lack of any alternative architectural solutions that further community needs in times of crisis. Some researchers have looked at mosque categories (Mortada:2003) developed from the Arab Urban Development Institute, which referred to three types of mosques: *masjid al-jami* (daily mosques), *masjid al-jomah* (Friday mosques), and *musalla* (prayer halls).

This paper proposes yet a fourth type of mosque, which is a mosque prototype that serves the needs for humanitarian relief areas. It may be considered, functionally, to fit between the daily mosque and the musalla. It is a mosque that is constructed as a modular system that may be reconfigured and adjusted according to specific local needs and environmental conditions. The adjustment of mosque activities may also be attuned to different situations. For example, it may provide educational services to lower income communities or a makeshift clinic to support relief from environmental disasters. The flexibility of the concept allows for rapid deployment and easy construction to adapt to various scenarios.

Methodology

Research through Design

The method used for this study is ‘research through design’ which is similar but slightly different from ‘research by design’. It is a practice-based inquiry where the design process and final product becomes a way to gain new knowledge. Although this concept has been used for centuries by experimentation and trial-and-error to develop design (Groat & Wang:2013), the role and value of this approach to research in architecture has only recently emerged as an accepted research method. It is a dynamic and evolving concept in an academic context (Ibid:2013). Research through design or RtD was a term coined by Frayling

in 1993. He described RtD as design as a particular way of thinking to gain a particular approach to knowledge to understand certain things that are outside design (Frayling:1993).

Some researchers see research through design as a design inquiry that produces an artifact with the intended goal of societal change (Binder & Redstorm: 2006, Swann: 2002, Zimmerman et al: 2007). Zimmerman and Forlizzi define it as an “approach to conducting scholarly research that employs the methods, practices, and processes of design practice with the intention of generating new knowledge” (Zimmerman et al: 2007). It is the process of “iteratively designing artifacts as a creative way of investigating what a potential future might be” (Zimmerman et al: 2010). It uses trial and error to constantly develop projects in the real world (Toeters et al: 2013).

There is a fine line between the two design research methods in architecture. Research by design, is defined as research in which design is explored as a method of inquiry usually by the development of a project which uses different mediums such as sketches and mapping. Others see research by design as gaining experience from practice and its process of designing as pillars of research (Verbeke:2011). The design frames and guides the methods, data collection, and results of the study. Thus, both research by and through design approaches become valuable in gaining new insights and knowledge, which may have a tangible impact on people’s quality of life (Fraser:2013).

For this study, the process of design empowers the researcher to explore multiple paths towards a new Mosque prototype. Knowledge gained in the process contributes to existing knowledge, which in turn enriches discussions between theory and practice. The process of research is itself sometimes considered more important than the product. It is through the architect’s design, design experiences, data collection and application of strategies that generates new understandings and transforms it into knowledge better acquired and expressed (Barrett & Bolt:2010). In research by design, the practitioner becomes a ‘practitioner-researcher’ (Nelson: 2013).

Proposed Mosque Prototype Design

The proposed design aims at meeting the guidance provided by the International Organization for Migration (IOM) on Design Developments of Evacuation Centers which stipulates that victims of disasters prefer to stay as close to their home as possible (IOM-OIM: 2013). The mosque prototype is designed to move where and when it’s needed and transforms its adjunct functions to meet contextual constraints. As discussed this may take shape as community engagement and social service providers for undervalued or poverty stricken areas, war zones, refugees camps, and environmental disasters. It can also serve the function of engaging with the community in other ways such as a catalyst to drive programs to promote prayer among the youth and charity initiatives in Ramadan. The proposed prototype may also be essential in providing mosque services to newly established residential districts that either do not have a built mosque as yet or their mosque is under construction.

Modular components

The Modular design concept basically subdivides the Mosque into smaller parts called modules that come together to build a larger structure. The parts may be modified, replaced, and recreated to adapt to worshipper needs and different environmental constraints. Some modules or spaces within spaces

may be developed and serve new purposes. For this prototype mosque, the modules have been derived from the dimensions of a standard container unit, which has a width of 2.44 meters height of 2.59 meters and length of 12.19 meters.

Mobility

Although the mosque is known as a solid permanent structure grounded to its surroundings, this mosque design proposes the opposite. The mosque moves and is a dynamic, fluid, living entity that allows multiple reconfigurations to engage with people and their daily practices and truly serves the needs of the people. The container base model shape has been used to allow the components to move easily and quickly to be reassembled where needed. The containers are then placed into trucks to be transported to the site and assembled or four containers are then placed into a mega container and may be transported to the site by helicopter. The building process is shown in Figure (3).

Sustainable strategies

The design also takes into account that during disasters the local water supply may be vulnerable, and therefore, a rainwater collection system is installed. Furthermore, passive solar energy is used in the form of a solar minaret to render the building independent from the electrical grid. There may not be enough energy to power the Mosque from this alone, and therefore, a hybrid green generator is used that is an off-grid and sustainable alternative to polluting, conventional units. The generator reduces carbon dioxide emissions by using batteries charged by solar panels. This method reduces operating costs dramatically and enables freedom of movement for the proposed mobile prototype Mosque.

The interior finishes proposal uses foamed sustainable rubber floorings that make the interior comfortable for prayer while easy to clean and adjust within the modular system. Carefully placed reused wooden columns and recycled mesh screens have also been applied to provide a visual connection with the surroundings while enclosing the space. The columns also serve as louvers and may be open to allow cross-ventilation or shut to prevent rain or harsher weather from affecting the interior.

Social and cultural activities

The design allows for multiple spatial organizations. Sixty percent of the mosque will be allocated for prayer space and forty percent will be multi-functional and act as a socio-cultural incubator that may take shape as educational services such as a nursery or daycare for families that need to regroup after natural catastrophes. The center will enable families to leave their children in a safe place to give them and an opportunity to find work and rebuild their houses and lives.

Another essential adjunct function for the proposed mosque may be to act as a platform to promote health services. This may be done in partnership with other organizations such as Doctors Without Borders (Medicins sans Frontiers) or the White Helmets in the form of immunization drives and supporting local communities who do not have access to healthcare. In emergency events the mosque may respond as part of a larger field hospital.

The modular system makes it easy to subdivide the spaces according to each situation and local needs. A community room provides a multi-functional space that may be used as a place to relax, socialize, and heal in times of crisis. A kitchen is used to cook and distribute food for famine stricken areas. A charity organization may use the space for a donation drive. The concept's advantage is to allow for a variety of functions and services simultaneously. One such potential configuration is illustrated in figures (2), (3), and (4) below.

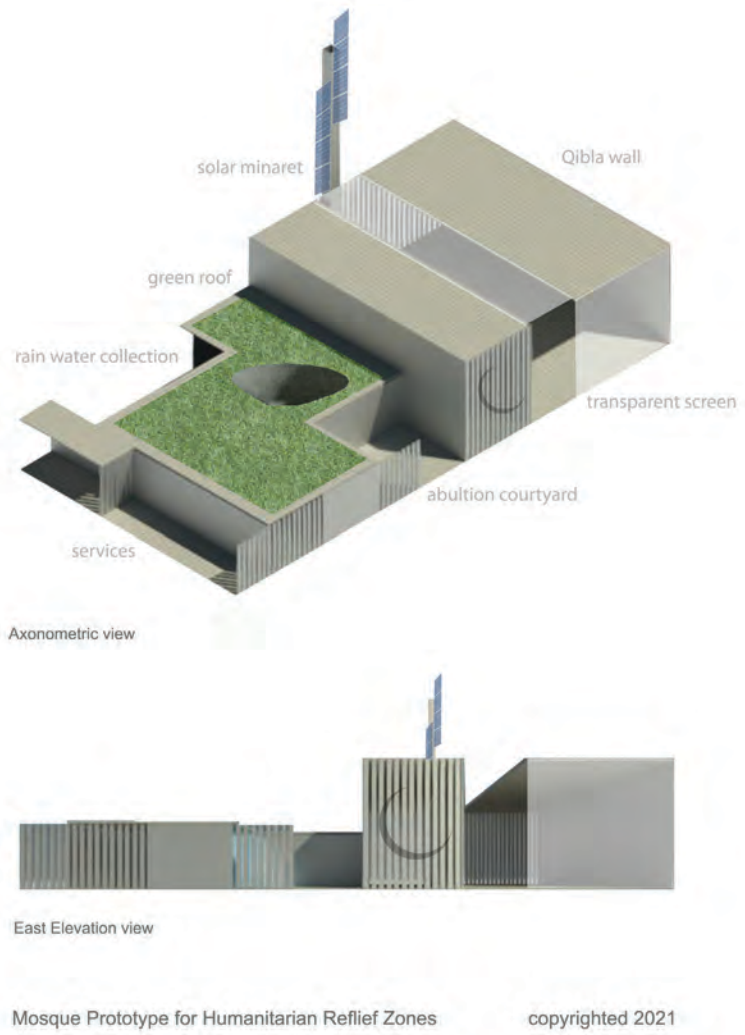


Figure 2. Axonometric view and elevation of the proposed Mosque Prototype for Humanitarian Relief Zones (Source: The Author: 2021).

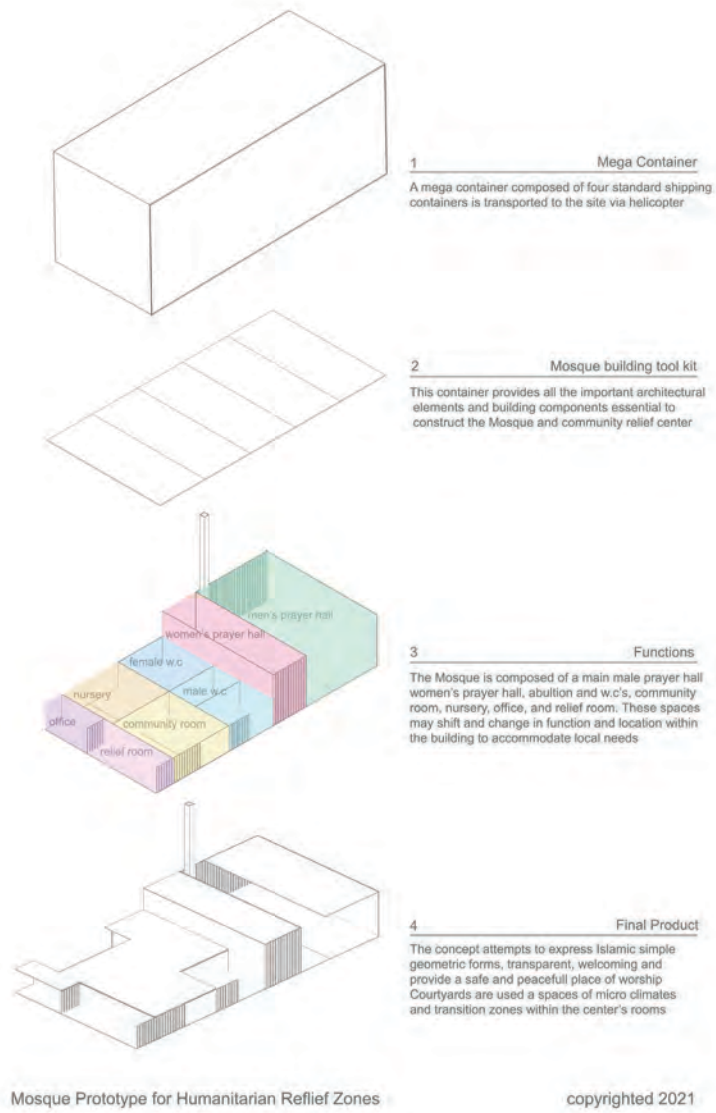
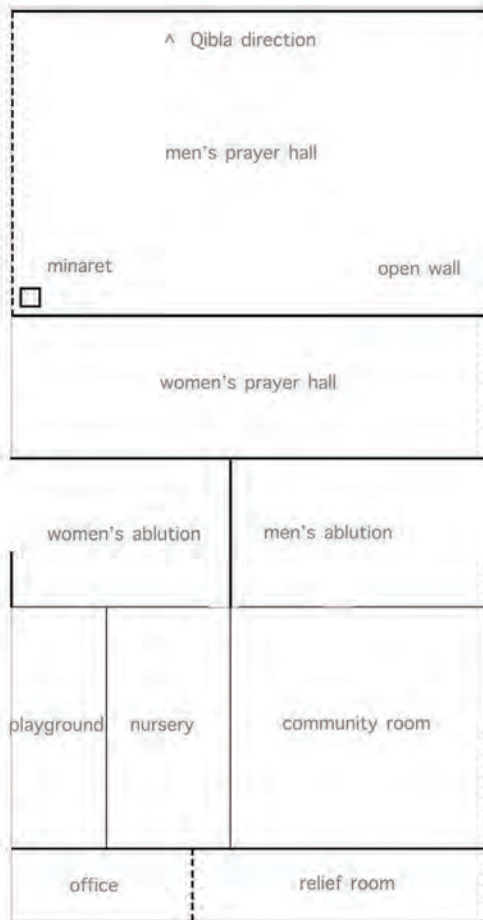


Figure 3.

Diagram of proposed mosque design as it relates to building process and functions.

(Source: The Author: 2021).



Mosque Prototype for Humanitarian Relief Zones - Floor Plan

Figure 4.

Floor plan of proposed prototype mosque.
(Source: The Author: 2021).

Reflections and future research

This paper only discusses stage one of the 'research through design' for the proposed prototype of the 3M (Modular Mobile Mosque) mosque for humanitarian relief areas. The methodological process is still incomplete and needs to further develop the design in the real world. Stage two would include providing complete technical, specification working drawings of the above proposal and actually construct the prototype 3M mosque. The research team would then conduct a post occupancy exam and monitor the design outcomes. An iterative design process will commence that further develops the design to meet specific human needs on the ground. The idea is to move from theory to practice and vice versa until the prototype becomes a more resilient and

adaptive vehicle that may be used anywhere in the world. The research also intends to highlight this idea and attract potential sponsors for building the prototype, be it relief agencies, charitable organizations, government agencies, or other NGOs. Therefore, future research and development is of paramount importance to continue with this concept as the means to elevate people's quality of lives despite challenging circumstances.

Conclusion

This research intends to raise awareness of the need of a 3M (modular mobile mosque) prototype to serve people with diverse, economic, social, and environmental challenges. The 3M prototype is an evolving idea and the proposal may further be transformed to adapt to each response and environmental condition. It is by no means a final product. Rather, it is a first step in exploring the idea of a new mosque for the future that moves and accommodates people that need support or have had their lives destroyed by war or natural disasters. History tells us that the mosque concept plays many roles in Muslim lives, so why not provide another: one that reaches out and welcomes worshippers (and others, in keeping with Quranic teaching) to feel a sense of tranquility and peace in a time of hardship. Perhaps, this prototype may bring back what has been forgotten in mosques: a much needed multi-facetted leadership role and center for all Muslim life, and a beacon of hope in a broken world.

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DESIGN GUIDELINES FOR THE CONTEXT OF THE HOLY MOSQUE IN MAKKAH ALMUKARRAMAH



Abdelmohsen M. Farahat

Abstract:

Both the Holy Mosque (*al-Masjid al-Haram*) in Makkah AlMukarramah and its context, especially the central area inside the first ring road, have gone through considerable stages of growth and transformation. The attempt in this paper is to give urban design guidelines for the natural environmental and urban contexts of the Holy Mosque. Natural environmental guidelines include Controls in relation to Zamzam ground water and mountain slopes and peaks. Urban design guidelines include controls and suggestions in relation to height, sight lines, open spaces, urban tissue, and extension of prayer areas beyond the Holy Mosque. Gradual scale relationships, including human and landmark scales will be addressed.

Introduction:

Huge development has gone on and is still going on, in the urban context of the Holy Mosque, including several massive high-rise buildings. Much debate was has taken place on the suitability of this concentrated development to the most sacred place in *Ummah* (the Muslim world), a place that all the Qibla walls in all the mosques on the planet point toward, and a place that Muslims typically face when they pray. It was the Conviction of the author, that led to this paper, that the issues involved are not just visual, and that visual aspects are a reflection of deeper issues. Because of the limitation of space allowed for this paper, it was deemed to be more fitting to concentrate on the alternative design guidelines, that would imply clearly the criticism of current urban patterns.

The methodology applied in this research relied on library research in addition to the author's experience with the place for many years, to be synthesized into an objective series of design guidelines.

1. Basic Principles:

The thrust of this paper is based on three principles: fitting within the natural environment, enlightened interpretation of the historical/cultural context, and properly coping with contemporary aspects, including the needs of an increasing number of pilgrims and people praying, in addition to making use of contemporary thought and technology.

1.1 Fitting Within the Natural Environment:

The natural environment, in general, represents the basic fact of the place, "The Natural Base". As contemporary environmental thought has found, it has an "Intrinsic Value" (1), that cannot be compensated for in monetary terms. In the case of Makkah AlMukarramah, this "Intrinsic Value" is even compounded several fold, due to the inseparable attachment of the spiritual/religious aspects of the Holy Mosque to the natural environmental elements, e.g. Zamzam ground water. Mountains and Wadis are also extremely important in themselves, and in the major spatial form they take. The central area of Makkah AlMukarramah exists in the middle part of wadi Ibrahim, and is surrounded by seven mountains that form a major space, or basin (fig.1.1)(2).

Topographic levels range from 240m above sea level at the end of Wadi Ibrahim to 919m at the top of Alahdab Mountain. Makkah AlMukarramah is described as a mountainous city, whose human geography is shaped by its topography. These mountains represent a reservoir of history and its visible memory, in addition to its religious dimensions, in general and within the

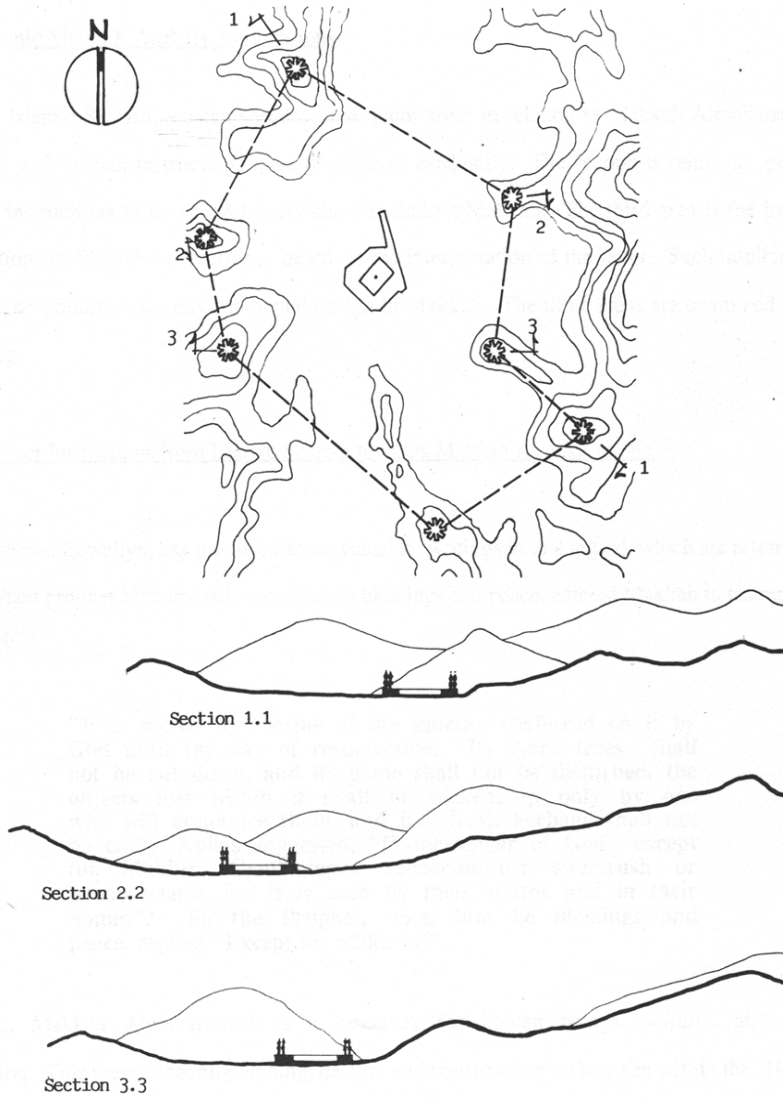


Fig (1.1)

Plan and Sections for the Middle Part of Wadi Ibrahim Showing the Major Space Defined by Seven Hill Tops Surrounding the Holy Mosque. (Fadaaq T. & Farahat, A.)

Haram boundaries of Makkah Almukarramah, in particular. Wadis and tributaries contribute significantly to the identity of Makkah Almukarramah, especially in historic terms (3) (fig.1.2).

Zamzam water, though not seen being underground, and the distinct terrain of mountains and wadis give Makkah Almukarramah its distinct character and identity, more than any architectural style, historic or contemporary. Conservation of all elements of the natural environment is a must, especially in reference to Hadith related to strict conservation measures in the "Haram" area of Makkah Almukarramah (4). Buildings must fit topographic formations, at the micro and macro scales, as will be discussed.

Contemporary urban design cannot be successful without applying principles

of sustainability, whose essence is harmony with the natural environment physically, and accordingly avoiding any depletion of natural resources as well as any damage to elements of the natural environment (5).

1.2. Enlightened Interpretation of the historical/cultural context:

Historic architectural “styles” were found to be of minor value or even misleading. The Sharia instruction that all of Makkah Almukarrama , not just the Holy Mosque, is a “Haram” to the Sharia Boundaries, led to an important urban pattern, in which the Holy Mosque was strongly integrated with its urban surroundings (fig.1.3) (6).



Fig (1.2)
Wadi Ibrahem & its tributaries in the context of the Holy Mosque.

1.3 Properly Coping with Contemporary Aspects:

The pressing functional needs of the continuously growing number of pilgrims, and people wanting to pray inside the Holy Mosque, should not compromise the previous two points relating to the environment and the cultural context. In addition, relating to the contemporary context is inevitable. Contemporary technology should not impose its own reductionist overall system. On the contrary, it should be employed to further serve the previous two points, in one holistic continuum, encompassing contemporary intellectual streams that balance the three and even produces synergistic effects from integrating them (9).

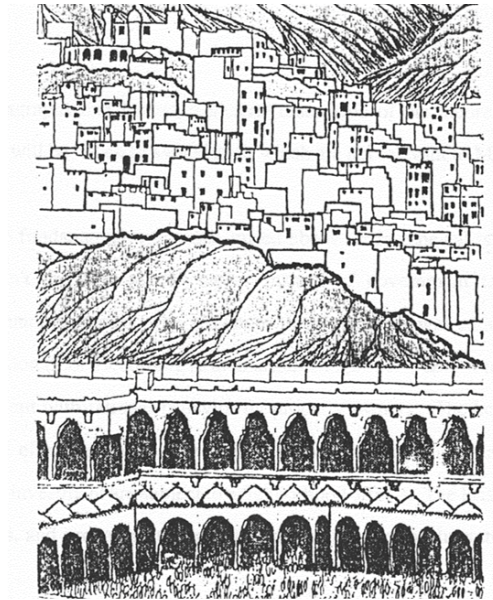
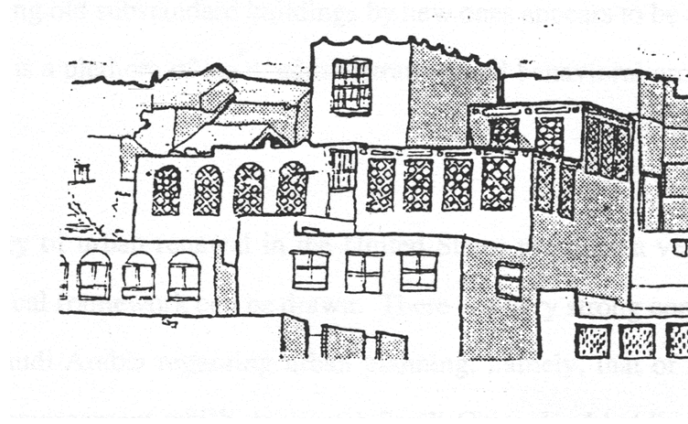


Fig (1.4)
Terraced traditional building & their cumulative effect, as an urban tissue expressing topography (Fadan, Y.)

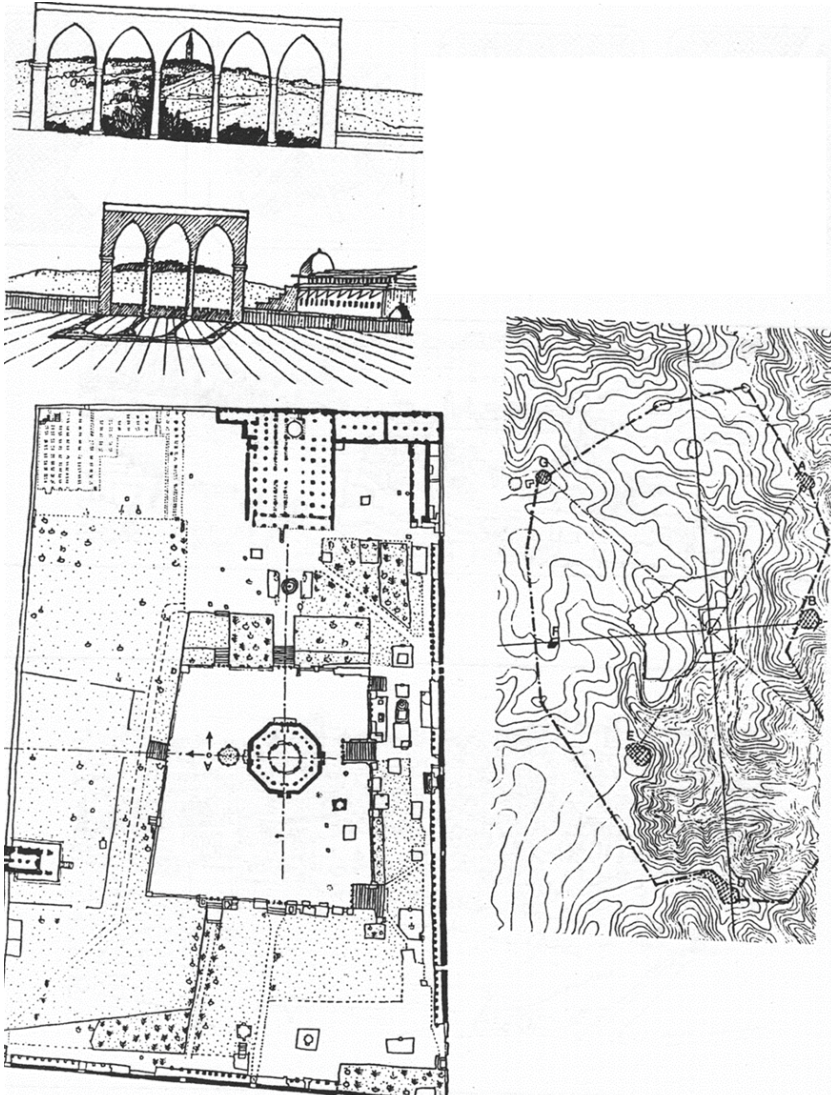


Fig (1.5)

Major space in historic Jerusalem defined by Hill Tops, & effects on urban design, in terms of axes, gates & landmarks (Kutcher, A.)

2. Design Guidelines for the Context of the Holy Mosque:

These guidelines were developed in response to the three basic principles explained above.

2.1 Guidelines for the protection of Zamzam Water:

Zamzam water is certainly the most important element of the natural environment of Makkah Almukarramah. Studies have shown that it has been susceptible to negative effects, including temporary loss of recharge, both historically and in recent times. It is true that considerable efforts have been taken recently to prevent these negative effects from recurring. However,

the fragile nature of the geologic formation (rock fracture), and the extensive spread of the natural drainage basin (fig.2.1 & 2.2) (10), necessitates stricter building permit and urban design measures.

2.1.1 Preventing any leakage in the sanitary pipe system, feeding or discharging, and ensuring an efficient, tight system (fig.2.3), in order not to pollute Zamzam water.

2.1.2 Preventing Pile foundations of buildings, in zones carrying underground Zamzam water (main courses or subsidiary ones). Basements are recommended to be limited to two (fig.2.4). These two limitations would automatically limit building heights. Further studies are needed to specifically determine zones and related limitations.

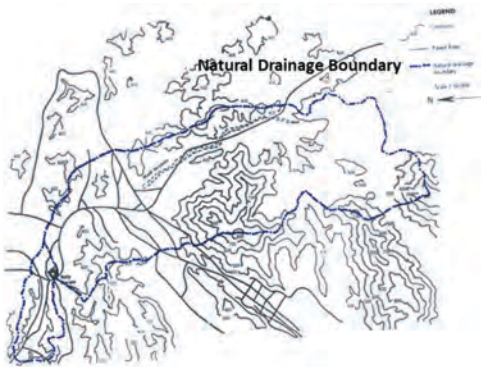


Fig (2.1)
Natural drainage boundary in the regional context of Makkah Almuqarramah (Koshak)

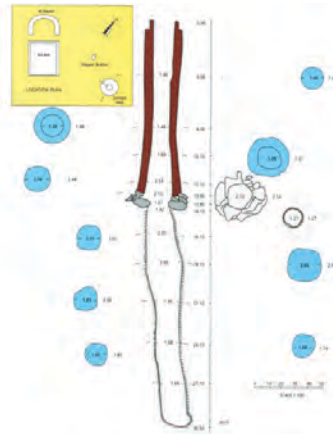


Fig (2.2)
Section across Zamzam well (Koshak)

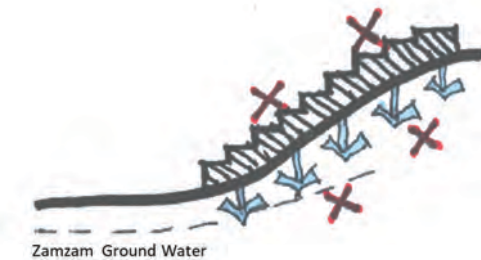


Fig (2.3)
No leakage from sanitary system

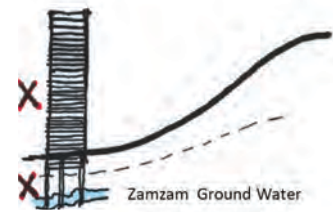


Fig (2.4)
No pile foundations

2.2 Guidelines for Controls related to Topography and Visibility:

In Urban design literature, controls are recommended, not only for protection of the natural environment and its intrinsic value, but also for harmonizing the urban environment with it, as well as protecting public rights to important views toward scenery and important landmarks, especially historic ones, which is more than justified in views toward the Holy Mosque. This recommendation can be realized through height controls, as well as space and mass controls that allow visual "holes" and "visual penetration" (11).

2.2.1 Grading of slopes should be limited to a height difference of 6 meters maximum (fig.2.5), in order to conserve topographic variations, and mountains.

2.2.2 Maximum height of buildings should not exceed 50% of the height of the Holy Mosque minaret (96m), nor 50% of the mountain height, whichever is shorter (fig.2.6). Heights of buildings directly in front of the Holy Mosque should not exceed its height (20m). Buildings on slopes should be terraced in moderate heights.

2.2.3 In relation to slopes, land uses are recommended to be commercial, with services and parking at the bottom and some mixed uses, but mostly residential on slopes, and only residential and hotels on top ridges (fig.2.7). In this way, decreased heights at bottom are compensated for by land uses of higher economic value, and views in general, and to the Holy Mosque in particular, would be maximized, Accordingly, overall investment would be both efficient and aligned with the design guidelines (fig.2.8).



Fig (2.5)

Minimizing cut, to conserve topographic variations.

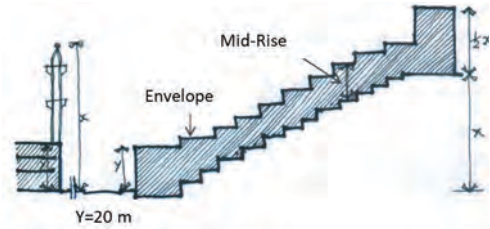


Fig (2.6)

Recommended height limits

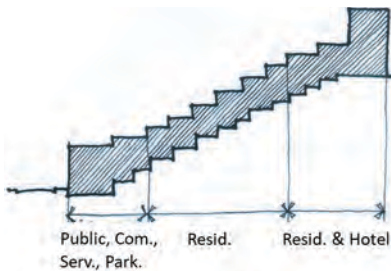


Fig (2.7)

Recommended distribution of land uses.

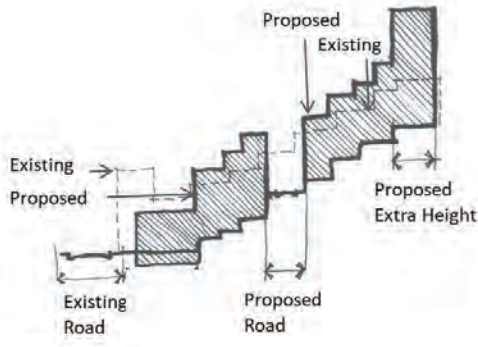


Fig (2.8)
Increasing overall investment efficiency, within other urban design guidelines

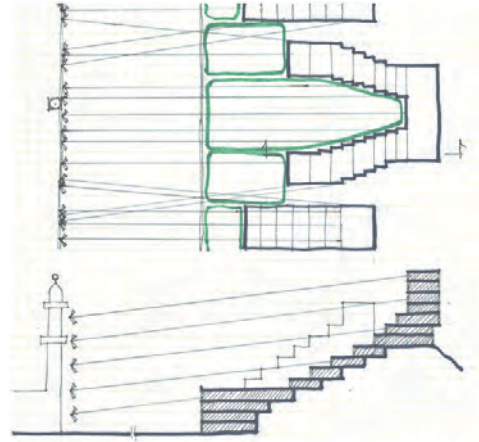


Fig (2.9)
Distribution of building masses & spaces to maximize views to the H. Mosque

2.2.4 Distribution of Building masses and spaces should be planned and designed, in the three dimensions, to allow maximum views toward the Holy Mosque and its minarets (fig.2.9.). This guideline should be linked to guideline 2.3.1. that deals with distribution of prayer areas in the context of the Holy Mosque.

2.3 Guidelines for More Efficiency & Humane Environment in Praying Areas, Extending from the Holy Mosque:

2.3.1 Maximum distribution of praying area within the urban fabric in general, and in the Central Area in particular, in open plazas, roofs, shaded arcades, and air-conditioned interiors. Innovative ways should be investigated for closing, opening shading covering, uncovering, multi-use at various times, and giant T.V. screens that illustrate group prayers in the Holy Mosque, and accordingly minimize the need for going to it, and leaving it mostly for Tawaf and Saai (fig.2.10).

2.3.2 Encouraging pedestrian movement especially from the under-utilized Holy Mosque roof to roofs of surrounding buildings, and decrease crowding in the over-used ground floor. This could also decrease the need for elevators (fig.2.11).

2.3.3 Maximize the use of bridge-like buildings (Sabat-Saqifa), that would lead to efficient utilization of land. Photo-Voltaic solar collectors, and plants (especially climbing on pergolas) are recommended for shading and decreasing the "heat-island" effect (fig.2.12).

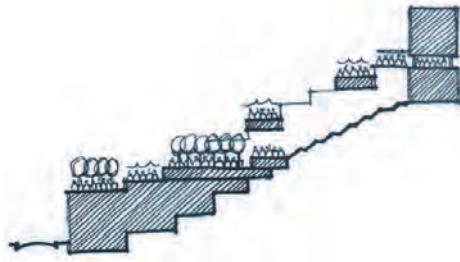


Fig (2.10)
Distribution of defined prayer areas, within the urban fabric

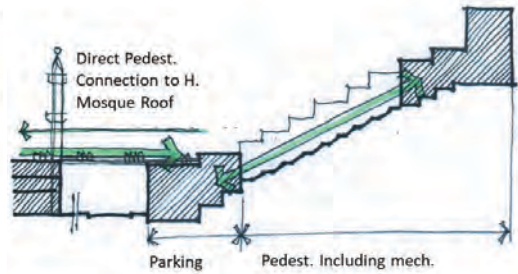


Fig (2.11)
Recommended movement system

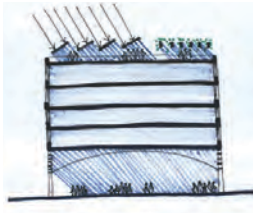


Fig (2.12)
Bridge-like buildings are recommended, in addition to P.V. collectors & climbing plants on pergolas, for efficient land utilization & shading.

3. Design Example:

The winning project of the international competition of Jabal Omar, designed by King Abdul-Aziz first team, August 2000, exemplifies much of the above mentioned guidelines, translated into urban designs and architectural designs (Fig. 3.1, 3.2, 3.3) (12)

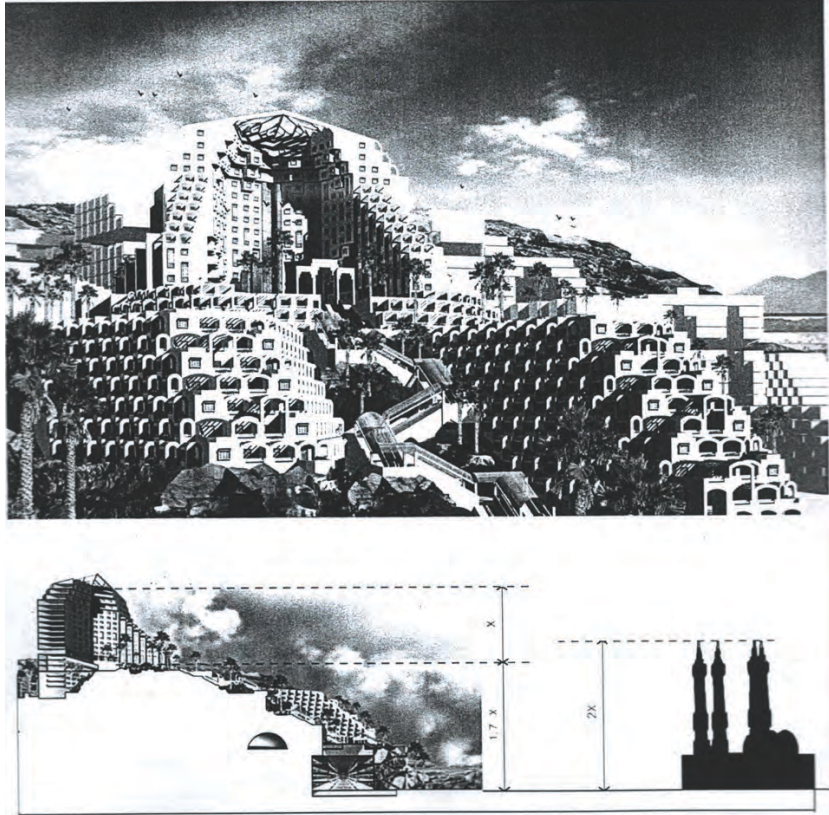


Fig (3.1)
 Jabal Omar competition winning project, Aug. 2000,
 perspective & section in relation to H. Mosque (Farahat)

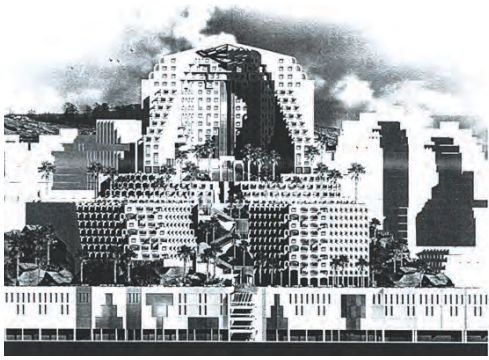
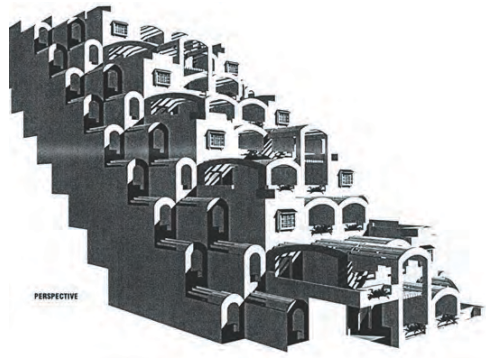


Fig (3.2)
Sub-area elevation of buildings on different levels (Farahat)



PERSPECTIVE

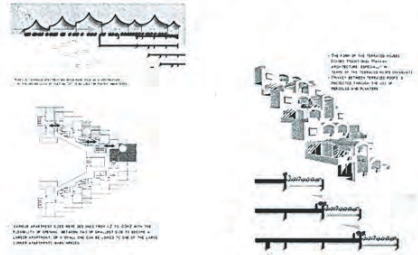


Fig (3.3)
Perspective & other drawings of a cluster on slopes (Farahat)

Conclusion:

The design guidelines presented are not, by any means, exhaustive. Wider scope and more detailed guidelines are still and will always be needed, and should be updated continuously. Zamzam water, in particular, needs more comprehensive and accurate guidelines, to define the safest distances, zones and foundation types in various situations, related to it. The presented guidelines can be directly useful for new developments. As for existing developments, a new set of guidelines will be needed, in addition to a case by case study and design. The cumulative effect of applying all kinds of guidelines would improve the present situation.

Wadis and tributaries, mostly not dealt with here, should be the basis of any future plans for the open space system of Makkah Almukarramah, in spite of the huge damage that occurred to them. Another important element of the urban /cultural identity of Makkah Almukarramah is its traditional alleys, that occur basically on tributaries, and range from quite residential alleys (devoted to their residences) to public mixed use alleys. Their urban character is enriched further by their intimate socio- cultural characteristics (13). Further research is needed to conserve the remaining, and to establish their sound contemporary alternative.

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MOSQUE ARCHITECTURE IN CONTEMPORARY POPULAR CULTURES A CRITICAL PERSPECTIVE



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This research paper claims that among important phenomena of several forms of contemporary mosques, there is a blurring of a clear distinction between their related 'popular/low cultural' and 'formal/high-cultural' status. For many centuries, high cultural mosques have followed 'formal architectural aesthetics', to the extent they've existed, which themselves have been shaped by specific sets of well-established design principles and elements, trends, styles, tastes, designs, etc. Parallel to that, mosques in a context of popular cultures have been shaped by folkloric signals, signs, and symbols, producing what can be called 'Informal aesthetics'.

The popularization of mosque architecture in various contexts of cultural communities has different expressions that blend and reflect that culture into mosques' architectural language and vocabularies. Consequently, the popular practice of mosque architecture is predominant, making concessions to the public's imagination and spreading various hybrid forms through folkloric practices, eclectic styles, populist architecture, hybrid architecture, and kitsch architecture, among other popular types.

The popular taste of mosque architectural aesthetics, with all of their vitality, reflection, expression, and sometimes their discrepancy, vulgarity, and use or misuse of signs and symbols "...expresses growing dilemmas to the contemporary mosque architecture" (citation?). While the aesthetics seem to have a certain appeal to many people, who enjoy their informality, they may embody a superficial, flashy, or exaggerated discourse to others.

Through a literature critical review, and through the analysis and examination of case studies of contemporary mosque architecture in popular culture communities, this paper attempts to explore the emerged popular architectural design approaches of mosques in the Muslim World.

Key words: Mosque Architecture, Popular Culture, High Culture, Architectural Aesthetics

Popular Vs. High Culture

The culture of any society is a synthesis of both tangible and intangible factors. It's a combination of the society's values, traditions, beliefs, social forms, and behaviors, among other factors. It is an evolving body, which affects and is being affected by different generations of societies exposed to different levels of education, economy, political factors, social classes, etc. In general, the culture of any society reflects people's various tastes in different aspects of life, such as music, art or even dealing with language vocabularies. Classification of people or groups of people within that culture often portrays the educational and socio-economic class of a certain person's category, or a community at large. Building on that, cultures can be measured through communities' responses to the same factors. For example, low culture might be more into popular/populist music, while high culture might be more into classical music. In this context, Gans (1999) stated that "Popular Culture and High Culture that the different classes of culture are linked correspondingly to socio-economic and educational classes."

In general, while *high culture* is often associated with the elite and intelligentsia social class of a given society, *popular culture* (also defined as 'low culture') is

often associated with the "mass appeal". The Sociology Dictionary defines 'low culture' as synonymous with 'popular culture' and in contrast it defines 'high culture' as "...typically associated with and consumed by the elites of society: the well-educated or wealthy". The IGI Global Dictionary defines low culture as "popular culture", as it is connected to the various art forms that are associated with the masses (non-elites). It is hypothetically "the anti-thesis of high culture".

High Culture in Architecture

High culture architecture is often shaped by a well-established set of design principles, such as proportion, scale, elements, aesthetics, etc. which typically reflects a formal architectural expression and language. It is also known as formal architecture, and can be seen or interpreted differently based on different concepts and perspectives. Many scholars, such as Daenekindt (2018) and DiMaggio, (1987) have stated that what constitutes high culture and who considers any given architectural object high is relative and “..demarcated from one another..”. What constitutes high culture architecture is the subject of debate, with some seeing it as new iconic buildings that have won competitions or prestigious awards, while others see high culture architecture as evidenced by old and heritage-quality buildings that typically reflect a society’s history and manifest its culture authentically (Spacey 2018). Oksala (1979) sees that one perspective on how to categorize architecture as formal is through structural systems, or through the hierarchical system of building forms.

Popular Culture in Architecture

To build on the notion of popular versus high culture, architecturally, this concept is represented by a form of manipulated artistic taste, and the reflection of common and widely circulated symbols among groups descended, and architects boast of showing them in outrageous or provocative ways. It seeks conciliation and success that lacks rationality and alters the sense of architectural aesthetics. Scholars, such as K. Michael Hays, see that there is a strong, established relationship between culture and form, in which the form is “...representing the value of the former” (Hays 1984).

Mosque Architecture: Elements and Principles

The architecture of Mosques is well established, and has been since the beginning of Islam. Starting from the Prophet’s Mosque, we can identify the essential elements of mosques: a physical place for praying (*Beit al-Salah*, or ‘house of prayer’), the mosque court (*Sahn*, a (typically) unroofed place for several activities of prayers), the *Qibla wall* that indicates the direction of prayer towards Mecca, and the *Mehrab* (a niche in the qibla wall) and often faced by an imam for leading group prayer in the Beit al-Salah (see Moenes (1981) and Al-Ali, N. & Al Ali, S. (2012).

By reviewing the essential elements of mosques, it is clear that other elements, such as minarets or domes are added elements to mosques that are used to identify them as Islamic landmarks. In current times, those added elements are critical parts of forming mosque architectural aesthetics and perceived image. In this context, Serageldin and Steele (1996), and Allahham (2019) agree that elements of mosques are not rigid; due to their social, cultural, political, educational roles (among others). Al-Wakil (1999) argues that principles of designing mosques were created by the use of “...symbols and cosmic geometry...”. Recently, they were developed according to emerged architectural trends, which have resulted in new mosque aesthetics and expressions. Aksamija, (2007) claims that design principles of mosques should be generative that they should, “...enable designers to develop a stylistic and conceptual continuity with the past...” in response to emerged social, economic, and political changes, among other factors.

Popular Mosque Architecture

This paper argues that popular architecture has impacted mosque architectural language and has resulted in emerged forms that reflect the various cultures of societies.

Reading through selected examples, the paper attempts to explore various languages and design approaches of different practices of popular mosque architecture that can be related to different orientations. Examples of mosques were selected based on diversity of geographical regions that result in a variety of cultural Islamic contexts, a diversity of scale, and being nationally or internationally valued and recognized. Fig.1 shows the selected case studies.

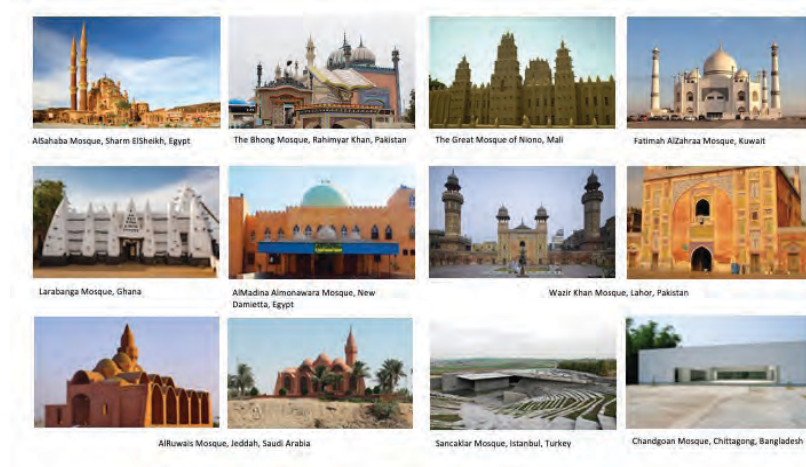


Fig. 1. Selected Case Studies

5.1 Wazir Khan Mosque

Location: Lahore, Pakistan

Construction: 1634-35

Architect: Hakim Ilmud Din

Value: On the UNESCO World Heritage tentative list. During the 17th century, it was the largest mosque in Lahore.

The Mosque has a unique façade that went through a restoration project funded by the Aga Khan Trust for Culture. The mosque façade makes the mosque "...one of the major monuments of the world." AKDN. The decorative façade of the mosque reflect a high craftsmanship standard that can be compared to traditional Pakistani Truck Art. It follows its patterns, divisions, and sophisticated diversity of Mughal delicate ornamentations (*kashi kari*), fresco painting, engraved stones, and brick. Fig. 2 shows the folkloric art used in the mosque's decorated façade and in the famous 'truck art' of the Pakistani culture.



Fig. 2. The folkloric art used in Wazir Khan Mosque's decorated façade and in the famous 'truck art' in the Pakistani culture.

The Wazir Khan Mosque can be then seen as a representation of Pakistani Folkloric Architecture as it reflects the art, crafts, and the most common local cultural signs and symbols.

As per the Oxford Dictionary, folklore is "the traditions and stories of a country or community". Merriam Webster states that folklore is related to "... traditional...tales...or art forms preserved among a people".

5.2 The Bhong Mosque

Location: Sadiqabad, Punjab, Pakistan

Completed: 1982

Architect: Local Master Masons and Craftsmen

Value: Aga Khan Award recipient

The Bhong Mosque combines different masses, functions, architectural styles, and vocabularies. The mosque complex includes a *madrasa* with classrooms for students. The mosque complex was designed and built over a fifty year period of time, where styles from Iran, Spain, Turkey, and India were borrowed and placed next to each other. Also, various traditional and modern materials and crafts from many countries were used to form the hybrid mosque complex. The mosque can be considered a Hybrid Mosque Architecture, as Hybrid as a term is defined as a mixture of different things, or as "something heterogeneous in origin or composition" (Merriam Webster).

The Bhong Mosque was described by the Aga Khan juries as adding taste to the "...Pakistani architecture with all its vigor, pride, tension and sentiment. Its use, and misuse, of signs and symbols..."



Fig. 3: The hybrid architectural elements and functions of the Bhong Mosque in Pakistan.

5.3 Al Ruwais Mosque

Location: Jeddah, Saudi Arabia

Construction: 1987

Architect: Abde-Wahed El-Wakil

Value: One of the landmark mosques in Jeddah city due to its design and location. The mosque was nominated to the Aga Khan Award for Architecture.

The design of Al Ruwais Mosque depends on "...prototyping the pre-modern architectural heritage of the Islamic world." It manifests a unique combination of perfectly integrated historical architectural vocabularies that were used in previous projects. In this context, Al-Asad (1992) states that "every one of El-Wakil's designs includes direct, and often literal, quotations from monuments belonging to the enormous corpus of Islamic architecture." Many scholars saw that El-Wakil's mosque's architecture is a rebirth of architecture in an Eclectic way.

Fig. 4 shows the reformulation of architectural vocabulary originally used by Hassan Fathy in the New Gournia Village of Egypt in 1948, for an environmental reason, which was similarly used by El-Wakil in the design of the Al Ruwais Mosque of Jeddah in 1987.

As per Merriam Webster, 'Eclectic' is "composed of elements drawn from various sources." Cambridge Dictionary defines 'Eclectic' as a combination of different things "...or systems, rather than following a single system."



Fig. 4: The left column shows Al Ruwais Mosque by Abd El-Wahed Al Wakil. The right column shows the New Gournia Village by Hassan Fathy.

5.4 Al-Sahaba Mosque

Location: Sharm El-Sheikh, Egypt

Construction: 2011- 2017

Architect: Fouad Tawfik

Value: Second largest mosque in Sharm El-Sheikh city. Due to its design, the mosque is very popular with both the city's tourists and residents. In addition, the mosque complex serves the national and international communities through its library, cultural and educational centers.

The mosque is inspired by the Ottoman style, yet it has many elements and details taken from the Mughal style (See Fig. 5). Although the mosque's domes are different in terms of design and number than the Dome of the Rock, their golden color mentally links both mosques to a near visual impression. Furthermore, the setting and the number of the mosque's domes link it visually with the Mohamed Ali Mosque, located in the Salah El-Din Citadel of Cairo. Hence, the mosque tends to be a clear example of Kitsch Architecture.

The term 'kitsch' is a rather vague term as it is interpreted differently by various scholars, and the term is often confused with the term "Hybrid". Vendrame (2021) states that kitsch architecture "...falsif[ies] history, freely mixing different styles and histories..." Trocka-Leszczynska, E. & Jablonska, Joanna. (2014) claim that kitsch architecture "...very often produces a style-less building decorated with pitiful imitations of what used to be good architectural solutions."



Fig. 5: The left column shows Al Sahaba Mosque, Sharm El-Sheikh, Egypt. The right photo shows Mohamed Ali Mosque, Cairo, Egypt.

5.5 Siddiqa Fatima Zahra Mosque:

Location: Kuwait City, Kuwait

Construction: 2008-2011

Value: The mosque has a capacity of 4,000 worshippers.

It is clear that the Siddiqa Fatima Zahra Mosque is similar in design to the Taj Mahal's Mughal Architectural style, which is also mentioned as part of its description. It follows the same number of minarets, domes, design, and materials of the Taj Mahal. Yet, building proportions, setting, and craftsmanship show that it is a mimicked copy of the Taj Mahal, its original reference.

As per Merriam Webster, mimicking something is to closely imitate it. Other synonyms of 'mimic' as an adjective include, "artificial, fake, false, simulated..."



Fig. 6 . The left photo: Siddiqa Fatimah Zahraa Mosque, Kuwait. The right photo: Taj Mahal, Agra, India

5.6 The Great Mosque of Niono

Location: Niono, Mali

Construction: 1973

Value: On the UNESCO World Heritage tentative list. Recently, it was restored with funding provided by the Aga Khan Trust for Culture. The mosque is also an Aga Khan Award recipient.

The Mosque is considered a model of authentic, traditional Malian architecture in the modern era, in terms of its form and use of traditional mud brick as a building material. Furthermore, through its spaces and functions, it retains the original cultural identity of Niono. The Aga Khan Award jury stated that the mosque represents "...the continuing existence of traditional form..." The mosque manifests an authentic Traditional Architecture that expresses community cultural identity.



Fig. 7: Left column: Niono Mosque architecture, "a continuing existence of the authentic traditional form".

Right column: Traditional architecture of Mali

5.7 Larabanga Mosque, Ghana

Location: Larabanga, Ghana

Construction: 1421

Value: Listed as a World Monument. The oldest mosque in Ghana. Also the most popular, the most visited, and the most valued mosque in Ghana.

The Larabanga Mosque follows a Sudanese architectural style. The mosque has undergone a thorough conservation project to reconstruct its collapsed minaret in its northwest corner to be the nearest point to Mecca. The original structure of the mosque was built using timber and earthen materials following a vernacular construction system. After restoration, damaged walls were restored using a mud-based plaster. A community participatory approach was followed by involving community members in the conservation work of the mosque, which has resulted in a "...newly trained workforce..." (World Monuments Fund).

Fig. 8 shows the masses and the form of the mosque after the restoration and conservation programs. The Larabanga Mosque is a clear example of a **Vernacular Architecture**.

Vernacular architecture is defined as the "...use of materials and knowledge of the region..." (citation). From a contextual perspective, it is also defined as local construction using traditional materials. Yet, the term 'vernacular' is sometimes used to indicate architecture without architects, in which it also indicates a spontaneous approach to construction in which the construction work is performed by the community.



Fig. 8: The restored and conserved Larabanga Mosque in Ghana as a clear example of Vernacular Architecture.

5.8 The Green Dome as a Symbol of Sacredness

Several mosques are designed based on the intentional use of signs, symbols, or colors that recall iconic, sacred or highly-valued mosques, such as *Al-Haram Al-Sharif Mosque* in Mecca, *Al-Masjid an-Nabawi Mosque (Prophet's Mosque)* in the sacred city of al-Madinah al-Munawwarah, or *Al-Aqsa Mosque* in al-Quds (Jerusalem). In some popular contexts, mosques with green domes are appreciated as they are mentally linked with the sacredness of the Prophet's Mosque. Fig. 9 shows several examples of using a green dome as a symbol and sign to the sacredness of the mosque.



Fig. 9: The left photo shows the formal aesthetics of the Prophet's Mosque, al-Madinah al-Munawwarah. The right column shows the informal aesthetics of populist expressions of mosque architecture.

Examining those mosques, we find that the uses of the green domes are not following any standards of proportionality, positioning, or overall aesthetics of their reference, in which they give the viewer the impression of fake or naive copies, producing what can be labeled 'informal aesthetics', following a **Populist Architectural Approach**.

While 'popular' is related to aesthetic tastes, understanding, or means of the general public, Alsoltani (2013) claims that 'populist' is a concept that promotes simplistic solutions that are usually fake or false, unhelpful to the complex problems facing their societies. Populist notions glorify "vulgarity" and make a mockery of serious solutions. The concept of 'populist' is different from 'popular,' which is, according to the Cambridge English Dictionary, an adjective meaning "liked, enjoyed, or supported by many people." (Cambridge Dictionary; n.d.)

5.9 Chandgaon Mosque

Location: Chittagong, Bangladesh

Construction: 2007

Architect: Kashef Mahboob Chowdhury

Value: Shortlisted for the 2008-2010 Aga Khan Award Cycle.

Chandgaon Mosque was designed to be a spiritual place as well as a community gathering place. It has a simple, yet very strong, geometrical form of two identical cuboid structures that fulfill all the required design elements of a traditional mosque, while at the same time refraining from being just another typical mosque in its design. The mosque was designed to be a clear, stark, geometrically bold architectural statement, rendered in a contemporary way to promote the "...desire to live in spaces that reflect the universal values of the present day..." (See fig. 10). The mosque is a clear example of an **Emerged Mosque** design thinking.



Fig. 10: Chandgaon Mosque, Chittagong, Bangladesh is a bold statement of an Emerged Mosque architecture.

5.10 Sancaklar Mosque

Location: Istanbul, Turkey

Construction: 2012

Architect: Emre Arolat.

Value: Received several awards, such as the Religious Building of the Year Award from ArchDaily.

Sancaklar Mosque reflects the architect's philosophy of distancing his mosque design from the dilemma of the architectural form; yet "...focusing solely on the essence of religious space." Arolat intended to confront the typical classical Ottoman Mosque architecture: "The disappearance of the building in the slope of the site,...getting rid of all temporal and cultural engagements were aimed."

The mosque structure blends in with the surrounding topography and site landscape, and therefore "...delivers back the form of the ground, avoiding the chaotic outer world." See fig. 11.

Sancaklar Mosque with all its philosophies, aims, and design product manifests an **Emerged Mosque Architecture** approach based on new design fundamentals. It emphasizes a sense of place, and explores a unique spatial experience over the conventional classical approach to mosque design.



Fig. 11: Sancaklar Mosque blends in with the surrounding topography and landscape of the site.

Conclusion

Throughout the course of this research, ideas and assumptions of mosque architecture in various popular cultures were discussed and analyzed. The popular taste of mosque architectural aesthetics expresses growing dilemmas to the relative taste of contemporary mosque architecture. While they seem have appeal to many people who enjoy their informal aesthetics, they may embody a superficial, ostentatious, and exaggerated discourse to others. This paper analyzed various languages of different practices of popular mosque architecture. It attempted to classify those languages into different approaches.

Popular mosque architecture is guided by a variety of approaches in different cultural contexts. Yet, more approaches to achieve a popular mosque architecture can be further explored and discussed. Figure 12 summarizes the guided approaches of designing popular mosques that were discussed in this research paper.

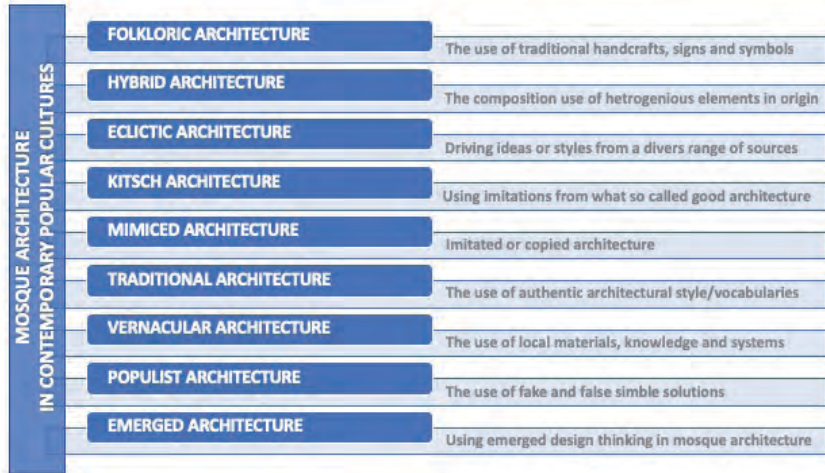


Fig. 12: The Guiding Approaches of Mosque Architecture in Contemporary Popular Cultures.

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By the author



UN-HABITAT APPROACH

**FUTURE MASJIDS: RETAINING
A SUSTAINABLE COMMUNITY
CULTURE
BY GOING BACK TO THE
ROOTS OF DESIGN**

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Introduction

The aim of this paper is to present the UN-Habitat vision and approach for future mosques to return to their roots, for mosques to become multi-functional, sustainable, contemporary mosques while incorporating their original functions. Encouraging future mosques to take a pioneering global step at all levels: 1- Electricity Rationalization, 2- Water Rationalization, 3- Water Treatment and Recycling, 4- Watering the Plants in the Mosque's Garden, and 5- Mind the Gap.

Keywords: Mosques, Masjid, Sustainability, UN-Habitat, Culture Centres.

The etymology of the word 'mosque' tells us that it is from the Arabic word *masjid / jāmi'* (place of prostration / Congregation Place), meaning the place where people place their forehead on the ground in the act of *Sujūd* (prostration) during their *salat* (prayer) facing the direction of *qiblah* (direction of the Kaaba in Mecca, in the Kingdom of Saudi Arabia (hereafter, 'KSA')). According to Islamic historic literature, the first masjid was constructed during the lifetime of the Prophet Muhamad, called Quba Masjid, romanized: *Masjid Qubā'*, at a location six kilometres from Medina, see Figure (1). It was designed to serve several functions, but its primary purpose was as a place to worship Allah and as a learning centre to spread knowledge. Back then, with no cultural activities available, the masjid served as a multipurpose hall and a place of worship. In the following centuries, the mosque's role in society expanded and new types of ornamentation were introduced in the masjids constructed.



Figure 1:
Quba Masjid in
KSA and modern
mosque in
Kuwait.



The masjid's role was as a community social hub, with its traditional set-up developed in many areas worldwide, especially in remote villages where Islam was newly spreading. However, in the past few decades, we see the typical masjid's social function receding, becoming more of a place of daily prayers and serving during the Islamic holy month: Ramadan prayers, as well as Eid Al-Fitr and Eid Al Adha prayer. Masjids borrowed their designs and building materials from local sources in the countries they were built until we saw newly constructed masjids with impressive unique structures and designs, see Figure (2).



Figure 2:
Uniquely
constructed
mosques
reflecting
societies'
cultures.

As Islam, in essence a transnational culture that dissolves different races within itself to form one united community of believers, the masjid represents the culture of the people who construct it in addition to its original function. One can see that all masjids of the world have a 'Mihrab' constructed in the direction of the "Qibla- Makkah". They all include the basic elements of this building as a place of worshipping Allah, and they never changed their fundamentals throughout history. Nevertheless, their building materials, artistic design, and social perspective depend on the region where they are built. The different building styles of some masjids led them to become more like monuments or international attractions rather than a place of worshipping Allah, either due to their ornamental interventions, or because they became home to tombs of famous historical figures, or for some other unique feature. Unfortunately, in some segregated areas, abandoned mosques attracted extremist young people who criticised their communities and could not build a shared understanding with their peers. see Figure (3).



Figure 3:
Jame Alhassan
Althani Mosque –
Morocco.

As new cities developed, the number of masjids in each city has grown significantly, dramatically increasing the amount of electricity and water consumed. Each masjid impacts its city's infrastructure and causes environmental pollution.

Now, there is an opportunity for the mosque's role to switch from depleting resources to becoming a sustainable tool that helps combat climate change and positively contributes to the greening of cities and even improves the general public's health where possible, see Figure (4).



Figure 4: Simple mosque interventions can help it achieve Agenda 2030 Sustainable Development Goal (SDG) targets.

So, based on sustainable architecture expertise, what could be the best sustainable design solution for a masjid to achieve the above goals?

Project description

This UN-Habitat project aims to turn back to the original functions of the masjid, i.e., a place for congregational prayer, prostration, and education while sustaining modern living standards. The above can be achieved by designing and constructing a cultural community religious centre with a sustainable, Earth-friendly environmentally-conscious architectural design.

The project's goal is to support a societal culture of tolerance, coexistence, knowledge, health, and sustainability. Replacing the existing vast divide in society caused by the limited number of places for family activities and the shift of societal practices from daily social interactions into depending totally on media in everyday practice.

Since the inception of modern states, governments have constructed formal public schools with facilities, including school instruction rooms, portable rooms, playgrounds, libraries, prayer rooms, dining halls, open green areas, etc. At the same time, modern governments have constructed museums, social centres and other social facilities like public libraries, confirming the importance of cultural and social centres and their constructive role in society. With non-conventional media growing, libraries and museums lost their appeal.

Therefore, there is a need to make those places turn back to their original roles by introducing alterations to their design or making them a part of other matrices to reclaim their role. Adding mosques to the portfolio of cultural family centres can help communities respond to our modern era's challenges and opportunities. Mosques can also help achieve each society's Islamic identity, seek knowledge, and maintain cohesive families through the practice of cultural activities, etc.

Nowadays, day schools, libraries, mosques, and various museums, have come under the government's jurisdiction. Moreover, modern families' activities are restricted to commercial complexes, as they are spacious and provide entertainment and physical comfort in hot (or cold) weather. However, there is a difference in how various commercial complexes provide services to families. As a result, it is necessary to build new cultural centres in newly developed areas of each country.

More of the masjids these days are financially unsustainable and large portions of their budgets are "for salaries and maintenance and cleaning." We need to work to reduce the burden on the government by engaging the private sector.

This project aims to build a religious, cultural, and community centre that supports the achievement of the sustainable development goals (SDGs) and the New Urban Agenda and consolidates the principles of religious moderation. These centers will include sections that serve community members in a way that ensures equality. At the same time, it encourages the development of a more moderate religious culture and identity and develops societal awareness of critical global issues such as clean energy, sustainable consumption, creativity, and innovation. The building will be designed based on sustainable design principles while considering the requirements of all the target audiences / users of the centre. The centre will also include electronic offices and modern publications to promote a culture of reading and literacy.

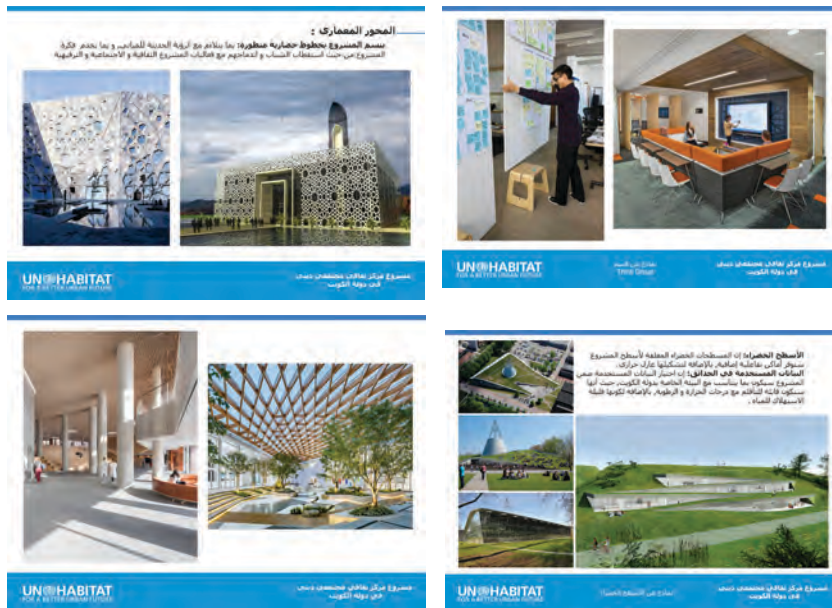


Figure (5):
The five pillars of the Culture Centre: social – environmental – religious – cultural – community service.

To encourage city dwellers to visit the cultural community centre, it will be designed to serve the diverse needs of the different members of the community. Architectural experts from the United Nations Human Settlements Programme, UN-Habitat will be used to design each side of the main building in the form of an icon and a distinctive architectural masterpiece that responds to the nature of the local weather and works to combat the effects of climate change and reduces, as much as possible, the impact of extreme (high or low) temperatures by adding shaded areas and increasing the green area through re-use of grey water, see Figure (6).



Figure 6:
Masjids becoming a community attraction, a source of knowledge, and saving the environment.

The grey water usage will contribute to irrigating open public spaces in the surrounding area and mitigating the effect of climate change, see Figure (7).



Figure (7):
Masjids contribute in rehabilitating soil and combating climate change effects.

The United Nations Human Settlements Programme (UN-Habitat) is one of the United Nations' specialised agencies mandated by the United Nations General Assembly to support socially and environmentally sustainable cities and towns. It is the focal point for all issues related to urbanisation and human settlements within the United Nations system. More than ever before in the history of humanity, this represents a unique opportunity to mobilise and prepare members to achieve their countries' economic, social, and environmental goals. For young people to achieve their future aspirations, they need to learn ways to become innovative, sustainable solution makers to resolve their communities' challenges and respond to opportunities.

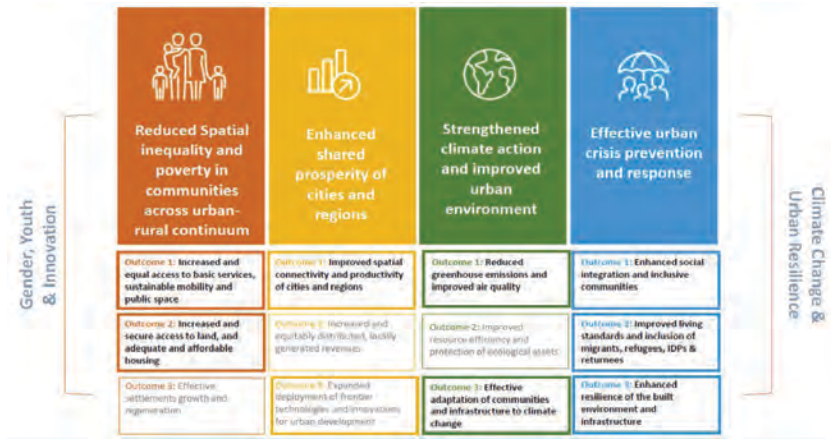
Therefore, the most appropriate solution here is to provide continuous education and training appropriate to their abilities and in connection with local needs. Studies have found that young people see prosperity as beneficial to them and their cities. This can only be possible through education and democratic culture, which achieves equitable urban development for all, ensuring no one is left behind. Young people must be involved in different activities and streams of education that respond to the present and future needs of the labour market, as well as sports activities that improve public health. Closing the gap in education means that all learners will be provided with a fair chance for professional and scientific experiences, enabling them to realize their dreams.

This project aims to provide a knowledge and education environment for youngsters, to serve them by training them to acquire the soft skills that they will need in their daily and professional lives. The training will also complement the spiritual, psychological, mental, and physical aspects of what other authorities provide to the state.

Each cultural centre will achieve the following outcomes:

- 1- Provide easy access to recreational time and general culture that achieves the seventeen Sustainable Development Goals of Agenda 2030 and the New Urban Agenda (NUA).
- 2- Develop a participatory culture that promotes change.
- 3- Spread a democratic culture among all users of the centre.
- 4- Combat the effect of climate change; effect and achieve gender equality.
- 5- Achieve Agenda 2030 SDGs with a particular focus on SDG11.

Figure 8:
The project achieving Domain of Change (3) Strengthened Climate Action and (4) Effective Urban Crises prevention as part of UN-Habitat Strategic Plan 2020-2023.



The project will begin by surveying users' opinions about their current and future needs so that the project will be a new addition to the existing centres in their home country. Then the experts of the United Nations Human Settlements Program (UN-Habitat) will begin designing the centre that is a bridge through which the government's vision, Agenda 2030 goals and the NUA will be achieved (see Figure 9).



Figure (9):

The project's link to the Sustainable Development Goals and related targets

Goal 11 (SDG11) – Make cities and human settlements inclusive, safe, resilient, and sustainable. 11.4 Strengthening efforts to protect and preserve the world's cultural and natural heritage

For capacity building, the employment of local youth in an international project like this one, under the supervision of United Nations experts, will enhance their work experience and qualify them at the end of the project to carry out similar projects anywhere else in the world. This kind of training covers both vocational and technical skills to increase the scope and level of expertise.

The process will not stop at the end of the project. However, the project can be further developed with additional elements related to conserving the environment and reducing the consumption rate of energy so that new additions are introduced with newly discovered sustainable technologies. The project will also be documented and introduced to the general public through the national reports of the United Nations as it achieves sustainable development goals.

The United Nations Human Settlements Program, UN-Habitat, is keen to maintain continuous and close communication and consultation with stakeholders in local governments, strengthen partnerships, enhance people's confidence in government, and encourage them to innovate work in a

sustainable manner. The following steps should be taken to achieve the project objectives:

- Monitoring and measuring the intellectual and youth societal trends related to culture and innovation and the current gap so that the most critical needs are known and identified, whose monitoring will be reflected in the implementation and design of the mentioned cultural centres.
- Designing and implementing cultural centres for activities suitable for all social groups and all ages. There are currently public libraries in many cities in the world. However, the cultural centres sought by the United Nations Human Settlements Program (UN-Habitat) will be distinguished from the conventional library in that they are multifunctional, serving society members to encourage family engagement and at the same time create an atmosphere conducive to promoting the culture of the community and the community practicing collective hobbies, e.g., sports, walking, and sitting in a healthy and safe atmosphere.
- The design task will be entrusted to architects agreed upon by all the project's parties, who will ensure that the buildings are designed at a high level of quality, architects that make use of innovative models that achieve sustainable development goals. Those pioneering designs will be the first of their kind, making the buildings achieve the Net Zero Carbon emissions target and reduce the impact of dust-inducing winds, contributing to rationalizing energy consumption, and increasing green areas (see Figure 10).

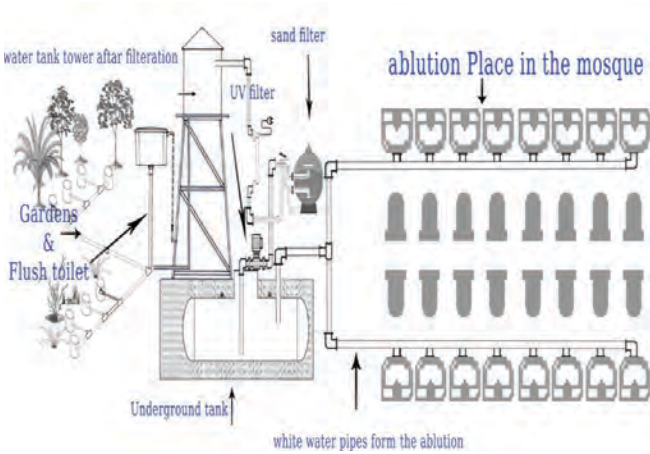


Figure (10):
White water 3-way filtration and watering of the mosque's garden plants¹

- The implementation process will be subject to high-quality standards, starting with the appointment of site engineers who provide daily supervision to verify the quality and progress of the work according to the agreed upon schedule and who submit interim reports on the progress achieved. Also, the signing of contracts with contractors is carried out according to a specific mechanism, and payments will be made after ensuring targets are met following a strict timeline and quantitative technical specifications as per the United Nations

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Human Settlements Program (UN-Habitat).

- One of the distinguishing aspects of UN-Habitat projects is that all contracts are legally and technically verified and are subject to continuous scrutiny. Also, each project is supervised by the country office to ensure proper work progress.

- Periodic reports will be prepared according to the length of the project schedule and submitted to the main funding body.

- At the end of the project, it will be presented on various United Nations platforms as an example to implement all sustainable development goals and the new urban agenda.

Finally, it is worth mentioning that every project feasibility study includes sources of risk and risk mitigation methods to ensure successful implementation. The source of risk for this project lies in securing funding due to donors not realizing its benefit to society and the environment. Therefore, transparency in sharing information about this new approach to building sustainable religious centres will surely lead to a better understanding of its benefits and obtaining funds.

Conclusion

This pioneering project responds to increasing societal demand for science, knowledge, culture, and family communication in a healthy, safe, and sustainable environment and creates job opportunities, as it will provide new job opportunities for youth to develop their expertise in sustainable architecture.

The nanotechnology revolution has enabled us to build complex buildings at an unprecedented speed in a historically unprecedented manner. It has also increased the isolation of community members, and it has become our duty to identify innovative ways to build more sustainable buildings, including worship places that help restore societal cohesion while preserving both the environment and heritage. Taking these brave steps will earn us the respect of future generations who will inherit the Earth from us.

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INTERACTION BETWEEN LOCAL TRADITIONS AND THE UNIQUENESS OF PERSONAL STYLE: MIMAR SINAN'S POTENTIAL WORKS IN BAGHDAD



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Abstract:

It is known that Ottoman architecture evolved as a result of the interaction of Islamic architectural styles with Byzantine architecture, led by a group of genius architects, and without a doubt Mimar Sinan was the most famous and most productive of them, with his work spanning most of the 16th century – the works designed by Mimar Sinan are widespread. Sinan supervised the implementation of his designs from Istanbul, the capital of the Ottomans, as well as from many other cities under Ottoman rule.

The general research problem: There are works attributed to the architect Sinan in the city of Baghdad, the capital of a former caliphate and the source of development for various aspects of Islamic civilization. Historians and architects differ in their opinion of him, some are supporters, others opponents, over the years some have changed their opinion of Sinan, others no longer have an opinion. Of those works attributed to Mimar Sinan, most appear similar to local Iraqi architecture, and their appearance differs from classic Ottoman architecture.

Research problem: There is a lack of clear architectural methodology or theoretical framework to verify the relevance of these works to Mimar Sinan and there is a lack of understanding of the design strategies he used, or how Sinan dealt with the local traditions of cities conquered by the Ottomans.

Research objective: This research aims to investigate the validity of attributing some architectural works in the city of Baghdad to the Architect Mimar Sinan, then build a theoretical framework that summarizes the most important architectural characteristics compatible with Sinan's style, as well as developing a framework that summarizes the architectural characteristics of the local Iraqi architecture., enabling practioners to distinguish between the works of Mimar Sinan and local Iraqi architects.

Main research hypothesis: This research assumes that Mimar Sinan used design methods in cities with a rich cultural heritage different from the cultural environment of Istanbul or other major cities in the heart of the Ottoman Empire. Sinan tends to interact more with the local climate, prevailing local materials, and local construction techniques.

Research methodology: The detection method in this research does not depend on the typical historian's methodology of investigating texts and historical facts (despite the importance of texts, many of these texts are conflicting). Rather, a theoretical framework is built that summarizes the architectural characteristics of Mimar Sinan's style. The characteristics are extracted from a study of his most important works and the most important characteristics of Iraqi local architecture at the time, then the framework is tested against the works attributed to him in Baghdad. This work will focus on: 1) analyzing the architectural space and its proportions, 2) identifying the methods of treating architectural mass and elements, structural materials, and systems, and 3) comparing those characteristics of Sinan's work with local Iraqi architecture, with masterpieces in particular, and the Ottoman architecture in general.

Keywords: Mimar Sinan, Baghdad, Iraqi architecture, Abbasid Architecture, Ottoman architecture, architectural analysis, Cultural interaction

PREFACE:

Architectural styles of the Islamic world are crystallized over time because of their citation and interaction with other architectural styles of civilizations prior to or contemporaneous with Islam. (Hoag,1977, preface) Many researchers agree that the beginning of the 3rd Hijri century represented a historical moment that produced what can be called the 'Classical style' of Islamic art and architecture in the world (Grabar,1973, p.266). That style found its most important and greatest examples in both Abbasid capitals – *Baghdad* and *Samarra* – and from this archetype, Classical style, the rest of the architectural models quoted and developed in all regions of the Islamic world evolved (Ibid,p.212).

Baghdad is unique in the Islamic architectural imagination, and in a unique position, as for five centuries in the Middle Ages it was the capital of the Islamic caliphate. At the same time, Baghdad represented the cultural capital in which various aspects of Islamic civilization – ideological, theological, literary, and artistic – developed and which were transmitted to all parts of the Muslim world. Although Baghdad was conquered by the Mongols in 1258 A.D., and subsequently experienced a long period of distress and instability, but its image from the Golden Age of Abbasid remained, and that image held by *Ummah* (the Muslim world) of Baghdad from that five century period remained (Cooperson,1996, p.111).

Ibn Battuta, who visited Baghdad in 1326 AC after the Mongol's invasion, introduced the city by calling it, "The City of Peace, the capital of Islam, noble rank and conspicuous virtue, the resting place of the caliphs, and the home of scholars" (Ibn Battuta,1964, P.221).

The Islamic civilization reached a new peak at the beginning of the sixteenth century. It was compared by many researchers with the European Renaissance, which emanated from Italy. So, the period can be termed the 'Islamic Renaissance', which ended with the reign of Sultan Suleiman the Magnificent. In his time, the evolution of architectural style reached its peak with Mimar Sinan, which points to the existence of open, unprecedented cultural interaction. Despite the spread of Sinan's works over most areas of the Sultanate from the Danube to the Tigris, Sinan's works in the Middle East (especially at the beginning of his career, before becoming the Chief Imperial Architect) and when he accompanied the Sultan Suleiman in his campaign in Iraq and Iran in 1534-1535 his work was essentially unknown: Sinan had not been referred to and his work had not gotten the study it deserves (Goodwin,1971, p.200) (Freely & Burell,1992, p.15).

The conqueror Sultan Suleiman the Magnificent entered Baghdad in 941AH/ 1534 AD. Later, the Safavid state acquired the city in 1032 AH/1623 AD. Still later, Sultan Murat IV reopened Baghdad in 1047 AH/1638 AD, leading a military campaign.

The exceptional importance of Baghdad for the Ottomans lies in its religious and political situation evolving in the Islamic collective memory, as described above. In addition, Baghdad's reputation as a scientific and spiritual center, as well as it being the home of the tombs of a large number of scholars and Imams of Sufism made Baghdad the place to which the court of the Ottoman Empire tried to emulate.

Baghdad is where the Hanafi school of Islamic thought emerged, and contains the tomb of its founder, Abu Hanifa Al-numan'. The Sultanate adopted the Hanafi school as its official doctrine (Imber, 2002, P.225). The Ottoman sultans were engaged in conducting the Sufi, which is called the Vefaiyye Order, due to Abu al-Wafa of Baghdad, who died in 1107 AD (Ibid, P.124).

As the Ottoman sultans were the inheritors of the Abbasid Caliphate (after they made Istanbul the center of the Islamic world), they were keen to join the two capitals of the Abbasid Caliphate – Baghdad and Cairo – a symbol of the legitimacy of their caliphate (Aktur,1987, p.99).

According to folktales about certain parts of the Sulaymaniyah Mosque in Istanbul had been brought in from Baghdad, this indicates the status of Baghdad in the eyes of Sultan Suleiman the magnificent ⁽¹⁾.

Literature Review

So, when Suleiman the Magnificent entered Baghdad in winter 1534 and stayed there until spring 1535, the city had been hit by devastation – wars and sedition – and no architectural landmark remained. He has given his order to reconstruct the Imam Abu Hanifa Mosque and Tomb (Turbe) (Al-Azzawi, العزاوي, 1949, p.447), and reconstruction of Madrasa and (Turbe) of Sheikh Abdul Qadir Al- Jailany. Some sources mention that this task had been entrusted to Mimar Sinan in 1535 (before assigning him as a chief Imperial Architect) when he was working as an Engineer in the Ottoman army. Also, some of those sources attribute the construction of the Mouradia Mosque to Mimar Sinan at a late stage in his career in 1570 during the reign of Sultan Selim II.

The construction of the works above in the list of buildings that have been built or supervised by the architect Sinan was mentioned in his book (Tazkirat Al-Abniyah), however, the sources ⁽²⁾ about the subject are rare and there is no architectural researches to analyze those buildings and to indicate Sinan's original and innovative contribution in their construction. The famous sources, in general, about Islamic architecture neglect mentioning the architecture of Baghdad in the Ottoman period and there is not any direct or indirect statement like in the study of (Hoag, 1977) and the study of (Papadopoulos, 1976) or the study of (Michell, 1978) or the study of (Hillenbrand, 1994) with a reference to the last three studies. They include broad and very rich appendices of architectural work from different countries of the Islamic world, but this reference was missing even in encyclopedias of Turkish Architecture (written in the Turkish-language, for example the study Aslan Apa-1971) does not address the architecture of Baghdad in the Ottoman period, in spite of dealing with a broad spectrum of ages and regions. The study of (Kuran,1987) addresses these works attributed to Sinan in Baghdad without mentioning the details or analysis.

There is a description of these buildings at the website [Arch.net](#), (specialist in Islamic architecture), but without mentioning the architect, or any document, whether pictures or drawings. While the website of the institution [GEKUL Foundation](#) which is interested in the work of Mimar Sinan, states that he has buildings in Baghdad without giving any information or details on the subject.

As the Arab sources - in particular the Iraqi ones - have the following attitudes towards Sinan's works which are:

First: Refusing to relate such works to Mimar Sinan: as in the study (Al-Kusairy القصيري, 1981), which deals with building and development of Al- Muratiye Mosque historically and archaeologically. The study of (Al-Samarrai السامرائي, 1994) deals with the description and analysis of the Dome of the Mosque of Sheikh Abdul Qadir Al-Jailany.

Second: the sources that did not show the relationship of these works to any architect and just launched the description "Iraqi architecture". Such sources provide photographs, simple diagrams and explanation of those buildings such as the study of (Salman & other سلمان وآخرون, 1982) and the study of (Al-Janabi الجنابي, 1985).

Third: the sources attributed the mosques "Abu Hanifa, Al-Jailany and Muratiye" to Mimar Sinan, such as the study (Mahfooz محفوظ, 1985), who just attributes such works to Sinan without a prescription or analysis. In addition to studies of (Youssef يوسف, 1982) and (Al-Adhami العظمي, 1971) and (Al-Mohadh Al-Jailany الكيالتي المحض, 1994) which attributed Jaylani Mosque Dome to Mimar Sinan.

However, all the above sources, in spite of their differences in attributing these buildings to Mimar Sinan, agree on the dates of construction and that the mosques "Abu Hanifa" and "Al-Jailany" had been built by order of Sultan Suleiman the Magnificent during his personal visit to Baghdad when he opened it.

Other observations about these sources are that they were written by researchers in history and archaeology who follow the historical method in the investigation and the adoption of achievement and the likelihood of texts and historical and archaeological documents.

Another problem that faces the researcher in the history of these buildings is that such buildings had been applied continuously and through the ages to processes of renovating, addition, modification, and reconstruction. Up to this day, in fact, the sources differ in mentioning all such works so it causes difficulty for the researcher in the accuracy of identification of the original parts in the midst of such additions or the identification of the degree of such changes to which the original parts were exposed during the renovation and reconstruction.

The other problem facing the researcher is the paucity of architectural documentation of such buildings. Most of the above sources depend on the verbal description with a few of pictures, some of which depend on the plans, without elevations, sections or details and which are processed from the administrations and offices of archeology and seem that they are painted by non-specialist surveyors except (Al Kusairy study, 1982), which provided additional schemes for Al-Muratiye mosque (plans, section and elevations) and the study of (Al-Samarrai, 1994) which adds the scheme to the dome of Al-Jailany mosque only. Both studies of the archaeological researchers determine the aims of the research ⁽³⁾:

"Despite the relativity and uncertainty of attributing these works to Sinan due to the scarcity and weakness of documentation in this area and the conflicting opinions about it, as we noted from the discussion of previous literature on the subject ... However, there are historical facts that confirm the importance and position of Baghdad among the Ottoman sultans, which supports the narrative that Buildings of specific religious and spiritual significance in Baghdad are attributed to him ... whether he was present directly or through his assistants" (citation)

What confirms this unique position of Baghdad is that Sultan Murad IV did establish the kiosk of Baghdad. Top Capi palace represents a symbol of the victory of the Sultan of Baghdad returned to the rule of the Sultanate, as well as the judges (alquda) from Baghdad and Edirne, Cairo, Damascus, and Barsa consider the basic references with Istanbul for the whole Sultanate (Imber,2002, p.232), all the above clarified the political, spiritual and symbolic importance of Baghdad for the Ottomans.

From All Above:

THE RESEARCH OBJECTIVES ARE DEFINED AS FOLLOWS:

First: The research aims to address the architectural works of Sinan in Baghdad, according to documentary methodology to the definition of the research community who are interested in his works, and try to diagnose what had remained and added to this work through a critical and analogical vision for archaeological and historical texts dealing with that period of Baghdad

Second: - The research aims to diagnose the local features of these buildings and try to isolate them from the distinctive style of Sinan in his masterpieces, and how he integrated these characteristics with his special and unique style to produce this unique architectural whole which reflects his deep understanding of local traditions. We have followed an analytical approach comparing these works and Baghdad architectural heritage, which was the former to Sinan, on the one hand, and on the other hand, compared with his other works, especially in the states of the Middle East neighbors (such as Aleppo and Damascus).

Third: - The research aims to identify how Sinan's works affected the subsequent buildings in Baghdad, and how the local architecture evolved after that.

BUILDING THE CONCEPTUAL FRAMEWORK FOR THE RESEARCH:

To achieve these aims above, we will adopt a methodology which is based on the comparative analysis of the architectural characteristics of Sinan's works in Baghdad on the one hand and his works in the capital, Istanbul, and the rest of the provinces, on the other hand.

Before that, it requires the analysis of the architectural characteristics of the architecture of Baghdad before the advent of the Ottomans, to determine the change which took place with Sinan and how these effects continued after that.

Baghdad Architecture Before the Ottoman Conquest:

Based on that, the architectural features of Baghdad before the Ottoman era can be summarized as follows:

1. Type of Plan:

The type of plan prevailing in Baghdadi architecture is **Hypostyle**, and it is clear from the re-drawing and the re-imagination in both studies of Herzfeld and Creswell and as in the re-imagination in the study of Jawad & Sousse, 1966 for the first mosque built in (The Round City Of Baghdad) was built next to the palace in the middle of Baghdad (it was expanded later to the north within the Palace). It consists of two courts and two hypostyle Halls (Jawad, Sousse, 1966, P.7-13). The remnants of the Great Mosque and the Mosque of Abu Dalaf in Samarra describe that its plan was hypostyle (Al- Ameen ^{علي}, 1976, P.188) as Jami Qumriya, which dates back to the end of the Abbasid period, is hypostyle (Salman & others, 1982, P.205). There is no conclusive evidence on the use of the dome above the "mihrab" (place of praying of Al-Imam), this period witness emergence of (Iwan plan) in the architecture of schools, such as the Mustansiriya school (Al-Janabi, 1983, P.73) and Al-madrassa al-mirjaniya from the Jalairid era (Ibid, P.113).

2. Structural System:

The structural system in Mesopotamia since ancient times depended on Load Bearing walls and Vaults which were based on a simple construction material, brick, and even the columns were built in the shape of pillars of bricks (Ibid, P.201). The arch and pointed vault appeared in the Abbasid era (Ibid, P.225-233). Also in that era, the muqarnas element was widely used (Ibid, P.235).

3. The dome:

It is known that the dome appeared as a construction architectural element in Mesopotamia since ancient times and then its use was developed through the Persian Byzantine ages. There is no evidence about its use in Mosques, on the contrary, the study of (Bloom, 1993) shows that the dome in the beginning was a sign of authority and was used in palaces and the most famous example is Qubbat Al-khaddra (Green dome) in the Caliphate palace in Baghdad. Then the dome moved on to be used in Tombs (turbe) to demonstrate the power and authority of the person buried, and then used in Tomb Architecture for religious figures.

There is no clear idea of the form of those domes that were used in the Early Abbasid era. Then conical Muqarnas domes appeared at the end of the Abbasid period and appears in one of the paintings of the painter **Matrakci Nasuh**, (P2) who accompanied Suleiman the Magnificent in his campaign to Baghdad. Several domes with the conical Muqarnas form, which dominated the urban scene of the city at that time beside some small semi-circular domes. It's difficult to know if those domes belong to mosques or tombs.

4. architectural elements:

Architecture in Baghdad know pointed and graded arches of doors and windows at this time. Plenty of palaces and schools intensively use the Iwan's with pointed arches. The forms of the minarets were of circular section with a balcony based on muqarnas with a pointed small dome at the top, its body adorned with bricks ornaments. Some minarets that remained from the Abbasid age: the minarets of Jami Al-khaffafin (1184), Sheikh Maroof Mosque (1215), Jami Qumriya (1228), and suq- Al-Ghazl (1279) and from the Jalairid age, the minaret of Mirjan mosque (1356) (Al-Anni, 1994, p.59).

5. Decoration and ornamentation:

The common way to decorate classic Iraqi architecture is either carving on brick or manipulating the manner of arranging the brick with geometric shapes. The decoration techniques of that time were also widely known as stucco carving techniques. The themes of decoration – as known in Islamic art – are geometric, plants, and calligraphy. Also glazing bricks was well-known since the ancient times in Iraq (Al-Janabi, 1983, P.241).

CASE STUDY: THREE MOSQUES IN BAGHDAD:

The research here deals with three of the most important heritage buildings remaining in Baghdad from the Ottoman period, about which much was mentioned of the possibility of attributing them to Mimar Sinan during his early period of work with Sultan Suleiman during his campaign to conquer Baghdad or his late period during the reign of Sultan Selim II. The research tries here to provide a documentary database for the research community interested in the subject on the one hand and trying to explore the concepts of the effect of the inherited local Iraqi architecture on Sinan's ideas and its interaction with (the other architecture) through these three important Baghdadi works, which our research will analyze through the five properties that are adopting as a conceptual framework upon which the research in the study of these works is based.

First work: Abu Hanifa Mosque and The Tomb (The Greatest Imam)

- There was a tomb, mosque and school for Abu Hanifa since the Seljuk era in

1066 AH (Al-Adhami,1960, P.28) and (Salman & others, 1982, P.133)

- The legal sources agree that **Suleiman the magnificent**, after conquering Baghdad in 1534, gave orders to rebuild the mosque and the tomb because they had been demolished during the Safavid conquest of Baghdad.
- The mosque had been vandalized again during the new invasion of Baghdad by the Safavid at the beginning of the seventeenth century, and later Baghdad was subsequently recaptured from the Safavids by Sultan Murad IV in 1638 and was ordered to reconstruct the building (Youssef, 1982, P.459), (Al-Adhami,P.29).
- The mosque witnessed reconstruction and addition by an order of Sultan Mehmed IV in 1681 (Salman& other, 1982, P.133).
- In 1871, the mosque witnessed reconstruction and expansion by Sultan Abdul Aziz 's orders. (Adhami,P.30) (Youssef, P.459).
- Sultan Abdul Hameed II ordered to reconstruct the building in 1902 (Youssef, P.460) (Salman & others,1982, P.133).
- An external colonnade (Revak) was added in 1948, implemented by The Ministry of Awqaf and Religious Affairs (Al-Adhami, P.35), which indicates a shift toward a modern architectural form.
- Another Renewal was happening in 1959 (Al-Adhami, P.36) under the guidance of the King of Morocco, Mohammed V (Salman & others, P.137), inside the mosque and the tomb was ornamented by a Moroccan plaster inscription which changed the elements of the building and gave him a different personality
- The last renewal of the mosque was in 1996, where the external colonnade (Revak) have been rebuilt with bricks with Baghdadi Iwan`s (see P3,D2)

From each of the above, we notice that the mosque was exposed to many changes, making it difficult for any researcher to find the effect of Mimar Sinan on it. As appears from the context of the historical texts that the injury suffered during the second Safavid invasion was so great, it required an entire reconstruction in 1638 by Sultan Murad IV.

(Despite the frequent narratives that support the contribution of Mimar Sinan to the construction of the shrine and the Abu Hanifa mosque, the research will exclude it from analyzing the architectural characteristics and building the conceptual framework for research as it has undergone a lot of change, addition and reconstruction, which calls into question the purity of many of its current features).

Second work: Abdul-Qadir Al-Jailany mosque and tomb:

- The place of the tomb was basically the school in which the sheik taught and later he was buried and still later a conical muqarnas dome was built above him, the building was destroyed during the invasion of the first Safavid (Salman & others, 1982, P.126) (Al-Janabi, 1985, P.305) (Jaylani,1994, P.11) (Al-Samarrai, 1994, P.106). (see P4)
- The above sources agree that **Suleiman the Magnificent** give his order to rebuild the tomb and to build a large mosque beside him in 1534, and (Al-Jailany study, 1994) indicates that the mosque and the tomb had been

finished in 1535.

- Historians differ on the date of completion of the huge dome of the mosque as being done at the same time or the work continuing for a long time later. During the reign of several Ottoman governors for Baghdad, the two studies (Al-Jailany, p.62) and (Al- Samarrai .P.106) discussed this subject (who based their research on the sources and historical documents which were contradictory in some dates with the inscriptions around the mosque). Al-Jailany confirms that the architect of the Dome is Sinan, (Al-Samarrai, p.107) denies that, saying it may overlap with the name of the governor **Sinan**, who ruled Baghdad and completed supervision on the construction of the mosque in 1586 while (Youssef ,1982) confirms that it was Sinan who built the dome (Youssef,1982, P465).
- The eastern minaret is the only work since the time of the Ottomans and it belonged to the Jalaired era, being built in 1398 (Al-Ani, 1992, P.68) (see P5).
- The sources state that the mosque and the tomb were at risk of sabotage during the second Safavid invasion, while the Safavids were unable to demolish the dome of the mosque because of its magnitude and durability (Jaylani, 1994, P.62) and Sultan Murad IV rebuilt the mosque and the tomb in 1638.
- Lehdar built a new colonnade (revak) round the mosque and the tomb in 1664 (Salman & others, 1982, P.126) (Al-Jailany, 1994, P.74).
- Several buildings were built around the courtyard and were under the consecutive works of refurbishment and restoration which is discussed in the Al-Jailany and Samarrai studies in detail. (see D3)
- At the ninetieth of twentieth century under the orders of the authorities the mosque and the tomb were renewed completely, the interior walls were covered with colorful marble and the large dome was covered with white marble to maintain its white shape that it was covered with stucco so it was known to the public as the white dome (Al-Jailany, 1994, P.53) (see P6, P8).

From all of the above, what draws the attention of the research here is the great dome of the mosque, which many historians claimed that it was built by Sinan, so those who mentioned that the governor of Baghdad (Sinan Pasha), who followed, completed it in 1586.

This means it was also within Mimar Sinan's time when he was chief architect of the Sultanate and was responsible for any construction in the cities of the Sultanate as well as sending builders and supervising them.(Aktur, 1987, P.99). Now we will leave a historical investigation to specialists and future research may help to study the Turkish documents and sources so the matter would be clarified better. Depending on the approach which was introduced and the properties of the conceptual framework – which the research inferred in the previous section –the following is a comparative analysis of this mosque (in its original form) with the architectural properties of each of the pre-Ottoman Baghdadi architecture and with Sinan architecture:

Type of plan:

The Mosque is characterized by a square shape of the prayer hall's interior

dimensions measuring 22.8m on each side (Al- Samarrai, 1994, P.109) (see D4), which is covered with a single dome. If we compare it with the ancient architecture of Baghdad we do not find any precedent, and this calls for dismissing the idea that Baghdad architects choose this new form entirely on the style of the city's mosques and the likelihood that this new shape was ordered by the Sultan to give this important work new Ottoman identity. Also, the type of central Dome plan is the ideal shape of Ottoman mosque architecture (Goodwin, 1973, P.200). Since both mosques of Sultan Bayezid II in Edirne 1488, and Sultan Selim I in Istanbul in 1522 are of this kind, and were built before Sinan, Goodwin thought that Mimar Sinan contributed (at the beginning of his career) of building the mosque of Sultan Selim I.

Structural System:

There are differences in the attribution of the dome in Al-Jailany mosque from its former equivalents (Bayezid II, and Selim I mosques) which depends on the large "pendentives" to convert the square to the circle of the dome, and it depends on the construction of huge stone arches. The Al-Jailany dome has been converted from the square into the octagonal form by squinches which is similar to the Oriental way that depends on a load-bearing brick wall system and as the former mosques contain "buttresses" with multiple windows on the bottom of the dome to support it, the Al-Jailany dome is based on the conversion of the square to the octagon and then to hexadecimal to support the dome.

This unique dome is different from the domes of the other Ottoman domes as it is built with bricks and stucco and uses squinches to support the dome, which is different from the oriental domes of Persia since it does not contain a drum and it is like Ottoman Empire domes in the presence of four windows with the main axes within the dome itself and all this is due to the architect Sinan, who was interested in studying the other provinces' buildings and had experimented with these methods to build this dome. (see P7)

The diameter of the dome is 22 m, which puts the building as one of the few Sultanate buildings that have not reached this diameter, only the mosques of Istanbul and Edirne. (see T1)

Thus, the importance of the diameter of Al-Jailany mosque dome is recognized, (as it is attributed to architect Sinan), it represents the first great dome built in 1535 prior to his assumption as chief architect of the Sultanate 1538 (Goodwin, 1973, P.20).

The importance of Baghdad city to the Ottoman sultans has been demonstrated, there were no other Domes Built, neither in Syria (Kafescioglu, 1999), nor Egypt (Behrens Abouseif, 1989, P.158) with the exception of the Muhammad Ali Pasha Mosque in the Castle, which took on the Ottoman Empire, and an American architect has been tasked to design the mosque (Ibid, P.165).

Also shown is the importance of the date of building Al-Jailany mosque. It was built by Sinan in 1535 as his first large and distinguished scale work, tasked by the Sultan, and not as many sources as the Hasrew Pasa Mosque in Aleppo, built by Sinan in 1539 (Goodwin.1973, P.200).

Above, it can highlight the importance of Al-Jailany's huge scale Dome of 22 m to the architect Sinan as the first significant work attributed to him, and that his use of materials and innovative technologies requires researchers in the history of his work to take a real pause and re-consider it, in terms of assessing the evolution of Ottoman architecture on the one hand and Iraqi Architecture

on the other.

Third Work: Muratiye Mosque:

- Murat Pasha was ordered to construct the mosque in the era of Sultan Selim II in 1570 (Al- Kusairy,1981, P.21) (Youssef,1982, P.549) (Salman & others, 1982, P.235)
- The mosque underwent maintenance and renovation in 1889 (Al-Kusairy, 1981, P.31)
- The Sultan Abdul Hameed II ordered the reconstruction of the mosque after cracks were discovered between the years 1901-1903 (see P9)
- The sources stated that the reconstruction and maintenance did not affect the original design or decorative elements. (Salman & others, 1982, P.235) (Al- Kusairy, 1982, P.35). Most of those sources omit the attribution of these mosques to any architect, although they agree on the dates of construction and restoration, except for (Mahfouz study 1985) which is attributed to architect Sinan (Mahfouz, 1985, P.97).
- The construction of the mosque in 1570 by Sinan means that he had worked in the position of chief architect of the sultanate by that time for more than 30 years. The important point in the history of this mosque is that it is the first new mosque built during the Ottoman era as a whole (as the work conducted on the Abu Hanifa and Al-Jailany mosques were re-building projects) and does not have any mention of building a new mosque on a new site before.
- The research would conduct architectural analysis of the building by comparing its properties with architectural characteristics of each of architecture before and after the Ottoman conquest with Ottoman architecture in Turkey.
- This mosque is characterized by its normal scale: the diameter of the dome is about ten meters. This mosque belongs to the style of mosques with a central dome with two side aisles roofed with three small domes, the center of which is larger in diameter than the other two domes. (see D5), and fronted by (Revak) surmounted by five domes, so it resembles some of the mosques in Turkey before Sinan. It also looks like the Rustam Pasha Mosque (1563) in Istanbul and the Mihrimah Sultan Mosque in Istanbul (1548) in its plan and the distribution of domes (see D6).

Type of Plan:

This is due to the use of prepared drawings because of the huge volume of work in the cities of the empire, all of which must be supervised by the architect himself: he visits the site, and arranges a proper design, then sends it with one of his trainers on hand and whom he trusts, and then the architect supervises the workflow from Istanbul (Goodwin, 1973, P.291) (Aktur, 1987, P.103). This has become the model which represents (archetype) the process in which most of the mosques of Baghdad were built, such as the Ahmetiye Mosque (1796) (Hameed, 2000, P.340) and the Hyder Khanah Mosque (1823) (Naqshbandi, 1973, P.246) this model has emerged in some mosques in Damascus, such as the Governor Sinan Pasha Mosque and the Mosque of Darwish Pasha (Kalesci Oglu, 1999, P.90).

Structural System:

The mosque was built with bricks, except for the four marble pillars (which were

brought in from northern Iraq), and the square under the dome is converted to an octagon by arches that sit between the column and the load bearing wall, with buttresses. These load bearing walls are characterized by being (working) like (dotted) buttresses to carry the domes, while the rest of the wall (which is less thick) enabled the placement of large windows. This feature makes us compare them with what was characterized by the geniality of Sinan's works, who is characterized by *deleting everything that is excessive in the structural system, and daring to reduce the size of elements in the structural system.* (Goodwin, 1973, P.200) (Ozgules, 2005). This courage and genius were not repeated in the works of Ottoman Architecture after Sinan, as well as in the mosques of Baghdad, though it followed the same type of plan as the Murattiye Mosque in terms of distributing spaces and domes, but it was characterized by the great size of its brick pillars, and the thickness of walls and small windows. (see D7)

The Dome:

The dome is very similar – with a different scale – to the dome of Al-Jailani Mosque, which was analyzed before, that it is a semi-circular, flat – but its end is not tapered – dome that sits on 'squinches', and there are four windows under the dome which are located on the main axes and the dome has no drum (see P12) as well as the rest of the small domes are of the same type but without windows. The rest of the Baghdad mosques that followed have used a bulbous dome style with drums which are filled with windows and covered with colored tiles called 'Qashani', and these domes indeed consisted of a double dome.

architectural and decorative elements:

The mosque is characterized by the appearance which resemble Baghdad local Architecture from the preceding ages as to the form of the "Iwan" and forms of the opening and ways of distributing decorative lines and their techniques concerning the form of the "minaret". Sinan was known for his respect for the traditions of local architecture of the regions and his dependence on local craftsmen and builders for the implementation details (Goodwin, 1973, P.257).

Space and Lighting:

This mosque remained distinct from the rest of the mosques in Baghdad – which were built later (according to the same style) – in terms of its beautiful proportions and its fluency of spaces,

and distinguish its lightweight construction and daring and innovation (Kuran, 1987. P.79) while the rest of mosques in Baghdad, "Because of its huge pillars, the space inside the prayer hall appears dispersed and fragmented and isolated from the side spaces (see P12, P13). the lightness of the structural system in Muratiye Mosque led to enlarge the size of windows and the fluency of lighting gives more lightness to the structural system and helps to create spiritual atmosphere, (one of the most important characteristics of Ottoman architecture, which emerged the formula forms in the works of Sinan) (Snyder, 2000, P.238).

CONCLUSIONS

1. Research has proven that both the Muratiye Mosque and the Dome of Al-Jailany were designed by Mimar Sinan by logical argument and systematic

analysis of the architecture of both works and comparing them with the distinctive architectural properties of the work of Sinan, without dependency on the conflicting historical narratives of the various archeological research.

2. The findings and concluded conceptual framework can be used in the future to analyze the different architectures at different times and different building types.

3. This research shows the comprehension of Sinan and his benefit from many trips (through participation in the campaigns with the Janissary Corps from the Balkans to Iran) and his understanding of the architectural achievements of different Eastern and Western civilizations, and his intelligent way to dealing with these (now) landmarks and trying to develop them according to their cultural environment and their own material and technical skills, with special emphasis on his experience in the cultural interaction with the Abbasid cultural heritage (especially that the Ottoman Empire was still in the process of forming its Special Cultural Character).

4. The importance of these mosques lies in the fact that they reflect an original style (Archetype) on which the mosques of Baghdad were later built (such as Alwaziir mosque (1599), and Al- Ahmetye (1796), Alfathel (1793), and Al-Haydar Khana (1823)), and despite the fact that these mosques belong to the Ottoman classical style, (in their Spatial Design, and their Structural System) but the intelligent use of local building materials such as bricks and plaster and architectural elements make these works of architecture belong to the Baghdad Local Architecture, and – we believe – there are two main reasons: the first one is the use of local craftsmen and builders and the second is the desire of Sinan and the authorities (whether in Baghdad or Istanbul) to respect the uniqueness of Baghdad and its image as a religious and cultural symbol in the Islamic imagination (especially for non-Arab Muslims).

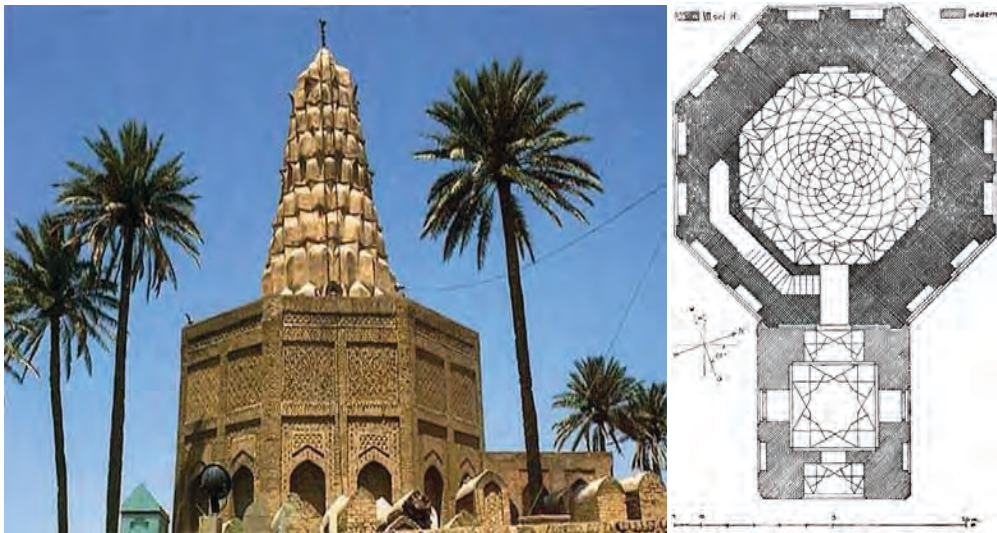
5. These mosques remained distinct from the rest of the mosques in Baghdad – which were built later (according to the same style) – in terms of beautiful proportions and their fluency of spaces. We missed this feeling in the mosques that followed, which had been lost for those daring to deal with the openings and the thickness of walls and columns (and therefore the flow of internal space and the amount of natural light within it). This marks the unique genius of Sinan, and the failure of the subsequent architects to match it.

This research summary raises a final vision of how the interaction of Mimar Sinan and his interpretation of past civilizations' achievements and how he developed the 'Other' cultural achievement within a deep understanding of the requirements of the local environment, and his development of these works to establish an architecture and urban scene, which confirms the spirit of the emerging Ottoman Empire, while his personal interpretation and dialogue with classical Abbasid architecture made another dimension in which he confirmed an attempt to resolve Baghdad local traditions with a spirit of contemporary design accordance with the Ottoman Central Dome style, which was customized with the local materials and methods of construction and ornaments, to produce both innovative architecture and architecture befitting the capital of the Abbasid Caliphate.

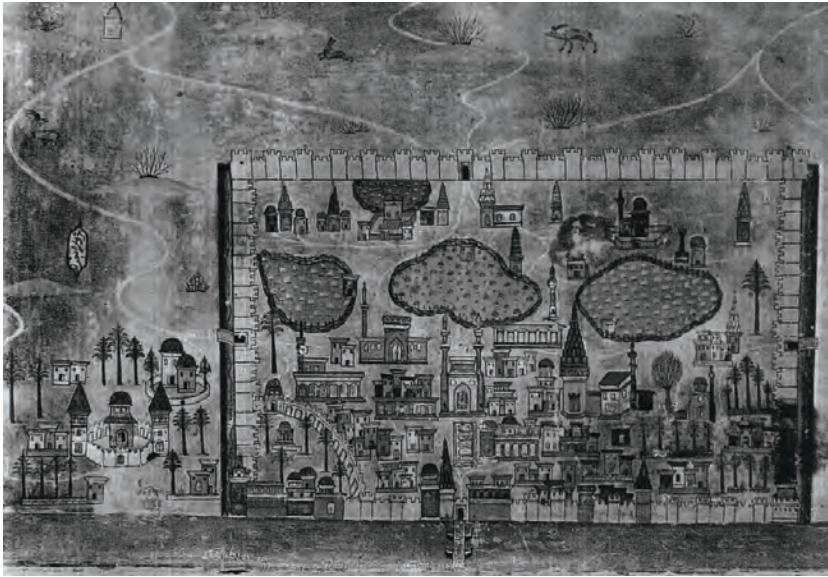
visual material:

	Mosque	Year of construction	Location	Diameter of thedome(M)	Page N. 1973 in Goodwin
Before Sinan	Byzet ii	1488	Edirne	20.5	128
	Fateh	Rebuild 1509	Istanbul	26	146
	Byzet ii	1522	Istanbul	17.5	169
	Selim i		Istanbul	24.5	184
Works of Sinan	Sehzade	1548	Istanbul	19	209
	Sulaymaniye	1557	Istanbul	26.5	237
	Mihrimah	1550	Istanbul	20	255
	Selimiye	1575	Edirne	31	262
After Sinan	Sultan Ahmet	1626	Istanbul	23.5	346
	Nuruosmaniye	1755	Istanbul	24	382

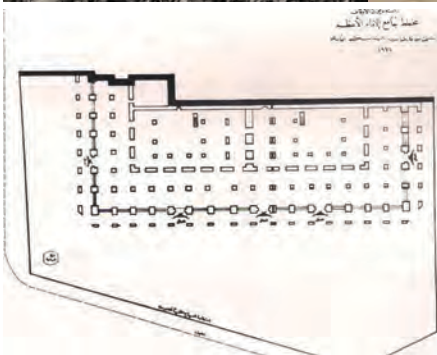
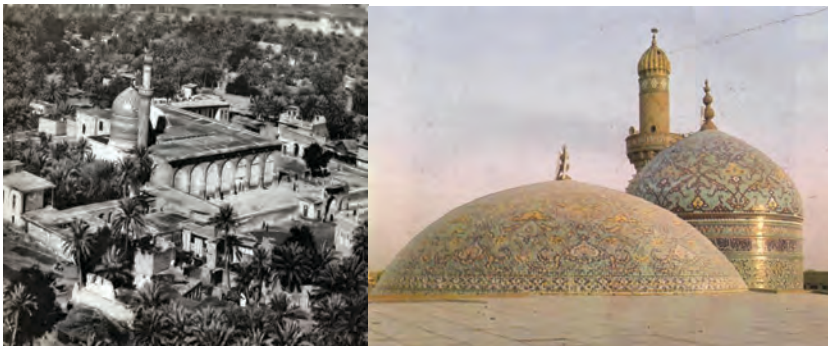
Table -1- The largest Domes in Ottoman Architecture



P1: Zumurud Khatun Turbe at the (photo on end 19th century) D1: Plan of: Zumurud Khatun Turbe



P2: Baghdad as it is During the Campaigns of Suleyman (paintings from Matrakci Nasuh 1537)



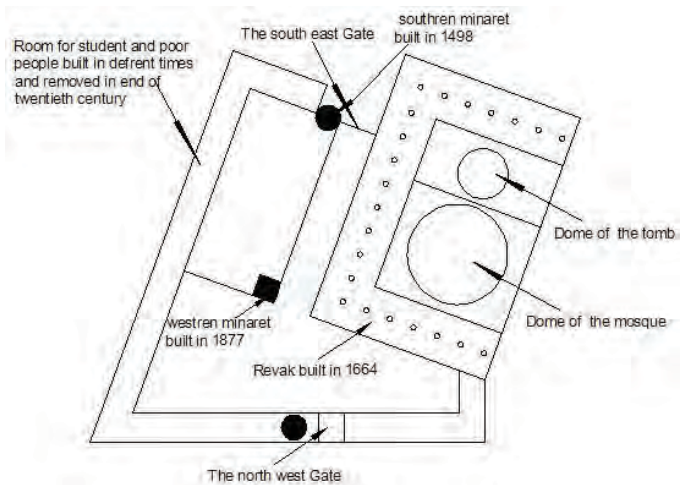
P3: Mosque and Turbe of Abu-Hanifa (from 1919) D2: Plan of Mosque and Turbe of Abu-Hanifa



Al-Jailany mosque aerial view (from 1890)



P4: Mosque and Turbe of Al-Jailany at the beginning of 20th century



D3: Plan of Al-Jailany Mosque and Turbe (prepared by researcher)

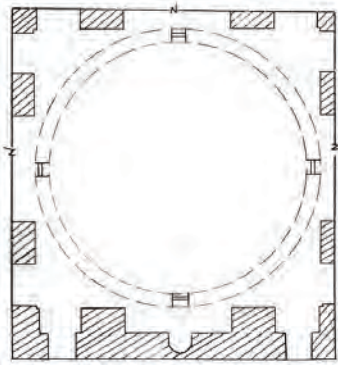


P5: Al-Jailany Mosque Southern

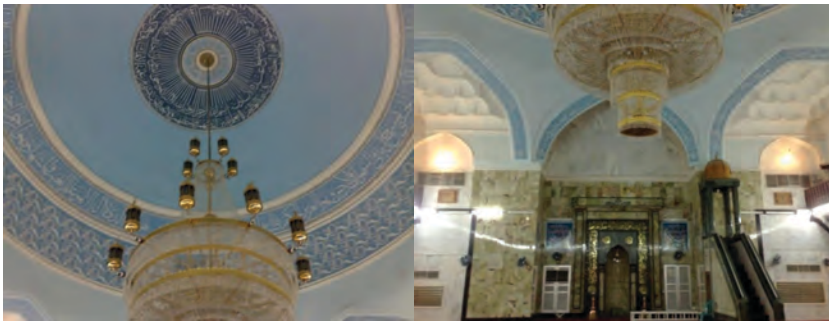
P6: Al-Jailany Mosque Western minaret built in 1877 , minaret built in 1398 (photo by researchers)



P7: Al-Jailany Mosque Eastern elevation



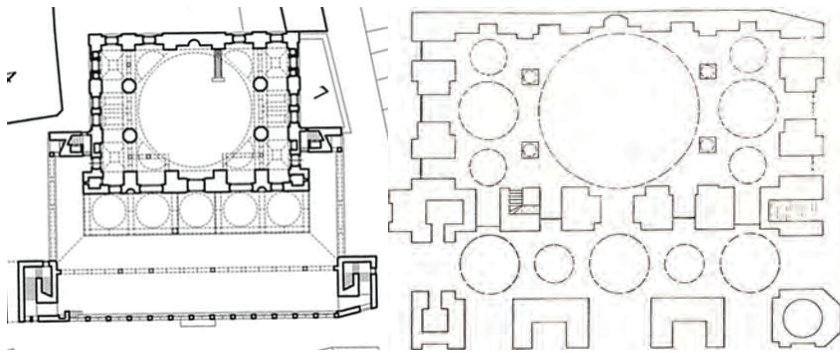
D4: Plan of Al-Jailany Dome (photo by researchers)



P8: Interior of Al-Jailany Mosque (photo by researchers)



P9: Al-Muratiye Mosque in beginning 20th century



D5: Plan of Al- Muratiye Mosque-Baghdad-1570 D6: Plan of Rustam Pasha Mosque - Istanbul1563



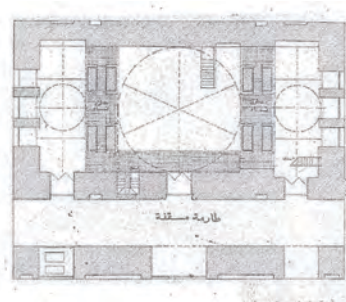
P11: minaret of Muratiye Mosque (photo by researchers). P10: Interior of Muratiye Mosque (photo by researchers)



P12: Eastern elevation of Al-Ahmetiye



P13: Interior of Al-Ahmetiye Mosque (photo by researchers) (photo by researchers)



D7: Plan of Al-Ahmetiye Mosque

NOTE:

1. The parts transferred from Baghdad was a board of porphyry marble in the colonnade (Revak) of the entrance and two Rose windows in the (qibla) wall (Goodwin, 1971, P.228)
2. Researchers familiar with English and Arabic literature only, without Turkish
3. Mentioned in this context that the researchers tried to obtain any schemes from Al-Jailany innovation and Restoration project office or consultants of the project, but they stated that most of these schemes lost during the 2003 war, as most architects, (supervisors of the project) had traveled outside the country after the war.

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تحويل الكنائس إلى مساجد: مسجد كتشاوة بالجزائر نموذجاً

بوسماحة سعيد
أستاذ باحث
المدرسة المتعددة العلوم للهندسة المعمارية
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الملخص:

خلفت فترة الاستعمار الفرنسي بالجزائر إضافة إلى البنايات السكنية والمدنية والعسكرية، مجموعة من أماكن العبادة المسيحية كالكنائس التي تظل إلى حد الآن تشهد على حقبة زمنية من تاريخ الجزائر. بعد استقلال الجزائر، سارعت السلطات الحكومية مدعومة من المواطنين الجزائريين إلى تأميم البنايات الدينية كغيرها من المنشآت، حيث حولت أغلبها إلى مساجد وتم استغلال الباقي كمتاحف.

تعد عملية تحويل الكنائس ودور العبادات الأخرى إلى مساجد بالنسبة إلى الجزائر عملية ذات أهمية كبيرة من أجل إثبات وتأكيد الهوية الإسلامية للبلد والتي حاول المستعمر الفرنسي جاهداً لطمسها بفتح بناء المساجد وتحويل أكثرها إلى كنائس وهدم أغلبها. وتشير الإحصائيات الرسمية الجزائرية إلى تحويل أكثر من ستمائة بناية دينية غير إسلامية إلى مساجد بعد استقلال الجزائر فيما بقي القليل منها في المدن الكبرى كالجزائر العاصمة، عنابة ووهران يحافظ إلى اليوم على وظيفته.

من خلال هذا البحث نسلط الضوء على التجربة الدولية الجزائرية المستقلة في تحويل الكنائس الفرنسية إلى مساجد من خلال عرض ودراسة مسجد كتشاوة بالجزائر العاصمة الذي يعد مثلاً معمارياً فريداً حيث تم تحويله إلى كاتدرائية القديس فيليب في العهد الفرنسي، وبعد ذلك إلى وظيفته الأصلية كمسجد بعد الاستقلال.

الكلمات المفتاحية: مسجد كتشاوة، كاتدرائية، تحويل وظيفي، الجزائر، الهوية.

مقدمة:

كان تحويل أماكن العبادة من دين إلى آخر ممارسة شائعة عبر التاريخ، مرتبطة بشكل أساسي بالصراعات بين طرفين من ديانات مختلفة؛ وهكذا فإن الاستيلاء على أماكن العبادة للطرف الخصم المهزوم يبدو استمراراً منطقياً للنصر العسكري وشكلاً من أشكال تكريس هيمنة جماعة على أخرى.

الجزائر، التي عرفت عبر تاريخها العديد من الغزاة وفترة طويلة من الاستعمار ادت إلى صراعات حول أماكن العبادة، وهذا بدءاً من الاستعمار الروماني الذي ولد نوعاً من المزيج بين المعتقدات الرومانية إلى غاية الاستيطان الفرنسي للجزائر الذي بدأ عام 1830. حيث شكّل هذا الأخير اضطراباً حقيقياً خاصة من الناحية الثقافية والدينية عانت منه الجزائر. إذ كانت المواجهة بين الثقافتين المختلفتين عنيفة بشكل خاص في الجزائر، حيث مارست فرنسا الاستعمار الاستيطاني على عكس سياسات الحماية التي مورست خلال نفس الفترة في المغرب وتونس.

مع بدء الاستعمار الاستيطاني واحتلال شمال الجزائر، لجأت فرنسا إلى إنشاء دور العبادة للمستوطنين باختلاف أديانهم، إما عن طريق بناء مبانٍ دينية جديدة أو عن طريق تغيير أماكن العبادة الموجودة في المنطقة.

وفي هذه الفئة الثانية، يندرج نموذج هذه الدراسة «مسجد كتشاوة»، الذي تحول إلى دار عبادة مسيحية خلال السنوات الأولى من الاستعمار ليصبح فيما بعد أول كاتدرائية في الجزائر العاصمة «كاتدرائية سانت فيليب».

استغرق تحول هذا المبنى عدة عقود ليصبح كاتدرائية في حد ذاته، سواء من وجهة نظر وظيفية أو معمارية أو زخرفية؛ حيث تضمنت هذه العملية تدخلات على المبنى وتخطيطه، وذلك حتى استقلال الجزائر عام 1962 واسترجاع الجزائريين المسلمين للمبنى، الذي سرعان ما حول إلى مسجد دون إجراء تغييرات معمارية كبيرة عليه.

إن دراسة انتقال هذا المبنى من خلال التحليل الزمني لتاريخه من شأنه أن يحجب القضايا الحقيقية وتأثير تطور هذا المبنى بمرور الوقت، ويمثل هذا التطور تسلسلات في حياة هذا المسجد. وتمثل هذه التسلسلات التدخلات الرئيسية التي خضع لها المبنى، بدءاً من إنشائه كمسجد إلى تحويله إلى كاتدرائية وأخيراً استعادته لوظيفته الأصلية كمسجد.

تضمن هذه الدراسة بالتحليل تطور «مسجد كتشاوة» خلال الفترات التاريخية المختلفة للجزائر استناداً إلى المصادر العلمية الموثقة بالإضافة إلى الآثار المعمارية وهذا بعرض حالت المسجد الحالية وشرح خطط التدخلات المختلفة التي خضع لها.

بناء مسجد كتشاوة:

تعود تسمية مسجد كتشاوة إلى موقعه على هضبة الماعز (بالتركية: كتشاوة)، ولا يزال التاريخ الدقيق لتأسيس هذا المسجد غير معروف ولكن الراجح أنه بني قبل عام 1612، وهو التاريخ الذي تشير إليه إحدى وثائق القاضي بوجود المسجد¹. كما تمت توسعة المسجد الكبير في عام 1794 في عهد حسن باشا²، وهو ما تؤكد كتابه مؤرخة بالكرونوجرام أعلى مدخل المبنى³.

من الناحية الانشائية، يعد مسجد كتشاوة ضمن فئة المساجد الفارسية التي تتميز بتوسط المسجد ذو القبة المركزية الكبيرة لفناء واسع محاط بأربعة إيوانات (الإيوان عبارة عن غرفة مقببة مفتوحة من جانب واحد)⁴. وهو ما يتبين من خلال مخطط المسجد لرافوازيه، حيث يظهر الرسم أن قاعة الصلاة الرئيسية للمسجد، مربعة الشكل تعلوها قبة مركزية كبيرة ذات قاعدة مئمنة وتحيط بها أروقة مغطاة بقباب صغيرة. كما أن هيكل السقف للمساحة المربعة تحمله أعمدة رخامية قوية تصطف من ثلاث جهات مع ممرات مقطوعة بواسطة حوامل عريضة موضوعة في منتصف المسافة من أرضية الأقواس. ومن الناحية الجمالية، تم تزيين الفضاء الداخلي للمسجد باللوحات والنقوش المختلفة⁵.

تقع المئذنة الأصلية لمسجد كتشاوة في الجزء الخلفي من الصف المزدوج من الأروقة، على جانب المحراب وتشير إلى اتجاه الكعبة بمكة المكرمة (اتجاه القبلة)، وهذا المبدأ التخطيطي اعتمد عليه بكثرة في تميم المساجد القديمة بتركيا، ويتوافق أيضاً مع مساجد المغرب الأوسط التي بنيت خلال الفترة العثمانية. «وتتميز مئذنة مسجد كتشاوة من الداخل بزخرفتها بنقوش كبيرة بأحرف عربية»⁶.

كما أعطى المؤرخ والكاتب لوسيان غولفين وصفاً عاماً لهذا المبنى الذي تم بناؤه «على مخطط طويل، حوالي 20/24 م، ويضم المسجد غرفة الصلاة مربعة الشكل طولها 11.50 م، تعلوها قبة مئمنة واسعة، مرفوعة على حنيات ركنية... جميع الأقواس، على شكل حدوة حصان مكسورة، مدعمة بأعمدة كبيرة ذات تيجان واسعة»⁷.

1 KLEIN Henri, Feuillet d'El Djazair, Tome I et II, Ed du Tell, Alger, 2003.

2 MARÇAIS Georges, Manuel d'art musulman : L'Architecture (Tunisie, Algérie, Maroc, Espagne, Sicile), Vol II, Chap.7-9, Ed Picard, Paris, 1926-1927.

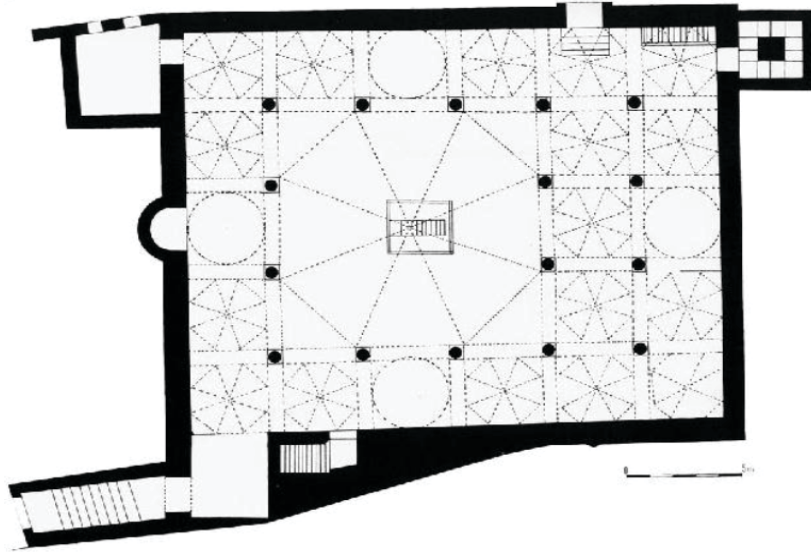
3 KLEIN Henri, op.cit.

4 BAYLE.M. Hélène, Qu'est-ce qu'une mosquée ? Institut européen en sciences des religions, Septembre 2007.

5 Albert DEVOULX, responsable des Domaines, dans KOUMAS Ahmed, NAFAA Chéhrzade, « L'Algérie et son patrimoine », éditions du patrimoine, Paris, 2003.

6 BERQUE.A, art antique et art musulman en Algérie, dans : cahiers du centenaire de l'Algérie – livret VI, publications du comité national métropolitain du centenaire de l'Algérie, 1930.

7 GOLVIN Lucien, Le legs des Ottomans dans le domaine artistique en Afrique du Nord, dans : Revue de l'Occident musulman et de la Méditerranée, N°39, 1985



ومن جانب الموقع العمراني، فقد كان مسجد كتشاوة يحتل مكاناً متميزاً في المدينة؛ حيث يقع في القصة السفلى بين المدينة في الارتفاع والواجهة البحرية للجزائر العاصمة بجوار قصر حسن باشا وعلى بعد أمتار قليلة من دار عزيزة. وكانت تضم المنطقة أيضاً «الجنينة» وهي دار إقامة الداى، إضافة إلى المسجدين الكبيرين للمدينة وهما: الجامع الجديد والجامع الكبير. وكان مسجد كتشاوة جزءاً من قلب المدينة ومن أرقى مساجدها؛ وكُرِّس بفضل زخارفه الفخمة ومظهره الضخم حضور العمارة العثمانية في الجزائر العاصمة.⁸

التحول الوظيفي الأول لمسجد كتشاوة (من مسجد الى كاتدرائية):

بعد استيلاء الجيش الفرنسي على الجزائر في عام 1830، نصت معاهدة الاستسلام التي وقعها داي الجزائر حسين باشا وكونت بورمونت من الجانب الفرنسي على «ترك الحرية للسكان من جميع الطبقات، وأن ديانتهم، تجارتهم وصناعاتهم لن تتعرض لأي مضايقات»⁹. استحوذت السلطة الاستيطانية على الملكيات «الجوس» (أي الوقفية) من خلال تغيير التشريعات المتعلقة بالملكية، بحجة التعارض مع المفاهيم القانونية الفرنسية¹⁰؛ و بموجب هذا التشريع الجديد، يتم نقل الوظيفة المساجد القائمة إلى العقيدة الكاثوليكية على غرار ما حدث مع مسجد كتشاوة، أو تدميرها في إطار عمليات التجديد كما كان الحال بالنسبة لمسجد «السيدة» و مسجد «جنينة». كما تم تحويل العديد من المساجد الاخرى إلى كنائس ومستودعات للجيش الفرنسي. وهكذا بدأت السياسة الاستدمارية في الجزائر العاصمة عام 1830، وما زاد إذلال السكان الأصليين هو احتلال المباني الدينية وخاصة المساجد.

8 Nedjari Samir, CONVERSION DES LIEUX DE CULTE A ALGER DU XVIIIEME AU XXEME SIECLE: CAS DE LA MOSQUEE/CATHEDRALE KETCHAOUA, mémoire de master, Paris, 2012.

9 Louis de BAUDICOUR, La Colonisation de l'Algérie : ses éléments, Ed Jaques Lecoffre, Paris, 1856.

10 TERRAS Jean, Essai sur les biens habous en Algérie et en Tunisie, Etude de la législation coloniale, Lyon, Impr. du Salut public, 1899, cité dans OULEBSIR Nabila, «Les usages du patrimoine», Éd. La Maison des sciences de l'homme, Paris, 2004



الشكل 3:

قاعة الصلاة مسجد كتشاوة قبل 1832 لشارل ديسبريز ، لوحة ممسوحة ضوئياً بواسطة أرشيفات المكتبة الوطنية في الجزائر. (المصدر: أمال بلالا، 2019).



الشكل 2:

مسجد كتشاوة قبل تحويله الى كنيسة عام 1832، بعد الطباعة الحجرية بواسطة ليسور وويلد. (المصدر: جورج مارسلي، 1926-1927).

المرحلة الأولى: أخذ المسجد:

تم تحويل مسجد كتشاوة إلى مبنى مخصص للعبادة المسيحية في 24 ديسمبر من عام 1832¹¹. كان هذا التحول مثيراً للجدل وتنازع عليه الجالية المسلمة وكذلك من قبل بعض الأحزاب في معسكر المحتلين الجدد؛ واستند هذا الخلاف إلى الفقرة الخامسة من معاهدة استسلام الجزائر في 5 يوليو 1830، والتي تنص على أن «ممارسة الدين المحمدي ستبقى حرة وتضمن للمسلمين صيانة أماكن عبادتهم»¹².

ويعد دوق روفيجو¹³ المحرض الرئيسي للاستيلاء على مسجد كتشاوة، ولم يكن اختياره لهذا المسجد مصادفة، حيث كان يعلم انه يعد أهم مكان للعبادة الإسلامية في المدينة، وأراد روفيجو من خلال احتلاله للمسجد إظهار القوة للسكان المحليين¹⁴. ورغم كل التهديدات، رفض الجزائريون تسليم المسجد والتخلي عنه. لكن الدوق روفيجو أصر على استيطان مسجد كتشاوة، وأصدر، في 17 ديسمبر 1831، أمراً باحتلال المسجد في اليوم التالي وتثبيت الصليب والعلم الفرنسي على المنذنة وأمر أيضاً بإطلاق قنابل البطاريات البرية والبحرية احتفالاً بذلك¹⁵.

11 KLEIN.H.op.cit.

12 Traité de capitulation d'Alger du 5 juillet 1830, dans Nadine GASTALDI, Culte musulman 1839-1905, paris, 2006.

13 Anne-Jean-Marie-René SAVARY, Duc de Rovigo nommé par CHARLES X le 6 décembre 1831 comme Gouverneur des Possessions Françaises en Afrique.

14 OULEBSIR Nabila, « Les usages du patrimoine », Éd. de la Maison des sciences de l'homme, Paris, 2004.

15 Nedjari Samir, op.cit.

ويذكر المؤرخون المعاصرون على غرار فارون فلوريان¹⁶ أن القوات الفرنسية باسرت الاستيلاء على مسجد كتشاوة في 18 ديسمبر 1832، حيث حبست يومها حوالي أربعة آلاف مسلم داخل المسجد وبدأ الهجوم بنسف الباب الرئيسي بالمتفجرات واطلاق بعض الاعيرة النارية. وأثناء الاقتحام دفعت القوات المسلحة بالمسلمين إلى المسجد حيث استولى عليهم الذعر وحاولوا المقاومة... وعثر في المسجد على عدد من الرجال نصفهم مختنقون وجرح عدد آخر أثناء محاولة مغادرتهم للمسجد. وبعدها أقحم الدوق روفيغو فرقة مشاة داخل المسجد خوفاً من استرجاعه من المسلمين¹⁷. وتم استغلاله وافتتاحه رسمياً ككنيسة بعد ذلك بأسبوع بمناسبة عيد الميلاد في 24 ديسمبر 1832.

المرحلة الثانية: تخصيص المسجد للعبادة المسيحية:

تمت الترتيبات داخل المسجد كتشاوة القديم بإعادة تنظيمه من أجل تكييفه مع العبادة الكاثوليكية، من خلال تركيب أثاث جديد دون الاستغناء عن استغلال القديم، كما كان الحال مع حوض الوضوء الذي تم تحويله إلى حوض للمعمودية، وتم استعمال بعض أجزاء المنبر القديم لبناء منبر آخر يتناسب مع الديانة النصرانية. إضافة إلى بعض الإيماءات الرمزية مثل نصب تمثال للسيدة العذراء في المحراب الذي كان يشير سابقاً إلى اتجاه القبلة. كما تم تركيب عام 1840 م صليب على القبة الرئيسية للمسجد¹⁸.

ويحسب وصف آبي بارجاس للكنيسة في عام 1832، فإنه « باستثناء الرواق الشرقي، يوجد فوق كل رواق، مدرج مخصص للسيدات به درابزين خشبي من الأعمال الفنية للغاية. ومكان محجوز للحاكم وعائلته الذين يمكنهم الذهاب إلى هناك مباشرة من القصر المجاور للمبنى. كما تم إضافة الخزانات هنا وهناك على طول الجدران؛ تميز الأبواب بألواح ملققة، كل منها بلون مختلف. الجوانب الداخلية للكنيسة مغطاة، حتى ارتفاع المدرجات، بلاط البورسلين الأبيض والأزرق ذو التأثير الفريد للغاية. المنبر، المتكئ على عمود، مزين بمنحوتات ذات تشطيب دقيق ومميز. وأمام المحراب، الذي كان المسلمون يتجهون نحوه أثناء كل صلاة، تم نصب تمثال للسيدة العذراء. على بعد خطوات قليلة من هذا الأخير، نجد المذبح الرئيسي المعد من عدة أنواع من الرخام النفيس والذي يتناغم ثرائه مع جمال هذا المكان. أكثر ما يلفت الانتباه عند دخول هذه الكنيسة هي النقوش الضخمة التي تزين الجدران. يبلغ طول الحروف من ثلاثة إلى أربعة أقدام. هذه النقوش تعبر عن جمل مأخوذة من القرآن¹⁹ ».

بصرف النظر عن التحسينات القليلة التي تم إجراؤها، فإن مبنى الكنيسة الجديدة بقي يحافظ على آثار المسجد القديم بأعمده المزيّنة وزخارفه النباتية والنقوش القرآنية على جميع الجدران.

المرحلة الثالثة: التحويل إلى كاتدرائية:

بدأ بناء كاتدرائية سانت فيليب في موقع مسجد كتشاوة السابق في عام 1845 بعد أعمال الهدم التي بدأت في عام 1844؛ وتأتي هذه الأعمال بعد تعيين المونسنيور دويوش أسقفًا في الجزائر العاصمة عام 1838؛ حيث طلب هذا الأخير بناء كنيسة جديدة تكون كاتدرائية الجزائر العاصمة. لكن السلطات القائمة في الجزائر، والتي تولت تمويل الكنيسة في الجزائر

16 JULIEN Charles André, Histoire de l'Algérie contemporaine, Vol I, Presse universitaires de France, Paris, 1964.

17 Déclaration du baron Pichon, intendant civil de la Régence, cité dans : JULIEN Charles André, Histoire de l'Algérie contemporaine, Vol I, Presse universitaires de France, Paris, 1964.

18 Nedjari Samir, op.cit.

19 L'abbé Bargès, « notice sur la cathédrale d'Alger en 1839 », dans le journal asiatique, troisième série, Tome XI, l'imprimerie royale, Paris, 1841.

بسبب الكونكوردي، قررت تغيير استغلال المبنى القديم وتوسيعه.²⁰

كانت مشاريع تحويل المبنى قد بدأت بالفعل في السنوات التي أعقبت تحويله في عام 1832، ولا سيما من قبل المهندس المعماري للمباني المدنية بيير أوغست جياوتشاين الذي قدم «مشروع تحويل وترميم في منتصف ثلاثينيات القرن التاسع عشر»²¹، هذا المشروع استؤنف في عام 1839 من قبل المهندس المعماري أمابل رافوازييه في إطار الاستكشاف العلمي للجزائر، هذا الأخير أجري مسجًا للمكان واقترح ترميم المبنى²². تمت مياسة الأشغال على التوالي من قبل المهندسين المعماريين الأبرشيات هارو رومان، جان بايتيست فيرود (1884-1815) وحل محله جان أوجين فروماجاو المعين من قبل كبير المهندسين المعماريين في وزارة المستعمرات المباني الأبرشية في الجزائر.

تم توسيع الكنيسة بشكل كبير حيث تم هدمها بالكامل تقريبًا وإعادة بنائها لتحل حوالي أربعة أضعاف سطح المسجد القديم، والذي كان يقتصر على مساحة جوقة الكاتدرائية في نهاية العمل، وقد تم تجهيزها بـ «درج ضخم يطل على الساحة ويرجى للأجراس»²³.

تعطل مشروع تحويل المسجد القديم عدة مرات بسبب مشاكل استقرار المبنى قيد الإنشاء، وارتبطت هذه المشاكل بعدم استقرار الأرض على جانب شارع ديوان، ومن ثم وجود دعائم في الحجر المقطوع على طول الطريق. طول الجدار بالكامل على هذا الجانب؛ بعد مشاكل عدم استقرار الأرض هذه، تم إجراء مسوحات و «تم العثور على فسيفساء مثيرة للاهتمام تمثل رؤوس الحيوانات وأيضًا رصاص ... هذه الفسيفساء، التي لا يزال جزء



الشكل 4:

مشروع استكمال واجهة كاتدرائية القديس فيليب، لوحة مائية لألبرت بالو، الجزائر العاصمة سنة 1886. المصدر: كوماس أحمد، نافع شهرزاد، (2003).

20 Nedjari Samir, op.cit.

21 OULEBSIR Nabila, op.cit

22 OULEBSIR Nabila, op.cit

23 KOUMAS Ahmed, NAFAA Chérazade, « L'Algérie et son patrimoine », éditions du patrimoine, Paris, 2003.

منها تحت أساسات الكاتدرائية، نُسبت إلى الحمامات الرومانية القديمة»²⁴.

واستمر بناء الكاتدرائية من عام 1845 إلى 1860، وفي أثناء الأشغال، احتلت كنيسة نوتردام دي فيكتور (مسجد بيتشين السابق) مؤقتًا مكان كاتدرائية مدينة الجزائر²⁵. ومن ناحية أخرى، لم يتم الانتهاء من معالجة الواجهة حتى نهاية القرن التاسع عشر، وفي عام 1886 اعتمد اقتراح المهندس المعماري ألبرت بالو الذي تم تنفيذه، بعد عدة مقترحات فاشلة. المميز على مستوى الواجهة الكاتدرائية هو فكرة الارجين الجانبيين المستوحاة من العمارة المشرقية على غرار مآذن مسجد الناصر محمد في قلعة القاهرة.

ومن جانب النمط المعماري للكاتدرائية، فقد تم تشييد المبنى بأكمله بأسلوب معماري يمزج بين أنماط هندسية مختلفة، من الرومانية-البيزنطية إلى النمط الشرقي، وهو ما ولد العمارة المغاربية الجديدة (Néo-Mauresque) السائدة في الجزائر في بداية القرن العشرين. وفي عام 1908 تم إدراج مبنى الكاتدرائية ضمن قائمة جرد الآثار التاريخية.

وبقيت تحتفظ كنيسة سانت فيليب بوظيفتها ككاتدرائية لمدينة الجزائر حتى استقلال الجزائر عام 1962 وهو تاريخ استعادة المبنى لوظيفته الأصلية كمسجد. ومن جهة أخرى، فقد تم اختيار كنيسة القلب المقدس الجديدة التي بنيت عام 1956 لتحتل مكان كاتدرائية المدينة إلى يومنا هذا.



الشكل 5:

على اليسار، الحالة الأصلية للمسجد، على اليمين، المسجد بعد تحويله إلى كاتدرائية إضافة إلى استحداث الطرق وساحة إيفيتشي. (المصدر: أمال بلالا، 2018).

24 KLEIN.H, op.cit.

25 Nedjari Samir, op.cit.

التحول الوظيفي الثاني لمسجد كتشاوة (من كاتدرائية الى مسجد):

بعد 130 عامًا من الاحتلال الفرنسي للجزائر وسبع سنوات من حرب التحرير التي خاضها الجزائريون من أجل استرجاع سيادة البلد، انتهت بشكل رسمي بعد اقتراع تقرير المصير في 1 يوليو 1962، والذي صوت خلاله أغلبية الشعب الجزائري لصالح استقلال الجزائر، وأعترفت فرنسا رسمياً باستقلال الجزائر في 4 يوليو 1962²⁶. في الأشهر التي تلت ذلك، تم سريعا تحويل كاتدرائية سانت فيليب إلى المسلمين وأصبحت مرة أخرى مسجد كتشاوة (نظرا للأحداث الكبرى التي مرت بها العاصمة خلال هذه الفترة لم يتم التحديد التاريخ الدقيق للتحول، لكن يمكن الجزم أن تحويل كاتدرائية سانت فيليب إلى مسجد تم بين يوليو 1962 وديسمبر من نفس العام، بالموازاة مع ترقية كنيسة القلب المقدس إلى رتبة كاتدرائية مدينة الجزائر).

يروى الأب جان بيير هنري، أبرشية الجزائر العاصمة، حادثة استرجاع المبنى على أنه: «في اليوم التالي للاستقلال، اجتاح أهل الجزائر الكاتدرائية وطلبوا بإعادتها إلى عبادة المسلمين. وأعقبت ذلك المفاوضات، حتى أصبح مسجداً مرة أخرى في تشرين الثاني (نوفمبر) 1962»²⁷.

منذ أن استعاد المبنى وظيفته الأصلية كمسجد، لم تخضع كاتدرائية سان فيليب السابقة لتعديلات معمارية كبيرة؛ باستثناء تغيير الأثاث الداخلي وأفسحت كراسي الكنيسة القديمة المجال لسجاد المسجد، واستعاد المنبر القديم مكانه في قاعة الصلاة ووظيفته الأصلية بعد أن عمل كمنبر للكاتدرائية لمدة 130 عامًا. وتم أيضا إزالة الإخفاف وجميع الإشارات إلى المسيحية، وغيرت كذلك الصلبان المتدلية لأبراج الكاتدرائية القديمة والقبة المركزية بأهلة القمر.

التحدي الحقيقي لعملية إعادة شكل ووظيفة المسجد كان تطوير المحراب الذي يتجه إليه المؤمنون أثناء الصلاة والذي يجب بالضرورة أن يكون موجهاً نحو مكة، أي نحو الشرق في حالة مدينة الجزائر. في أغلب المخططات النموذجية للمساجد، يتم استحداث المدخل الى قاعة الصلاة على الجانب المقابل للمحراب، وهو ما يسمح للمصلين بأن يجدوا أنفسهم متجهين مباشرة نحو مكة وكذلك لتيسير التداول والحركة داخل قاعة الصلاة حيث لا يحق للمسلم التخطي بين صفوف المصلين وقت الصلاة. ومع ذلك، فإن مدخل كاتدرائية سانت فيليب القديمة يقع على الجدار الشرقي للمبنى أي على جدار القبلة، مما دفع السلطات الدينية إلى تثبيت جدار معزول عند المدخل، حيث تم استحداث محراب جديد للمسجد. وبهذا، يعتبر التصميم الداخلي لمسجد كتشاوة فريداً، حيث يتعين على المرء الانتفاخ حول الحائط عند مدخل المسجد، وأخذ الممرات على جانبي قاعة الصلاة للانضمام إلى الخط الخلفي للمصلي. وهو ما يثبت الى حد بعيد أن التصميم الداخلي للمبنى القائم لم يكن لمسجد. بالإضافة إلى التهيئة الداخلية للمبنى، فقد تم إنشاء مكان للوضوء على الجانب الشمالي الغربي من المسجد، مما يلزم المصلين بعبور المسجد بأكمله للوصول إليه ثم العودة إلى قاعة الصلاة.²⁸

26 Journal officiel France, 04 juillet 1962, P6483.

27 Reportage, « Ketchaoua : mosquée d'Alger », revue TDC, Diffusion Lundi 2 avril 2001 sur La Cinquième, Conception Hervé Pernot, Auteur-Réalisateur Mehdi Zergoun.

28 Nedjari Samir, op.cit



الشكل 7:

واجهة مسجد كتشاوة بعد آخر ترميم وافتتاحه سنة 2018. (المصدر: www.aa.com.tr, 2022)

الشكل 6:

مسجد كتشاوة ، تفاصيل الأبراج ، الجزائر العاصمة ، 2009. (المصدر: تصوير عماري رضا، 2009.)

خضع المبنى الذي يشهد على تعاقب أربعة قرون من تاريخ الجزائر للعديد من عمليات الترميم الحديثة والتي لم تؤثر كثيرا على شكل عمارته، وقد اقتصرَت هذه العمليات على تقوية وتعزيز المبنى والتي تمت على أجزاء مختلفة بسبب مشاكل عدم استقرار الأرضية. وانطلقت عملية الترميم الأخيرة في عام 2008، وهذا في أعقاب زلزال عام 2003 الذي ضرب المناطق المحيطة بالجزائر العاصمة، والذي عانى خلاله مسجد كتشاوة حيث لحقت أضرار كبيرة بالأبراج التي كانت مهددة بالانهيار وكان التحدي الكبير هو ضمان استقرار البناء بتعزيز هيكله.

خلال أعمال الترميم، ظل المسجد مغلقاً أمام الجمهور، إلى غاية إتمام الأشغال به وإعادة افتتاحه رسمياً في يوم الاثنين 09 ابريل من عام 2018. أسندت الأشغال إلى الوكالة التركية للتسيق والتعاون (TIKA)، بإشراف الشركات الجزائرية المتخصصة في الآثار.

ملخص عمليات التغيير والتكيف على مسجد كتشاوة:

يعتبر المخطط الأصلي لمسجد كتشاوة قبل تحويله إلى كنيسة والذي يتميز بمساحته المركزية المربعة تعلوها قبة مئمنة الأضلاع، تصميمًا جديدًا مستوحى من عمارة المساجد التركية خلال نفس الفترة الزمنية مقارنة بالمساجد المحلية أو حتى تلك المنتشرة في شمال أفريقيا. وهو ما يمكن تفسيره برغبة الـداي مثلًا عن السلطات العثمانية وضع البصمة التركية على العمارة الجزائرية من خلال اعتماد النمط العثماني في إنشاء المباني الجديدة.

مع احتلال الجزائر سنة 1830 وتنازل الاتراك عن مسجد كتشاوة لصالح القائد العام للجيش الفرنسي، تم استغلال المبنى «الديني» كمستودع للقوات الفرنسية المحتلة، رغم معارضة ومقاومة السكان المحليين لهذا القرار. ودام ذلك حوالي سنتين من الزمن حيث لم تشر الدراسات إلى وجود تغييرات مستحدثة على المبنى خلال هذه المدة.

بعدها تقرر تحويل مسجد كتشاوة إلى كنيسة، كمرحلة أولى، ومن أجل ذلك تم أحداث بعض التغييرات الخفيفة على البناية بغية تكيفها مع الوظيفة الجديدة، وأعلن رسمياً عن افتتاحها يوم 24 ديسمبر من عام 1832. ومن مجمل ما تم استحداثه نذكر:

• تركيب أثاث جديد بالإضافة إلى استغلال أثاث المسجد.

• تحويل ميضأة المسجد الموجودة عند المدخل على جانب شارع **ديفان** الى جرن المعمودية حيث يتميز بمحتواته التي يهيمن عليها الشكل الهلالي.

• كما استخدم المنحدر الرخامي ويرج المنبر في بناء منصة الوعظ للكنيسة، وتم عرض وعاء خبز القربان على الطاولة التي تدعم المقعد الرخامي للإمام والمزين بأعمدة ملتوية ومغطاة بالجرع.

• وأضيفت كذلك بعض الاشارات الرمزية، مثل تمثال للسيدة العذراء في المحراب، الذي كان يشير سابقاً إلى اتجاه القبلة.

• مرحلة ثانية في احداث التغييرات على مسجد كمشاوة، يعتبر تغيير اتجاه الصلاة التعديل الرئيسي الذي تم استحداثه على المبنى والذي أثر بشكل كبير على تنظيمه المجالي. كما يمكننا أن نلخص التغييرات الأخرى كالتالي:

• استحداث المذبح في الاتجاه المعاكس لجدار القبلة، وذلك بإعادة استخدام المنضدة الرخامية التي وضع عليها كرسي الإمام.

• وبناءً على طلب المارشال **بوجاود**، تم وضع صليب على البناية، ويمكننا أيضاً أن نرى فيه ثقلاً على مستوى المحراب، والذي أصبح باب الوصول إلى الكنيسة من فضاء الأسقفية.

• وبهذا، أصبح المبنى يوضح بشكل مثالي الوظيفة المزدوجة للمساجد التي تم تحويلها خلال هذه الفترة إلى كنائس. لا يبدو أن هذه الكنائس الهجينة التي تتميز بعمارته وزخارفها الإسلامية أثرت على المصلين في الكنيسة، حيث تم الاحتفاظ بالآيات القرآنية المنقوشة بأحرف كبيرة وكذلك مختلف الزخارف الداخلية للمسجد الأصلي .

• وبمناسبة احتفالات عيد الفصح لعام 1833، قدمت الملكة **ماري-أميلي** الأواني المقدسة للكنيسة الجديدة وأول أنواب الكهنة كما تبرع البابا **غريغوري** السادس عشر للكنيسة الجديدة بلوحة **لكاراتشي**، تمثل في الديانة المسيحية انتقال العذراء، وكذلك كأس ذهبي محاط بالجواهر ومزخرف بالديك (رمز اليقظة)²⁹.

وفي مرحلة أخرى، قررت السلطات الفرنسية أخيراً الهدم الكلي للمسجد وبناء كاتدرائية كبير في نفس المكان. حيث أزيلت القبة الرئيسية وكذا الأروقة الشرقية والغربية، وتم توسيع المبنى في كلا الاتجاهين على جانب الأسقفية واستحداث الأبراج. وتشير آخر أعمال الترميم على المبنى، أن جزءاً من الجدار المجاور لقصر حسين باشا عثمانى الأصل. تم توسيع الكاتدرائية بشكل كبير لتحتل حوالي أربع أضعاف سطح المسجد القديم. وتم استحداث درج ضخم يحده من كل جان برج ويطل على مكان الأسقفية بغية تدارك الاختلاف الكبير في مستوى الأرض.

مع استخدام أعمدة المنبر وحوض الوضوء للمسجد القديم وكذلك أعمدة معبد **جوبيتر** الأولمي المستعادة من موقع شرشال الروماني القديم، وأخيراً بناء الأبراج المستوحاة من العمارة الإسلامية، تظهر الكاتدرائية أخيراً الى حد ما بمزيج من الأنماط بين الطراز الروماني البيزنطي الى الإسلامي العثماني. كما أن الأعمدة الجديدة هي في الغالب نسخة عن الأصلية. وتجدر الإشارة الى ان هذا المزج بين الأنماط المعمارية المختلفة يعد بداية ظهور نمط معماري جديد في الجزائر ذو ميول شرقي وهو: الأسلوب المغاربي الجديد أو ما يعرف بنمط **جونارت** (جونارت هو الحاكم العام الذي أمر باستخدام الطراز المعماري المحلي في

29 Charles-André Julien, Histoire de l'Algérie contemporaine, vol. I, Presse universitaires de France, Paris, 1964, p. 91.

المباني العامة) حيث انتشر على نطاق واسع في بداية القرن العشرين.³⁰

حافظت الكاتدرائية على شكلها ووظيفتها الى غاية استقلال الجزائر يوم 05 جويلية 1962، وهو نفس تاريخ إعادة تحويلها الى وظيفتها الأصلية كمسجد. منذ ذلك التاريخ لم تطرأ تغييرات كبيرة على المبنى باستثناء بعض الترميمات وتكييف مبنى الكاتدرائية مع المتطلبات الوظيفية للمسجد، كاستحداث المحراب وإزالة الإشارات الرمزية التي لها علاقة بالديانة المسيحية .

الخاتمة:

رافقت تحولات دور العبادة في الجزائر خلال القرنين التاسع عشر والعشرين جميع الاضطرابات التاريخية التي مرت بها المدينة والبلاد بشكل عام، منذ فترة الحماية العثمانية في الجزائر، تليها فترة الاستعمار الفرنسي. بعد استقلال البلاد عام 1962، عانت دور العبادة من تذبذب ميزان القوى بين الطوائف المختلفة وانتماءاتها الدينية.

التدخلات على هذه الأماكن المقدسة ليست صدفه، فهي تلامس الرموز الدينية، وتعكس مدى ارتباط المجتمع دينه. في الجزائر في عام 1832 وعام 1962، كان مسجد / كاتدرائية كشاوة هو الهدف من عمليات التحويل هذه، بالتأكيد لاحتياجات الاستخدام الديني، ولكن بشكل أساسي الأهمية الرمزية لاستيلاء المستعمر على مكان عبادة رئيسي يثبت به جانباً من بسط السيطرة.

من خلال تحويل مسجد كشاوة إلى كنيسة في عام 1832 وتحويله المعماري من عام 1845 حتى نهاية القرن التاسع عشر، يمكننا ملاحظة تغيير عمق مسجد كشاوة القديم، من خلال التحول الذي أدى إلى تحويل معظم آثار المبنى القديم، بإعطاء الكاتدرائية الجديدة أسلوباً معمارياً ذو ميول شرقي.

ومع تحويل كاتدرائية سان فيليب إلى مسجد خلال صيف عام 1962، تم إعادة تهيئة المكان لاستقبال المصلين المسلمين من جديد، وينسجم مع الوظيفة الجديدة. يتمتع المبنى حالياً بالحماية حيث يرمم المسجد كلما دعت الضرورة الى ذلك على غرار آخر عملية صيانة شهدها البناء ودامت حوالي عشر سنوات.

30 Amel Bellala, « Sur les traces de la première cathédrale d'Alger », Livraisons de l'histoire de l'architecture [En ligne], 38 | 2019, mis en ligne le 02 janvier 2021.

1. Albert DEVOULX, responsable des Domaines, dans KOUMAS Ahmed, NAFAA Chéhrzade, « L'Algérie et son patrimoine », éditions du patrimoine, Paris, 2003.
2. Amel Bellala, « Sur les traces de la première cathédrale d'Alger », Livraisons de l'histoire de l'architecture [En ligne], 38 | 2019, mis en ligne le 02 janvier 2021
3. Amel Bellala, Essai de restitution de la mosquée Ketchawa 1794-1840, thèse de magistère, LVAP, EPAU, 2018.
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15. Louis de BAUDICOUR, La Colonisation de l'Algérie : ses éléments, Ed Jaques Le coffre, Paris, 1856.
16. MARÇAIS Georges, Manuel d'art musulman : L'Architecture (Tunisie, Algérie, Maroc, Espagne, Sicile), Vol II, Chap.7-9, Ed Picard, Paris, 1926-1927.
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19. TERRAS Jean, Essai sur les biens habous en Algérie et en Tunisie, Etude de la législation coloniale, Lyon, Impr. du Salut public, 1899, cité dans OULEBSIR Nabila, « Les usages du patrimoine », Éd. La Maison des sciences de l'homme, Paris, 2004.
20. Traité de capitulation d'Alger du 5 juillet 1830, dans Nadine GASTALDI, Culte musulman 1839-1905, paris, 2006.



أغراض النقوش الكتابية التاريخية العربية في الجامع الأعلى بحماة

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الملخص:

يحتوي الجامع الأعلى الكبير في حماة على عددٍ من النقوش الزخرفية والكتايب التاريخية بعددٍ من اللغات فضلاً عن اللغة العربية. يحصر البحث النصوص العربية التاريخية في الجامع بناءً على مواقع تواجدها ضمنه، أهدافها والحقب التاريخية المتميزة إليها، كما يحلل أهدافها والأغراض من تواجدها. توصل البحث للعديد من النتائج أهمها الدور الإعلامي للجامع كمنبر للتواصل ونشر المراسيم والقوانين مما يحمل صفةً دينية ومرجعيةً رسمية شفاقة بين الحكام وبين أفراد الشعب. يمثل البحث بحد ذاته دعوة للاهتمام بتوثيق جميع المعالم الأثرية والكتايب التي تحتويها بأدق تفاصيلها وصفاً ورسمياً وتصويراً بحيث تتم حماية المعلومات التاريخية التي تحملها في حال تعرضت أصول الكتابات إلى أضرار كلية أو جزئية.

الكلمات المفتاحية: الجامع الأعلى، الجامع الكبير، حماة، كتابة، نقش.

Abstract:

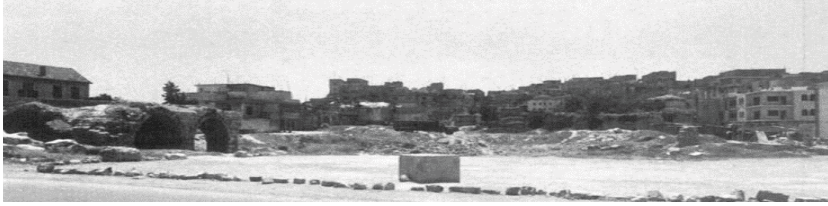
The Great Mosque of Hama includes within it a number of both decorative and written historical inscriptions in several languages along with Arabic. This paper classifies the historical Arabic texts within the mosque on several bases; such as their locations, subjects and time periods. It also analyzes their objectives and the purpose of existence. One of the important results of this study is the media role played by the Great Mosque as a platform for communication and publicity, carrying the role of being an official yet a clear reference between rulers and people, along with its original religious role. The research recommends documenting historical scripts accurately using all possible means in order to keep the information which they carry safe for next generations even if the actual monument got completely destroyed or partially damaged.

Keywords: Great Moaque, Hama, Inscription, Script, Upper Mosque.

1. مقدمة - الجامع الأعلى الكبير بحماة ونقوشه التاريخية العربية

طالما كانت المساجد الجامعة تؤدي وظائفاً هامة على أصعدةٍ مختلفة: تعليمية، إعلامية، إنسانية، سياسية واجتماعية وغيرها ... فضلاً عن وظيفتها الأساسية كفراغٍ مخصص لإقامة الصلوات الخمس. يرصد البحث جزءاً من هذه الوظائف المختلفة في الجامع الأعلى الكبير بمدينة حماة في الجمهورية العربية السورية كمنالٍ على مسجدٍ جامعٍ خدم المجتمع المسلم في مدينة حماة منذ دخلها الفتح الإسلامي وحتى اليوم. يعتمد البحث على رصد الكتابات العربية التاريخية المنقوشة على العناصر المعمارية ضمن الجامع الأعلى بحماة وتحليلها بناءً على الأعراس التي ترمي إليها وذلك للتعرف على نوع الرسائل التي تحملها تلك النقوش ليكون الجامع وسيلةً لنقلها أو نشرها.

تم عمل دراسة مهمة وثقت نقوش الجامع من قبل كامل شحادة بعنوان: الجامع الأعلى الكبير بحماة (1976م)، وقد استند إليها البحث بشكلٍ كامل في نقل نصوص الكتابات العربية حيث خسر الجامع جزءاً منها بعد أن هدمت أجزاءً كبيرة من بنيانه، وزالت مفروشاتة الخشبية بالكامل في ثمانينات القرن الماضي¹ (2009, 219, O'Kane, 220)، تظهر (الصورة 01) موقع الجامع الأعلى عام 1988م. إضافةً إلى صعوبة الوصول إلى جميع النصوص في الوقت الراهن حيث يقع البعض منها في أماكن مغلقة على الزوار. هذا البحث يتميز عن الدراسة السابقة في تحليله للنصوص وتصنيفها وفقاً لمواقع تواجدها ولأغراضها، عوضاً عن الاكتفاء بتوثيقها وجمعها. إضافةً إلى اهتمامه بالنقوش العربية فقط بينما شملت الدراسة السابقة جميع النصوص الموجودة في الجامع.



صورة 01:

موقع الجامع الأعلى الكبير، التقطها: Bernard O'Kane, 1988
المصدر: (O'Kane, 2009, 220)

1.1. لمحة تاريخية عن الجامع الأعلى الكبير بحماة

طالما كان الموقع الحالي للجامع الأعلى مركز مدينة حماة الديني على مر العصور؛ ففي البدء أنشئ معبداً خلال الفترة الواقعة بين القرنين 5-7 ق.م. عند بدايات القرن 4 م تم تحويله إلى كنيسة عرفت باسم (كنيسة يوحنا المعمدان)²، غير أنه أعيد معبداً وثياً للإله (باخوس)³ عام 362م، ثم كنيسةً مجدداً عام 363م لتحمل لاحقاً اسم (كنيسة يوحنا ذهبي الفم)⁴ (نحاس،

1 أعيد بناء الجامع في التسعينات من القرن الماضي، كما تمت صناعة نماذج مشابهة للعناصر الخشبية الأصلية.

2 يوحنا المعمدان/ النبي يحيى بن زكريا (John the Baptist): شخصية مقدسة لدى المسيحية والإسلام والصابئة والبهائية. بحسب المعتقدين الإسلامي والمسيحي فهو نبي وابنٌ للنبي زكريا عليه السلام، وهو من قام بتعميد المسيح بحسب المعتقد المسيحي.

3 الإله باخوس/ ديونيسوس (Dionysus/ Bacchus): أحد رموز الميثولوجيا الإغريقية، يُمثل إله الخمر.

4 يوحنا ذهبي الفم (John Chrysostom): قس وكاتب مسيحي ولد بأنطاكية، شغل منصب بطريرك القسطنطينية ولقب (فم الذهب) لفصاحته. يعتبر قديساً لدى جميع الطوائف المسيحية. عاش 347-407م.

(2007، 37). عام 15هـ/ 636م فتحت حماة صلحاً على يد أبي عبيدة ابن الجراح⁵ رضي الله عنه وكان شرط الصلح: «جعل الكنيسة العظمى جامعاً» (أبو الفداء، 1958، 1/ 109). وبهذا بات جامع مدينة حماة الكبير.

يقع الجامع الأعلى الكبير في (حي المدينة) جنوب (قلعة حماة)⁶ على الضفة الغربية من نهر العاصي⁷ وحمل لقب (الأعلى) لتفريقه عن (الجامع النوري)⁸ الذي بني عقبه على مستوى أدنى منه (شهادة، 1969، 100). تظهر (الصورة 02) موقع الجامع في مدينة حماة. يحوي الجامع العديد من الآثار والكتابات التي تعود إلى العصور التاريخية التي مرّ بها؛ أقدمها كتابات على أربعة أحجار بازلتية⁹ تعود إلى العهد الحثي¹⁰ تم نقلها إلى (متحف إسطنبول الأثري)¹¹ عام 1872م (الجيجكلي، 2014، 1/ 5). وكتابتان باللغة اليونانية؛ يقدر أن أقدمهما تعود إلى القرن 5-6م (شهادة، 1976، 196)، بينما الأخرى منقوشة على قوس إحدى النوافذ وهي مؤرخة عام 595م (نحاس، 2007، 38). إضافة إلى مجموعة من الكتابات العربية التي تعود إلى العصور؛ الزنكي، الأيوبي والمملوكي.



صورة 02:

موقع الجامع الأعلى الكبير بحماة.
المصدر: Google Earth، تاريخ الاسترجاع: 2020/07/16م.

1. 2. أهمية الجامع الأعلى الكبير بحماة

- 5 أبو عبيدة عامر بن الجراح: أحد كبار الصحابة من السابقين للإسلام والمبشرين بالجنة، لقبه (أمين الأمة). ولد 42ق.هـ/ 582م. هاجر إلى الحبشة، قاد معارك في عهد النبي ﷺ، عيّن قائداً عاماً لجيوش فتح الشام، توفي (بطاعون عمواس) 18هـ.
- 6 قلعة حماة: تقع وسط حماة فوق تل طبيعي على الضفة الغربية لنهر العاصي. تحوي آثاراً تعود إلى الألف 5ق.م. تعرضت للعديد من عمليات الترميم حتى قام (تيمورلنك) بهدمها عام 1258م.
- 7 نهر العاصي (Orontes): ينبع من (سهل اللبوة) بمنطقة (البقاع) بלבنا، ويصب في (البحر الأبيض المتوسط) عند خليج (السويدية) مروراً بحمص وحماة وسهل الغاب، طوله 571 كلم. تعزى تسميته إلى اتجاهه من الجنوب إلى الشمال مخالفاً طبيعة أنهار المنطقة، أو لكونه عصي الورد.
- 8 الجامع النوري/ حماة: أحد أهم جوامع حماة الأثرية، يقع في محلة (باب الناعورة) بمنطقة (الكيلانية)، يطل على نهر العاصي من ضفته الشرقية ويرتبط بثلاثة نواعير؛ (الجعبرية)، (الطيارة) و(الكيلانية). بناه (نور الدين زنكي) موضع (دير قرما) عام 558هـ/ 1162م ويجواره بيماستان.
- 9 البازلت (Basalt): صخر بركاني أسود اللون. يتميز بثقل وزنه وصلابته الشديدة وخشونة ملمسه.
- 10 الحثيون (Hittites): أقوام هندو-أوروبيين سكنوا آسيا الصغرى وبلاد الشام منذ الألف 3 ق.م. ازدهرت ممالكهم خلال 2000-1200 ق.م. حيث أنهاوا سلالة بابل الأولى وحكم الميتانية، وأسسوا دولاً منها دولة قوية شمال سورية 1450-1200ق.م. استخدموا الكتابات المسمارية والهيروغليفية الحثية.
- 11 متحف إسطنبول الأثري (Istanbul Arkeoloji Müzeleri): يقع في منطقة (إمينونو Eminönü) قرب قصر (طوب كابي Topkapı Sarayı)، أنشئ عام 1891م. يضم حوالي مليون قطعة أثرية.

يمثل الجامع الأعلى الكبير بحماة أحد أقدم المساجد الجامعة تاريخياً، حيث استمر مسجداً جامعاً منذ فتح المدينة في مطلع العهد العمري¹² وحتى اليوم، وهو مثال هام على إعادة توظيف المباني إلى مساجد إذ كان أول كنيسة يتم تحويلها إلى جامع في الإسلام (شحادة، 1969، 100). يندرج مخطط الجامع تحت النمط العربي للمساجد،¹³ والمكون من ثلاثية أساسية: الحرم، والصحن محاطاً بأروقة مععمدة. يوضح الشكل (01) المخطط العام للجامع الأعلى بحماة. وقد نشأ هذا النمط استمراراً للمسجد النبوي في المدينة (Hakim, 2008, 47)، وكان هو النمط السائد في المساجد الجامعة لبلاد الشام، وعلى هذا النمط بني لاحقاً الجامع الأموي بدمشق¹⁴ (عقيلي، 2015، 46). ويتضح من المدخل المغلق للمعبد الوثني، الواقع في الجدار الشرقي للحرم، ومن المدخل المغلق للكنيسة الواقع في الجدار الغربي للحرم (نحاس، 2007، 40-41) أن فراغ الحرم قد تمت إعادة توظيفه ليناسب وظيفة الصلاة عبر إغلاق المداخل القديمة، وتحويل الدخول إلى الجهة الشمالية المقابلة لجدار القبلة (شحادة، 1969، 100)، فيما يبدو أن الأروقة المععمدة أضيفت في مراحل لاحقة.¹⁵



شكل 01: المخطط العام للجامع الأعلى الكبير بحماة. المصدر: (الجبجكي، 2020، 7).

يضم الجامع الأعلى مئذنتين تاريخيتين؛ الأولى تعود إلى العصر الزنكي وتقع في الراوية الجنوبية الشرقية

منه، وهي ذات مسقط مربع مئذنة بأحجار كلسية بيضاء وبازلتية سوداء. تظهر الصورتان 03، 07 المئذنة الجنوبية. شيدت عام 529هـ/ 1135م بأمر صلاح الدين الياغساني¹⁶، هذه المنارة مقطوعة الرأس (الصابوني، 2015، 63)؛ وتعرف لهذا السبب بأن: نصفها ذهب، أي: نصفها زال. أما المئذنة الثانية فتعود إلى العصر المملوكي وتقع في صدر الرواق الشمالي، وهي ذات مسقط مربع في قاعدتها وبدن مئذنة، مئذنة من حجر كلسي منحوت ومكحل بالحجر الأسود البازلتي ومزينة بمقرنصات ومحاريب وفتحات على الطراز المملوكي للمآذن. تظهر الصورة 04 المئذنة الشمالية. أمر بنائها إبراهيم الهاشمي،¹⁷ وانتهى البناء في عام 825هـ/ 1422م (شحادة، 1976، 208).

12 تولى الخليفة عمر بن الخطاب رضي الله عنه الخلافة عقب وفاة أبي بكر الصديق رضي الله عنه في جمادى الآخرة من عام 13هـ، وفتحت حماة في العام 15هـ.

13 Arabic hypostyle mosque-type

14 بدأ العمل على بناء الجامع الأموي بدمشق في عهد الخليفة الأموي الوليد بن عبد الملك عام 86هـ/ 705م، وانتهى في عهد خليفته سليمان بن عبد الملك عام 96هـ/ 715م.

15 للاستزادة: (الجبجكي، 2020، 6).

16 صلاح الدين محمد أيوب الياغساني: عامل الدولة الزنكية على حماة في عهدي (عماد الدين زنكي) وابنه (نور الدين)، تولى إقطاع حمص عقب حماة وتوفي بها 552هـ/ 1157م.

17 إبراهيم الهاشمي: نائب مملوكي، بنى الرواق الشرقي في الجامع الأعلى بحماة 823هـ/ 1420م كمدرسة عرفت باسم (المدرسة/ الراوية الهاشمية) ليتحول لاحقاً إلى (الحرم السعودي)، كما بنى مئذنته الشمالية 825هـ/ 1422م.

فضلاً عن الآثار العائدة إلى العصور ما قبل الإسلام، فإن الجامع الأعلى يضم العديد من العناصر المعمارية والزخارف والزنوك¹⁸ العائدة لعصور إسلامية مختلفة تبعاً للترميمات التي



صورة 04:

المئذنة الشمالية المملوكية في الجامع الأعلى بحماة. التقطها: K.A.C. Creswell, 1921
المصدر: (Beta, 2021B)

صورة 03:

المئذنة الجنوبية الزنكية في الجامع الأعلى بحماة. التقطها: K.A.C. Creswell, 1926
المصدر: (Beta, 2021B)

أجريت عليه. يظهر (الشكل 02) المخطط التاريخي للجامع الأعلى. وقد تميز صحن الجامع الأعلى بحماة بتواجد قبة الخزنة التي كان إنشاؤها في المساجد الجامعة عادةً في مدن الشام وغيرها (المقدسي، 1991، 182)،¹⁹ ولم يبق منها سوى ثلاثة: في الجامع الأقصى²⁰ بالقدس، والجامع الأموي²¹ بدمشق، والجامع الأعلى بحماة. بنيت قبة الخزنة في العهد العمري، حيث أمر عمر بن الخطاب²² رضي الله عنه بإنشاء قباب لبيوت المال عقب سرقة وقعت لبيت المال في مدينة البصرة (شحادة، 1976، 198-197). تظهر قبة الخزنة ضمن الصورة 07.

18 الزنك: شعار اتخذته أمراء الدول السلجوقية والمملوكية لأنفسهم، وجمعه (زنوك).

19 ذكر كرينويل (1984، 113) وجود قبة المال في جامع عمرو بن العاص في الفسطاط محمولةً على عشر أعمدة.

20 المسجد الأقصى/ القدس: أحد أهم المساجد يقع في مدينة القدس القديمة فوق (هضبة موريا)، يحمل قدسية هامة لدى المسلمين كونه أولى القبليتين ومسرى النبي (محمد) ﷺ. تبلغ مساحته 144,000م². يضم المصلى المرواني وقبة الصخرة والمسجد القبلي إضافة إلى حوالي 200 معلم أثري. يقدس اليهود موقع المسجد حيث يعتقدون أنه موقع (هيكل سليمان).

21 الجامع الأموي الكبير/ دمشق: يقع وسط مدينة دمشق القديمة. كان بدايةً معبداً آرامياً ثم يونانياً ورومانياً ثم بنيت فيه كنيسة. أمر الخليفة الأموي (الوليد بن عبد الملك) بينائه الذي استمر 705-715م.

22 عمر بن الخطاب العدوي/ الفاروق: أحد كبار الصحابة ومن المبشرين بالجنة، والد أم المؤمنين (حفصة)، وثاني الخلفاء الراشدين. هاجر إلى المدينة وشهد الوقائع مع النبي ﷺ. خلال حكمه فتح العراق والشام والجزيرة الفراتية وفارس. استشهد 23هـ/ 644م.



شكل 02:

المخطط التاريخي للجامع الأعلى الكبير بحماة. المصدر: (الجيكلبي، 2020، 6).

1.3. مواضع تواجد الكتابات التاريخية العربية في الجامع الأعلى الكبير

تتوزع النقوش التاريخية العربية في أربعة مواقع من

الجامع:

يوضح (الشكل 03) مواضع تواجد الكتابات العربية التاريخية في الجامع الأعلى الكبير.

1. المئذنة الجنوبية: تحتوي على كتابتين ترتفعان عن قاعدتها؛ إحداهما في واجهتها الجنوبية والأخرى في واجهتها الشرقية. تظهر المئذنة الجنوبية في (الصورة 03) وفي يسر (الصورة 07).
2. منبر الحرم: هو منبر خشبي أنري صنع عام 701هـ/ 1302م بأمر الكافل²³ زين الدين كتيغاً²⁴. تواجد داخل الحرم القبلي مجاوراً للمحراب. تواجدت الكتابات على مدخله وجانبه وكسوته الداخلية. يظهر المنبر اليمن (الصورة 06).
3. الرواق الشرقي في الحرم السعدي: هو رواق ذو أعمدة يتصل من شرق الجامع حتى جهته الشمالية. يحتوي على ثمان كتابات متوزعة في سواكف النوافذ والأعمدة. تظهر (الصورة 07) جزءاً من الرواق السعدي تحت المئذنة الشمالية.
4. أعمدة قبة الخزنة: تواجد قبة الخزنة في الجزء الغربي من ساحة الجامع، تحملها أعمدة ثمانية كورنثية²⁵ التيجان،²⁶ وتحتها بحرة صغيرة (الصابوني، 2015، 165)، كانت تستخدم للوضوء كبكرة ثانوية بالإضافة إلى بحرة الجامع الأصلية (شهادة، 1976، 198). تم نقش كتابات على سبعة من أصل ثمانية أعمدة. تظهر قبة الخزنة اليمن (الصورة 07).
5. التابوت الخشبي للملكين الأيوبيين: يقع التابوت في غرفة مدفون خاصة تعلوها قبة، يتم الوصول إليها عبر الرواق الغربي مروراً بساحة صغيرة تحوي بحرة مربعة. يتوضع التابوت فوق درجة حجرية بارتفاع 15م، وهو تابوت مزدوج يضم جثمانين

23 الكافل: لقب مملوكي يعني نائب السلطان أو الوزير، استبدل في العهد العثماني بلقب (المتسلم).

24 العادل زين الدين كتيغاً: سلطان مملوكي، بدأ مملوكاً لدى السلطان (الملك المنصور بن قلاوون)، وترقى حتى صار سلطاناً على مصر والشام 694هـ/ 1294م، ثم نزل عنها مقابل صرخد 696هـ/ 1297م، ثم صار نائباً لحماة 699هـ/ 1300م، وبها توفي ودفن بدمشق 702هـ/ 1302م.

25 كورنثي (Corinthian): أحد الطرز الكلاسيكية الثلاثة في العمارة اليونانية والرومانية؛ الدوري، الأيوبي والكورنثي. يتميز العمود الكورنثي بتاجه ذي الأربع زوايا وبكونه شديد الزخرفة بزخارف نباتية.

26 العمود الكلاسيكي: يتكون العمود الكلاسيكي من ثلاثة أجزاء: القاعدة، البدن والتاج.

ملكي حماة الأيوبيين؛ المنصور الثاني²⁷ وابنه المظفر الثالث محمود²⁸ التابوت مصنوع من خشب الأبنوس، مربع المسقط يعلوه غطاءان جملونياً²⁹ الشكل، يغطي كل منهما أحد قبوري الملكين. (تظهر الصورة 08) صورة التابوت الخشبي المزدوج.



صورة 06:

المنبر الخشبي الحالي داخل الحرم القبلي (نسخة عن الأصلي).
المصدر: الباحثة، مارس 2010م.

صورة 07:

صحن الجامع الأعلى الكبير بحماة، توضح: قبة الخزنة، الحرم القبلي، المئذنة الجنوبية، وجزءاً من الحرم السعدي في أقصى اليسار.
المصدر: الباحثة، مارس 2010م.



صورة 08:

القبور المزدوج للملكين الأيوبيين (نسخة عن الأصلي).
المصدر: الباحثة، مارس 2010م.



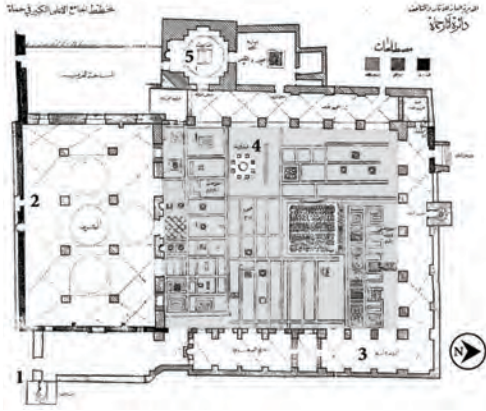
صورة 07:

المئذنة الشمالية للجامع الأعلى وتحتها يظهر جزء من الرواق السعدي (الشمالي).
المصدر: الباحثة، مارس 2010م.

27 المنصور الثاني: خامس الملوك الأيوبيين لحماة، خلف أباه (المظفر الثاني محمود) وعمره 10 سنوات، شهد (عين جالوت) وشارك فيها بجيشه بقيادة السلطان (قطز)، توفي بحماة ودفن بجامعها الأعلى. حكم 1214-1284م.

28 المظفر الثالث محمود: سادس الملوك الأيوبيين لمملكة حماة، خلف أباه (المنصور الثاني)، شارك في حرب الصليبيين بقيادة السلطان (قلاوون). حكم 1284-1298م.

29 جملون: جملة إنشائية تستخدم لتشبيد الأسقف، تتكون من موشور مثلث المقطع.



شكل 03:

مسقط أفقي للجامع الأعلى الكبير بحماة، يوضح مواقع تواجد النقوش الكتابية العربية؛

1. المئذنة الجنوبية (نقشان).
 2. منبر الجامع (9 نقوش).
 3. الرواق الشرقي (8 نقوش).
 4. قبة الخزنة (9 نقوش).
 5. تابوت الملكين (3 نقوش).
- المصدر: دائرة الآثار بحماة.

2. أغراض النقوش والكتابات التاريخية العربية في الجامع الأعلى الكبير

تنوع أغراض الكتابات التاريخية المنقوشة على الأجزاء الحجرية والخشبية في الجامع الأعلى الكبير، وقد يجمع النص التاريخي أكثر من غرض. خلال عرض نصوص النقوش تم توزيع الأسطر كما وردت في أصولها، كما تمت إحاطة الكلمات الغريبة أو غير المفهومة بقوسين، بينما تمت الاستعاضة عن الكلمات غير المقروءة أو المفقودة بثلاث نقاط.

2. 1. غرض التزيين

هذا الغرض سمة مشتركة بين معظم النصوص المنقوشة؛ حيث تم نقش الكتابات باستخدام أنواع جميلة من الخطوط وهي الكوفي والنسخ. إلا أن النصوص القرآنية وحدها تنفرد بهذا الغرض، بينما تجمع نصوص أخرى بين الغرض التزييني وغرض آخر. كما يلاحظ دائماً تناسب موضوع الآيات المختارة مع العنصر المنقوشة عليه حيث يتم اختيار آيات تحت على القيام بالصلاة والعبادات أو عمارة المساجد...

1. أهم الكتابات القرآنية تتواجد بشكل شريط كتابي مزخرف على الجانبين الخارجيين للمنبر الخشبي بشكل إطاراً شبه منحرف الشكل لدرابزين³⁰ المنبر (شحادة، 1976، 212)؛ نص الجانب الأيمن:

1. أَعُوذُ بِاللَّهِ السَّمِيعِ الْعَلِيمِ مِنَ الشَّيْطَانِ الرَّجِيمِ، بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ، أَقِمِ الصَّلَاةَ لِدُلُوكِ الشَّمْسِ إِلَى غَسَقِ اللَّيْلِ وَقُرْآنَ الْفَجْرِ • إِنَّ قُرْآنَ الْفَجْرِ كَانَ مَشْهُودًا. وَمِنَ اللَّيْلِ فَتَهَجَّدْ بِهِ نَافِلَةً لَكَ عَسَىٰ أَنْ يَبْعَثَكَ رَبُّكَ مَقَامًا مَّخْمُودًا. وَقُلْ رَبِّ أَدْخِلْنِي مُدْخَلَ صِدْقٍ وَأَخْرِجْنِي مُخْرَجَ صِدْقٍ وَاجْعَلْ لِي مِنْ لَدُنْكَ سُلْطَانًا نَصِيرًا.

(سورة الإسراء، 78-80)

2. إِنَّمَا يَعْزُمُ مَسَاجِدَ اللَّهِ مِنْ آمِنَ بِاللَّهِ وَالْيَوْمِ الْآخِرِ وَأَقَامَ الصَّلَاةَ وَآتَى الزَّكَاةَ وَلَمْ يَخْشَ إِلَّا اللَّهَ • فَعَسَىٰ أُولَئِكَ أَنْ يَكُونُوا مِنَ الْمُهْتَدِينَ. (سورة التوبة، 18) وافق الفراغ منه النصف من شهر شعبان المبارك من شهور إحدى وسبعمئة وصلى الله على سيدنا محمد وآله وأصحابه.

نص الجانب الأيسر:

30 الدرابزين/ الدرابزون: عنصر معماري عبارة عن حاجز قصير الارتفاع يحيط بجائني الأدرج وحواف الشرفات، تعود التسمية إلى الكلمة التركية (Trabzan).

1. إِنَّمَا يَغْمُرُ مَسَاجِدَ اللَّهِ مَنْ آمَنَ بِاللَّهِ وَالْيَوْمِ الْآخِرِ وَأَقَامَ الصَّلَاةَ وَآتَى الزَّكَاةَ وَلَمْ يَخْشَ إِلَّا اللَّهَ • فَعَسَىٰ أُولَٰئِكَ أَنْ يَكُونُوا مِنَ الْمُهْتَدِينَ. (سورة التوبة، 18) وافق الفراغ منه النصف من شهر شعبان المبارك من شهور إحدى وسبعمائة وصلى الله على سيدنا محمد وآله وصحبه.

2. التَّائِبُونَ الْعَابِدُونَ الْخَائِدُونَ السَّائِحُونَ الرَّاكِعُونَ السَّاجِدُونَ التَّامِرُونَ بِالْمَغْرُوفِ وَالنَّاهُونَ عَنِ الْمُنْكَرِ وَالْحَافِظُونَ لِحُدُودِ اللَّهِ • وَبَشِّرِ الْمُؤْمِنِينَ. (سورة التوبة، 112) يَسْتَبِينَ وَرُونَ بِنِعْمَةٍ مِّنَ اللَّهِ وَمُضْلٍ وَأَنَّ اللَّهَ لَا يُضِيعُ أَجْرَ الْمُؤْمِنِينَ. (سورة آل عمران، 171) صدق الله العظيم.

كتابات بالخط الكوفي المشجر بخلفية مزخرفة على درفتي³¹ باب المنبر الخشي (شهادة، 1976، 212): تظهر (الصورة 09) الجزء العلوي من بوابة المنبر الخشي. نص الجانب الأيمن:

قُلِ الْحَمْدُ لِلَّهِ وَسَلَامٌ (سورة النمل، 59)

نص الجانب الأيسر:

عَلَىٰ عِبَادِهِ الَّذِينَ اصْطَفَىٰ • (سورة النمل، 59)

كتابة على واجهة الهيكل الحامل لقبة المنبر الخشبية (شهادة، 1976، 202)؛ نص الكتابة:

رَبَّنَا أَفْرِغْ عَلَيْنَا صَبْرًا وَتَوَقَّفْنَا فَسْئَلِينَ. (سورة الأعراف، 126)

كتابات بالخط النسخي لآيات قرآنية على جسد التابوت الخشي تتوج حافته العلوية من الجهات الأربع ضمن شريط سماكته 8 سم (شهادة، 1975، 169)؛ نص الكتابة بدءاً من الجهة الغربية وصولاً إلى الجنوبية (باتجاه دوران عقارب الساعة):

1. بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ اللَّهُ لَا إِلَهَ إِلَّا هُوَ الْحَيُّ الْقَيُّومُ • لَا تَأْخُذُهُ سِنَّةٌ وَلَا نَوْمٌ • لَهُ مَا فِي

2. إِلَّا هُوَ الْحَيُّ الْقَيُّومُ • لَا تَأْخُذُهُ سِنَّةٌ وَلَا نَوْمٌ • لَهُ مَا فِي السَّمَاوَاتِ وَمَا فِي الْأَرْضِ • مَنْ ذَا الَّذِي يَشْفَعُ عِنْدَهُ إِلَّا بِإِذْنِهِ • يَعْلَمُ مَا بَيْنَ أَيْدِيهِمْ وَمَا خَلْفَهُمْ • وَلَا يُحِيطُونَ بِشَيْءٍ مِّنْ عِلْمِهِ إِلَّا بِمَا شَاءَ • وَسِعَ كُرْسِيُّهُ السَّمَاوَاتِ وَالْأَرْضَ • وَلَا

3. يَئُودُهُ حِفْظُهُمَا • وَهُوَ الْعَلِيُّ الْعَظِيمُ. (سورة البقرة، 255) صدق الله العظيم ورسوله الكريم

4. يُبَشِّرُهُمْ رَبُّهُمْ بِرَحْمَةٍ مِّنْهُ وَرِضْوَانٍ وَجَنَّتْ لَهُمْ فِيهَا نَعِيمٌ مُّقِيمٌ. خَالِدِينَ فِيهَا أَبَدًا • إِنَّ اللَّهَ عِنْدَهُ أَجْرٌ عَظِيمٌ. (سورة التوبة، 22-21) صدق الله العظيم وصدق رسوله الكريم الحمد لله رب العالمين.



صورة 09:

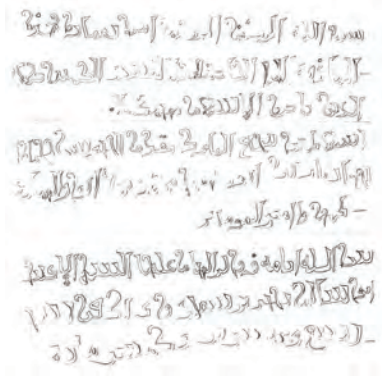
البوابة الخشبية للمنبر، التقطها: Bernard O'Kane، 1979 (المصدر: O'Kane، 2009، 234)

2.2. غرض التوثيق المعماري والإنشائي

يشمل هذا الغرض التوثيق التاريخي لأعمال الإنشاء أو التجديد وتواريخها، بالإضافة إلى توثيق أسماء الأئمة بتنفيذها، وقد يتضمن توثيق أسماء الصناعين أو الحرفيين الفنيين في بعض الأحيان.

1. الكتابة بالخط الكوفي على الواجهة الشرقية من قاعدة المئذنة الجنوبية، بارتفاع المدماك³² السابق، ضمن مستطيل عرضي أبعاده (300×50) سم (شحادة، 1976، 211)؛ توثق تاريخ إنشاء المئذنة عام 529هـ/ 1135م، وصاحب الأمر بإنشائها صلاح الدين الياساني، والقائم على الإنشاء يحيى بن سعيد³³ يظهر (الشكل 04) رقماً توثيقاً للكتابة.

1. بسم الله الرحمن الرحيم، أمر بعمارة هذه المئذنة الأمير الحاجب السيد الكبير صلاح الدين ناصر الإسلام معتمد
2. السلاطين شجاع الملوك مقدم الجيوش فخر الأئمة الحاجب ... أبو جعفر محمد أيوب العمادي ظهير أمير المؤمنين
3. ثبت الله أيامه وولي القيام عليها السيد الأكبر أبو سالم يحيى ابن سعيد وذلك في سنة تسع وعشرين وخمسماية.



شكل 04:

رفع لكتابة المئذنة الجنوبية، إنجاز مراقب آثار حماة والمعرفة: كامل شحادة عام 1954م. المصدر: مديرية الآثار والمتاحف بدمشق.

2. الكتابة بالخط الكوفي على الواجهة الجنوبية للمئذنة الجنوبية، بنفس ارتفاع الكتابة السابقة تقريباً، ضمن دائرة. تظهر (الصورة 10) الكتابة ضمن الدائرة على واجهة المئذنة الجنوبية. تتكون الكتابة من خمسة أسطر (شحادة، 1976، 200)؛ توثق تاريخ إنشاء المئذنة المذكور آنفاً، والقائم على بنائها:



صورة 10:

الكتابة ضمن الدائرة على الواجهة الجنوبية للمئذنة الجنوبية. التقطها: K.A.C Creswell, 1926 المصدر: (Beta, 2021C)

32 المدماك: الصف الأفقي من الحجارة أو اللبن ونحوها...

33 يحيى بن سعيد: شيخ ينتسب إلى قبيلة (بهراء) التي سكنت حماة. ولد 487هـ/ 1094م. تولى القيام على إنشاء المئذنة الجنوبية في جامع حماة الأعلى.

3. كتابة مدخل منبر الحرم بالخط النسخي على شكل حزام فوق المدخل (شهادة، 1976، 211-212)؛ توثق صاحب أمر إنشاء المنبر السلطان زين الدين كتبغا، وصاحب المشورة عليه أحمد الحنفي؛³⁴

أمر بإنشاء هذا المنبر المبارك المقام الشرف العالي المولوي السيدي المالكي المنصورة المظفري الخدمومي والعدالي الزبي كتبغا أعز الله أنصاره. بإشارة الفقير إلى الله تعالى الراجي عفو ربه أحمد بن أحمد الحنفي أعزه الله.

4. كتابة أخرى تقع تحت الكتابة السابقة عند مدخل المنبر الخشي بالخط النسخي؛¹ توثق اسمي النجارين صانعي المنبر الخشي:

عمل العبدین الفقیرین إلى الله تعالى علي ابن مكي وعبد الله بن أحمد رحمهما الله.

5. الكتابة التالية للآية القرآنية على الجانبين الخارجيين الأيمن والأيسر من المنبر الخشي، توثق تاريخ إنشاء المنبر عام 701هـ/ 1302م.

إِنَّمَا يَعْزُمُ مَسَاجِدَ اللَّهِ مِنْ آمَنَ بِاللَّهِ وَالْيَوْمِ الْآخِرِ وَأَقَامَ الصَّلَاةَ وَآتَى الزَّكَاةَ وَلَمْ يَخْشَ إِلَّا اللَّهَ • فَعَسَىٰ أُولَٰئِكَ أَنْ يَكُونُوا مِنَ الْمُهْتَدِينَ. (سورة التوبة، 18) وافق الفراغ منه النصف من شهر شعبان المبارك من شهور إحدى وسبعمائة وصلى الله على سيدنا محمد وآله وصحبه.

6. سطران بالخط النسخي كل واحد منهما يقع على درفة من درفات بوابة المنبر الخشي (شهادة، 1976، 213)؛ يوثق السطر على الدرفة اليمنى اسم الناقد، بينما يوثق السطر على الدرفة اليسرى اسم المَطْعَم؛ نص السطر الأيمن:

نصها علي ابن عثمان رحمه الله.

7. نص السطر الأيسر:

طعم هذا المنبر أبو بكر بن محمد رحمه الله.

8. ساكف³⁵ مدخل المئذنة الشمالية ضمن رواق الحرم السعدي يحتوي على كتابة بالخط النسخي تتألف من سطرين (شهادة، 1976، 200)؛ يوثقان تاريخ تجديد الرواق عام 823هـ/ 1420م، وصاحب التجديد إبراهيم الهاشمي:

1. جدد عمارة هذا المكان المبارك العبد الفقير إلى الله تعالى إبراهيم

2. الهاشمي عفا الله عنه بتاريخ ربيع الآخر سنة ثلاثة وعشرون وثمانمائة.

9. الكتابات التوثيقية على غطاء تابوت الملكين الخشي المزوج، توثق الكتابات اسمي الملكين وألقابهما وتاريخ وفاتهما بالإضافة إلى تاريخ صنع التابوت، تكون الكتابة إطاراً للواجهتين الخارجيتين والواجهتين الداخليتين لسقفي التابوت الجملونيين، يحدد هذا الإطار الجهات اليمنى والعلية واليسرى بسماكة 8سم ويتضمن الكتابات بالخط النسخي النافر (شهادة، 1975، 169-170)، توثق كتابات غطاء القبر الشمالي اسم صاحب القبر الملك المنصور الثاني، والأمر بعمل التابوت ابنه الملك المظفر الثالث محمود، إضافة إلى تاريخ صنعه عام 683هـ/ 1284م، أي بتاريخ وفاة والده، وقبل وفاته بأربعة عشر عاماً؛ نص كتابات الغطاء الشمالي، ثلاثة من الأسطر على الوجه الخارجي للجملون، وثلاثة منها على

34 أحمد الحنفي: وزير مملوكي، عمل كاتباً لدى (بيليك الظاهري) ثم لدى (المسعودي) ثم لدى (كتبغا) الذي ولاة نيابة حماة وتدرج في المناصب في عهده حتى تولى الوزارة في الشام. توفي 706هـ/ 1307م.

35 الساكف: عتبة مستطيلة الواجهة مصنوعة من الحجر أو الخشب تتواجد فوق الفتحات المعمارية للنافذ والأبواب المستطيلة أو المربعة.

وجهه الداخلي:

1. بسم الله الرحمن الرحيم
2. أمر بعمل هذا الضريح المبارك مولانا السلطان الملك المظفر العالم العادل المجاهد المرابط المتأغر المؤيد المظفر المنصور [نفي] الدنيا والدين أبي الفتح محمود
3. الدنيا والدين أبي المعالي محمد بن السلطان الملك
4. المظفر [نفي] الدنيا والدين أبي الفتح محمود
5. ابن السلطان الملك المنصور ناصر الدنيا والدين أبي المعالي محمد بن السلطان الملك المظفر تقي الدنيا والدين أبي الفتح عمر بن شاهان شاه بن أيوب أعز الله أنصاره وضاعف اقتداره وأعلا مناره وذلك في
6. العشر الأول من شهر شوال سنة ثلاث وثمانين وستمئة.
10. توثق كتابات الغطاء الجنوبي اسم صاحب القبر الملك المظفر الثالث محمود إضافةً إلى تاريخ وفاته عام 698هـ / 1299م؛ نص كتابات الغطاء الجنوبي، تظهر (الصورة 11) كتابات الغطاء الجنوبي. (ثلاثة من الأسطر على الوجه الخارجي للجملون، وثلاثة منها على وجهه الداخلي):

1. بسم الله الرحمن الرحيم
2. هذا الضريح المبارك ضريح السلطان الملك المظفر تقي الدين محمود سقى الله ساكنه صوب رحمته وعوضه عما سلب من نعمته رضوانه ومغفرته
3. وجعل قصر مدته في
4. الدنيا سبباً لخلوده
5. في جنته بمحمد وآله وذريته، توفي إلى كرم الله ورضوانه في ثاني عشرين ذي القعدة المبارك سنة ثمان
6. وتسعين وستماية.



صورة 11:
كتابات الغطاء الجنوبي لتابوت الملكين المزدوج، التقطها: Bernard O'Kane, 1979
المصدر: (O'Kane, 2009, 230)

2.3. غرض إعلان المراسيم الجديدة

يشمل هذا الغرض الإعلان والتوثيق التاريخي لتاريخ سنّ بعض القوانين الجديدة في حينها، بالإضافة إلى توثيق صاحب هذه القوانين، ونصوصها، وعقوبات مخالفتها.

1. يقع هذا النص على العضادة³⁶ المجاورة للنافذة الشمالية، مكوناً من سبعة أسطر (شهادة، 1976، 216-217)؛ توثق سنّ قانون من قبل كافل حماة الأمير دولة باي الأشرفي الخاصي،³⁷ بشأن عدم إضرار المواطنين من الحكام والأهالي، وعقوبته تعزيراً. يظهر الشكل (05) رفقاً لهذه الكتابة. بالإضافة إلى تاريخ سنّ القانون عام 904هـ / 1499م:

1. لما كان بتاريخ ثالث عشر رجب
2. سنة أربع وتسعمائة اتصل بالسامع الكريمة دولت باي الأشرفي كا-
3. -فل المملكة الحموية أعزه الله أن أمر المقربين الثلاثة يكتبوا أوراق
4. [بأنهوا] لا يحل سماعه كذب وزور وبهتان في أمر الحكام في تحصيل الضر
5. للمسلمين وغيرهم، وإنما يصل ذلك لمولانا الأمر بقطع يده
6. ولسانه. رسم بنقر حجر في جامع. وأن ملعون ابن ملعون من الحكام والنا-
7. -س بين بحماة. وأن لا أخذ أحد بورقة، وملعون من يجدد ذلك.



شكل 05:

رفع لكتابة العضادة المجاورة للنافذة الشمالية، إنجاز: Ernst Herzfeld, 1903
المصدر: (Smithsonian, n.d).

2. الكتابة على العمود الثاني من أعمدة قبة الخزنة، على واجهته الغربية، مؤلفة من ستة أسطر نافرة (شهادة، 1976، 216-217)؛ توثق قانوناً من قبل كافل حماة الأمير أركماس الناصري،³⁸ بشأن تسهيل أمور النازحين من قرية تازين³⁹ إلى حماة وضواحيها وعدم التعرض لهم. يظهر الصورة (12) الكتابة المذكورة.

1. لما كان بتاريخ ثالث عشر شعبان سنة اثنتين وتسعمائة وردت المراسيم الكريمة المقر الأشرف
2. السيفي أركماس ابن عبد الله الناصري أعز الله أنصاره، من بعد إلزام أهل
3. تازين النازحين منها إلى حماة، وأن يسكنوا حيث شاؤوا من البلاد حماة وغيرها
4. ومي تعرض لهم أحد بما يخالف ذلك فهو ملعون ابن ملعون
5. إلى يوم القيامة. ومن ساعدهم على الإقامة حيث ما اختاروا

36 العضادة: عامود إنشائي مستطيل المقطع يبرز عن الجدار الحجري.

37 دولت/ دولات باي الخاصي/ سكسان الأشرفي برسباي: أمير مملوكي تولى إمارته بمصر عشر سنوات ثم تغيرت مناصبه حتى استقر بحماة وبها توفي 883هـ / 1479م.

38 أركماس/ أركماس الناصري: أمير مملوكي تولى نيابة حماة 901هـ / 1496م عقب (قانسوه الشامي) خلال حكم السلطان (الأشرف قايتباي). اغتالته قوات السلطان العثماني (سليم الأول) في مصر 923هـ / 1517م.

39 تازين/ تيزين القصر: قرية سورية زراعية تقع 10 كلم غرب مدينة حماة، وتحتوي آثاراً مملوكية. بلغ عدد سكانها 5,072 نسمة حسب إحصاءات 2004م.

6. أعانه الله تعالى في الدنيا والآخرة والحمد لله وحده.



صورة 12:

الكتابة على العمود الثاني من أعمدة قبة الخزنة.
المصدر: فاطمة الجندي، أغسطس 2022م.

3. الكتابة على العمود السادس من أعمدة قبة الخزنة، في واجهته الشمال شرقية، مؤلفة من أربعة عشر سطراً نافرماً (شهادة، 1976، 219-220)؛ يتضمن النص إبطالاً لقوانين قديمة من قبل السلطان الأشرف قايتباي⁴⁰ وتنفيذ من قبل علاء الدين القصري وسفارة ابن مزهرة الشافعي⁴¹. (تظهر الصورة 13 الكتابة المنكوبة. إضافة إلى توضيح وتحديد اشتراطات للعاملين بمجالات الحكم والقضاء، وإلى تاريخ كتابة النص عام 874هـ / 1470م:

1. بسم الله الرحمن الرحيم، لما كان بمنتصف شهر شوال

2. سنة أربع وسبعين وثمانمائة وردت المراسيم الشريفة من حضرة مولانا

3. السلطان المالك الملك الأشرف أبي النصر قايت باي

4. أعز الله أنصاره على يد سندنا الشريف الحسيب النسيب [علائدين] القصري

5. الشافعي جليس الحضرة الشريفة وناظر السادة الأشراف

6. وناظر خانقاه الناصرية⁴² بسرياقوس⁴³ شيخ المدرسة الطبيرسية⁴⁴

7. أعاد الله علينا من بركاته كل واقف عليه من كفال الممالك الإسلامية وقضاة

40 الأشرف قايتباي: السلطان المملوكي البرجي السادس عشر، جركسي الأصل. ولد 815هـ / 1412م اشتراه الأمير (الأشرف برسباي) صغيراً، ثم الملك (الظاهر جقمق) فأعتقه وسلمه مناصب ترقى فيها حتى صار سلطاناً 872هـ / 1468م. توفي بالقاهرة 901هـ / 1496م. خلف العديد من الآثار المعمارية المنتشرة في مصر والشام والحجاز.

41 أبو بكر بن مزهرة الشافعي: تولى ديوان الإنشاء في دولة السلطان (الأشرف قايتباي).

42 خانقاه الناصرية: خانقاه تواجدت بقرية سرياقوس المصرية، وكانت ذات أوقاف ومرتببات مالية.

43 سرياقوس: قرية تابعة لمحافظة القليوبية في مصر. أنشأها السلطان (الناصر قلاوون) 723هـ / 1323م. أشهر معالمها الخانقاه الناصرية، كما تشتهر بإنتاج العسل السرياقوسي. بلغ عدد سكانها 22,805 نسمة حسب إحصاءات 2006م.

44 المدرسة الطبيرسية: أنشأها الأمير (علاء الدين طبيرس الخزنداري) 709هـ / 1309م غرب (الجامع الأزهر) بالقاهرة، وأضافها إليه.

قضاتها ذوي

8. المذاهب [الأربع] بإبطال ما هو كان اتخذته الكتاب السر بالديار المصرية على مناصب الحكم
9. والقضاء وعزل من يرتشي على شيء من الأحكام الشرعية وأن أحداً منهم لا [يتعاطا] على الأحكام رشوة ولا من نوابهم با-
10. لمعاملات ولا يأخذ رشوة على ولاية أحد منهم ولا مرتباً شهرياً ولا سنوياً ولا جعالة على أحكام ولا يلتمس أحد
11. منهم شيئاً من ذلك بطريق ومن اعتمد ذلك كان معزولاً من وظيفة القضاء ولا يحل له بعد ذلك تعاطي الأحكام الشرعية ولا العقود الحكيمة وقد رسمنا ذلك وختمناه وشرطنا عليهم
12. هذه الشروط كلها وكان ذلك بسفارة المقر الشريف الزيني ابن مزهرة الشافعي صاحب دواوين الإنشاء الشريف بالديار المصرية
13. عظم الله شأنه ورسم تسطير ذلك بهذا الجامع المبارك ... وفي هذه السنة رسم بإبطال ما شرطناه وختمنا
14. رسومه والحمد لله وحده.



صورة 13:

الكتابة على العمود السادس من أعمدة قبة الخزنة.
المصدر: فاطمة الجندي، أغسطس 2022م.

2. 4. غرض إعلان مراسيم إبطال المظالم والقوانين القديمة الجائرة

يشمل هذا الغرض الإعلان والتوثيق التاريخي لتاريخ إبطال مراسيم وقوانين قديمة فيها نوع من الظلم على فئات من الناس أو مناطق معينة، بالإضافة إلى اسم صاحب قرار الإبطال، وعقوبة المخالفين. يذكر كامل شحادة (1976، 199-198) بشأن هذا النوع من الكتابات: «إن إعلان مراسيم إبطال المظالم وتسطيرها على ألواح الحجارة والأعمدة وسواكف الأبواب وسواها، لهو ذو أهمية تاريخية. وعادة رسمية، درجت عليها دولة المماليك ونوابها في الديار المصرية والبلاد الشامية وتتابعها في أوائل القرن السابع وحتى القرن العاشر الهجري»، حيث تظهر إعلانات مشابهة في الجامع الأموي بدمشق عددها أحد عشر إعلاناً (الريحاوي، 1996، 100-101).

1. الكتابة على ساكف النافذة الجنوبية في الحرم السعودي، مؤلفاً من أربعة أسطر (شحادة، 1976، 213-214)؛ توثق مرسوماً لإبطال أجرة دورة الكفال⁴⁵ على فلاحى معرة النعمان⁴⁶

45 دورة الكفال: أجرة تم فرضها على الأهالي لصالح الكفال مقابل إجرائهم دورات في أنحاء المدينة.

46 معرة النعمان: مدينة سورية تقع جنوب إدلب، تحتوي مبانى أثرية إضافة إلى متحف للفسيفساء (خان مراد باشا) وقبر شاعرها (أبي العلاء المعري). بلغ عدد سكانها 372,960 نسمة حسب إحصاءات 2004م.

وضواحيها، من قبل كافل حماة الأمير سيبي الظاهري الأشرفي،⁴⁷ إضافةً إلى تاريخ فرض المرسوم عام 891هـ / 1486م:

1. لما كان بتاريخ نهار الخميس ثاني شعبان المكرم سنة إحدى وتسعين وثمانمائة برزت المراسيم الكريمة العالية المولوية المالكية المخدومية السيفية سيبي الظاهري الأشرفي مولانا ملك الأمراء كافل المملكة الشريفة الحموية أعز الله أنصاره
2. وقدره على فعل الخيرات ... بإبطال ما جدت على بلاد المعرة وفلاحيها من الدورة للكفال بحماة وأن تسطر هذه الموثب في الصايف الشريفة الكريمة ونظراً في حال الرعية وعمارة البلد ابتغاء
3. مرضاة الله تعالى وطلباً لثوابه وأن ملعون من أعاد ذلك
4. أو سعى في إعادته وغفر لمن كان السبب في ذلك.
2. الكتابة على العضادة أيسر النافذة الجنوبية في الحرم السعودي، مؤلفاً من تسعة أسطر (شهادة، 1976، 214)؛ توثق مرسوماً فرضه كافل حماة الأمير يشبك الجاسي الظاهري⁴⁸ بإبطال ضريبة فرضت على التجار، إضافةً إلى تاريخ فرض المرسوم عام 874هـ / 1469م:

1. لما كان بتاريخ الأحد رابع
2. عشر من شهر المحرم في عام أربع وسبعين وثمانمائة
3. -نمائه رسم مولانا ملك الأمراء كافل المملكة
4. الحموية يشبك الجاسي الظاهري
5. أعز الله أنصاره بإبطال المظلمة
6. الذي كان يؤخذ من التجار وتختيم الأوراق
7. في رأس كل سنة بستنها وملعون ابن ملعون
8. من يجدها أو يسعى في تجديدها وعليه لعنة الله و
9. الملائكة والناس أجمعين. والحمد لله وحده.

3. الكتابة على العضادة أيسر النافذة الجنوبية في الحرم السعودي -تحت الكتابة السابقة- مؤلفاً من خمسة أسطر (شهادة، 1976، 214-215)؛ توثق مرسوماً من قبل كافل حماة الأمير بخش باي⁴⁹ وبإيعاز من يوسف بن الخاسي بإبطال ضريبة كانت تؤخذ من حارات مدينة حماة، إضافةً إلى تاريخ فرض المرسوم عام 903هـ / 1498م:

1. لما كان بتاريخ حادي عشر من رمضان سنة ثلاث وتسعمائة رسم الأميري الكبير
2. الحاج بخش باي كافل المملكة الحموية أعز الله بإبطال المظلمة التي
3. حين جدوها الفسقة العتاة مشايخ الحارات أنه ملعون ابن ملعون من صفته
4. من لبس خلعت وأخذ عليها من أهل الحارة درهم فرد عليه لعنة

47 سيبي الظاهري الأشرفي: كافل مملوكي كان حاجب دمشق، ثم عينه السلطان (الأشرف قايتباي) كافلاً لحماة 890هـ / 1485م وبقي كافلاً لها حتى توفي بها 893هـ / 1488م.

48 يشبك الجاسي الظاهري: أحد مماليك (الأشرف ينال)، تولى منصب حاجب حجاب طلب ثم عزل ليتولى نيابة حماة 873هـ / 1468م، ثم نقل عنها إلى نيابة طرابلس 874هـ / 1470م. توفي بصفد 890هـ / 1485م.

49 بخش باي: كان كافلاً مملوكياً في دمشق، ثم عينه السلطان (الظاهر قانص الأشرفي) نائباً لحماة 903هـ / 1498م. قبض عليه السلطان (العاذل طومان باي) وعزله 906هـ / 1501م.

5. الله والملائكة والناس أجمعين أمين وكان السبب يوسف ابن الخاسي

4. الكتابة المنقوشة على ساكف النافذة الوسطى في الحرم السعودي، مؤلفةً من سطرين (شهادة، 1976، 215)؛ توثق مرسوماً من قبل كافل حلب الأمير سيف الدين قصره الأشرفي،⁵⁰ بإبطال الصرائب عن أنواع معينة من السلع، بالإضافة إلى تاريخ فرض المرسوم عام 836هـ / 1433م:

1. الحمد لله، لما كان بتاريخ العشر الأوسط من شهر رمضان المعظم قدره عام ستة وثلاثين وثمانمائة، وردت المراسيم الشريفة الأميرية زادها الله رفعةً وتعظيماً من حلب المحروسة إلى حماة المحروسة بإبطال ما يجدد من المظالم وهي [المزيمات] و[المسدرة]

2. والخام والروس والأرز والصابون وما يجدد [بدر العبي] من المظالم وعلى النشائين من المسادة، وأن يعامل المسلمون بالعدل والإنصاف وينقش على أبواب الجوامع دوام العدل لتصادف أدعية المسلمين بدوام أيامنا الشريفة. والحمد لله وحده.

5. كتابات النافذة الشمالية في الحرم السعودي، مؤلفةً من سطرين على ساكفها وسطرين ونصف على العضادة الواقعة في ميمنتها (شهادة، 1976، 215-216)؛ توثق مرسوماً صادراً من قبل كافل حماة إينال الأشرفي⁵¹ بإبطال صريبة (مكوس)⁵² كانت مفروضةً على طائفة القطنين⁵³ الذين كانوا يمثلون عدداً كبيراً في المدينة (يوسف، 1970، 91)، نظراً لأهمية الصناعات الزراعية فيها، بالإضافة إلى تاريخ فرض المرسوم عام 894هـ / 1489م:

1. لما كان بتاريخ رابع عشر من شهر شعبان سنة أربع وتسعين وثمانمائة أمر مولانا المقر الأشرف الكريم العالي المولوي الملكي المخدومي

2. الكافلي السيفي إينال الأشرفي كافل المملكة الحموية المحروسة أعز الله أنصاره بإبطال ما كان يؤخذ على القطنين بحماة

3. من المكس الذي كان يؤخذ على دخل الحلاجين [بنة]

4. القطن طلباً للثواب واغتنام الأجر ملعون ابن ملعون

5. في الدنيا والآخرة من يجدد ذلك.

6. الكتابة الواقعة على العامود الثالث من أعمدة قبة الخزنة، على واجهته الغربية، مؤلفةً من خمسة أسطر نافذة (شهادة، 1976، 217-218)؛ توثق مرسوماً صادراً من قبل كافل حماة الأمير قانصوه الشامي⁵⁴ بإبطال صريبة كانت تؤخذ على ساقية السلمية.⁵⁵ تظهر الصورة (14) الكتابة المنقوشة. بالإضافة إلى تاريخ فرض المرسوم عام 901هـ / 1496م:

1. لما كان بتاريخ خامس عشر شهر جماد الأول من شهر سنة واحد وتسعمائة برز

50 سيف الدين قصره الأشرفي: أمير مملوكي تولى كفالة حلب 836-837هـ / 1433م-1434م حين تولى كفالة دمشق وبها توفي 839هـ / 1435م.

51 إينال الخيف الأشرفي: أحد مماليك السلطان (الأشرف قايتباي)، تولى نيابة صفد وسييس، إضافةً إلى نيابة العسكر بلبل وحاجبا بدمشق. تولى نيابة حماة 893هـ / 1488م. توفي غرقاً بمصر.

52 المكس: الضريبة، جمعها (مكوس).

53 القطنون: إحدى طوائف الصناعات التقليدية تشمل العاملين بحلج القطن؛ أي فصل أليافه عن بذوره.

54 قانصوه الشامي: أحد مماليك السلطان (الأشرف سيف الدين قايتباي)، أقره السلطان (الناصر محمد قايتباي) على نيابة حماة 900هـ / 1495م. نقل إلى رأس النوبة الكبرى 902هـ / 1496م وفيها قتل في نفس العام.

55 سلمية: مدينة سورية تقع 30 كلم شرق حماة. خرج منها (عبيد الله المهدي) ليؤسس الدولة الفاطمية/ العبيدية في تونس. بلغ تعداد سكانها 105,166 نسمة حسب إحصاءات 2010م. تشتهر بقناتها الأثرية التي تجلب المياه من السلمية إلى أقاميا وحماة، (ساقية سلمية/ قناة العاشق).

1 المرسوم

2. الكريم العالي المولوي الأميري الكبير الملكي المخدومي الكافلي السيفي

3. الأشرفي قانصوه الشريف الشامي كافل المملكة الحموية أعز الله نصره بإبطال

4. ما كان يؤخذ للديوان السعيد وغيره من ساقية سلمية ولم يؤخذ منها سوى
أجرة الفعالة

5. العمالين بها ومن جدد ذلك كان ملعون ابن ملعون وكان نبيه خصمه.



صورة 14:

الكتابة على العمود الثالث من أعمدة قبة الخزنة.
المصدر: فاطمة الجندي، أغسطس 2022م.

7. الكتابة الواقعة على العمود الرابع من أعمدة قبة الخزنة، على واجهته الغربية، مؤلفة من ثلاثة أسطر نافرة بخط النسخ (شهادة، 1976، 217-218)؛ تؤثق مرسوماً صادراً عن كافل حماة الأمير قانصوه الشامي بإبطال سخرة تخص منطقة الحولة⁵⁶ بسبب سخرة قرية جرنية.⁵⁷ تظهر (الصورة 15) العمود المذكور. إلا أن هذا المرسوم قد ورد بلا تاريخ، ولعله يتبع المرسوم السابق له حيث أصدر المرسوم في عهد الكافل ذاته:

1. الكبير السيدي المالكي المخدومي الكافلي السيفي قانصوه الشامي

2. كافل المملكة الشريفة الحموية المحروسة أعز الله أنصاره بإبطال ما كان

3. من سخرة بلاد الحولة بسبب سخرة قرية جرنية.

56 الحولة: منطقة سهلية تقع بين حمص وحماة غرب نهر العاصي، بلغ تعداد سكان المنطقة 123,000 نسمة حسب إحصاءات 2003م. تشمل المنطقة العديد من البلدات والقرى، وتضم (سد الحولة/ سد تلدو).

57 جرنية: هي إحدى قرنتين؛ الأولى (جرنية العاصي/ الجوزية الجرنية) تقع بالقرب من حماة، بلغ تعداد سكانها 2,443 نسمة حسب إحصاءات 2004م. والثانية (جرنية الطار) تقع في منطقة السقيلية قرب حماة.



صورة 15:

الكتابة على العمود الرابع من أعمدة قبة الخزنة.
المصدر: فاطمة الجندي، أغسطس 2022م.

8. الكتابة الثانية الواقعة على العمود الخامس من الشمال الشرقي من أعمدة قبة الخزنة -تحت كتابة تسبقها، مؤلفةً من ستة أسطر نافرة (شحادة، 1976، 219)؛ توثق مرسوماً يقضي بنقل حماية قرية كازو⁵⁸ من حماية أمير آخور⁵⁹ إلى حماية الديوان السعيد،⁶⁰ وزيادة عدد المكاي⁶¹ من الشعير المفروضة على القرية سنوياً. إلا أن هذا المرسوم لا يوثق اسم الكافل الذي قام باستصداره، وهو على الأغلب دولة باي الأشرفي حيث يشير تاريخ المرسوم عام 904هـ/ 1498م وفي حينها كانت حماة تحت كفالته.

1. لما كان بتاريخ رابع عشر ربيع الأول سنة أربع وتسعمائة
2. برز مرسوم كريم بنقل حماية قرية كازو من أمير آخور إلى
3. حماية الديوان السعيد وقرر على القرية المذكورة
4. كل سنة أربعين مكوك شعير وكان على القرية المذكورة حماية أمير آخور
5. كل سنة عشر مكاي. وردت المراسيم الكريمة أن يؤخذ على الحاصل
6. برسم أمير آخور عشر مكاي شعير عوضاً عن ذلك ملعون ابن ملعون إلى يوم القيامة من يجدد ذلك.
9. الكتابة الواردة على العمود السادس من أعمدة قبة الخزنة، في واجهته الشرقية، مؤلفةً

58 كازو: قرية صغيرة تقع شمال غرب حماة، دخلت عام 1984م ضمن حدود المدينة فعدت من أحيائها، فيها ناعورة تحمل اسمها.

59 أمير آخور: منصب أحدثه (بيبرس البندقداري) ويعني (أمير الإسطبل)، مهنته تولي أمور إسطبل السلطان وخيوله وشؤونها. يتولى المنصب شخص ذو رتبة عسكرية وللمنصب العديد من التدرجات؛ أمير آخور كبير، صغير، ثالث ...

60 الديوان السعيد: مجمع للنشاطات التجارية خاص بالمنتجات التي تبيعها الدولة؛ يضم مستودعات، مخازن ومعامل تصنيع، إضافة إلى الأقسام الإدارية لهذه المنشآت ووسائل نقل القوافل التجارية البرية والبحرية وأساطيل حمايتها.

61 المكوك: وحدة قياس للحبوب كانت تستعمل في العهد العثماني، تعادل نحو طنين/ 2000 كلغ.

من أربعة عشر سطرًا نافرًا (شهادة، 1976، 219-220)؛ توثق مرسومًا سلطانيًا صادرًا من السلطان الأشرف قايتباي، وتنفيذ علاء الدين القصري وسفارة ابن مزهرة الشافعي، بإبطال قرارات سابقة لكتاب السر وعزل الفاسدين والمرشّين من العاملين بالمناصب الحكومية والقضاة، وتحديد اشتراطات للعاملين بهذه المجالات. تظهر (الصورة 13) الكتابة المذكورة.
إضافة إلى تاريخ كتابة النص عام 874هـ / 1470م:

1. بسم الله الرحمن الرحيم، لما كان بمنتصف شهر شوال
2. سنة أربع وسبعين وثمانمائة، وردت المراسيم الشريفة من حضرة مولانا
3. السلطان المالك الملك الأشرف أبي النصر قايت باي
4. أعز الله أنصاره، على يد سندا الشريف الحسيب النسيب [علائدين] القصري
5. الشافعي جليس الحضرة الشريفة وناظر السادة الأشراف
6. وناظر خانقاه الناصرية بسرياقوس شيخ المدرسة الطيرسية
7. أعاد الله علينا من بركاته كل واقف عليه من كفال الممالك الإسلامية وقضاة قضائتها ذوي
8. المذاهب الأربع بإبطال ما هو كان اتخذه الكتاب السر بالديار المصرية على مناصب الحكم
9. والقضاء وعزل من يرتشي على شيء من الأحكام الشرعية وأن أحداً منهم لا [يتعاطا] على الأحكام رشوة ولا من نوابهم با-
10. لمعاملات ولا يأخذ رشوة على ولاية أحد منهم ولا مرتباً شهرياً ولا سنوياً ولا جعالة على أحكام ولا يلتمس أحد
11. منهم شيئاً من ذلك بطريق ومن اعتمد ذلك كان معزولاً من وظيفة القضاء ولا يحل له بعد ذلك تعاطي الأحكام الشرعية ولا العقود الحكمية وقد رسمنا ذلك وختمناه وشرطنا عليهم
12. هذه الشروط كلها وكان ذلك بسفارة المقر الشريف الزيني ابن مزهرة الشافعي صاحب دواوين الإنشاء الشريف بالديار المصرية
13. عظم الله شأنه ورسم تسطير ذلك بهذا الجامع المبارك ... وفي هذه السنة رسم بإبطال ما شرطناه وختمناه
14. رسومه والحمد لله وحده.

10. الكتابة على العامود السابع في الجهة الجنوب شرقية من أعمدة قبة الخزنة، مؤلفة من ستة أسطر نافرة (شهادة، 1976، 220-221)؛ توثق مرسومًا صادرًا من قبل كافل حماة الأمير دولة باي الأشرفي بإنقاص قيمة الضريبة على حارة الجعابرة⁶² إلى تسعة أبقار. تظهر (الصورة 16) الكتابة المذكورة.
بالإضافة إلى تاريخ فرض المرسوم عام 903هـ / 1498م:

1. لما كان بتاريخ عشرين رجب سنة ثلاث وتسعمائة رسم
2. مولانا ملك الأمراء كافل المملكة الحموية
3. دولت باي أن لا يؤخذ من حارة الجعابرة
4. سوى تسعة أبقار وملعون ابن ملعون من

62 الجعابرة: حي من أحياء مدينة حماة، سمي نسبة إلى مجموعة استقرت بحماة من بلدة (قلعة جعبر) قرب الفرات.

5. يجدد فعله لعنة الله والناس أجمعين

6. إلى يوم القيامة.



صورة 16:

الكتابة على العمود السابع من أعمدة قبة الخزنة.
المصدر: فاطمة الجندي، أغسطس 2022م.

11. الكتابة على العمود الثامن من أعمدة قبة الخزنة،

في واجهته الجنوبية، مؤلفة من سبعة أسطر نافرة (شحادة، 1976، 221)؛ توثق مرسوماً
صدراً عن كافل حماة الأمير دولة باي الناصري، بإبطال ضريبة مفروضة على أوقاف حماة
وإعادة ربعها إلى جملة أموال الأوقاف. تظهر (الصورة 17) الكتابة المذكورة. بالإضافة إلى تاريخ فرض
المرسوم عام 903هـ / 1498م:

1. لما كان بتاريخ خامس شهر من رجب سنة ثلاث

2. وتسعمائة برزت المراسيم الكريمة الأميرية

3. السعيدية دولت باي الناصري مولانا ملك الأمراء

4. كافل المملكة الحموية الشريفة بحماة المحروسة أعز الله تعالى

5. أنصاره بإبطال ما أخذت على أوقاف حماة من المظلمة والدين بحماة المتخذ
من خراج مبلغ

6. من جهة الأوقاف وملعون ابن ملعون من بغى من الكفال يأمر بإخراج ذلك من
الأوقاف

7. إلا بمراسيم شريفة.



صورة 17:

الكتابة على العمود الثامن من أعمدة قبة الخزنة.
المصدر: فاطمة الجندي، أغسطس 2022م.

2. 5. الأغراض الخاصة

يشمل هذا الغرض الإعلان والتوثيق التاريخي لفعل خير متعلق بالصالح العام كصدقة أو وقف أو شفاقة أو تراجع عن مظلمة ما ... من قبل طرف غير سلطاني لا دور له في السلطات الحاكمة، حيث يستأذن صاحب هذا الأمر في الإعلان عن الفعل المتعلق به عبر نقشه في الجامع من قبل شخص مسؤول، ويجب أن يكون صاحب الإعلان شخصاً ذا قيمة معنوية هامة كأن يكون أميراً أو عالماً أو نحوه، كما يجب أن يكون الإعلان عن أمر فيه مصلحة عامة وكبيرة للمسلمين.

1. كتابة العمود الخامس من أعمدة قبة الخزنة، من واجهته شمال الشرقية، مؤلفة من خمسة عشر سطراً نافرماً (شهادة، 1976، 219-220)؛ تص على سماح كافل حماة الأمير خاير الأشرفي⁶³ للشيخ علاء الدين علوان⁶⁴ بنقش إعلان خاص به في الجامع الأعلى بحماة. تمت كتابة الإعلان بتاريخ 918هـ/ 1512م، وتعتبر هذه الكتابة أحدث الكتابات التاريخية في الجامع الأعلى:

1. بسم الله الرحمن الرحيم لما كان بتاريخ نهار الجمعة

2. المبارك ثلاث وعشرين صفر الخير من شهور سنة ثمان

3. عشر وتسعمائة أمر الشيخ الصالح الزاهد المبا-

4. -رك علاء الدين علي الشهير بعلوان إلى خدمة مولانا

63 خاير بك الأشرفي الجركسي: أمير مملوكي جركسي، آخر الولاة المملوكيين وأول النواب العثمانيين في مصر. قدمه أبوه للسلطان (الأشرف قايتباي) فتدرج في الناصب حتى تولى نيابة حلب 901هـ/ 1504م وظل نائباً شامياً حتى 922هـ/ 1516م حيث ساعد العثمانيين في انتصارهم على المالك منذ معركة (مرج دابق) وحتى سقوط الدولة المملوكية في (معركة الريدانية)، ثم تولى حكم مصر باسم الدولة العثمانية. توفي 928هـ/ 1521م.

64 علاء الدين علي علوان الحموي: فقيه وعالم أصول شافعي صوفي شاذلي أصله من مدينة هيت، سكن جده الثالث حماة هرباً من الاجتياح المغولي. ولد في حماة بمحلة (باب الجسر) 873هـ/ 1468م. توفي 963هـ/ 1530م. وله ذرية باقية في حماة إلى اليوم يعرفون باسم (آل العلواني).

5. المقر الأشرف الكريم العالي المولوي السندي السدي
6. المالكي الملكي المخدومي والكافلي السيفي خير ابن عبد الله الأشرفي
7. مولانا ملك الأمراء الكافل للمملكة الشريفة الحموية المحروسة أعز الله تعالى أنصاره
8. شفاعة به عن مظلمة ما وسؤال صدقات مولانا ملك الأمراء في العفو له عن جعالة ختن
9. الاستدار كان وأنه أناب إلى الله تعالى وأعادته لله وحلف أيماناً بالله تعالى وبالقرآن
10. والأثر وسر أمانه مذ عاد إلى مباشرة الولاية واستدار إلى عمله من حيث شاء بأعلى السوق في
11. البلدة أو غيرها كان دمه مباحاً وإله منا حلالاً فإن له شتمت تقرت لكم بذلك جبراً با-
12. -لجامع الكبير أو غيره فأجار مولانا الملك ولاء الشيخ في ذلك ورسم بنقر حجر
13. في الجامع المشار إليه وكان ذلك بحضرة السادة الموالي
14. قضاة القضاة وأكابر الدولة الخاص
15. والعامر والحمد لله وحده.

2. 6. الأغراض غير الواضحة

تعرض بعض الكتابات إلى التلف أو التخريب في بعض أجزائها فتصبح غير مقروءة بشكل واضح لتفقد معلومة أو أكثر، غير أن التلف قد يشمل أجزاءً كبيرة تجعل من المتعذر التعرف على العديد من المعلومات الهامة أو على الهدف الأساسي من الكتابة.

1. الكتابة على العضاة أيمن النافذة الجنوبية في الحرم السعدي، مؤلفة من خمسة أسطر (شجادة، 1976، 213-214)؛ توثق إبطال كافل حماة الأمير يشبك حيدر⁶⁵ لأمر ما غير ظاهر، كما توثق التاريخ في عام 896هـ/ 1491م:

1. لما كان بتاريخ العشرين من شهر شوال المبارك سنة ستة

2. وتسعين وثمانمائة أمر مولانا ملك الأمراء يشبك حيدر كافل

3. المملكة الحموية أعز الله نصره حين أن

... 4.

... 5.

3. تحليل ومقارنة أغراض النقوش التاريخية العربية في الجامع الأعلى الكبير بحماة

3. 1. تحليل النقوش العربية ضمن الجامع الأعلى بحماة

تنوعت نقوش الكتابات العربية التاريخية في الجامع الأعلى الكبير لتشتمل على الأغراض

65 يشبك حيدر: مملوك كان من مماليك الأشرف إبنال، تولى ولاية القاهرة، ثم عينه السلطان (فايتباي) كافيلاً لحماة 896هـ/ 1491م وبقي كافيلاً لها حتى توفي بها 899هـ/ 1494م.

1. التزيين.

2. التوثيق المعماري والتاريخي.

3. إعلان/ توثيق المراسيم:

أ. مراسيم القوانين الجديدة.

ب. مراسيم إبطال القوانين القديمة (المظالم).

4. الأغراض الخاصة.

5. الأغراض غير الواضحة.

لعلّ الكتابات القرآنية هي التي حظيت بالاهتمام الأكبر بالشكل ونوع الخط كونها تؤدي هدفاً جمالياً بامتياز؛ إلا أن بعض الكتابات الأخرى تم نقشها باهتمام وباستخدام خطوط جميلة كالخط الكوفي مما يجعلها جميلةً للناظر بالإضافة إلى الهدف التوثيقي الذي تؤديه. وتمثل النقوش الخطية أو الكتابية، إلى جانب الزخارف الهندسية والنباتية سمةً ممتازة للفن والعمارة الإسلامية بشكل عام (الدراسة وعبد الهادي، 2014، 43).

رغم أن غرض التوثيق المعماري والأثري قد تم استيفاءه في الجامع الأعلى إلا أن شكلاً من أشكاله المتعارف عليها والمنتشر في حماة قد غاب عن التواجد في الجامع؛ وهو ما يعرف باسم (أحجار التاريخ) وهي تؤدي نفس غرض التوثيق التاريخي لسنة الإنشاء أو التجديد واسم صاحب العمل وإنما بطريقة شعرية خاصة،⁶⁶ وبذلك يمكن اعتبار أن نقوش الجامع تجمع غرض التوثيق إلا أنها تنقص شكلاً من أشكاله.

إن غرض التوثيق التاريخي دائماً ما يكون تابعاً لعملية إنشاء جديدة أو ترميم سواءً لكامل البناء أو لأحد عناصره المعمارية، بحيث يتم توثيق هذه العملية بنقش الكتابة على العنصر المعماري الجديد أو المرمم توثق تاريخ الإنشاء والأشخاص المعنيين بهذه العملية. الجامع الأعلى يظهر فيه أربعة عناصر تمت إضافتها؛ المئذنة الجنوبية المنشأة في العهد الزنكي، المنبر الخشبي المضاف في العهد الأيوبي، المئذنة الشمالية المضافة في العهد المملوكي، والتابوت الخشبي المزودج. وبالتالي فإن كلاً من هذه العناصر يحمل نصوصاً كافية لتوثيق عملية إنشائه، ويلاحظ هنا توضع النص يكون على العنصر المحدث أو بقربه بحيث يقرأ النص عند الاقتراب منه بشكل خاص.

رتب (الشكل 06) علاقة أغراض كتابات الجامع الأعلى بالخطبة الوصية المتضمنة لها، كما بين (الشكل 07) علاقة أغراض الكتابات بمواقعها ضمن الجامع. جدير بالذكر أن نصاً كان مدوناً على لوح حجري في الجامع، بات مفقوداً اليوم، وثق ترميماً جرى لبناء الجامع بشكل عام من قبل الخليفة العباسي المهدي،⁶⁷ وكان مصدر أموال التجديد من خراج حمص (شهادة، 1976، 196-197).

بالنسبة لنقش المراسيم في مواقع مرئية من الجامع كأماكن الوضوء والصلاة والساحة فهو بالتأكيد يحمل طابعاً إعلامياً؛ حيث يساهم المسجد الجامع في إيصال الأوامر والمراسيم من مصدرها ككافل المنطقة أو السلطان إلى الناس مباشرة مما يضمن للناس التعرف على حقوقهم وواجباتهم دون إخفاؤها أو تحويرها، ما يجعل المسجد قناةً إعلامية مباشرة تربط أصحاب السلطات بالعامّة من الناس. الأمر الذي يظهر شيئاً كبيراً من الشفافية والحرص على المصلحة العامة. وهي كما أسلف ذكره عادة تاريخية رسمية اتخذها أمراء

66 تقتضي هذه الطريقة نقش بيت من الشعر ينتهي صدره بكلمة (أرخ، مؤرخاً، ونحوها...) بينما يحقق مجموع حروف عجزه، عند احتساب قيمها، تاريخ إنشاء المكان أو تجديده. ثم ينقش تحت البيت تاريخ الإنشاء أو التجديد رقماً. عادةً يسبق البيت أبيات تهدف إلى توثيق اسم صاحب البناء أو التجديد، ووصف المكان أو العمل الذي قام به.

67 محمد المهدي: ثالث الخلفاء العباسيين، ولد بالأهواز 127هـ/754م. خلف أباه (أبو جعفر المنصور)، فتحت مناطق بالهند وبلاد الروم في عهده، أسس البريد بين الحجاز والعراق. حكم 158-169هـ/775-185م.

وكفّال الدولة المملوكية في بلاد مصر والشام لتكون أداةً إعلامية من جهة، بالإضافة إلى تحميلها نوعاً خاصاً من القيمة المعنوية لتكون بمثابة عهدٍ مقدس من مقدّمه أمام الله ويشهد عليه الملاء؛ كونها نقشت في بيتٍ من بيوت الله يجتمع فيه المسلمون بشكلٍ دائم لأداء عبادتهم وتدارس أمور دينهم وديناهم.

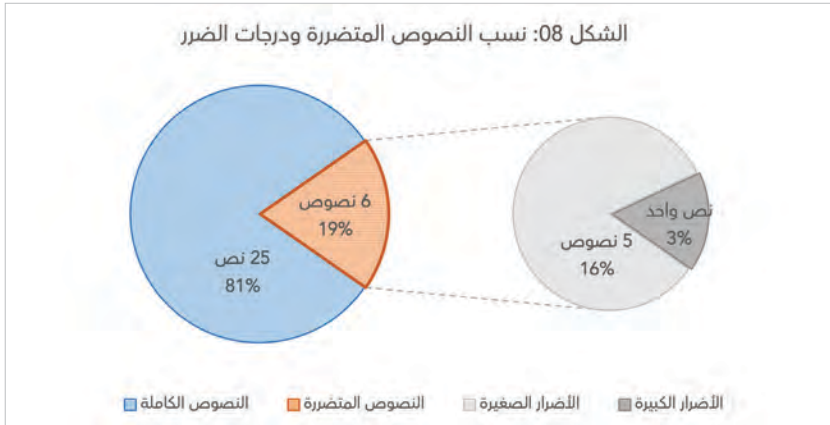
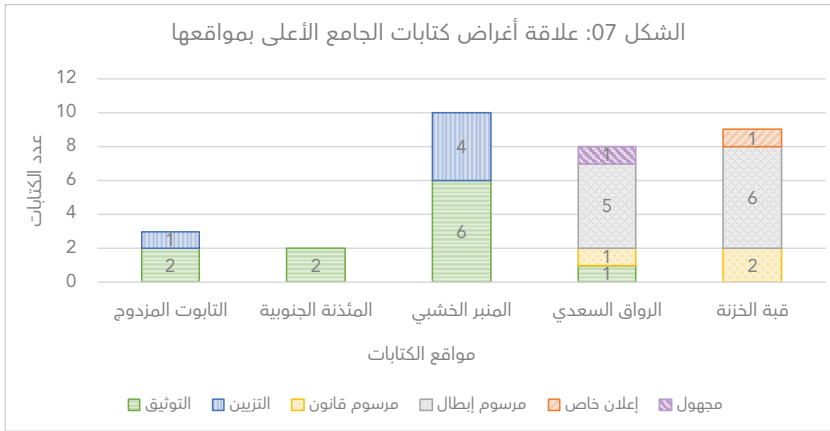
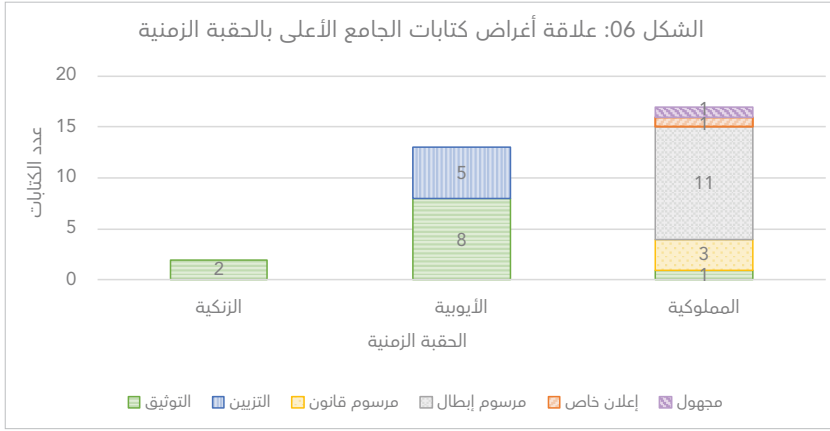
يتعرض كل بناء أو معلم أثري إلى عوامل الطبيعة كالزمن والطقس والكوارث كالزلازل والفيضانات ونحوها... إضافةً إلى عوامل التغيير البشرية كالتهريب والتجديد والحروب وغيرها... لتتغير أجزاء من معالمه وتتعرض للتشوه الجزئي أو التلف الكلي. يحوي الجامع الأعلى في حماة عدداً من النصوص التي فقدت أو تشوهت بعض من كلماتها لتصعب قراءتها في بعض الأحيان أو تستحيل في البعض الآخر، كما وثقت الآثار المكتوبة نصاً زال بكامله يتحدث عن تجديد الخليفة العباسي المهدي للجامع، بينما وثقت بعض الصور القديمة أجزاءً من كتابات زالت ولم يبقَ منها سوى مواضعها. بين (الشكل 08) عدد ونسب النصوص المنقرئة، ويوضح درجات الضرر. هنا تبرز أهمية التوثيق التاريخي للكتابات التاريخية؛ حيث إن توثيقها بجميع الوسائل المتاحة لدينا وصفاً ورسمياً وتصويراً يضمن الاحتفاظ بالمعلومات التاريخية التي تحملها هذه النصوص، مما يؤمن حماية الرسائل التي جعلت لإيصالها ويسهل دراستها على جميع الأصدقاء التاريخية والاجتماعية والاقتصادية وغيرها... يضم (الجدول 01) الكتابات التاريخية العربية

موضحاً جميع المعلومات المتعلقة بها.

جدول 01: قائمة بالكتابات التاريخية العربية في الجامع الأعلى الكبير بحماة ومعلومات عنها.

العنصر المعماري	موقع الكتابة	تاريخها		غرضها	الخط المستخدم	عدد الأسطر	الحقبة الزمنية
		م	هـ				
المئذنة الجنوبية	الواجهة الشرقية من القاعدة، المدماك السابع الواجهة الجنوبية، المدماك السابع	1135	529	التوثيق	الكوفي	3	زنيقة
				=	=	5	
المنبر الخشبي	إطار الدرابزين الأيمن	1302	701	التزيين التوثيق	-	-	أبوية
	إطار الدرابزين الأيسر			=	-		
	الدرقة اليمنى للباب			التزيين	الكوفي المشجر	1	
	الدرقة اليمنى للباب			التوثيق	النسخ	1	
	الدرقة اليسرى للباب			التزيين	الكوفي المشجر	1	
	الدرقة اليسرى للباب			التوثيق	النسخ	1	
	حزام أعلى المدخل			التوثيق	النسخ	1	
	أعلى المدخل			=	=	1	
أروقة الحرم والحرم السعودي	سكف باب المئذنة الشمالية رواق الحرم السعودي	1420	823	=	-	2	مملوكية
	العضادة المجاورة للنافذة الشمالية في الحرم السعودي	1499	904	قانون	-	7	
	سكف النافذة الجنوبية في الحرم السعودي	1486	891	إبطال	-	4	
	العضادة أيسر النافذة الجنوبية في الحرم السعودي	1469	874	=	-	9	
		1498	903	=	-	5	
	سكف النافذة الوسطى في الحرم السعودي	1433	836	=	-	2	
	العضادة اليمنى المجاورة للنافذة الشمالية في الحرم السعودي بالإضافة لسكفها	1489	894	=	-	4,5	
	العضادة اليمنى النافذة الجنوبية في الحرم السعودي	1491	896	-	-	5	
	العامود الثاني	1497	902	قانون	-	6	
	العامود الثالث	1496	901	إبطال	-	5	
العامود الرابع	1496	(901)	=	-	3		
أعمدة قبة الخزانة	العامود الخامس	1512	918	إعلان خاص	-	15	
		1498	904	إبطال	-	6	
	العامود السادس	1470	874	قانون وإبطال	-	14	
	العامود السابع	1498	903	إبطال	-	6	
	العامود الثامن	1498	903	=	-	7	
	التابوت الخشبي	جسد التابوت	1284	683	التزيين	النسخ	4
		غطاء التابوت الشمالي			التوثيق	=	6
غطاء التابوت الجنوبي		=			=	6	

المصدر: الباحثة.



المصدر: الباحثة.

3.2. مقارنة النقوش الكتابية العربية في الجامع الأعلى مع جوامع مشابهة

إن اجتماع الأغراض الستة للكتابات في الجامع الأعلى يجعله حالةً نموذجية جمعت أغراض الكتابات المختلفة التي يمكن أن تتواجد في المساجد الجامعة الكبرى؛ ففي الجامع الأموي الكبير) بدمشق تتحقق جميع الأغراض في الكتابات التاريخية المنقوشة ضمنه (الريحاوي، 1996، 104-96)، كونه واحداً من أهم المساجد الجامعة في بلاد الشام، لتكون كتاباته حالةً نموذجية أيضاً.

بينما قد لا تحتوي بقية الجوامع بالضرورة نصوصاً تتناول جميع الأغراض السابقة؛ حيث يعتبر (الجامع النوري)⁶⁸ ثانياً جوامع حماة من حيث الأهمية والمساحة؛ إلا أنه لا يحتوي على إعلانات مراسيم إبطال المظالم (شحادة، 1965، 89-92)، كذلك (جامع الحسين)⁶⁹ الأثري لا تحوي كتاباته توثيقاً لمراسيم جديدة أو إبطالاً لقديمية (شحادة، 1970، 97-99)، ومثله (جامع أبي الفداء)⁷⁰ جديراً بالذكر أن (الجامع النوري) بحماة وحده يتميز عن الجامع الأعلى لاحتوائه على حجرٍ يؤرخ⁷¹ سنة بناء (التيكية القادرية)⁷² الموجودة ضمنه شعراً (شحادة، 1965، 87)، وهذا النوع من التوثيق غائبٌ عن نقوش الجامع الأعلى.

يظهر (الجدول 02) أهم المساجد الجامعة في مدينة حماة

موضحة الأغراض التي تناولتها النقوش العربية التاريخية في كلٍ منها.

جدول 02: أغراض النقوش الكتابية العربية في الجوامع الكبرى بمدينة حماة							
اسم الجامع	أغراض النقوش العربية						
	التزيين	التوثيق التاريخي		توثيق المراسيم		إعلانات خاصة	غير مقروءة
		أحجار التواريخ	التوثيق المعماري	القوانين الجديدة	إبطال المظالم		
الجامع الأعلى	•	-	•	•	•	•	•
الجامع النوري	•	•	•	-	•	•	-
جامع أبي الفداء	•	-	•	-	-	-	-
جامع الحسين	•	-	•	-	-	-	-

المصدر: الباحثة.

4. خاتمة:

تمثل الكتابات التاريخية العربية في الجامع الأعلى الكبير مثلاً نموذجياً يجمع الأغراض المختلفة للكتابات النقشية في مختلف العصور التاريخية العربية؛ التزيين، التوثيق المعماري والتاريخي، توثيق إعلان المراسيم الجديدة وإبطال القديمة، الإعلانات الخاصة. يمكن ملاحظة أن النصوص المنقوشة في العهد الزنكي اهتمت بغرض التوثيق الإنشائي، بينما بدأ الغرض التزييني يظهر خلال العهد الأيوبي حيث كان عهداً شهد مرحلةً من الازدهار والاستقرار النسبيين، إلا أن توثيق عمليات الترميم والإضافات كان ذا أهمية أكبر نظراً للنهضة العمرانية

68 ويعرف باسم (الجامع الأدنى).

69 جامع الحسين/ الحسينين: جامع أثري بني على أنقاض معبد، يقع جنوب (قلعة حماة). جدده (نور الدين زنكي) عقب الزلزال الذي ضرب حماة 552هـ/ 1157م.

70 جامع أبي الفداء/ الدهشة/ الدهيشة/ الحيايا: جامع أثري يقع على الضفة الشمالية لنهر العاصي بمحلة (باب الجسر) بحماة. بناه الملك الأيوبي (أبو الفداء) على أنقاض معبد قديم فوق تربة الملك الأيوبي (المظفر عمر) 727هـ/ 1326م، وأنشأ فيه مكتبةً عامرة ودفن في ضريح شماليه. سُمي باسم (جامع الحيايا) لأن أعمدة مظفرة تزين نوافذه.

71 يؤرخ بنائها البيت: «فأرخ علا الأفاق زهواً بأنه جوار بيت الله أبهى المحافل»، والموافق لعام 1317هـ.

72 التكية القادرية: بناء ملحق بشمال (الجامع النوري) بحماة، بناه (محمد مرتضى بن محمد نجيب الكيلاني) كمثوى للمحتاجين.

التي وقعت في العصرين الزنكي والأيوبي (الريحاوي، 1979، 157-158)، ويظهر تميز غرض التوثيق في عدد نصوصه الأكبر. أما العهد المملوكي الذي يتميز بعمارته الحربية وعدم الاستقرار السياسي نتيجة تغير الحكام وسياساتهم؛ فقد اختفت خلاله النقوش التزيينية تماماً، كما تراجع عدد نصوص التوثيق الإنشائي لقلة عمليات التجديد والإضافات المعمارية للجامع، بينما ظهرت أغراض أخرى جديدة تلائم طبيعة المرحلة غير المستقرة والتغير الدائم في الأنظمة والمراسيم.

ويمكن تلخيص النتائج التي توصل لها البحث بخصوص النقوش التاريخية العربية في الجامع الأعلى بحماة بالنقاط التالية:

- غرض التزيين تصدرته الآيات القرآنية، بالإضافة إلى بعض النصوص التي جمعت بين غرضها الأصلي وبين غرض التزيين فتمت كتابتها باستخدام خطوط جميلة الشكل؛ كخط النسخ، والكوفي، والكوفي المشجر.
- تميزت النصوص المنقوشة خلال العهد الزنكي بكتابتها باستخدام الخط الكوفي، بينما استخدم كل من خطي النسخ والكوفي المشجر خلال العهد الأيوبي.
- غرض التوثيق التاريخي ارتبط على الأغلب بإضافة أو تجديد عنصرٍ معماري على الجامع، وتضمن توثيق معلومات هذا العنصر؛ تاريخ إنشائه، الأشخاص المعينون بإنشائه، وأحياناً أسماء بعض الحرفيين أو العاملين عليه. كما ارتبطت نصوص التوثيق بكتابتها على العناصر المراد توثيقها مباشرة أو بالقرب منها مما يجعل الوصول إليها لقرائها ليس بالأمر السهل دائماً. بالإضافة إلى توثيق اسم وتاريخ وفاة صاحب المدفن وذلك في حالة كتابات التابوت الخشبي.
- غرض توثيق المراسيم السلطانية والأميرية الكافية انقسم إلى قسمين؛ الأول توثيق مراسيم القوانين الجديدة عبر توضيح تاريخ وجهه إصدارها، نص القانون أو الأمر المحدث، بالإضافة إلى عقوبة مخالفتها. أما القسم الثاني فهو توثيق مراسيم إبطال قوانين قديمة تم اعتبارها مظلماً عبر توثيق تاريخ وجهه إصدارها، الأمر المراد إبطاله بالكامل أو تغييره، النهي عن إعادته والدعاء على من يقوم بتجديده.
- نقش المراسيم السلطانية الجديدة وإبطال المراسيم القديمة كان يحمل إضافةً إلى غرض التوثيق غرض الإعلان عنها، حيث يضمن وجودها بشكل دائم في المساجد الجامعة وصولها إلى جميع الناس إضافةً إلى تعهدٍ مغلظٍ من مُصدرها أمام الله والناس عبر توثيقها على الملأ وفي مكانٍ مطهرٍ ومخصص للعبادة.
- غرض توثيق إعلانات أو مطالب خاصة تختص به شخصيات ذات أهمية اعتبارية سياسية أو دينية أو اجتماعية ونحوها؛ حيث تستجلب الإذن الأميري أو الكافلي بنقش أمرٍ جليل تم تقريره من طرفها يعود بفائدة كبيرة للصالح العام. يوثق هذا النوع من النصوص تاريخ كتابته، الجهة التي أصدرت الموافقة على كتابته، صاحب الأمر أو الإعلان الشخصي، إضافةً إلى نص الإعلان المراد نشره.
- الدور الإعلامي للجامع كمنبر تواصل واضح وشفاف، بين الحكام وأفراد الشعب، لنشر المراسيم والقوانين لما يحمله من صفة دينية ومرجعية رسمية.
- ختاماً فإن هذا البحث هو محاولة ودراسة بنيت في أساسها على نصوص زال جزءٌ منها وإنما حفظ مضمونها عبر توثيقها كتابياً، مما يرفع دعوةً للتوثيق الدقيق للمعالم الأثرية والكتابات التي تحتويها وصفاً ورسماً ونقلها ورفعاً وتصويراً حيث يشكل التوثيق حمايةً للمعلومات التاريخية التي تحملها ويسمح بالاستفادة منها حتى في حال تعرضها لتلفٍ كلي أو لضرٍ جزئي.

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عمارة المساجد في عجمان بين الأصالة والحداثة

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ملخص:

يتناول هذا البحث عمارة المساجد الحديثة في مدينة عجمان، التي بنيت بعد عام 2000م، حيث بلغ عددها لغاية اليوم ما يقارب 175 مسجداً. يهدف البحث إلى دراسة وتحليل عمارة هذه المساجد، ومحاولة التعرف بالخصائص المشتركة بينها وتحديد أوجه الاختلاف، ومن ثم تصنيف هذه المساجد من حيث الشكل العام والمظهر الخارجي والعلاقة مع الأنماط التاريخية للمساجد. وكذلك يهدف البحث إلى الإجابة عن بعض التساؤلات، مثل: هل يوجد نوع من الوحدة بين هذه المساجد، برغم التنوع الواضح في مظهرها الخارجي؟ ما هي العناصر المشتركة؟ وما هي التوجهات المعمارية السائدة؟ وهل المساجد الحديثة ترتبط بالمكان وتعكس الزمن الحاضر؟ فرضية البحث هي وجود الوحدة ضمن التنوع، وانتشار بعض الأنماط أكثر من غيرها، والرغبة في اظهار الهوية المحلية والطابع الإسلامي في تصميم المساجد.

تعتمد هذه الدراسة بشكل رئيس على زيارة كافة المساجد التي بنيت بعد عام 2000م، والحصول على بعض المخططات من قبل الهيئة العامة للشؤون الإسلامية والأوقاف، ودائرة البلدية والتخطيط، بالإضافة إلى مراجعة أهم الدراسات السابقة عن عمارة المساجد، التي تشكل الأساس النظري لهذا البحث. وتم في هذا البحث اتباع منهج الوصف التحليلي والمقارنة بين المساجد موضع الدراسة.

أظهرت النتائج وجود وحدة واضحة في التصميم والتوزيع الفراغي، إضافة إلى بعض العناصر الرئيسة المشتركة بين هذه المساجد، رغم التنوع في المظهر الخارجي. كذلك أظهرت الدراسة وجود بعض الأنماط الأكثر انتشاراً.

تضيف هذه الدراسة مزيداً من المعرفة عن الخصائص المعمارية المميزة للمساجد الحديثة في عجمان، والتوجهات التصميمية السائدة، وتظهر بعض الأمثلة التي تصلح كنماذج يمكن الاستفادة منها في تصميم المساجد المستقبلية. وتقدم توصيات يمكن أخذها بعين الاعتبار من قبل القائمين على بناء المساجد.

عمارة المساجد، مساجد عجمان، مساجد حديثه، مساجد الإمارات

مقدمة:

تم خلال السنوات الأخيرة بناء عدد من المساجد في مدينة عجمان بدولة الإمارات العربية المتحدة، وأكثر ما يلفت الانتباه معمارياً في تلك المساجد ذلك التنوع الكبير والاختلافات الواضحة في الطابع المعماري لكل مسجد، على الرغم من أن مدينة عجمان تعد صغيرة الحجم نسبياً. ومن وجود بعض الشروط والارشادات المتعلقة بتصميم المساجد، التي تشرف عليها الهيئة العامة للشؤون الإسلامية والأوقاف، الا أن مسألة الوحدة والهوية ما تزال موضع نقاش وتساؤل. وعلى الرغم من وجود تفاوت كبير في المظهر المعماري الخارجي، لدرجة يصعب فيها تحديد العناصر المشتركة أو المتشابهة بين تلك المساجد، إذ أن بعض تلك المساجد بنيت بطابع حديث، وبعض آخر تأثر بطرز معمارية من مناطق مختلفة من العالم الإسلامي، أو فترات تاريخية مختلفة، وبعض المحاولات للجمع بين الطابع التقليدي، سواء المحلي أو «المستورد»، مع الطابع الحديث، الا أنه يعتقد بأن هناك نوع من الوحدة في التخطيط العام والفراغ الداخلي والعناصر التصميمية الرئيسة التي تجعل معظم هذه المساجد تندرج تحت نمط تصميمي واحد. أما عن العلاقة مع أو التأثير بالتراث المعماري المحلي من حيث الشكل الخارجي فيبقى موضع نقاش.

تقع مدينة عجمان ضمن إمارة عجمان، وهي الإمارة الأصغر مساحة بين الإمارات السبع التي تتكون منها دولة الإمارات العربية المتحدة. ومدينة عجمان تعد صغيرة الحجم نسبياً، مقارنة مع المدن الأخرى مثل أبو ظبي، دبي، والشارقة، إلا أنها شهدت خلال العقدين الأخيرين تطوراً عمرانياً كبيراً وبتيرة متسارعة.

وخلال السنوات القليلة الماضية شهدت مدينة عجمان ازدياداً ملحوظاً في عدد المساجد والجوامع التي أنشئت حديثاً، إضافة إلى إعادة بناء وترميم المساجد القديمة، التي أنشئت

قبل عام 2000م، وهذا يشير إلى توجه عام لدى إمارة عجمان والهيئة العامة للشؤون الإسلامية والأوقاف (الأوقاف) لإعطاء أهمية خاصة لإنشاء مزيد من المساجد ذات طابع معماري متميز، مع التركيز في تطوير أشكال معمارية معاصرة تجمع بين التقليدية والحداثة. وقد أسهم في ذلك أيضاً ازدياد عدد المحسنين والمتبرعين من أبناء الإمارة لإنشاء مساجد جديدة.

تهدف هذه الدراسة إلى تسليط الضوء على النماذج الحديثة لعمارة المساجد في عجمان وتحديد أوجه الشبه وجوانب الاختلاف بين المساجد التي بنيت بعد عام 2000م، وتعزيز فرضية أنه بالرغم من وجود التنوع الكبير بين هذه المساجد من حيث الشكل والمظهر المعماري الخارجي، إلا أنه توجد وحدة كبيرة من حيث التخطيط العام والتوزيع الفراغي. وتحاول هذه الدراسة الإجابة عن التساؤلات التالية: على الرغم من التنوع الكبير في المساجد الحديثة، هل ما يزال هناك قواسم مشتركة بينها؟ وهل يمكن تصنيف هذه المساجد ضمن نماذج واضحة ومحددة؟ وهل هناك نموذجاً سائداً؟ وما هي الخصائص المشتركة التي تميز مساجد عجمان؟

آلية وأسلوب البحث:

تعتمد هذه الدراسة بشكل رئيس على الزيارات الميدانية لمساجد عجمان، ودراسة مخططاتها وتحليلها والمقارنة بينها. من خلال التعاون مع دائرة البلدية والتخطيط والهيئة العامة للشؤون الإسلامية والأوقاف، تم الحصول على مخططات أكثر من 50 مسجداً حديثاً، وكذلك وثيقة «الشروط الواجب توافرها في عمارة المساجد» (ملحق 1).

لقد تم خلال العامين الماضيين زيارة ما مجموعه 170 مسجداً وجامعاً في مدينة عجمان، جميعها بنيت بعد عام 2000م، وتم تحليل ومقارنة المخططات المعمارية لنحو 50 مسجداً وجامعاً. باستثناء المساجد القديمة التي بنيت قبل عام 2000م من هذه الدراسة، لأن معظم المساجد القديمة طرأ عليها تغييرات كثيرة نتيجة التعديلات والإضافات على مر السنين، بحيث أصبحت معالمها الأصلية غير واضحة، بالإضافة إلى بضع مساجد صغيرة بنيت بعد عام 2000م، وأصبحت قديمة نسبياً وتغيرت معالمها بسبب الإضافات. وبهذا فإن العدد الكلي للمساجد التي شملتها الدراسة هو 140 مسجداً وجامعاً (ملحق 2).

لقد روعي في اختيار المساجد التي تم زيارتها التوزيع على مختلف مناطق عجمان، التفاوت في المساحة، ومساجد وجوامع، والتنوع في الأشكال المعمارية، المواقع على شوارع رئيسية أو داخلية ضمن الأحياء السكنية، التفاوت في تواريخ الإنشاء، والتنوع في الجهات المصممة، والتركيز في الدراسة على الشكل العام والمظهر الخارجي للمسجد وتخطيطه (المسقط الأفقي) وعناصره الرئيسية. ويخلص البحث إلى تقديم بعض التوصيات لأخذها بعين الاعتبار من أجل تحقيق نوع من الوحدة التي يجب أن تعكس هوية معمارية واضحة تعبر عن الزمان والمكان الذي تبنى فيه تلك المساجد.

تعتمد الدراسة أسلوب ومنهج الوصف التحليلي والمقارنة بين المساجد موضع الدراسة، وتشكل الدراسات السابقة والأبحاث المنشورة عن عمارة المساجد الإطار النظري لهذه الدراسة.

دراسات سابقة عن عمارة المساجد:

توجد دراسات عديدة عن عمارة المساجد بشكل عام، لكن الدراسات التي تناولت عمارة المساجد في دولة الإمارات عددها محدود جداً. ويختلف الباحثون في تحديد أنواع ونماذج المساجد وكيفية تصنيفها. بعضهم يصنف المساجد وفقاً للشكل العام والتوزيع الفراغي والعناصر الرئيسية [1] [2]، وآخرون يعتمدون مواد البناء وطرق الإنشاء [3]، وبعض آخر يصنف

المساجد وفقاً للحجم والسعة والموقع [4]. أما الطرز والأنماط المعمارية فإنها ترتبط عادة بالخصائص والعناصر المميزة للمسجد التي سادت في منطقة جغرافية معينة أو فترة زمنية محددة (كالطرز الفاطمي أو المملوكي أو العثماني أو الأندلسي، الخ).

الاختلافات بين الباحثين ليست كبيرة في تحديد أنواع وأنماط المساجد التاريخية، لكن الجدل ما يزال قائماً بين الباحثين والمصممين فيما يتعلق بالتوجهات المعاصرة في تصميم المساجد ومدى ارتباطها أو تأثرها بالأنماط التاريخية وعلاقتها بالمكان وتعبيرها عن الفترة الزمنية الحالية والمحاولات التي تدعو لتأكيد الهوية وإيجاد لغة معمارية معاصرة لتصميم المساجد.

بشكل عام، يجمع معظم الباحثين على ثلاثة نماذج رئيسة من المساجد التاريخية ويصنفونها وفقاً لتخطيطها وشكلها العام على النحو الآتي (شكل 1):

النموذج العربي ذو القاعة متعددة الأعمدة (Hypostyle type)، ولها سقف أفقي إما دون قبة، أو بوجود قبة أو أكثر. وهو النوع أكثر انتشاراً خصوصاً في العالم العربي. وعلى الأغلب يتقدم قاعة الصلاة الرئيسة ساحة مكشوفة أو فناء (courtyard) مع أروقة على الجوانب [5].

النموذج العثماني ذو القبة المركزية الضخمة (Central-dome type) مدعومة بأصاف قباب، يتقدمها كذلك في معظم الحالات فناء مكشوف محاط بالأروقة التي غالباً ما تكون مغطاة بقباب صغيرة. هذا بالإضافة إلى المآذن الرفيعة والمدببة.

النموذج الفارسي ذو الأواوين الأربعة (Four-iwans type) التي تتوسط أضلاع الفناء المكشوف وتكون قاعة الصلاة الرئيسة في جهة الإيوان الأكبر.

ويضيف بعض الباحثين نماذج أخرى لكن انتشارها كان محدوداً في بعض المناطق الجغرافية وأهمها نموذج شبه القارة الهندية، أو النموذج المغولي ذو القباب الثلاث والفناء الضخم والمآذن الأربع في زوايا المسجد [6]. إلا أن الكثير من الباحثين يعتبرون النموذج العربي هو الأصل لباقي النماذج الأخرى المتفرعة عنه، وهو الأكثر انتشاراً إضافة إلى النموذج العثماني [7].



شكل 1

النماذج الرئيسة للمساجد التاريخية [1]

وبالنظر إلى هذه النماذج التاريخية ومقارنة المساجد المعاصرة بها، نجد أن الغالبية العظمى من المساجد الحديثة، خاصة في العالم العربي ومن ضمنها المساجد في دولة الإمارات، تتبع النموذج العربي ذو القاعة المستطيلة أو المربعة المحمول سقفاً الأفقي على أعمدة، رغم التوجه الحديث لتقليل عدد الأعمدة الداخلية أو التخلي عنها.

لقد شهدت دولة الإمارات خلال العقدين الماضيين حركة عمرانية مميزة، وتم بناء مئات المساجد في مختلف المدن الإماراتية. وحيث أن هذا البحث لا يتسع لتغطية المساجد في كافة المدن الإماراتية، التي تحتاج لمزيد من الدراسات، فإنه يقتصر على مساجد مدينة

عجمان، ويشكل حالة دراسية يمكن تكرارها للبحث في مساجد باقي المدن.

مساجد وجوامع عجمان:

وفقاً لأحدث قائمة تم الحصول عليها من قبل الهيئة العامة للشؤون الإسلامية والأوقاف (في شهر نيسان/ أبريل 2021)، فإن العدد الكلي لمساجد عجمان هو 343 مسجداً/ جامع (إضافة إلى بعض المساجد قيد الإنشاء)، من بينها 571 مسجداً تم بناؤها أو أعيد إنشاؤها بعد عام 2002. ويشترط بالمساجد التي تبني حديثاً أن تلتزم بالبنود الواردة في وثيقة «الشروط الواجب توفرها في عمارة المساجد» (ملحق 1)، والتي تحددها الهيئة العامة للشؤون الإسلامية والأوقاف، الجهة الرئيسية المسؤولة عن المساجد في الإمارة. وتتناول هذه الشروط بشكل أساسي: تنسيق الموقع العام، الطابع والتصميم المعماري للمساجد، سكن العاملين (الإمام والمؤذن)، وكذلك أماكن الوضوء ودورات المياه.

ويمكن تصنيف مساجد عجمان بشكل عام وفقاً للمساحة والسعة على النحو الآتي: مساجد الحي، وهي صغيرة الحجم لا تقام فيها صلاة الجمعة وتقتصر على الصلوات اليومية، وجوامع متوسطة الحجم، وجوامع كبيرة الحجم (تزيد سعتها عن 800 مصل).

اختيار المواقع والأراضي التي تبني فيها المساجد تخصص وتمنح في الغالب عن طريق الأوقاف، وأحياناً من قبل مترعين. كذلك بناء المسجد يتم غالباً من قبل مترعين، والذين يقومون بدورهم بتقديم المخططات الهندسية اللازمة عن طريق مكاتب هندسية استشارية مع مراعاة الشروط الواجب توافرها وفقاً للمعايير التي تبنها الأوقاف. أما بالنسبة لمساحة المسجد، فإنها تخضع لعدة عوامل أهمها: مساحة الأرض المراد إنشاء المسجد عليها، وموقع المسجد، وتعداد السكان في المنطقة، وإمكانات الممول أو المترع، ووجود مساجد أخرى في المنطقة.

الشروط التصميمية والمعايير التخطيطية:

الشرط الأول الذي تضعه الأوقاف بهذا الشأن هو أن يلتزم الاستشاري المصمم بالطابع المعماري الإسلامي، والطابع العام لدولة الإمارات، وترعى الاعتبارات الشرعية والعمرانية في تصميم المساجد. وتعتمد الشروط مساحة متر مربع واحد في قاعة الصلاة لكل مصل، دورة مياه واحدة لكل 100 مصل، ومكان وضوء لكل 30 مصل. ويشترط إنشاء مظله (ليوان) على مداخل المسجد لتظليل المصلين عند الدخول والخروج وتكون ضمن تصميم المسجد، ويجب عدم الإسراف في زخرفة المسجد، ويراعى حسن اختيار فرش المسجد دون زخارف، وضرورة الالتزام بالشكل المعماري المنتظم (مربع أو مستطيل) للحفاظ على استقامة الصفوف، ويراعى التقليل من عدد الأعمدة الداخلية لعدم قطع الصفوف. في المساجد الجامعة التي تقام فيها خطبة الجمعة يجب فتح باب في المحراب لدخول الخطيب، ويمكن عمل مصلى للنساء على أن يكون جزءاً من المسجد يمكن فصله أو ضمه بقواطع متحركة أو أبواب، ومزوداً بالخدمات (مبضأة وباب خارجي منفصل). يمكن إضافة ملحقات ومرافق أخرى للمسجد، مثل: الأروقة، وغرف التدريس، ومكتبة، وغرف العبادة، الخ.. وبخصوص سكن العاملين تشترط الهيئة إنشاء سكن للإمام والمؤذن لا يقل عن غرفتي نوم وحمام ومطبخ ومجلس له باب خارجي، مع ضرورة بناء سور حول السكن فيه أبواب خارجية على الشارع، مع ترك مساحة كافية لاستخدامها كحوش. وفي المساجد التي تزيد سعتها على 1000 مصل يجب إضافة غرفة للحارس. أما دورات المياه فيراعى فصلها عن مبنى المسجد، إلا في حالات الضرورة، وأن تكون غير مستقبلة أو مستديرة للقبلة ويعكس اتجاه الرياح. ويجب توفير أماكن وضوء ودورات مياه خاصة للمعاقين إضافة إلى منحدرات لهم عند المداخل.

عناصر المساجد الحديثة وخصائصها في عجمان:

قاعة الصلاة الرئيسية:

بعد دراسة وتحليل المساجد التي تم زيارتها والحصول على مخططاتها، فإنه يمكن القول إن 95% من المساجد الحديثة في عجمان تكون فيها قاعة الصلاة الرئيسية مربعة الشكل أو مستطيلة، حيث يقع المحراب في منتصف الضلع الأطول للقاعة المستطيلة. وفي بعض الحالات النادرة يكون شكل قاعة الصلاة غير منتظم (53. حذيفه بن اليمان)، أو مضع ثماني الشكل (220. علي الحمراي) أو على هيئة نجمة ثمانية الشكل (158. شهداء القوات المسلحة).

في معظم المساجد الحديثة يتقدم قاعة الصلاة الرئيسية إما رواق أو ليوان، وفي غالبية الجوامع يتقدم قاعة الصلاة الرئيسية قاعة ثانوية أصغر حجماً تخصص عادة للصلوات اليومية، في حين تستخدم القاعة الرئيسية وقت صلاة الجمعة وفي رمضان.

معظم المساجد لها مداخل في الواجهة الأمامية فقط، وفي بعض الحالات توجد مداخل ثانوية لقاعة الصلاة تكون عادة في بداية الواجهات الجانبية بالقرب من واجهة المدخل الرئيس، وذلك لتجنب الدخول من منتصف الواجهتين الجانبيتين.

روعي في تصميم المساجد الحديثة تقليل عدد الأعمدة داخل قاعة الصلاة قدر الإمكان، وذلك لضمان استمرارية صفوف الصلاة، وفي عدد من المساجد تم الاستغناء كلياً عن الأعمدة، وإن وجدت تكون غالباً في الوسط لحمل القبة على أربعة أعمدة.

المآذن:

بالنسبة لمواقع المآذن وعددها فإن ما نسبته 86% من المساجد الحديثة لها مئذنة واحدة فقط، وتقع دائماً في الجهة الأمامية، واجهة المدخل الرئيس، وفي الغالب على الجانب الأيمن، وقد تكون منفصلة أو متصلة بالمبنى الرئيس لقاعة الصلاة. ولا يوجد أي مسجد من بين المساجد الحديثة في عجمان له أكثر من مئذنتين سوى جامع الشيخ زايد (شكل 2). وتختلف أشكال وتفصيل المآذن وفقاً للطابع المعماري للمسجد. ومن بين المساجد والجوامع التي تمت دراستها وتحليلها (140)، بلغ عدد الجوامع التي تحتوي على مئذنتين 19 جامعاً فقط.

القباب:

ماعدا بعض الحالات الاستثنائية التي يوجد بها أكثر من قبة، أو أنها لا تحتوي على قبة نهائية، فإن غالبية المساجد الحديثة تحتوي على قبة واحدة تقع دائماً في منتصف



قاعة الصلاة. وفي بعض الحالات التي يوجد بها أكثر من قبة فإن القباب الإضافية تكون دائما أصغر من الرئيسة، وتقع عادة فوق المداخل أو فوق قاعة الصلاة الثانوية. شكل القبة غالباً نصف كروي، مقطوعها نصف دائري، وأحياناً مدببة، وفي إحدى الحالات بصليبة الشكل، وفي حالة أخرى تمر الاستعاضة عنها بشكل هرمي قزميدي (شكل 3).

شكل 2
جامع الشيخ زايد في عجمان (2000)



شكل 3:
أشكال مختلفة للقباب في مساجد عجمان

سكن الإمام والمؤذن:

من أهم الملحقات وأحد الشروط الرئيسة في بناء المساجد في عجمان هو مسكن الإمام، وفي بعض الأحيان مسكن للمؤذن أيضاً. ويشترط في هذا المسكن ألا يقل عن غرفتي نوم، وفي كثير من الحالات ثلاث غرف نوم، مع توفير خصوصية تامة ومدخل منفصل بعيداً عن المدخل الرئيس للمسجد، ويفضل في الجهة الخلفية ومنفصلاً عن بناء المسجد الرئيس.

دورات المياه وأماكن وضوء الرجال:

كذلك دورات المياه وأماكن الوضوء يفضل أن تكون منفصلة، ويجب ألا تأخذ دورات المياه اتجاهها موازياً لاتجاه القبلة. ووفقاً لشروط ومعايير الهيئة العامة للشؤون الإسلامية والأوقاف، فإنه يجب تخصيص دورة مياه واحدة لكل 100 مصل، ومكان وضوء لكل 30 مصل (شروط الأوقاف، ملحق 1). وكذلك يشترط تخصيص دورات مياه وأماكن وضوء لذوي الاحتياجات الخاصة، بالإضافة إلى مراعاة الفصل التام بين مناطق الوضوء ودورات المياه من خلال إيجاد منطقة انتقالية مثل موزع أو ممر بينها.

مصلى النساء:

يقتصر ذلك - غالباً - على الجوامع، وتكون إما قاعة جانبية، متصلة بالبناء الرئيس للمسجد أو منفصلة. وفي بعض الحالات تكون في طابق علوي (ميزانين)، وتزود دائماً بمرافق خاصة بالنساء ومدخل منفصلة.

الفناء:

من اللافت للانتباه في المساجد الحديثة غياب الفناء المكشوف بشكل كلي تقريباً، برغم كونه من العناصر الأساسية في عدد من المساجد التاريخية، وبشكل خاص في المناطق الحارة. فهو يمثل مساحة إضافية يمكن استخدامها للصلاة أيام الجمعة. ومن بين المساجد الحديثة التي تمت زيارتها وجد الفناء في أربعة مساجد فقط، (جامع أمانة بنت الغرير، وجامع ثاني بن عيسى بن حارب 1، وجامع حميد حسن الشامي، وجامع فوزي بن مرعي النصار وعائشة الخطاب)، أما جامع الشيخ حميد بن عبد العزيز النعيمي 1، فقد أُجريت تعديلات عليه وتغطية الفناء.

الفتحات والعناصر الزخرفية:

استخدمت الأقواس، أو عناصر زخرفية على شكل أقواس، في أكثر المساجد الحديثة. ومع أن استخدام مختلف الأنواع من الأقواس، إلا أن الأقواس المدببة ونصف الدائرية هي الأكثر انتشاراً، باختلاف نسبها وأحجامها. وفي كل المساجد تقريباً أعطيت الواجهة الأمامية عند المدخل الرئيس أهمية خاصة من حيث حجم الفتحات وشكلها والتفاصيل المعمارية. وتجدر الإشارة إلى أن معظم هذه المساجد كان عدد فتحات المداخل أو أقواس الرواق الأمامي فردية، 1 أو 3 وأحياناً 5، وذلك للتأكيد على منتصف واجهة المدخل ومحور اتجاه القبلة الواصل بين المدخل والمحراب، الذي يمثل أيضاً محور التماثل الذي هو أحد المبادئ الأساسية في تصميم الواجهة الأمامية للمساجد. أما جدار القبلة فقد روعي فيه تقليل عدد الفتحات قدر الإمكان، لتجنب أشعة الشمس المباشرة بعد الظهر وتجنب تشتت النظر. أما بالنسبة للزخارف والتفاصيل الخارجية فإن المبدأ العام هو عدم المبالغة باستخدام العناصر الزخرفية، باستثناء بعض الحالات في عدد من الجوامع المميزة.

التوجهات المعمارية السائدة في تصميم المساجد المعاصرة في عجمان:

الاختلافات في عمارة المساجد تبدو أكثر وضوحاً في الشكل والمظهر الخارجي والطابع المعماري. إذ تتفاوت المساجد الحديثة في شكلها الخارجي بدرجة كبيرة، على الرغم من وجود عدد من العناصر المشتركة في التخطيط. ويمكن تصنيف المساجد من حيث الطابع المعماري العام والشكل الخارجي إلى أربع مجموعات تعكس التوجهات المعاصرة في تصميم المساجد الحديثة بمدينة عجمان:

1. مساجد ذات طابع تقليدي محلي (إماراتي):

تميزت هذه المساجد بالبساطة في التصميم واستخدام بعض العناصر المستوحاة من التراث المعماري المحلي (الإماراتي)، وبشكل خاص بعض العناصر الزخرفية التي تعلو الفتحات، وهي بشكل عام صغيرة الحجم لأداء الصلوات اليومية داخل الأحياء السكنية. بعضها فيه قبة صغيرة وبعضها الآخر لا يوجد. وتمثل هذه المساجد نسبة 15.5% من العدد الكلي للمساجد التي شملتها الدراسة (140 مسجد وجامع). ومن اللافت للانتباه أن عدد هذه المساجد تضاعف في السنوات الخمس الأخيرة، ما يشير إلى الرغبة في التمسك بالطابع المحلي وتأكيد الهوية المعمارية والارتباط بالمكان. شكل 4 يظهر بعض المساجد التي تمثل هذا التوجه.



102. عليا بنت سلطان النعيمي (2020)



276. دار البر (2013)



316. أرحمه بن علي الشوبهي (2018)



317. فاطمة بنت العويد (2019)

شكل 4: مساجد ذات طابع تقليدي محلي (اماراتي)

2. مساجد مستوحاة من نماذج تاريخية من مناطق أو عصور مختلفة (شكل 5):

ما يميز هذه المساجد هو استخدام عناصر معمارية من مناطق أخرى أو من فترات تاريخية مختلفة (أندلسي، مملوكي، فاطمي، عثماني، الخ)، وفي كثير من الحالات يتم الجمع والتنسيق بين عناصر من عدة طرز وأنماط مختلفة. وتظهر الدراسة أن هذا النوع من المساجد يمثل النسبة الأكبر (68%)، برغم التناقص الواضح في عددها خلال السنوات الأخيرة كما أثبتت الدراسة.



256. جامع الفلا (2010)



287. سعيد عبد الله السعيد (2014)



3. عثمان بن عفان (2013)



98. الشيخ عبد الله بن راشد النعيمي (2015)

شكل 5: مساجد مستوحاة من نماذج تاريخية وعصور مختلفة

3. مساجد ذات طابع معماري يجمع بين التقليدي والحديث (الأشكال 6، 7، 8):

والمقصود هنا بالتقليدي إما الطابع المحلي أو التاريخي، مع بعض عناصر الحداثة، أي محاولة تحديث العناصر القديمة واستخدامها بطريقة معاصرة. وقد لوحظ أن محاولات تطوير أو تحديث الخصائص المحلية عددها محدود بالمقارنة مع تحديث العناصر التاريخية المستوحاة من مناطق وفترات زمنية مختلفة. وتظهر بعض الأمثلة على هذا التوجه حلولاً متميزة وأفكاراً إبداعية للجمع بين القديم والحديث، بحيث يتم الحفاظ على الطابع المتعارف عليه للمسجد ولكن باستخدام لغة العصر وأساليب مبتكرة.



1. الشيخ حميد بن عبد العزيز النعيمي 1 (2007)



96. عبد الله سعيد بن غليظة (2013)



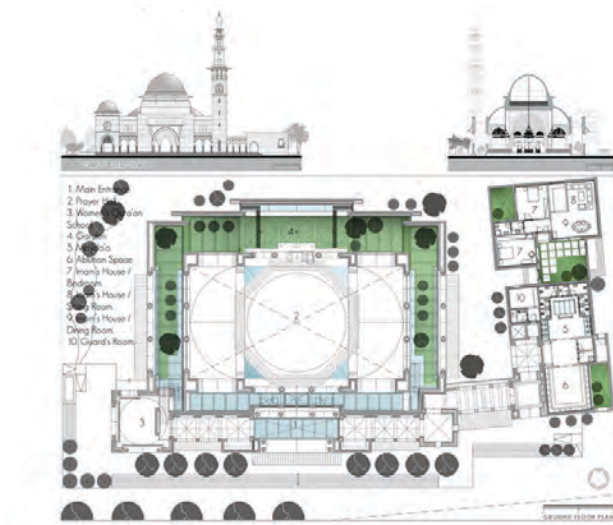
275. جامع الشيخ حميد بن راشد (2012)



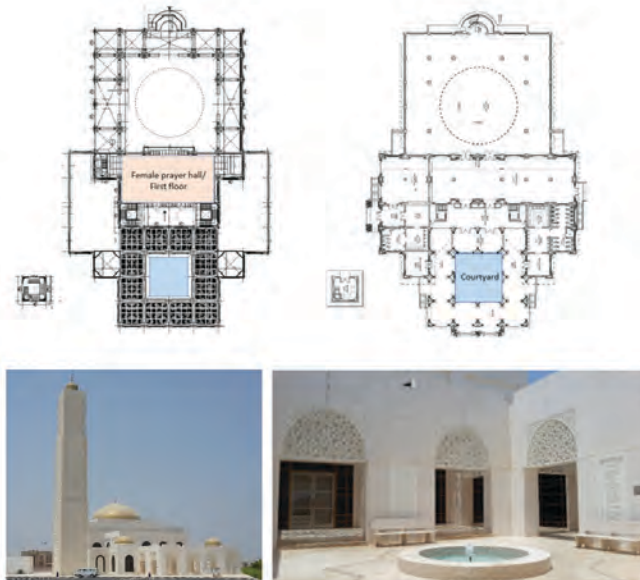
280. جامع أمينة بنت أحمد الغرير (2013)

شكل 6: مساجد ذات طابع معماري يجمع بين التقليدي والحديث

ومن بين الأمثلة المتميزة التي تصلح أن تكون مرجعاً ونموذجاً ناجحاً لتطوير خصائص العمارة المحلية بأسلوب معاصر، جامع الشيخ حميد بن راشد في الصفا (شكل 7) وجامع أمينة بنت الغرير (شكل 8) في المنطقة نفسها. إذ تم الاعتماد في جامع الشيخ حميد بشكل كبير على الإنارة الطبيعية من الأعلى وبأسلوب حديث، إضافة إلى وجود منطقة خضراء داخل قاعة الصلاة بمحاذاة جدار القبلة تصلها الإنارة الطبيعية من الأعلى. كما أن الفتحات الخارجية فقد وضعت مظلات فوفها لتجنب أشعة الشمس المباشرة. أما جامع أمينة فإنه يتميز بوجود فناء مكشوف يتقدم المدخل الرئيس لقاعات الصلاة ومحاط بالأروقة شبه المظلمة. ويتوسط الفناء بركة ماء صغيرة ونافورة. ومن العناصر المميزة للمسجد مئذنته الضخمة التي غطيت جدرانها بنماذج خطية مجردة بطريقة مبتكرة. وفي الداخل يتميز الجامع بالكتابات على جدار القبلة بطريقة فنية مسطحة تمثل أسماء الله الحسنى. كذلك المنبر المتحرك الذي تم تصميمه بحيث يتم سحبه وإبرازه ضمن قاعة الصلاة فقط لأداء الخطبة.



شكل 7
 جامع الشيخ حميد بن راشد في الصفايا، 2012 (المصدر: الباحث)



شكل 8
 جامع أمينة بنت الغرير (2013)

4. مساجد يغلب عليها طابع الحدائثة:

هذه المساجد تكاد تخلو من أي عناصر أو خصائص محلية أو تاريخية معروفة، ويظهر فيها الابتعاد الواضح عن الأنماط القديمة. وهذا النوع من المساجد ما يزال موضع جدل بين الباحثين والمعماريين وحتى عامة الناس [10] [9] [8]. إذ أنها لا ترتبط بالمكان وليس لها هوية واضحة سوى أنها تتصف بالحدائثة لمجرد أنها تخلت عن أي عناصر قد تشير للماضي (شكل 9). وبالرغم من أن نسبة هذه المساجد حسب الدراسة لا تتعدى 8%، إلا أن عددها تزايد في الخمس سنوات الأخيرة. في بعض الحالات يتم استخدام بعض الأشكال الهندسية المستوحاة من الفن الإسلامي في زجاج النوافذ أو على بعض الأجزاء من الجدران، في محاولة للتلميح للماضي، إلا أن هذه الأشكال لا تبدو واضحة عن بعد ولا تعطى أهمية.



311. جامع شهداء الوطن (2018)



مسجد قرب نادي عجمان الرياضي (2021)



305. مسجد الإخاء (2016)



مسجد أدنوك

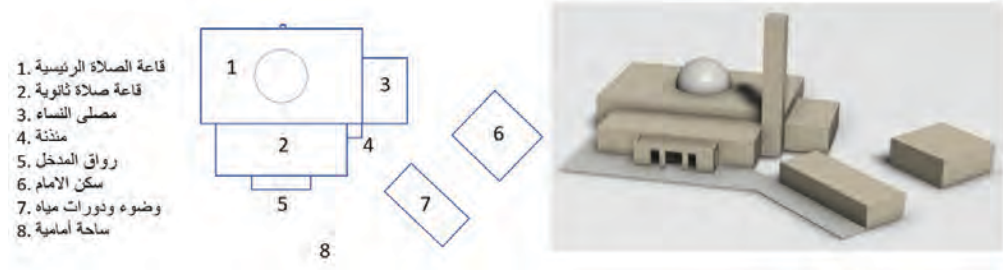
شكل 9: مساجد يغلب عليها طابع الحدائثة

النتائج:

بعد دراسة وتحليل المساجد التي تم زيارتها، توصل الباحثون إلى أن هناك وحدة واضحة في التخطيط والتوزيع الفراغي للمساجد المعاصرة في عجمان، رغم التنوع في المظهر الخارجي. إذ أن العنصر الرئيس في المسجد، قاعة الصلاة الرئيسة، يغلب عليها الشكل المربع أو المستطيل، بحيث يمثل الضلع الأطول من المستطيل جدار القبلة الذي يتوسطه المحراب، وعلى يمينه المنبر في حالة الجوامع. وفي الجوامع الأكبر حجماً توجد عادة قاعة صلاة ثانوية تتقدم قاعة الصلاة الرئيسة لكنها أصغر حجماً (بمعدل ثلث المساحة) وتخصص للصلاة اليومية. إضافة إلى قاعات الصلاة للرجال فإن كافة الجوامع تضم قاعات صلاة للنساء أيضاً، وتكون إما جانبية أو في طابق علوي مع مداخل منفصلة وبعيدة عن مداخل الرجال. وقد لوحظ إضافة قاعة صلاة للنساء في بعض مساجد الأحياء التي بنيت حديثاً.

بالإضافة إلى قاعات الصلاة فإن العناصر الرئيسة الأخرى التي وجدت في كافة المساجد

والجوامع هي: أماكن الوضوء ودورات المياه، والمثذنة، وسكن الامام. هذه العناصر المشتركة بين جميع المساجد والتخطيط الفراغي وترتيب هذه العناصر ومواقعها والعلاقة الوظيفية بينها هي التي أنتجت الوحدة الواضحة. أما بالنسبة للقبة ورواق المدخل الرئيس فإنها تعد عناصر ثانوية، إذ أنه بالرغم من وجودها في كثير من المساجد إلا أنها لا توجد في كل المساجد. أما المنبر لخطبة الجمعة فإنه بالتأكيد من العناصر الرئيسة للجوامع، والفناء المكشوف وجد في عدد محدود جداً من الجوامع، ويبدو أنه استبدل بالساحة الأمامية المكشوفة التي تتقدم معظم المساجد، والتي يتم أحياناً تغطيتها بمظلات معدنية بطريقة غير مدروسة ولا تتسجم مع تصميم المسجد. شكل 01 يعطي تصوراً عاماً للنموذج السائد في مساجد عجمان ويظهر العناصر الرئيسة والثانوية.



شكل 10 تصور للنموذج السائد في مساجد عجمان يظهر العناصر الرئيسة والثانوية

أما الاختلافات في الشكل والمظهر الخارجي، فإنها تعود بشكل رئيس لدور المصمم، وإلى رأي وتدخل وميزانية الممول، بعد الالتزام بشروط بناء المساجد وموافقة الهيئة العامة للشؤون الإسلامية والأوقاف.

وقد اتضح من الدراسة أن التوجه السائد في تصميم المساجد المعاصرة في عجمان هو الحرص على إظهار العلاقة بالماضي، سواء باتجاه الأنماط التقليدية المحلية (15.5%) أم الأنماط التاريخية من مناطق وفترات مختلفة (68%)، مع تناقص الاتجاه الثاني والازدياد في الاتجاه الأول خلال السنوات القليلة الماضية. وهذا يشير إلى التوجه القوي نحو تأكيد الهوية والتمسك بالتراث والربط بالمكان. وفي المقابل وينسب أقل، هناك محاولات للتحديث، أما من خلال الفهم الخاطئ للتحديث وحصره فقط بفكرة التخلي عن كل ما يشير للماضي، أو من خلال الجمع بين القديم والحديث بطرق مختلفة ونسب متفاوتة من النتائج المقنعة. لوحظ في بعض المساجد قيد الإنشاء بعض البوادر لظهور توجه جديد لتطوير بعض الأفكار المستوحاة من التراث الإماراتي وصياغتها بأسلوب معاصر ولغة معمارية جديدة تعبر عن المكان والزمان، وليس مجرد إعادة استخدام بعض العناصر الشكلية كما هي عناصر زخرفية. وبشكل عام، وتتسم المساجد المعاصرة في عجمان بالبساطة في التصميم وعدم المبالغة في استخدام الزخارف والعناصر التجميلية، سواء من الداخل أم الخارج، بل وفي كثير من الأحيان الغياب التام لهذه الزخارف. وهذا يتسجم مع خصائص المساجد التاريخية والمباني التراثية في دولة الإمارات. كما لوحظ في عدد من المساجد التي أنشئت مؤخراً، وخاصة في مساجد الأحياء، التوجه لربط المسجد بالمجتمع والبيئة المحيطة بشكل أكبر من خلال إعطاء المسجد دوراً أكبر لا يقتصر فقط على العبادة، حيث تم تخصيص مناطق تجمع وأماكن مظلة للعب الأطفال الصغار ومناطق خضراء مجاورة للمسجد كفراغات اجتماعية للحى (شكل 11).



شكل 11
مناطق لعب أطفال وحدائق قرب المسجد

الخلاصة والتوصيات:

تمثل بعض التصاميم الحديثة للمساجد في عجمان نموذجاً جيداً ومتقدماً لما يمكن أن يكون عليه المسجد المعاصر في القرن الواحد والعشرين وتصلح أن تكون مرجعاً لتصميم المساجد الحديثة في مناطق أخرى. خلصت الدراسة إلى أن هناك توجهاً متنامياً لتأكيد الهوية والارتباط بالمكان. إلا أن المحاولات لتحقيق ذلك تقتصر في كثير من الأحيان على إعادة استخدام بعض العناصر التراثية، وهذا قد يحقق الغرض من حيث الارتباط بالمكان، لكنه قد لا يعبر عن العصر الذي نعيشه، ولذلك هناك حاجة لتطوير نماذج تنتمي للمكان والبيئة المحيطة تمثل الزمن الحالي ولغة العصر.

التطوير يجب ألا يقتصر على الأشكال وإعادة استخدام عناصر تراثية، بل لا بد من استخدام إيجابيات التكنولوجيا الحديثة ومواد وأساليب الإنشاء المعاصرة لتطوير تصاميم تستجيب لمتطلبات البيئة ومبادئ الاستدامة والتوفير باستهلاك الطاقة.

بعد زيارة أكثر من 170 مسجداً وجامعاً حديثاً، وتحليل ومقارنة مخططات 50 منها، يتضح ودون أدنى شك أن هناك تشابه كبير في التخطيط العام والتوزيع الفراغي الأساسي لهذه المساجد، رغم التفاوت والاختلافات الكبيرة في الشكل الخارجي والمظهر المعماري لكل مسجد. وبشكل عام يمكن أن تدرج أكثر المساجد الحديثة في عجمان ضمن نموذج واحد عام من حيث التخطيط. ويعود السبب في ذلك بشكل رئيس لطبيعة الشروط التصميمية التي تضعها الأوقاف، التي تعطي مجالاً واسعاً للتنوع في الأشكال المعمارية، وبنفس الوقت تضمن نوعاً من الوحدة بين هذه المساجد برغم اختلاف أشكالها. كذلك نتيجة للالتزام ببعض العناصر والمبادئ التصميمية المتبعة التي أصبحت مع مرور الوقت وكأنها قواعد وشروط متعارف عليها لكنها غير مكتوبة. إضافة إلى العدد المحدود من المكاتب الهندسية التي أصبحت نتيجة الخبرة ومع مرور الوقت وكأنها مختصة بتصميم المساجد، وهذا يعني في عدد من الحالات الاستخدام المتكرر لنفس اللغة والعناصر المعمارية، بل وأحياناً نفس المخطط المعماري أو نسخة معدلة منه (شكل 12).



56. مسجد المهاجرين (2014)



297. سيف محمد القراعة النعيمي (2015)



307. محمد بن عبد الله بن فهد (2016)



180. فاطمة بنت خليفة (2017)



310. مسجد الصالحين (2017)



323. أبو عبيدة بن الجراح (2021)



335. علي بن عبد الله خلفان الشامي (2021)



336. ثاني بن عيسى بن حرب 4 (2021)



240. عوشة الشامي (2018)



295. مسجد التوحيد (2015)

شكل 12: التشابه الكبير بين بعض المساجد

من الضروري الإبقاء على هامش حرية في تصميم الشكل الخارجي والمظهر المعماري العام، الا أنه لا بد في من تطوير بعض الضوابط التي تبقى على إمكانية التنوع ضمن الوحدة، مع تجنب القوانين التي تنتج في النهاية نسخ متكررة لنفس التصميم. بشكل عام تعتبر تجربة مساجد عجمان مثالا ناجحا لوضع بعض الشروط والقواعد التصميمية مع الإبقاء في نفس الوقت على هامش من الحرية للتنوع في المظهر العام ضمن بعض الضوابط. احدى المشاكل التي يجب أن تطرح لها حلول من خلال اضافة بعض الشروط، هي مشكلة اضافة المظلات المعدنية أمام الواجهة الرئيسة. اذ لا بد من أخذ هذه المسألة بعين الاعتبار ضمن التصميم الأصلي للمسجد. أحد الحلول التي يمكن طرحها قد يكون في تطوير فكرة الفناء المكشوف والمحاط بأروقة مغطاة وتكون جزءا من تصميم المسجد منذ البداية.

بالرغم من أن هذه الدراسة تغطي جزءا من النقص في الأبحاث عن عمارة المساجد الحديثة في دولة الإمارات، الا أن هناك حاجة لمزيد من الأبحاث في مجال الاستدامة والاستجابة للمتطلبات البيئية وتطوير العناصر المعمارية التقليدية، إضافة إلى دور الممول والمعماري والأوقاف في اختيار أو تحديد النمط المعماري للمسجد، وكذلك التعرف على آراء المستخدمين وقياس مدى رضاهم وتقبلهم للأنماط السائدة.

ملاحظة: كافة الصور من قبل المؤلف، ما لم يرد غير ذلك. وتتقدم بالشكر للهيئة العامة للشؤون الإسلامية والأوقاف وكذلك لدائرة البلدية والتخطيط في عجمان على تقديم المساعدة وتزويدنا بالمخططات والمعلومات الضرورية لهذا البحث.

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ملحق (1) الشروط الواجب توفرها في عمارة المساجد

الشروط الواجب توفرها في عمارة المساجد

أولاً، تنسيق الموقع العام:

- 1- يتم تنسيق الموقع العام بحيث يتكون هناك مساحة خلف المسجد وأن يقام سور منخفض الارتفاع (حديد، بناء) بحيث لا يمنع رؤية المسجد.
- 2- يجب عمل أرصيات من الحجر المصنوع (الترولوك أو ما شابه) حول بناء المسجد ومراقفه.
- 3- يجب إنشاء ممرات داخلية لأرض المسجد، وتحديد أماكن مرور المشاة، وأحواض للزراعية، وتوفير مواقف للسيارات تتناسب وحجم المسجد.
- 4- يجب الأخذ في الاعتبار بإمكانية التوسع المستقبلي للمسجد.

ثانياً، الطابع والتصميم المعماري للمساجد:

- 1- يجب أن يلتزم الاستشاري المصمم بالطابع المعماري الإسلامي، والطابع العام لدولة الإمارات وتراعى الاعتبارات الشرعية والمعمارية في تصميمات المساجد.
- 2- يخصص لكل مصلح مساحة تعادل متراً واحداً مربعاً.
- 3- يجب إنشاء مظلة (بوان) على مداخل المسجد لتظليل المصلين عند الدخول والخروج وتكون ضمن تصميم المسجد.
- 4- يراعى عمل رخام أو نحوها بارتفاع ٩٠ سم على الأقل لصحن المسجد والأعمدة الداخلية.
- 5- يراعى عمل شبك لتثبيت أو ما يماثله على النوافذ حسب الأسلوب المعماري المناسب، مع ترك مساحة لتنظيف الزجاج.
- 6- عدم الإسراف في زخرفة المسجد وعرض الزخارف والآيات القرآنية على الهيئة لاعضادها.
- 7- يجب عمل منحدر للمعاقين للدخول والخروج من المسجد وبكذلك لمراقفه.
- 8- يجب عمل زروف داخل المسجد لحفظ المصاحف، وزروف خارج المسجد لحفظ الأضحية.
- 9- يجب فتح باب في الحراب لدخول الخطيب (في المساجد الجامعة) .
- 10- يسمح بعمل ممسك للسان على أن يتكون جزءاً من المسجد بمسكن فضله أو ضمه بقواطع متحركة أو أبواب، ومزوداً بالخدمات (باب خارجي - ميساة).
- 11- يراعى التقليل من عدد الأعمدة الداخلية لعدم قطع الصفوف.
- 12- يراعى حسن اختيار فرش المسجد بدون زخارف ووضع طبقة لحمايته من الأسفل ويجب اعتماده من الهيئة.
- 13- تكون الأسيجة الداخلية والخارجية مناسبة وملئمة ومكافئة للمسجد، ويراعى توزيع الصوت والصوتيات في تصميم قاعة الصلاة بما يلائم المساحة والارتفاع.
- 14- يمكن إضافة بعض الملحقات للمسجد مثل (الأروقة، المحاريب، غرف التدريس، الإيوانات، غرف العبادة، الخ).
- 15- الالتزام بالمشغل المعماري المنظم (مربع- مستطيل) للحفاظ على استقامة الصفوف.
- 16- يجب عزل الفيش حرارياً وذلك بالطابق العازل للحرارة أو الجدار المزودج وذلك لتوفير الطاقة المستهلكة في التكييف.

ثالثاً، مسكن العاملين (الإمام، المؤذن):

- 1- يجب إنشاء مسكن للإمام والمؤذن، ويضاف غرفة للحاريس في المساجد التي تزيد سعتها على 1٠٠٠ مصل.
- 2- يجب أن لا يقل مسكن المؤذن والإمام عن غرفتي نوم وحمام ومطبخ ومجلس له باب خارجي.
- 3- يجب بناء سور حول المسكن فيه أبواب خارجية تطل على الشارع الرئيسي، ويراعى ترك مسافة صافية لاستخدامها كحوض.

رابعاً، أماكن الوضوء ودورات المياه:

- 1- يجب توفير أماكن للوضوء ودورات مياه مناسبة لحجم المسجد (بحيث يتكون هناك دورة مياه لكل 1٠٠ مصل ومسكان للوضوء لكل ٣٠ مصل).
- 2- يراعى فصل دورات المياه عن مبنى المسجد (إلا في حالة الضرورة) وأن تكون غير مستقلة أو مستديرة للقبلة وبمغطس الرياح لكي لا تحمل الروائح للمسجد.
- 3- يجب توفير أماكن للوضوء ودورات مياه للمعاقين.
- 4- يجب تكييف أماكن الوضوء والحمامات وعمل منافذ لتهوية دورات المياه بصفة مستمرة بشكل يتناسب والتكييف.
- 5- يراعى عمل مسكان واحد على الأقل للاستحمام.
- 6- حسن اختيار نوع السوراميك والإكسسوارات اللازمة للأرضيات والزوايا لتتح تراكم القاذورات فيها مع التأكيد على البية السحب التلقائي، لسيفون، الحمامات.
- 7- التأكيد على تركيب علاقات للملابس في الحمامات وأماكن الوضوء، وكذلك ضرورة وجود المرايا فوق المنافس أو في مكان مناسب عند المخرج.
- 8- يجب عمل أبواب ونوافذ من الألمنيوم لأماكن الوضوء ودورات المياه لفتحها في غير أوقات الصلاة، مع مراعاة ارتفاع باب الحمام عن الأرض ٢٠ سم.
- 9- يجب توفير أماكن لبرادات المياه، وكذلك مخزن لحفظ مستلزمات المسجد (التظاغة ونحوه ...).

خامساً، الوقف الخيري للمسجد:

- 1- يجب عمل وقف يتناسب وحجم المسجد للإنفاق على خدماته وقد يتكون هذا الوقف تجارياً أو مسكناً حسب المنطقة.
- 2- يراعى إن مسكان الوقف تجارياً بعدم بيع المحرمات شرعاً كالكافور وغيرها.
- 3- للتبرع بناء وقف في مكان غير أرض المسجد (بالجوار) أو مسكان آخر) أو التبرع بوقف قائم بالفعل في مكان آخر.
- 4- يختم 1٠٪ من المبلغ المتبرع به لصالح بناء وقف المسجد.

سادساً، جهة التمويل:

- 1- يمكن تمويل بناء المسجد عن طريق المتبرعين ويتم فتح حساب بنكي للمسجد لمن يرغب في التبرع ولا يتم صرف أي مبالغ للمعاول إلا بواسطة مكتب الهيئة بعد صرف شهادة الدفع من الاستشاري.

المصدر: وثيقة من الهيئة العامة للشؤون الإسلامية والأوقاف

(ملحق 2) أرقام وأسماء وصور كافة المساجد التي شملتها الدراسة

الرقم	اسم المسجد	
1	الشيخ حميد بن عبد العزيز النعيمي 1	2007
3	عثمان بن عفان	2013
5	خلفان بن عبد الله الشامسي	2005
15	الإمام أبو حنيفة النعمان	2009
34	عبد الله بن علي الحمراي	2001
38	عائشة سعيد الظاهري	2009
39	محمد عبيد الزعابي	2015
42	الشيخ حميد بن عبد العزيز النعيمي 2	2008
53	حذيفه بن اليمان	2013
54	الزبير بن العوام	2007
56	المهاجرين	2014
57	محمد بن علي الحمراي	2016
63	أبو سعيد الخدري	2002
65	معاذ بن جبل	2006
66	فاطمة بنت علي النعيمي	2003
70	الصفاء	2017
74	الشيخة شيخة بنت سعيد النعيمي	2018
89	الخير	2017
91	موزة بنت خلفان	2013
96	عبد الله سعيد بن غليظة	2013
98	الشيخ عبد الله بن راشد النعيمي	2015
100	هيام محمود مروه	2019
101	حسن عبد الله السعدي	2018
102	عليا بنت سلطان النعيمي	2020
103	النبي أيوب عليه السلام	2012
104	ثاني بن عيسى بن حارب 1	2014
116	هلال بن غابش	2011
127	سراقة بن مالك	2009
132	المغفرة	2007
141	حمد عبيد بن دلوان	2014
143	عائشة بنت حمد السوداني	2011
144	عائشة بنت ثاني عبد الله	2017
158	شهداء القوات المسلحة	2013
169	الروضة	2011
177	عائشة بنت عبد الله العاصي	2000
179	مستشفى الشيخ خليفة بن زايد آل نهيان	2000
180	فاطمة بنت خليفة	2017
181	زينب بنت جحش	2000
182	الشيخ زايد بن سلطان آل نهيان	2000
184	المغيرة بن شعبة	2001


























	2020	شيخة بنت أحمد الشامي	185
	2001	الإتحاد	189
	2010	حمد بن غانم الشامي	190
	2017	الإمام الشافعي	192
	2020	الصحابة	194
	2001	الخلفاء الراشدون	195
	2001	الشهيد غريب سعيد سليمان الكعبي	196
	2003	ماجد بن زايد	198
	2003	عبد العزيز بن باز	199
	2002	حمد عمران تريم	200
	2002	الجباب بن المنذر	203
	2015	خديجة بنت محمد	204
	2005	خليفة بخت المطروشي	209
	2014	فاطمة بنت محمد	213
	2003	علي الحمزاني	220
	2004	خلف الزفين	222
	2004	فاطمة الأنصاري	223
	2004	المهلب بن أبي صفرة	225
	2008	موزة بنت فارس الظاهري	231
	2008	فاطمة الهرمودي	236
	2008	علي بن سيف الحمزاني	237
	2009	الكوثر	238
	2008	التعيمي	239
	2018	عوشه الشامي	240
	2009	عائشة عبد الله لوتاه	242
	2009	موزة سالم الحمزاني	243
	2009	أمته علي الشامي	247
	2009	عبد الله الرميثي	248
	2010	محي الدين ثومبي	251
	2010	حبيب أحمد آل غريب	252
	2010	علي محمد خليفة بن سالمين	253
	2010	الشيخ صقر بن راشد التعيمي	254
	2010	عبد الله راشد بخت المطروشي	255
	2010	الغلا	256
	2010	موزة بنت علي الخاطري	257
	2010	ابن زايد	258
	2014	شيخة بنت راشد التعيمي	259
	2010	محمد عبد الله السعدي	260
	2015	أمته الزرعوني	262
	2011	حنيفة بنت إبراهيم بن يوسف	263
	2013	سلطة المنطقة الحرة	264
	2011	الهدى	266





























	2012	عمر بن الخطاب	268
	2012	ميرة خليفة محمد الغفلي	269
	2012	المهيري	270
	2012	أمهات المؤمنين	271
	2012	سالم بن عبد الله النعيمي	272
	2013	التي داود عليه السلام	274
	2012	حميد بن راشد	275
	2013	دار البر	276
	2013	عيسى السويدي	277
	2013	فاطمة أحمد السعدي	278
	2013	راشد بن بخت المطروشي	279
	2013	أمّة بنت أحمد الغرير	280
	2013	شيخة بنت إبراهيم	283
	2013	الشيخ عبد الله سلطان راشد النعيمي	284
	2014	هاجر	285
	2014	سعيد عبد الله السعدي	287
	2014	النعيمية	288
	2016	جامع مصلى العيد	289
	2014	الشهيد سمير محمد مراد البلوشي	290
	2015	فاطمة بنت محمد الحمزاني	292
	2016	شمسة بنت حميد الحمزاني	294
	2015	التوحيد	295
	2015	حميد حسن الشامسي	296
	2015	سيف محمد القراة النعيمي	297
	2016	حمد بن غليظة	300
	2016	موضي محمد الصميان	303
	2016	الريان	304
	2016	الإخاء	305
	2016	محمد بن عبد الله بن فهد	307
	2017	إبراهيم بن راشد الغملاسي	309
	2017	الصالحين	310
	2018	شهداء الوطن	311
	2017	عباد الرحمن	312
	2018	موزة بنت علي	314
	2018	ثاني بن عيسى بن حارب 2	315
	2018	أرحمه بن علي الشويهي	316
	2019	فاطمة بنت العويد	317
	2018	حسين بن محمد الشعالي	318
	2020	يوسف بن حافظ	320
	2019	أرحمه عبد الله العويس	321
	2019	بر الوالدين	322
	2021	أبو عبيدة بن الجراح	323

	2019	فوزي بن مرعي النصار وعائشة الخطاب	324
	2019	علي محمد الحوسني	325
	2020	فاطمة با نافع	331
	2021	علي بن عبد الله خلفان الشامسي	335
	2021	ثاني بن عيسى بن حارب 4	336
	2021	الإمام أحمد بن حنبل	337

1. Sheikh Humaid Al-Nuaimy 1 (2007)	3. Othman bin Affan (2013)	5. Khalfan Al-Shamsi (2005)	15. Abu Hanifah Al-Numan (2009)
34. Abdullah Al-Hamrani (2001)	38. Aysheh Saeed Al-Dhahiri (2009 - 1978)	39. Muhammad Al-Zaabi (2015)	42. Sheikh Humaid bin Abdulaziz Al-Nuaimi 2 (2008)
53. Huthaifah bin Al-Yaman (2013 - 1977)	54. Al-Zubair bin Al-Awwam (2007 - 1992)	56. Al Muhajireen (2014)	57. Mohammad Al-Hamrani (2016)
63. Abu Saeed Al-Khudari (2002 - 1980)	65. Muath bin Jabal (2006 - 1978)	66. Fatima bint Ali Al-Nuaimi (2003 - 1984)	70. Al Safa (2017)
74. Shaikha bint Saeed Al Nuaimi (2018)	89. Al Khair, Rawda 2 (1990-2017)	91. Mouza bint Khalfan (2013 - 1985)	96. Abdullah bin Saeed bin Ghleitah (2013)
98. Sh. Abdullah bin Rashed Al-Nuaimi (2015 - 1980)	100. Hiyam Mahmoud Marwa (2019)	101. Hassan Abdullah Al Saeedi (2018)	102. Alya bint Sultan Al Nuaimi (2020)
103. Nabi Ayyub (2012 - 1989)	104. Thani bin Hareb (2014 - 1984)	116. Hilal bin Ghabesh (2011)	127. Suraqah bin Malek (2009)

132. Al-Maghfirah (2007) (Electricity Authority)	141. Hamad Obaid bin Dalwan, Raqayeb (2014)	143. Aysha bint Hamad Al Suwaidi, Muwaihat 3 (2011)	144. Aysha bint Thani Abdullah, Rawda 3 (2017)
158. Myrters of Armed Forces (2013)	169. Al-Rawdah (2011)	177. Aysha bint Abdullah Aasi, Rawda (2000)	179. Sh. Khalifa Hospital Mosque (2000 --)
180. Fatima bint Khalifah (2017)	181. Zainab bint Jahsh (2000)	182. Sh. Zayed bin Sultan Al-Nahyan (2000)	184. Al-Mugheirah bin Shubah (2001) (near Aswaq Emarat)
185. Shaikha bint Ahmad Al Shamsi (2020)	189. Al-Ittihad (2001)	190. Hamad bin Ghanem Al-Shamsi (2010)	192. Imam Shafie (2017)
194. Al Sahabah mosque, Rawda 2 (2020)	195. Al Khulafa' Alrashideen (2001)	196. Ghareeb Saeed Al-Kaabi (2001)	198. Majed bin Zayed (2003)
199. Abdulaziz bin Baz (2003)	200. Hamad Imran Tarim (2002)	203. Al Habbab bin Al Monther (2002-2014)	204. Khadeejah bint Mohammad (2015)
209. Khalifa bin Bakheet (2005)	213. Fatima bint Muhammad (2014)	220. Ali Al-Hamrani (2003)	222. Khalaf Al-Zafeen (2013 - 2004)

			
223. Fatima Al-Ansari (2004)	225. Almuhallab bin abi Sufrah (2004)	231. Mouza bint Fares Al-Dhahiri (2008)	236. Fatima Al-Harmoudi (2008)
			
237. Ali bin Saif Al-Hamrani (2008)	238. Al-Kawthar (2009)	239. Al-Nuaimi (2008)	240. Oshah Al Shamsi, Raqayeb (2018)
			
242. Aysha Abdullah Lootah (2009)	243. Moza Salem Al-Hamrani (2009)	247. Amna Ali Al-Shamsi (2009)	248. Abdullah Al-Rumaithy (2009)
			
251. Muhyiddin Thumbay (2010)	252. Habeeb Ahmad Aal Ghareeb (2010)	253. Ali Mohammad Khalifa bin Salmeen (2010)	254. Sh. Saqr bin Rashed Al-Nuaimi (2010)
			
255. Abdullah Rashed Bakheet Al-Matroushi (2010)	256. Al-Ghala (2010)	257. Sh. Mouza bint Ali Al-Khatiri (2010)	258. Ibn Zayed (2010)
			
259. Shaikha bint Rashed Al-Nuaimi (2014)	260. Mohammad Abdullah Al-Saeedi (2010)	262. Amna Al-Zarouni (2015)	263. Haneefah bint Ibrahim bin Youssef (2011)
			
264. Free Zone Authority (2013)	266. Al-Huda (2011)	268. Omar bin Al-Khattab (2012)	269. Mirah Khalifa Al Ghafli (2012)

			
270. Al-Muhairi Mosque (2012)	271. Ummahat Al-Momeneen (2012)	272. Salem bin Abdullah Al-Nuaimi (2012)	274. Nabi Dawood (2013)
			
275. Humaid bin Rashed (2013)	276. Dar Al-Birr (2013)	277. Eissa bin Sultan Al-Suweidi (2013)	278. Fatimah Ahmad Al-Saeedi (2013)
			
279. Rashed bin Bakheet Al-Matroushi (2013)	280. Amna bint Ahmad Al-Ghurair (2013)	283. Sheikha bint Ibrahim (2013)	284. Sh. Abdullah bin Sultan Al-Nuaimi (2013)
			
285. Hajar (2014)	287. Saeed Abdullah Al-Saeedi (2014)	288. Nuaimiyah (Sh. Humaid bin Rashed Al-Nuaimy) (2014)	289. Musalla Al-Eid (2016)
			
290. Sameer Al Baloushi (2015)	292. Fatima bint Muhammad Al-Hamrani (2015)	294. Shamsah bint Humaid Al-Hamrani (2016)	295. Al-Tawheed (2015)
			
296. Humaid Hasan Al-Shamsi (2015)	297. Saif Mohammad Al-Qaraah Al-Nuaimi (2015)	300. Hamad bin Ghlaitah (2016)	303. Moudhi Mohammad Al-Sumian (2016)
			
304. Al Rayyan (2016)	305. Al-Ikhaa (2016)	307. Mohammad bin Abdullah bin Fahad (2016)	309. Ibrahim bin Rashid Al Ghimlasi (2017)

310. Al Saliheen (2017)	311. Al Watan Myrtners (2018)	312. Ibad Al Rahman, Rawda 2 (2017)	314. Mozah bint Ali (2018)
315. Thani bin Issa bin Hareb 2 (2018)	316. Arhamah bin Ali mosque (2018)	317. Fatima Al Kutbi (2019)	318. Hussein Al Shaali (2018)
320. Yousef bin Hafedh, Rawda 2 (2020)	321. Arhamah bin Abdullah Al Owais, Raqayeb (2019)	322. Birr Al Walidein, Rawda 2 (2019)	323. Abu Obaidah bin Al Jarrah, Muwaihath 2 (2021)
324. Fawzi Nassar and Aysha Khattab (2019)	325. Ali Mohammad Al Housani (2019)	331. Fatimah ba Nafe', Jurf industrial (2020)	335. Ali bin Abdullah Al Shamsi- Mintizi (2021)
336. Thani bin Eisa bin Hareb 4, Muwaihath 3 (2021)	337. Imam Ahmad bin Hanbal, Rawda 2 (2021)	00. ADNOC mosque	00. no name, Muwaihath 1
00. no name, Jurf industrial 1	00. no name - Hamidiyyah	00. no name, Raqayeb 2	00. under construction, Raqayeb 1 (2)
00. under construction - Mintizi	00. under construction in SZHP project Raqayeb	00. near Ajman Sport Club	00. under construction, Muwaihath 3 (Shamsi)
عدد المساجد التي شملتها الدراسة: 140 من أصل 170 تم زيارتها			



Conference Track 2



Spirituality
in Mosque Architecture

المحور الثاني للمؤتمر



الروحانيات
في عمارة المساجد



REDEFINING THE MIHRAB IN THE 21ST CENTURY

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Abstract

The *Mihrab* has always been a significant part of mosque architectural identity along with the *Minaret*, *Minbar*, and dome. The *Mihrab* is an architectural element that adds to mosque identity internally and externally as it emphasizes *Qibla* (direction) to *al-Kabah* for orienting worshippers for prayer and gives more attention to the *Qibla Wall*. With time, the architectural development of the *Mihrab* has given it a second role: as a means of enhancing the acoustics of prayer recitation so that sound is distributed equally and delivered evenly to the whole *Musallā* (Prayer Hall) and to all worshippers.

However, the current state-of-the-art technological capabilities of sound amplifiers are making that function obsolete; i.e., making the *Mihrab* return to its sole role as a visual and symbolic element. In other words, in most local mosques in Saudi Arabia, one will notice that the positioning of the Imam during prayer is pulled backwards leaving the original *Mihrab* and the first row empty. In response to this change, certain questions arise, such as:

1. Has the practical function of the *Mihrab* as a space diminished?
2. Alternatively – and on the contrary to the first question – does the *Mihrab* now imply the inclusion of the first row or the front portion of the Prayer Hall?

To answer these questions, a field survey of existing mosques was conducted using the Post Occupancy Evaluation (POE) technique by observing and documenting the behavior of worshippers in selected mosques. The study deduced that the *Mihrab* in today's mosques serves mostly as a symbolic image, and that its past functional uses are no longer relevant.

Keywords: *Mihrab*, Local Mosque, Islamic Symbolism

Introduction

The *Mihrab* is an architectural element found at the center of the *Qibla Wall* in mosques. It is an added mass that protrudes outwardly, making a niche in the interior of the Prayer Hall (*Musallā*). The *Mihrab* is where the Imam stands to lead prayer.

To study the *Mihrab*, its function, origin, and architectural importance, one must look at the meaning of it. Also, the history and origin of the *Mihrab* needs to be examined, to place it in the timeline of Islamic Architecture. However, since this study draws attention to the *Mihrab* in the current day, it will only provide a brief background focusing on highlights in the history and definition of this architectural element of mosques.

The research methodology of this study included a Post Occupancy Evaluation (POE), where a number of neighborhood mosques were examined. The main interest of this Field Survey is recording the behavior in which the *Mihrab* is used. The behavior observed was that occasionally the users of the mosque opt to not use the *Mihrab* for its original use. This will be addressed in detail in the Field Survey section of this study.

Literature Review

Researching the *Mihrab* for this study covered many aspects and topics: history, function, acoustical qualities, symbolic importance, and other topics. However, this study places its focus especially on how the *Mihrab* is used nowadays in the local neighborhood Mosque. It should be mentioned that covering the aforementioned topics is crucial to identify solutions to the issues addressed by the study.

Definition and Etymology

As any literal translation might affect the meaning of the word, it was necessary to look into the etymology of the Arabic word. '*Mihrab*,' which is a derivative of the Arabic word '*harb*;' which literally means the front of something. The word *harb* was used to identify the center of a sitting area, where the most important guests sat. On the non-literal side of the meaning, and before the rise of Islam, the word *Mihrab* was used to describe the high rooms in a house, or the best spot in a palace.

(المعجم الوسيط)

Another use of the term *Mihrab* on the part of Islamic scholars was to describe the *Qibla Wall*. Considering this use of the word provides important explanation for what a *Mihrab* is and why it was adopted in traditional mosque architecture.

(مساجد خليجية: 2006, Gulf mosques)

Looking for the word *Mihrab* in the Holy Qur'an, it is mentioned in *Surat Maryam*: "So he came out to his people from the Prayer Chamber [*Mihrab*] and signaled to them to exalt [*Allah*] in the morning and afternoon." Giving a pre-Islam & pre-Mosque use of the word. (Holy Qur'an, 19:11)

History and Origin

When looking at any architectural history on mosque design, it is often found that the *Mihrab* is considered to be an architectural *innovation* in Mosques. Going back to when Islam started to be announced, and in the very first Mosque of Islam – The *Prophet's Mosque* (Peace Be Upon Him) in the sacred city of *al-Madinah*, it can be seen from floor plans that the *Qibla Wall* did not feature any niche (*Mihrab*) recess in the mass, or any identifying element in its center. This brought the issue to the attention of the authors, whether the *Mihrab* is rooted in the rituals of prayer, or if it had any religiously functional origin. In addition, when Prophet Mohammad (PBUH) performed the rituals of prayer in an open field, he would stab a spear in the ground to mark the direction (*Qibla*) of prayer towards the *al-Ka'bah* (*house of Allah*).

(مساجد خليجية: 2006, Gulf mosques)

The *Mihrab* architectural element took on many alternative designs, in terms of geometry and shape. Each shape is either attached to a geographical location or related to an era. These two factors – in addition to more factors that will not be the subject of the study – dictate the shape of the *Mihrab*. The shapes feature symmetry and centrality, both apparent in most mosque designs. The *Mihrab* also defines the main axis of a mosque with its position at the centre of the *Qibla Wall*. (Eldien and Alshawan, 2016)

The first *Mihrab* to be built is said to be in the Umayyad Era, when the Caliph Al-Walid Bin Abdulmalik issued an order to renovate the Prophet's Holy Mosque (PBUH) in *al-Madinah*. The story behind this is that the person in charge of the renovation feared that the *Qibla* direction would be lost in the construction process. For that reason, he instructed the builders to construct a landmark in the *Qibla Wall*.

(الواقدي and عبدالله)

Other historians set the first *Mihrab* in history in Uthman Bin Affan's era, specifically within the *Juma'a Mosque* in Kufa, Iraq.

(مساجد خليجية: 2006, Gulf mosques)

One study suggests that the reasoning behind creating the *Mihrab* was that

it served as a means for raising a mosque's architecture to be on par with the neighbouring architectural advancement occurring at the time on the Arabian Peninsula. As Hillenbrand suggests, stark architectural mastery from the East (*Persia*) and the classical Byzantine structures in place urged Muslim architects to develop and enhance the design for their houses of worship. When this issue was resolved and the *Mihrab* was created, Muslim architects and builders perfected the craft and started to add embellishments, ornamentations, and calligraphic decoration. (Hillenbrand, 1994)

Use and Function

The functional and practical use of the *Mihrab* varies. It has multiple uses, some directly related to prayer and some not. This creates an opportunity to question whether the *Mihrab* is functional, or is it superfluous and redundant. The different uses and functions of the *Mihrab* include:

Qibla Wall Identification: The *Mihrab* (and the Qibla Wall it is contained within) mainly serves as a guide to direct worshippers to the accurate direction of prayer, the direction toward the al-Kabah. That is evident in what has been mentioned in the last paragraph of the previous section. It should be noted that nations outside the Arabian Peninsula used a similar practice where they would paint the centre of the *Qibla Wall* to identify it from other walls in a mosque. In this way, the painted centre portion of the wall forms a two-dimensional *Mihrab*. While this use of the *Mihrab* is not especially useful to the regular visitors of a given mosque, it is helpful to anyone visiting that particular mosque for the first time.

It is speculated that the first *Mihrab* was not as vertical and tall as we now expect to see. Khouri writes that it is possible that the first *Mihrab* was simple, merely one stone placed in the centre of the *Qibla Wall*. (Khouri, 1998)

Recitation Niche: Another use for the *Mihrab* is as a recitation and speech niche for the Imam. After leading the prayer, the Imam would sit in the *Mihrab* and address the worshippers in a speech or sit in solitude for reciting the Qur'an. This, however, is not a popular practice due to the availability of *Minbar* (Podium) in the Juma'a Mosques, which is provided for that function.

Also, the *Mihrab's* geometry was made to help save space, and avoid having the Imam take up the space of a whole row; adding a niche to the internal space of the Prayer Hall allows the Imam to be one step forward, and not affect the entirety of the Hall. (al-Walī, 1988)

Acoustics: Various studies addressed the acoustical importance of the *Mihrab* to the vocal transmission of Prayer in the early Islamic period. Going into detail would be redundant, as it would be more helpful to consult mentioned studies. However, it should be noted that the innovation of electronic sound amplifiers has made the facilitation of sound transmission *Mihrab* function obsolete. As a result, this purpose is not considered in today's mosque design, regardless of the *Mihrab* being a visual element. (Eldien and Alshawan, 2016)

Symbolic Importance

In contrast to the uses discussed in the previous section, the authors suggest that the *Mihrab* holds a non-functional, symbolic use. This paper mainly argues that the *Mihrab* is primarily an image – a visual architectural element. While they are subjective, interpretations of the symbolism conveyed by the *Mihrab* are nonetheless worth mentioning.

As mentioned earlier, the *Mihrab* sits at the centre of the mosque. It forms the main axis, or direction (*Qibla*) toward *al-Kabah* more prominent internally, and even externally on the mass. This brought Burckhardt to describe the analogy between the *Mihrab* and the heart, having similarities between the two. (Burckhardt, Nasr and Michon, 2009)

Another symbolic interpretation of the *Mihrab* is comparing it to the *Cave of Hira'*, which is known as the place on *Jabal Al-Nour* (Mount Hira', near Makkah) where a Divine Revelation occurred from *Allah* to the Prophet Mohammed (PBUH) through *Jibril (Archangel Gabriel)*. The Prophet (PBUH) used to spend a month of meditation inside the cave, annually. Trevathan wrote that there is a similarity between what is often called the '*sacred niche,*' and the "*Cave of Revelation.*" Visitors to the cave will note that it is only 4 km from *al-Kabah*, and its entrance points north, in the precise direction of *al-Kabah*. (Trevathan et al., 2020)

Field Survey

For an objective indicator on the validity and functional use of the *Mihrab*, a field survey was conducted by the authors. Twenty-three mosques in the Dammam Metropolitan Area (Dammam, Dhahran, and Khobar) were surveyed, observing the behavior of worshippers, Imam position, and the use of the *Mihrab*. The target mosque type was the low to medium-density neighborhood mosques. The authors encourage conducting similar studies that investigate high-density neighborhood mosques, or mosques in commercial areas.

Percentage of surveyed Mosques where the *Mihrab* is used

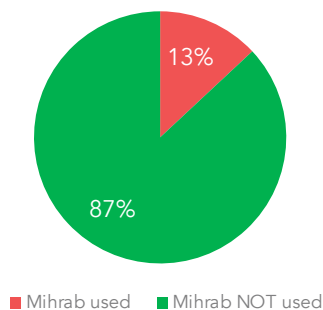


Figure 1:
Percentage of surveyed mosques

1. Islam recognizes five Divine Revelations of Allah to humanity: the Holy Qur'an revealed to the Prophet Mohammed (PBUH), the Tawrat revealed to Musa (the Jewish Torah (Genesis, Exodus, Leviticus, Numbers, and Deuteronomy) revealed to Moses), the Zabur revealed to Dawud (the Psalms revealed to David), the Injil revealed to Isa ibn Maryam (the Good News, or Gospel of eternal life and teachings revealed to Jesus, son of Mary), and an earlier revelation, the Sahifah revealed to Ibrahim (Scrolls of Abraham).

Findings

The survey showed results that can be categorized into two types of practices:

Category 1: Mihrab is used properly and is functional. The Imam is positioned well inside the *Mihrab*, and the first row is at its appropriate position, not displaced by more than two meters.

Category 2: Mihrab is NOT used by the Imam and/or the first row is pushed back. Both the Imam and the first row are displaced by more than two meters, and the use of a movable *Mihrab*.

Figure 1 shows a clear difference in percentages reflecting whether the *Mihrab* is used or not. These results are very important and support the study, where a majority of surveyed mosques were not giving the *Mihrab* any real use other than maintaining an image. Additionally, within this category there appears to be differences that will be demonstrated in the next section.

Examples of findings:

Example 1:

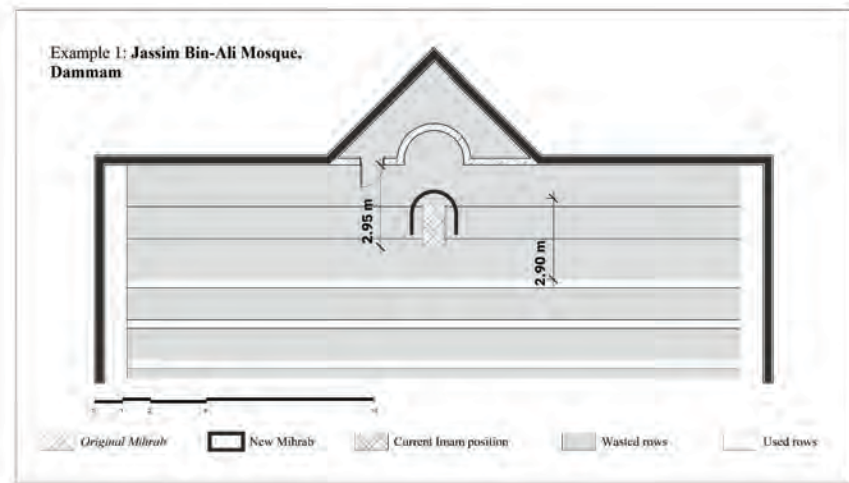


Figure 2:

Plan of Al-Bin Ali Mosque showing current Imam Position.

Table 1: Field Survey of Jassim Al-Bin Ali Mosque

Mosque Name	Jassim Al-Bin Ali Mosque
Location	Al-Shati, Dammam
Approx. Capacity	500 Worshippers
Imam Position	Outside the <i>Mihrab</i>
1 st Row Position	Displaced by 3 meters
Practice Category	Category 2

The Imam position in this Mosque was placed outside the *Mihrab*, approximately 2.9 meters away from the original position. As a result, the first row was 2.9 meters away from the original first row position. This wasted three rows of prayer space, space not used for worshippers.

We speculate that this practice occurred for a variety of reasons. The visibility between the Imam and the worshippers during speeches would not be as clear as it is after this alteration of the *Mihrab* position. It explains why the Imam followed this behavior, making this decision of not utilizing the existing *Mihrab* and used a *movable Mihrab*.

Example 2:

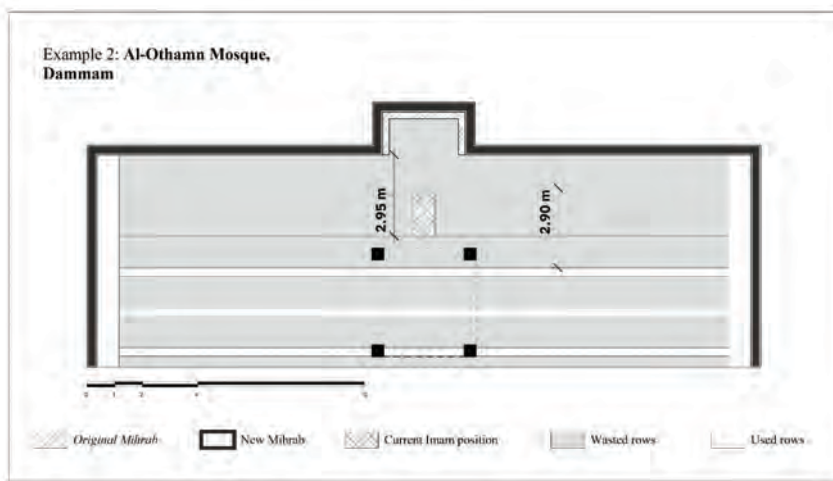


Figure 3: Plan of Al-Othman Mosque showing current Imam Position.

Table 2: Field Survey of Al-Othman Mosque

Mosque Name	Rashid Al-Othman Mosque
Location	Al-Faisaliah, Dammam
Approx. Capacity	250 Worshippers
Imam Position	Outside the <i>Mihrab</i>
1 st Row Position	Displaced by 3 meters
Practice Category	Category 2

Somewhat identical to the previous example, the Imam position here was shifted 2.9 meters from the original position, in addition to the first row being displaced 2.9 meters away from the original first row position. Therefore, two rows of prayer were not used.

The Imam in this Mosque is not just outside the *Mihrab* but is positioned in what should be the second row. This automatically places the first row in the third row, more than 4 meters away from the Qibla wall. A possible reason is the capacity of the Mosque is more than needed in that location, and it would be more practical to not use the unneeded space, freeing it up for maintenance, housekeeping, air conditioning, cleaning, or other operational purposes.

Example 3:

Table 3: Field Survey of Al-Safa Mosque

Mosque Name	Al-Safa Mosque
Location	Al-Safa, Dammam
Approx. Capacity	250 Worshippers
Imam Position	Outside the <i>Mihrab</i>
1 st Row Position	Displaced by 1.45 meters
Practice Category	Category 2

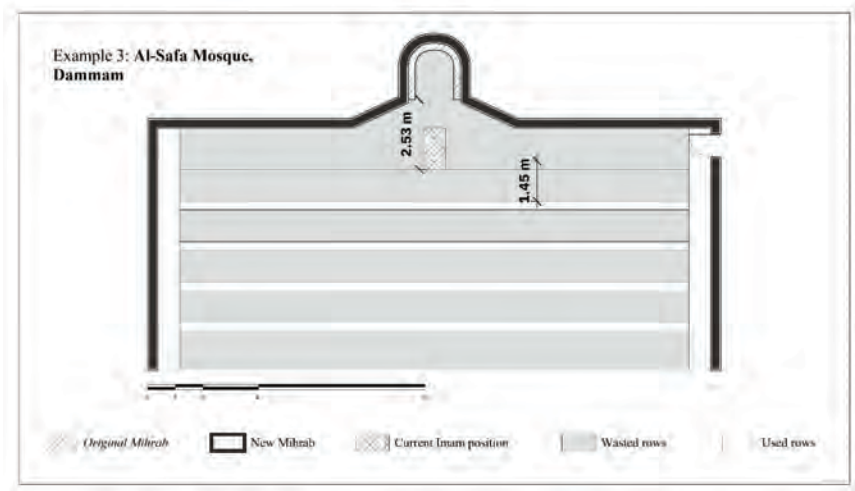


Figure 4:
Plan of Al-Safa Mosque showing current Imam position.

The original *Mihrab* in this Mosque protrudes outwardly for more than 2 meters, and the position of the Imam in this Mosque was placed outside the *Mihrab*, approximately 2.5 meters away from the original position. As a result, the first row was 1.4 meters away from the original first row position. This wasted one row of prayer that was not used for worshippers.

Judging by the *Mihrab* shape, and the poor visual connection between the Imam and the first row, it is clear why this decision was made: it enables a stronger visual connection between the Imam and worshippers.

Example 4:

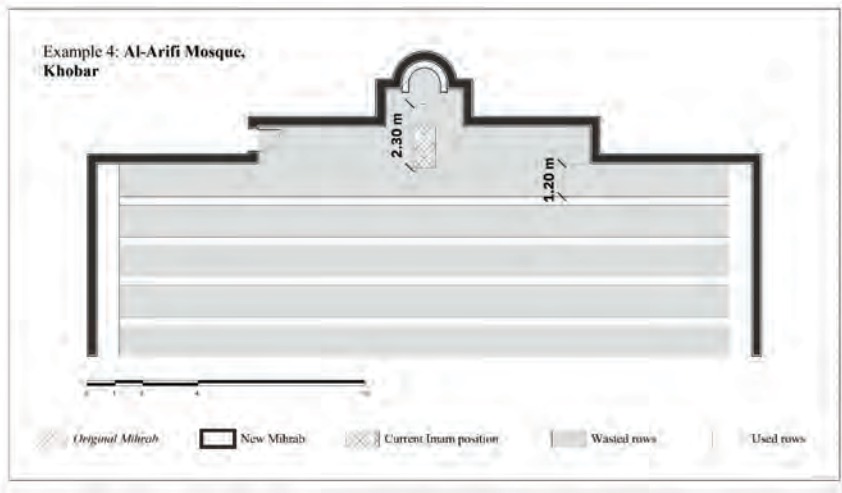


Figure 5:
Plan of Al-Arifi Mosque showing current Imam position.

Table 4: Field Survey of Al-Arifi Mosque

Mosque Name	Al-Arifi Mosque
Location	Al-Rakah, Khobar
Approx. Capacity	800 Worshippers
Imam Position	Inside the <i>Mihrab</i>
1 st Row Position	Displaced by 1.2 meters
Practice Category	Category 1

While this Mosque was placed in Category 1, it still had an alteration of the first row position. The Imam is placed well inside the *Mihrab*, but only because of the special stepped design of the *Qibla Wall*. Also, the first row was pushed back less than 2 meters.

It can be argued in Figure 5 that the Imam is inside a niche. This, however, is due to the way the *Qibla Wall* is designed: *a niche within a niche*. This also applies to the first row, because it is away from the *Qibla Wall* in some areas but not in others.

This was done to give the first row some importance, by increasing the space between the users and the wall facing them. Compared to being face-to-face with the *Qibla Wall*, this is a much more comfortable situation to be in. Similar to a previous example, the behavior in this Mosque provides a better visual connection between the Imam and the worshippers during speeches.

Conclusion

Analyzing all data examined in the study, we arrived at some answers to address the issue at hand. Modern-day users of mosques have maintained the *Mihrab* as an architectural element in their mosques, but users are not in need of any of the element's traditional functions, other than its clear identification of the *Qibla Wall* and any symbolic meaning the *Mihrab* provides. This led the users of mosques – and the *Mihrab* – to push the Imam and first row back, away from the *Mihrab* and *Qibla Wall*.

This shift in placement is due to a variety of reasons. First, the shift provides a better visual connection between the Imam and worshippers. Second and third, this change gives the first row emphasis and importance, and increases the Prayer Hall's quality of space by having more space between the first row and the *Qibla Wall*. Lastly, mosque operational services, such as HVAC, cleaning, artificial lighting, and maintenance, are less time consuming and less costly, as it is simpler and easier to tend to half of the mosque than all of it. All these reasons – and possibly some other unknown reasons – contributed to making this decision of pushing the rows back along with the Imam.

In summary, we learned that the *Mihrab* architectural element of mosques was adopted into mosque architecture in the early years of Islam for various functional purposes. Those functional reasons, other than providing clear identification of the *Qibla Wall*, are now either obsolete or irrelevant. Based on our research and findings, we conclude that the *Mihrab* in the 21st Century Mosque remains in a majority of local mosques as a symbolic image.

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MOSQUE ARCHITECTURAL SPACE: FROM A PHENOMENOLOGY OF SENSES TO MULTIPLE REALITIES



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Keywords: Sensorial architecture – mosque design – phenomenology – (IPA) interpretative phenomenological analysis – Architectural Space.

Abstract

The architectural space of a mosque can be determined using ocular-based assessment; however, a question arises in contradiction to this notion: is the ocular aspect all that the architectural space conveys to reality? This study suggests that architectural space as a phenomenon, which reveals itself to the human senses, experience, meaning, and memory will define the reality or even multiple realities of mosque buildings.

Introduction

It is through our experience in the field of architectural conservation and the history of architecture that the question of the value of architectural buildings emerged. We believe that the current theoretical framework for evaluating value in architecture is based on the ontological position of objectivism; i.e., the physicality of architecture (materiality, construction, design, systems, etc.). Our personal experience with mosques with historical significance that are being demolished and rebuilt triggers the question of, 'what is the reality of architectural value for architects and users alike?' The objective point of view holds that mosques exist with a fixed objective reality; however, these buildings – with all their presumed architectural value – are being demolished. This intrigues the mind. Perhaps users of these buildings do not find the architectural value architects dictate as true because that very architectural value alienates the users' interaction with the buildings and their deeper understanding (a deeper understanding than the understanding of the architects) of the meaning these buildings represent, meanings and associated value that transcend the buildings themselves.

In the process of bracketing the question of the reality of architectural value and trying to find its core meaning, it appears that the tools used to establish such value are not necessarily the only valid tools, hence they are based on the objectivity of architecture with less regard to the subjective part of it. Then comes the question of what is the reality of architectural value from the ontological standpoint not from an objectivist position but, from a constructivist position that pays attention to objectivity and subjectivity alike.

The metaverses and the contemporary technologies related to them (figure 1) add new forms of realities that are purely subjective depending on how a user senses and their judgment constructs these new forms of realities in their mind. The architectural space of mosques, and any other building for that matter, is to be appraised for value from the subjectivity of the users and the researcher alike. Hence, the methodology used in this study is interpretative phenomenology.

The research methodology used in this study is interpretative phenomenological analysis (IPA) adapted from Van Manen's method of hermeneutic phenomenology. Although IPA is a challenging and contemporary research method, its philosophical background starts from the descriptive phenomenology of Edmund Husserl (1927) that aims to describe a lived experience. Martin Heidegger (1962) further developed descriptive phenomenology into interpretative phenomenology to reveal and interpret the implicit meaning of lived experience. Gadamer (1990) further adapted Hermeneutics, aiming to provide surer foundations and processes for interpreting texts based on Heideggerian phenomenology.



This study strives to reveal the essence of architectural space in mosque buildings through human senses, experience, meaning, and memory and how all this shapes reality. In the endeavor to reveal reality, emerging technologies, such as augmented and virtual realities, will also be investigated from a phenomenological perspective.

Figure 1

A view of the first mosque built in a metaverse in 2022 (After ALTspace metaverse retrieved 25 July 2022).

Phenomenology in architecture

“Phenomenology is that branch of science which deals with things in their manner of appearing to us, for example; relative motion, or color, properties which are dependent on the human observer” Immanuel Kant (1724, 1804) (Moran,2000)

Perhaps Kant’s philosophy is the most influential to the final approach to architectural space that will be discussed in this study. Kant argued that space is not an empirical concept, derived from an exterior self-experience, but that space exists priorly in our minds as pure intuition, where all objects should be determined. Therefore, it is only from the human point of view that we could talk about space (Forty, 2000). His conception of space was further developed by many German theoreticians in the 19th and early 20th century who came up with significant ideas, such as Hildebrand (1893), Lipps (1893), Riegl (1901), Frankl (1914) (Üngür, 2011). However, Schmarsow’s 1893 theory of *Raumgestaltung* (Mitchell, W.Schwarzer, 1991) is the most substantial. It essentially states that a ‘spatial construct’ is a property of the mind and should not be confused with the actual geometrical space present in buildings. These theories and others were mainly developed in the early 20th century by Martin Husserl (HOPP, 2008), Martin Heidegger (Heidegger, 1924), and Merleau-Ponty (phenomenology of perception 1945) (Gallagher, 2010) All of them set new architectural theory within the realm of phenomenology (M. Reza, 2012). Phenomenology looks at the world based on personal experience, feeling, and memory. It is based on the belief that the individual calls on a heightened experience of all the senses to form their unique interpretation (Brown, 2015).

In the present day, the phenomenological approach to architecture is apparent in the work of Juhani Pallasmaa in his book, *The Eyes of the Skin* (2014). Pallasmaa criticizes the supremacy of ocular centrism and the architecture of visual images (Tamari, 2017). He then calls for a new method that investigates the essence of what he calls ‘the architecture of the senses’. (Pallasmaa, 2014). Steven

Holl is another eminent architectural figure. In his writings, he differentiates between the inner and the outer perception. He also embraces Gideon's idea of perceiving space through movement. However, Holl introduced the method of establishing phenomenological zones, such as color, light and shadow, the viscosity of space, the fluidity of space, water as a phenomenological lens, sound, detail, touch, and lived time (Shirazi, 2009).

The question of reality, objective/virtual realities

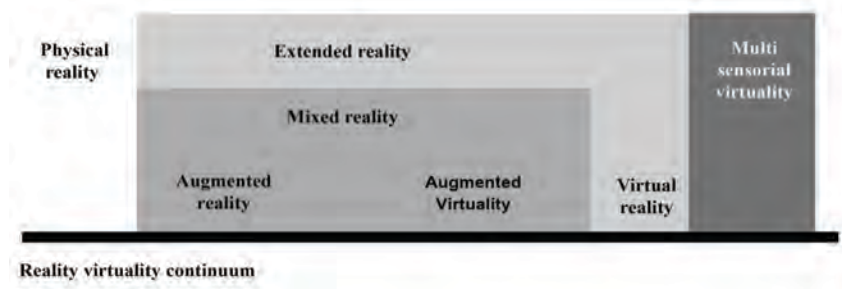


Figure 2

Reality- virtuality continuum adapted by the researcher after (Wohlgemant, Simons and Stieglitz, 2020).

Phenomenology in architecture has the ability to identify, in detail, how humans experience architecture through their senses. The physical world is perceived through the senses.

However, there are emerging new technologies that challenge the notion of the physical or real-world utilizing a computer-generated virtual environment. This dialect between the senses and the physical world materializes notions of virtuality. To tackle this idea, first one needs to differentiate between several terms. First, a 'virtual world' can be described as a virtual environment built by a software-enabled representation of the real world or a designed (fantasy) one (Wohlgemant, Simons and Stieglitz, 2020). Second, 'mixed reality' (MR) is distinguished by a real-time mix between the real physical world and the digital virtual environment.

In this context, one also finds 'augmented virtuality' (AV) and 'augmented reality' (AR) as subcategories of mixed reality. AV refers to a software-generated virtual environment that is augmented with physical/real-world videos or images. On the other hand, AR refers to the physical/real world combined with software-generated interactive objects utilizing technological wearables. Third, 'extended reality' (XR) is a mixture of human interactions with software and the technology of wearables (Fast-Berglund, Gong and Li, 2018).

All the discussed terms above use only two human senses ocular and auditory. It is still within the boundaries of these senses that humans can distinguish clearly between what is physically real and what is computer-generated, or virtual. However, in a more immersive experience using multi-sensorial virtuality using more senses like smell, taste, and haptics (related to touch, sensing motion, sensing temperature, etc.), the individual will start to lose the fine line between what is real and what is virtual. This will begin to change the meaning of architectural elements.

A recent study in 2020 suggests that the majority of virtual reality applications rely on audiovisual stimuli only and refrain from other sensorial factors. This consistent survey of the available literature on multisensory VR and the impact of olfactory, taste, and haptic top over ordinary virtual reality shows the impact on the users. The study also concluded that smell and taste are still underexplored sensory inputs, and enabling those two inputs can bring significant value to

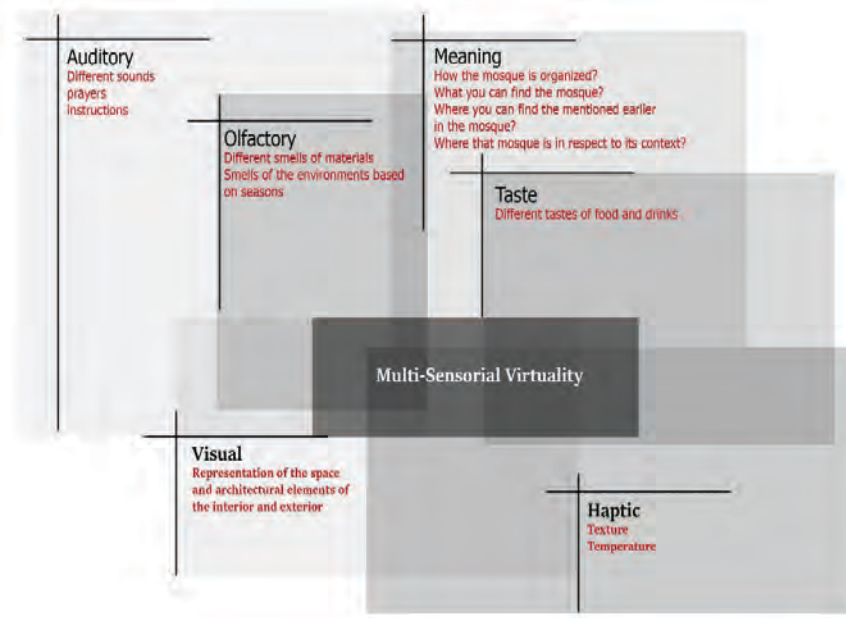


Figure 3
Multi-Sensorial Virtuality (after the researcher).

virtual reality applications (Wohlgenannt, Simons and Stieglitz, 2020), however recent technologies developed in 2022 shows new tools that have olfactory virtual realities. In addition, recent haptic suites are interactive with sophisticated interactive systems.

Conceptual framework and Methodology

IPA is used in this study to reveal the essence of architectural space in mosques and answer the question of the reality of architectural space. Ontologically speaking, the nature of reality here is the question (i.e., what is reality?). To answer the question, a constructivist ontological position is taken. From this position of questioning, it should always be kept in mind that reality, by its very nature, is continuously changing (Chowdhury, 2019). After understanding the essence of this reality, it would only be logical to examine and apply the contemporary technologies of virtual realities.

Sampling

A purposive sampling of professional experts of architecture participated in this study: ten men and three women with degrees in architecture ranging from Master's Degrees to full professors of architecture. All are Alexandrian architects and all were asked about their opinion toward architectural space, keeping particular mosques in mind while answering the questions. The mosques were chosen according to their date of construction as follows: two from the 16th and 17th centuries, two from the 18th century, two from the 19th century, and two from the 20th and 21st centuries. All the buildings are significant in the city of Alexandria and listed. Only one interviewee was not an architect (Director of Photography) chosen from outside the field of architecture. The average age was 48 years. Almost 46 % of the interviewees were full professors of architecture, 15% Assistant Professors, 15% PhDs, 15% Master's degrees, and 1 participant with a Bachelor's degree in art. Inclusion criteria were (a) possessing a higher degree in architectural education, (b) practicing in the architectural profession, and (c) teaching experience in architecture.

Figure 4

Two mosques from late 16th and early 17th centuries with parti of the building investigated (After the researcher).

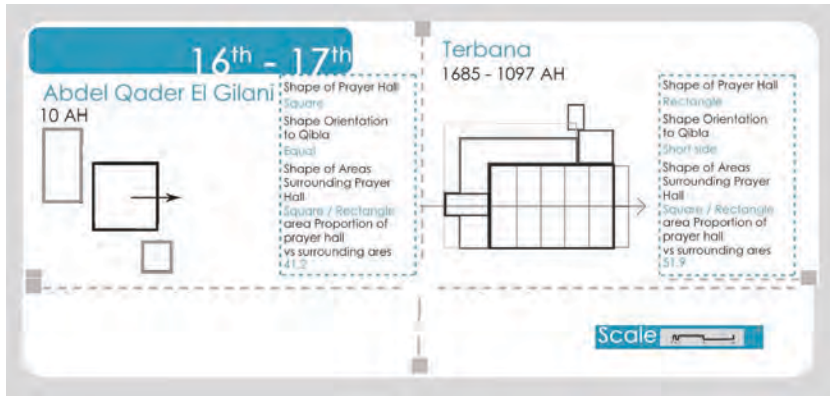


Figure 5

Two mosques from the 18th century with parti of the building investigated (After the researcher)

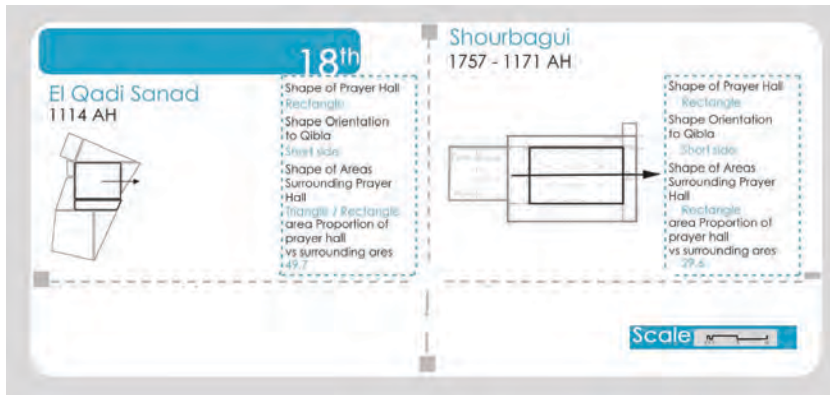


Figure 6

Two mosques from the 19th century with parti of the building investigated (After the researcher).

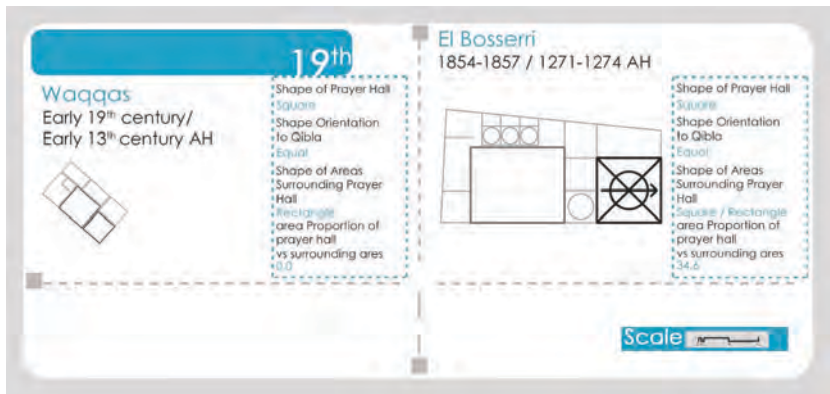
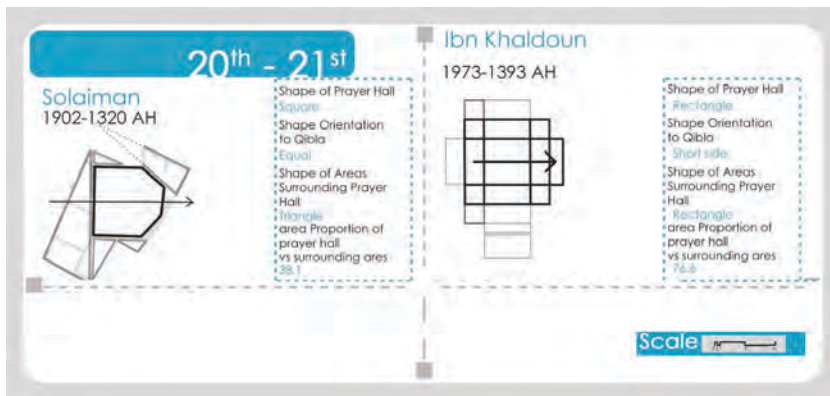


Figure 7

Two mosques from the 20th century with parti of the building investigated (After the researcher).



Procedures

Phenomenological study, in its essence, describes the shared meaning of several people regarding their experiences of a certain phenomenon. It is the focus of this method to describe what all participants have in common as they experience a phenomenon. The basic purpose of phenomenology is to reduce individual experiences with a phenomenon to a description of the universal essence. To this end, qualitative researchers identify a phenomenon. The researcher then collects data from persons who have experienced the phenomenon and then develop a composite description of the phenomenon (Creswell, 2013). After which the research will proceed with interpretative phenomenological analysis (IPA) to try to understand the parameters of architectural space in mosques following the steps depicted in table 1 which are adopted from the Van Manen method (Manen, 1990) and its adaptation by (Pincombe et al., 2016).

Stage	Activity	Action
1	Reading and re-reading the interview transcription	Preparing significant statements from the interviews and all collected data
2	Initial noting	Exploring the transcript and formulating meaning blocks
3	Developing emerging themes	Identifying meaning blocks from significant statements
4	Structuring the analysis and searching for connections across emergent themes	Cluster the themes and study their interrelations and try to deduce the essence
5	Moving to the next case	Preparing the results with themes and trying to bracket previous themes
6	Construction of a cohesive narrative and looking for patterns across cases	The interpretation of essence and significant themes from the results using finding patterns across cases.
7	Take interpretation to a deeper level	Deepening the analysis and extracting the essence of the study.

Table 1 The seven steps of IPA adopted after (Pincombe et al., 2016).

The following interview protocol was used on thirteen different individuals to describe their experience with mosque building architectural space, with the eight mosques in mind that were mentioned earlier, in figures 6,7,8 and 9.

Interview protocol: Mosque building, a novel phenomenological approach in conservation and construction.

- 1- Do you find that different times of the day change your sensation of the space in the mosque? (Yes / No) (Why? How?)
- 2- Does light intensity affect your sensation of space in the mosque? (Yes / No) (How?)
- 3- If you smell different odors in the architectural space, does it change your sensation of space in the mosque? (For example: the smell of food, landscape, or old construction material) (Yes / No)
- 4- Do different sounds affect your sensation of space in the mosque? (Yes / No) (Elaborate on different sounds you hear in the building. For example: call to prayer, street vendors, the sound of trees or traffic)
- 5- Does the temperature of the space of the mosque vary from outside to inside? (Yes / No) (Does it change your experience? (Yes / No) (How?)).
- 6- Do you feel different tactile patterns in the architectural space of the mosque? (For example: rough, smooth, and average). (Yes / No)
- 7- Do the proportions and the scale of the space in the mosque create a different meaning for you? (Yes / No)
- 8- Do any of the following terms affect your understanding of space in the mosque: physicality, functionality, cultural message, transcendental from one space to another? (Yes / No)
- 9- Does your cultural experience (architectural training) affect what you remember from any architectural space of the mosque? (Yes / No)
- 10- Does your memory of the same architectural space of the mosque differ from your childhood to the present time? (Yes / No)
- 11- Do your emotions during the encoding of your memory of the space of the mosque create a difference (for example if you experienced the architectural space of a mosque during prayer verses during a wedding) (Yes / No)
- 12- Does your personal experience affect your episodic memory of space (for example before and after becoming an architect and your attention to details for the same space?) (Yes / No)
- 13- Does your interest lead to different focal points in remembering the architectural space of the mosque? (Yes / No)

Table 2 Interview protocol for the study (After the researcher).

Results

In determining the universal or essential quality of a theme our concern is to discover aspects or qualities that make a phenomenon what it is and without which the phenomenon could not be what it is. (Manen, 1990)

From thirteen verbatim transcripts, seventy significant statements were extracted. After an extended analysis of the formulated meaning blocks, six main themes emerged. Table 2 shows an example of the significant statements and the meaning block formulated by them on the first theme of 'time.' Table 3 depicts how the theme of time emerged from the meaning blocks.

Theme 1 Time is the true module of architectural space. Time appeared in the interviews in three ways; the first was neglected and has no effect on architectural space, the second is the time associated with other bodily or objective parameters of architectural space, third was the durational time that the activity takes place in the space. A fourth aspect of time that did not appear but was concluded is the historical time which is the basic absolute determinant of value in architectural space. These parameters of that theme still did not reveal its essence, which is that time is the modular system that links all human senses, emotions, memories, meanings, and experiences together.

Code	Significant statements	Formulated meaning blocks
q1-1	It affects the natural variables and phenomena associated with time such as the natural cycles (day-night cycle) (cold-hot) and gives all the associations with the rhythm of the day.	Interviewees related time-associated phenomena such as natural cycles of night and day and human biological cycles rather than objective time in itself. There are direct relationships between memory and experience created in the architectural space with the duration or the amount of time spent in the space.
q1-2	Time is also related to the physiological state of the user for example stressed-relaxed, it is also related to the circadian or biological rhythm in the human body such as (alert- sleepy).	
q1-3	Temporality affects the activities and functions carried in the space, also our preconception of how the space is used, and this also appears if the space is crowded or empty.	
Q1-4	The amount of time spent in space makes a difference in all aspects, such as: memory, experience, sensation, and meaning.	
q1-5	Time can be neglected with the outside if the space is enclosed with no connection to the outside.	NA

Table 3 Examples of significant statements and formulated meaning blocks (after the researcher).

Code	Meaning blocks	Formulated Themes
Q1	1 Time	
1	This question had 5 answers. The understanding of 70% of the interviewees was related to the time-associated phenomena such as natural cycles of night and day and human biological cycles.	The responses to the essence of time ranged within 4 general categories as follows; <ol style="list-style-type: none"> 1. Neglected time; 2. Associated Time, which is the time that is associated with other phenomena for example its association with the functionality of the space, sensing the space, emotionality interaction with space by users; 3. Durational time is the time related to the personal impressions of the users such as their embedded feelings toward time that appears from the duration taken in space. 4. Historical time, which means it is an absolute determinant of value. This category was absent from all interviewees' responses.
2	10 % associated memory and experience created in the architectural space with the duration or the amount of time spent in the space.	
3	50% of the interviewees associated time with the functionality of the space. In other words, how the space is used at a certain time of the day.	
4	25% related time to the physiological state of the users which directly affects how they interact with the space.	

Table 4 Example of meaning blocks and formulated themes (after the researcher)

Theme 2 Human senses post the supremacy of vision. In this theme, other determinants of bodily architectural space were determined. If one has to arrange the significance of senses to architectural space according to the responses of the interviewees the following is the result: senses of hearing will be first followed by the sense of vision, then the sense of smell, then the sense of temperature, then the sense of tactility. Each of these senses has a different nature between surround and focal, hence affecting the user in the architectural space and his ability to assess the value of architectural space and its reality. Strangely enough, each of the mentioned senses has a threshold that varies from comfort to the point that the user will be forced to leave the architectural space except for the sense of vision.

Theme 3 Meaning and judgment. The meaning of architectural space is a purely bodily phenomenal parameter that is embedded in the mind of the observer and affects the value of architectural space accordingly. It is related to emotions and memory and experience in such a way that it is contentiously changing in a causal relationship with them. Meaning is fundamental, however, to all other parameters. After the senses convey the architectural space to the observer's mind, meaning becomes fundamental. It is affected in the sense of being fundamental and keeps changing according to other mutual interactions with other parameters.

Theme 4 Memory and the Formulation of Architectural space. Memory is a bodily phenomenal parameter that has a mutual interactive nature and effect on architectural space. Also, as mentioned in the previous theme it is interactive

with meaning and other parameters. Memory also affects the senses and their judgment of them.

Theme 5 Emotions and architectural space. Emotions and the creation of memory is a bodily phenomenal parameter of architectural space that has an interactive effect between emotions, memory, and architectural space. Interviewees reported that there is always a degree of appreciation for the architectural space regardless of the emotions of the user during the encoding of the memory of such a space. However, emotions do affect their assessment of architectural space.

Theme 6 Experience is a bodily phenomenal parameter of architectural space, and personal experience affects the creation of memory in the architectural space. The interviewees reported that across their lifetime, their appreciation of architectural space changes, and therefore changes how they create new memories of the architectural space. Experience then is one of the phenomenal parameters of architectural space.

Discussion

In this study experts of architecture were challenged to discuss the reality of the architectural space of mosques to reveal the essence of architectural space in mosque buildings through human senses, experience, meaning, and memory and how all this shapes reality. Their answers varied across six different themes. The process of bracketing the interviews of the participants revealed that their experiences of the mosque building were not only visual, their experiences were multi-sensorial. This study suggests that interactive and/or immersive machine-based experiences that control certain parameters – light, temperature, humidity, sound, smell, haptics (touch, sense of motion, etc.), and visual attributes – can be used to mimic or even alter the individual's experience in such mosque buildings. The use of virtual or augmented realities with novel approaches to incorporate more than just visual sensory inputs must change the architecture of 21st-century architecture. In essence, multi-sensorial virtuality can be used to have an adaptive mosque building architecture.

The study suggests that natural light as a stimulant of vision has a deep impact on the quality, comfort, and feeling of the architectural space of the mosque. For instance, the prayer hall of the *Sidi Solaiman Mosque* (figure 7) has one source of natural light from the skylight. The interviewees reported that the serene and holy-like effect of the light pouring in from the skylight and above the worshipers with a dramatic biophilic effect, completely changes their experience of the prayer hall from daytime to nighttime.

Sound is another parameter of phenomenal architectural space. The study supports the significant relationship between sound comfort level and the perceived quality of architectural space. An example of a sound effect on the users of mosques is the case of the prayer hall of *El Shourbagui Mosque* (figure 5) which is located on the first floor while the ground floor is composed of stores and the ablution (ritual bath) area. Being above the ground creates a degree of sound isolation, bearing in mind that the mosque is located in an old souq (*souq al midan*) combined with the 1 meter-wide walls the prayer hall is an oasis of serenity within the noise of the souq. Interviews also reported that the call to prayer acts as a time marker across the day that affects not only those people inside the mosque but is also transcendent to everywhere that the *muezzin's* (person calling worshippers to prayer) call to prayer can be heard, thereby acting as a *virtual* extension of the mosque to other public spaces and

places. This transcendental effect of the call for prayer is reported to exist due to the mental associations that occur to the users while hearing it.

The analysis of smell in mosque spaces identifies that different smells create associations and memories inside the mind of users. For example, the smell of incense on Fridays before Friday prayers is suggested to bring old memories to the users and play a significant role in their minds. In its nature, smells envelop the user like most other senses.

The analysis of thermal isolation qualities of the mosque buildings was one of the significant elements the study depicted. For masonry systems of the mosques dating from the 16th century to 19th century, such as the mosques of *Abdel Ghani* and *Terbana* (figure4), *El-Qadi Sanad*, and *Shourbagui* (figure5), all of which have their wall thickness varying from 0.80 m to 1.15 m with the outer walls consisting of an outer layer, inner layer, and a core. These buildings demonstrated thermal isolation of extreme hot and cold cycles during the extreme heat of summer as well as the extreme cold of winter. The study suggests that this quality affects the comfort and experience of the users in contrast to buildings built in the 20th century, such as the *Ibn Khaldoun Mosque* (figure 7) which has lower thermal isolation properties. Hence, 'thermosensation' is a 'sensory process' (also known as a 'sensory perception') that affects the quality of architectural space by affecting comfort level and degree of activity in the space.

In the context of tactility, the analysis suggests that users interact with different textures in the space of the mosques in two ways. The first is by touching the ground. The texture in this context affects their comfort. For example, the floor materials in the ablution place make a huge difference in the feeling of safety. In addition, rough and coarse floors in older mosques are safer when performing ablution in contrary to new mosques that consist of more slippery marble floors. Another significant note is that the textures affect mobility in the space. It was reported that the sound of texture is important to users as the sound of footsteps inside the prayer hall (especially on the mezzanine floor which is usually made of wood reacts to footsteps with squeaky sounds) affects the comfort and feel of users. The second feeling of tactility was reported by seeing the textures on the walls and ceilings of the architectural space of the mosque. This second comprehension of texture was reported to differentiate each part of the mosque's interior spaces (entrance space, ablution place, prayer hall, Imam's room, mezzanine floor, etc.).

It was clear during the study that the meaning of the building is another factor that transcends human senses to directly affect human perception and understanding. Being subjective, meaning is constructed within the human mind based on information carried by perceptual experiences (Vitiello, 2020). The meaning of architecture can be described on many different levels. The first level refers to the physical structure of the building, the second level of architectural meaning relates to the functionality of the building, the third level refers to cultural messages, and the last level relates to transcendental meaning. The last two levels can only be measured subjectively by the researcher (Suprapti and Iskandar, 2020). However, the first two can be described using objective measures that can be taken to unveil the meaning of the building. It is argued that an architectural parti covers all the main aspects of the definition of form and space, and, hence, describing the meaning of a building. It briefly reveals the design intentions of the requisites to solve the problem (Florio and Mateus, 2020).

The mosques in the city of Alexandria were chosen to identify parti and architectural meanings for this study for ease of accessibility for the researchers.

It is because of their shared religious and social values that they were chosen. Besides, mosque buildings stand through time and are used by a diverse pool of people. Eight mosques have been investigated for parti. They were classified chronologically into four categories from the 16th century to the 21st. Special care was taken to the different sizes of the building in each time category. Mosque design expresses the symbolism associated with this building typology and suggests cultural and religious meanings (Megahed, 2020) that can foster a better understanding of both conservation and construction procedures. The meanings of the mosque buildings in the study were not significantly different from one another. They retained the same logic of space across five centuries. However, their logic of space varied from one to the other. Moreover, the interviews explained that the meaning of each building varies due to the subjective experience of each person. It was also confirmed that the cultural and religious values were consistent with each individual. It is the difference in logic space that is the major difference.

Another significant subjective parameter was the memory of the building. There is a quite interrelated relationship between the meaning and the memory of the building. The two are suggested to be dependent on each other if not defining each other. However, memory as a term is defined as the ability to recall experiences, information, and people, and it is a collective system to recall data to leave the person with a coherent story of the events so that at its core it is the transformation of information and meaning into an experience, while employing interpretation and perception in the process (Vats, 2017).

The formation of architectural memory is a significant parameter for this study. Therefore, understanding the factors that affect the encoding of memory has been investigated, and based on a study on the impact of architecture on forming personal memories and applying these factors to the case of the mosques in Alexandria, a number of factors were deduced. Firstly, the culture and the environment that appear in the behavior of people sharing the same culture and the same built environment have similar reactions to their mosques. It is not only in the logic or in the scale or in any architectural treat, but also in the odors, in the sounds, and in the tastes of foods that are correlated with these buildings. Secondly, the scale of the person that is engaged in the encoding process of meaning and memory varies from child to adult. Thirdly, the emotions while encoding the memory. Strong emotions involved in performing rituals in the mosques directly affect the memory encoded.

The study suggests that the experience of the users is probably the most significant parameter of the architectural space of the mosques. The experience of the user is a complicated ever-changing state. When thinking of experience, it is not easy to grasp a starting point or end point of this process. Indeed, many parameters act in real-time to *continuously* create and change experience. This process includes human senses, emotions, memories, feelings, understanding, and formation of meaning. An example of how these are ever-changing is the appreciation of the architectural space that all interviewees reported in attending a funeral service vs. a marriage ceremony in the same mosque. These two contrasting social events that might take place in a certain mosque affect the users' experience by hindering or activating their ability to be attentive to details of the architectural space of the mosque which shows the effect of feeling as a parameter on other mentioned parameters of architectural space of the mosque. The experience itself is not a single parameter, it is twofold: the first is the personal experience of the user, while the second is the collective cultural experience of the users in the same architectural space.

Validation

To establish rigor in this study, the research took the following procedures to validate the study: first, the researchers were immersed through prolonged engagement and persistent observation in the field, second, the researchers applied triangulation using multiple and different sources, methods, investigators, and theories to provide corroborating evidence, and third by applying a face validity procedure with the help of a jury panel of three professors of architecture who peer-reviewed the interviews and the instruments that have been used in this study.

Conclusion

This study has challenged the conventional paradigms of mosque architecture using phenomenological study. It tried to reveal some of the uncharted territories of human experience and cognition regarding the subjectivity of the human mind. While the current paradigm is focused on ocular aspects of mosque building architecture, the phenomenological approach is more holistic as far as the human sensorial system, time, meaning and judgment, memory, emotions, and experience are concerned.

Also, the meaning of space should be re-established based on spatial characteristics, order, and logic of architectural space. Memory which was proven to be a correlated parameter to meaning is also a significant factor that needs to be challenged in both new construction and conservation endeavors. In its subjectivity, a need for computer-generated interactive parallel realities needs to be investigated. It is the notion of multiple realities in the same vicinity or architectural space that is the future of architecture. Architecture in that essence may not be a conventional tangible building but, "computer-generated senses" that develop sensorial experiences that generate meanings to the human mind, finally, developing individual subjective memories.

This study suggests that the lived experience of mosque architectural space is based essentially on time, in the sense that time is the true modulator of the system of architectural space. Time regulates the human senses, meaning and judgment formation, memory, emotions, and experience which are all related to architectural space and form the bodily space. Hence, the bodily space is fundamental, and the physical space comes next to it. Human senses transcend the sense of vision to the rest of the senses that create the perception of architectural space. It is through hearing, touching, thermal sensing, and smelling that bodily space is created first in the human mind. The process of creating the architectural space is in a state of perennial flux or continues changing with changes in perception, meaning, memory formation, emotions, and experience which all exist in and utilize time. It is hard to segregate after sensing the space, which parameter is affecting which, and which of these parameters is fundamental. They are all fundamentally affecting each other, causing a state of ongoing change in the value of architectural space. Hence, the phenomenal space – which is the bodily architectural space mentioned earlier – is fundamental and ever-changing. This is how architectural space reveals itself as a phenomenon to human senses as the well-known pre-Socratic philosopher Heraclitus once explained: "*No man ever steps in the same river twice, for it's not the same river and he's not the same man*", (Chowdhury, 2019).

This study was limited by the sampling size. However, to assess the findings on a larger scale, it is suggested to use contemporary mixed reality systems such as are found in the metaverse. These contemporary systems have the thread of reality on a check between virtual and physical realities. In this context, all the above could be measured via the use of computer algorithms.

Recommendation for future research

This study suggests that a phenomenal architectural space has a continuously varying essence, hence, to evaluate this essence on a major scale of users the study needs to be applied to a larger number of users in real-time. To achieve this, software should be developed to assess users' interaction with architectural space using their mobile phones. For example, focal points in an architectural space can be measured by the points where users usually take photos as this may correlate to architectural value from the user's point of view. Also, short questionnaires that are fed to an AI system that ask the users only one question at a time can be used. This can measure the value of different parameters that constitute architectural space, and suggest value and understanding of what is real.

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SYNTACTIC MEASURES OF SPATIAL EQUITY AND COEXISTENCE THE CASE OF SHUBRA AND HELIOPOLIS IN CAIRO

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Abstract

Cairo, Egypt is, and has always been, a multicultural tolerant city with a predominately Muslim population, and a significant Christian minority. These two groups of people, living peacefully side-by-side in the same districts for centuries has been a unique indicator of its tolerance and multicultural mix. However, it is not uncommon to hear about the spatial inequity of the numbers and locations of their places of worship during politically charged times. Are these rumors true? To what extent are the locations of religious buildings a true reflection of that inequity? How can we model a way to test the validity of these claims? Understanding this would reveal more about the way such coexistence is manifested in the built environment and also guide the future allocation of religious facilities in multi-ethnic communities.

This paper utilizes space syntax analytical techniques to objectively measure different locational properties of both congregational mosques and churches. Using a sample of Cairo city's districts, the underlying logic behind their locational choice is scrutinized. The study uses locational data of these key monuments to analyze and compare measures of choice and integration as two indices of spatial equity and coexistence.

Keywords: Mosque location – Church location – Coexistence – Spatial equity - Space syntax – Accessibility – Urban Tissue.

Introduction

“Just as none of us is beyond geography, none of us is completely free from the struggle over geography. That struggle is complex and interesting because it is not only about soldiers and cannons but also about ideas, about forms, about images and imaginings.”

Edward Saïd 1994

Locational discrimination may be created through biases imposed upon certain populations through access to services. In Egypt, Coptic Christians and Muslims have lived side by side since its Islamic conquest in 646 AD. Despite scattered troubled incidents and some notable periods of strain, recent surveys still show that the most optimistic living example of coexistence among all Arab countries is still found in Egypt. Rovati (2020) finds that 80% of those surveyed view the relationship between these two fabrics of society as that of brotherhood, citizenship, and cooperation. Of those surveyed, 96% considered themselves religious and about 63% prayed daily (Table 1).

	Persons	Percent	Places of Worship	Percent	Per 1000 Capita	Need Based (Per Prayer)
Muslims	89,727,500	95%	114,000	99 %	1.27	0.25
Christians	4,722,500	5%	894	1 %	0.19	0.19
Total	94,450,000		114,894			

Table 1.

Need Based Estimation of Numerical Equity of Religious Services

Source: Authors based on 2016 data from Rovati 2020

Yet, on one dimension of equity, it may seem that there is an element of inequity. On the surface, Muslims seem to have more mosques per capita than Christians have churches. The question has been raised without consideration to the frequency of need, as Muslims use mosques more frequently than Christians. However, spatial equity still needs to be tested and modeled. Is there spatial inequity between the two and is there a way to test and compare the locational superiority of religious facilities?

Models for Measuring Spatial Equity

The term “spatial equity” has not been commonly distinguished from justice until very recently. It involves the fair and equitable distribution in space of socially valued resources and the opportunities to use them (Soja, 2010). Locational discrimination is evidenced by biases imposed on certain populations in their access to certain facilities. It is a form of spatial injustice. Planning is usually perceived as an impartial objective tool for social equity and spatial justice. However, as shown by Ismail (2014), it is not uncommon to use planning to oppress, dominate, or contain a group. The same tools can be simultaneously used to achieve the interest of a few and guarantee maximum spatial control of another. If planning is deliberately used by some as an instrument of spatial domination over others, it becomes spatial injustice; that is, one group ensuring that the structural barriers of inequity are applied to others. If this structure is devoid of the perception of justice, it will inevitably lead to spatial conflict, raising the question: why do some have more prestigious locations than us?

Spatial equity, on the other hand, according to Kunzmann (1998), means equal access to basic public facilities, measured in distances, such as accessibility to schools, health facilities, or cultural events. Equity is thus a needs-based distribution of resources (Whitehead et al 2018), often defined in terms of the spatial proximities between residents and service facilities (Stanley et al 2015). The three most familiar forces shaping locational and spatial discrimination are class, race, and religion. Thus, the distribution of churches and mosques which require travel to a spatially fixed infrastructure may be regarded more as an equity case rather than an issue of justice.

The challenge of spatial equity is how to measure the extent to which everyone gets what they need. Scholars describe patterns of service distribution, and determinations of equity are always made in that context. Talen (1998) summarizes two primary methodological approaches to measuring proximity: (1) the ‘container’ approach (the number of facilities within an area), and (2) the ‘minimum distance’ approach (the distance from the ‘origin’ to the nearest facility). Proximities from the approximate center of a neighborhood-like unit to facility locations, is measured by Euclidean distance (the shortest, straight line distance), ‘Manhattan’, or street network distance (also known as “taxi cab” distance, the distance a taxi takes in a location like Manhattan with a street grid pattern, with streets meeting at ninety degree angles). Four widely cited conceptions of equity are applied to accessibility measures: equality, need, demand, and market criteria.

There is no direct and objective way to measure equity. Daniel Lewis (2011) offers three different ways of representing spatial equity: (1) Buffering Approaches, (2) Potential models, and (3) Density models. Each of these approaches has at its heart an attempt to capture variations in coverage; however, the issue of measuring “fairness” is far more complicated than this. Spatial justice as a spatial construct is affected by the locational amenities of the facilities, not just their distribution and coverage (Rafieian and Alizadeh 2017).

Accordingly, this study is concerned with measuring *equity* not *justice*. Equity is examined from the perspective of "Equality of locational opportunity". Used measures are based upon the "Space Syntax" technique, which makes use of parameters such as "Integration", "Control", "Connectivity", "Choice", and "Intelligibility".

To quantify spatial equity, many authors worked on measuring accessibility to different land uses. Yu et al (2022) investigates the spatial relationship between walkability and air pollution exposure via a spatial 'vertical equity' lens. Kelobonye et al (2019) use an 'accessible-opportunities' approach to examine the relative accessibility and spatial equity of five key urban land uses in Perth, Australia. The results show that jobs have the highest accessibility compared to other destination types. Zhang et al (2019) describe how space syntax can extend previous knowledge regarding associations between the built environment and physical activity with specific applications to research focused on parks and public open spaces. Bahrini et al (2017) used a combination of data from site surveys to examine the link between sixteen parks in Tehran and their accessibility within the urban street structure using space syntax. The syntactical results were correlated with several different aspects of each park collected and rated on a 1 to 5 scale. Munir et al (2020) analyzed inadequacy and equity issues in physical accessibility of the 'point of health care' (POHC) system in Muzaffargarh, Pakistan using network analysis in the software product ArcGIS (for a more detailed description, see: <https://pubag.nal.usda.gov/catalog/6950849>).

Methodology and Data.

Space syntax is usually used to analyze dimensions of Spatial Equity in the allocation of health service, parks, and service facilities. Many authors have used this technique, such as Bahrini et al (2017), Munir et al (2020), and others. However, no study has used it to check for religious service location analysis. Space syntax is both a theory and a set of analytical techniques that attempt to describe how the logic of society is spatially manifested in the configuration of space.

Space syntax uses simple geometrical attributes, such as lines of sight and movement or visual fields of perception, to create a network of spatial elements. This network is then turned into a pattern of relationships, or a graphical representation (Freeman 1977). Axial lines are the longest visibility lines for representing individual linear spaces in urban environments (Liu & Jiang, 2012). The least number of axial lines that cover the free space of an urban environment or the space between buildings constitute what is often called an axial map. These can be quantitatively analyzed to determine the relative role that each space plays in the configuration of the system, as a whole or in its parts. The chosen measures are Integration and Choice.

Integration is the fewest intervening lines which that can be passed through to go from one line to every other line in the system. The most integrated lines are those with minimum depth. It is a normalized measure of topological distance from each axial line or street to all others in a system, representing spatial accessibility of systems elements (Hillier and Hanson 1984). Integration represents the 'to-movement' potential of a space.

Choice measures how likely an axial line or a street segment it is to be passed through on all of the shortest routes from all spaces to all other spaces in the entire system or within a predetermined distance (radius) from each segment (Hillier et. Al 1978). It represents the potential quantity of movement that

passes through each segment between all pairs of segments in the system. Choice represents the 'through-movement' potential of system components.

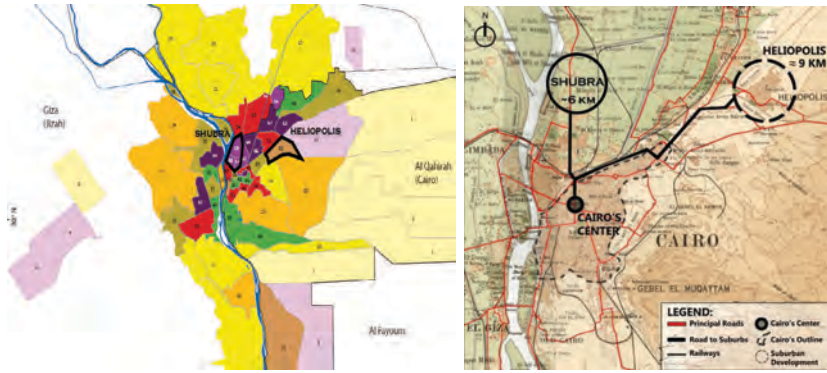
In other words, *integration* correspond to selecting a destination from an origin, while *choice* correspond to choosing the spaces to pass through between origin and destination.

CAD maps were prepared for both districts, imported into the DepthmapX¹ application, and converted into axial maps. An axial map is a graph with nodes and edges. Measures of integration and choice are then calculated for all system lines. Color coded integration and choice maps are then extracted (red colors represent high values, whereas blue represent lower values). Integration and choice values for streets with both mosques and churches were identified, and then imported into SPSS for statistical analysis. A statistical t-test was used to test whether or not a significant difference exists between properties of mosques and churches in both districts.

Shubra and Heliopolis: Two Suburban Cases for Spatial Equity

Egypt has a long history of religious tolerance. A Christian minority coexists with their Muslim neighbors throughout the city of Cairo, with no noticeable spatial ghettos as seen in other parts of the world. There are, however, some claims that arise, from time to time, that such coexistence is not real and that minorities do not enjoy their religious rights as compared to Muslims. To test the validity of such claims, at least spatially, this study undertakes to test whether the distribution of mosques and churches in selected districts from Cairo city have different spatial properties that show evidence of spatial privilege of one religious building type above another or that there is no evidence of such spatial difference, which would dismiss the claim of spatial injustice. The districts of Shubra and Heliopolis within Cairo were selected as case studies (Figures 1, 2). Both were not within Cairo proper at the time of their development. Both were linked by a mass transit line (Tram/Metro). Both were initially developer-led and planned as a project with land subdivisions. Both Shubra and Heliopolis were established under the reign of the Mohamed Ali dynasty, which is more known for its western orientation and religious tolerance. The assumption, therefore, is that their gradual development allowed natural, need-based religious services to be established, and thus should demonstrate comparable measures of spatial equity in the location choices of their places of worship. The next section explains the historical development of both Shubra and Heliopolis.

1 DepthmapX is the creation of Alasdair Turner and further developed by Tasos Varoudis from Space Syntax Laboratory, The Bartlett, UCL.



Figures 1,2 -

Locations of Shubra and Heliopolis in relation to Cairo's center.
 Source: Adapted on a 1920 map of Cairo from (Library of Congress).

Shubra (Arabic: شبرا also written as Shobra) originally derives from the Coptic word Šopro, which means a 'small village' or 'field'. In

the past, Shubra was much smaller, and more aristocratic. Now, it is home to millions of Egyptians in often-crowded conditions, most of whom belong to lower middle and lower socio-economic classes. It currently measures 2.8 km² and has the highest population density, 40% of which are Coptic Christians, many coming from Upper and Lower Egypt (Murad 2005).

Historically, Shubra has been mentioned since the 11th or 12th Century in relation to al-Afdal, son of the Emir, Badr al-Din al-Jamali (1094AD). However, its development began in 1809 A.D. when Muhammad Ali Pasha, founder of modern Egypt, chose a 50-acre site there on the shore of the Nile to build a retreat for himself (Raymond,1994). In 1847, one year before the end of his reign, Muhammad Ali ordered "the construction of a wide and straight road between Cairo and Shubrā" called at the time Gesr Shubrā (Shubrā Bridge) with Albizia and Sycamore trees planted on either side of it. The street became the escape of the elite as well as Europeans living in Cairo at the time. French travelers described Shubrā Street and its gardens as the Champs-Élysées of Cairo (Figures 3,4).



Figure 3
 Shubra in 1862 by Léon Belly



Figure 4
 A view of Shubra Street 1912

The transition from an elite-led to a middle-class neighborhood began in the 1880s and early 19th century. The British occupation urban development authority relied upon the allocation of large government-owned tracts of land – not yet apportioned – to private owners to subdivide and develop. When the ruling family abandoned Muhammad Ali's palace, aristocratic owners also abandoned their palaces and gardens along Shubrā Street (Arnaud 2002). Its location and proximity to factories to the north (Shubra El-Kheima) and the port of Bulaq prompted a rise in demand for development. For example, a single cigarette factory over Chicolani Palace was replaced by six cigarette factories by 1907. These factories had a dual effect. Firstly, they drove an increase in demand for low-cost housing for the workers. Secondly, the factories resulted in a net reduction in the overall area occupied by private gardens.

In 1902 the new tramway was extended into Shubrā. Automobiles could be seen for the first time in the streets of Cairo and, therefore, reaching Shubrā no longer presented a difficulty. By 1912 four metro lines (out of a total of 20 in all of Cairo) as well as three bus routes linked to Cairo were established.

By WWI, large concentrations of British and French citizens settled in the area now known as al-Be'tha Street (Mission Street) – who later built the church of *St Mark*. The French also annexed two schools to that church, *Notre Dame Des Apotres* for girls and *Saint Paul* for boys. A few other foreign missionary schools were also built, among them were *Bon Pasteur*, *Maria Ausiliatrice*, *Jean Paul*, the Italian *Don Bosco* and others. Most of them remain in operation today, educating Egyptian children. During the second half of the twentieth century, Shubrā witnessed a doubling in its population due to the internal migration from the countryside reaching 300,000 by 1987.

The neighborhood is currently famous for its middle class, and a high percentage of Egyptian Coptic Christians. This phenomenon has sparked controversy. Why are the Copts concentrated there and is that an indication of the end of religious and ethnic pluralism? In events since the 1970's, in 2009, in 2012 and afterwards claims on both sides are raised. Some claim that there is an "Islamization of street names" while others claim there is "Christening of Properties". These tensions are even reflected in drama productions as such as the film "Hassan and Marcos" (2008).

Chosen Monuments

Coexistence has been most notable in Shubrā. Where else would we find two places of worship such as Saint Therese's church and the Khāzindāra mosque side by side only separated by a short distance on Shubrā Street, being frequented by both Muslims and Christians (Figure 5).



The Church of Saint Therese (1931)



Al Khāzindāra Mosque (1927)



Saint Mary in Masarra (1925)



Al-Fath Mosque, al-Khalafāwī



Naṣr al-Islām in Victoria Sq.



Saint Mark in Minyat al-Sirg.(1960) Largest Church



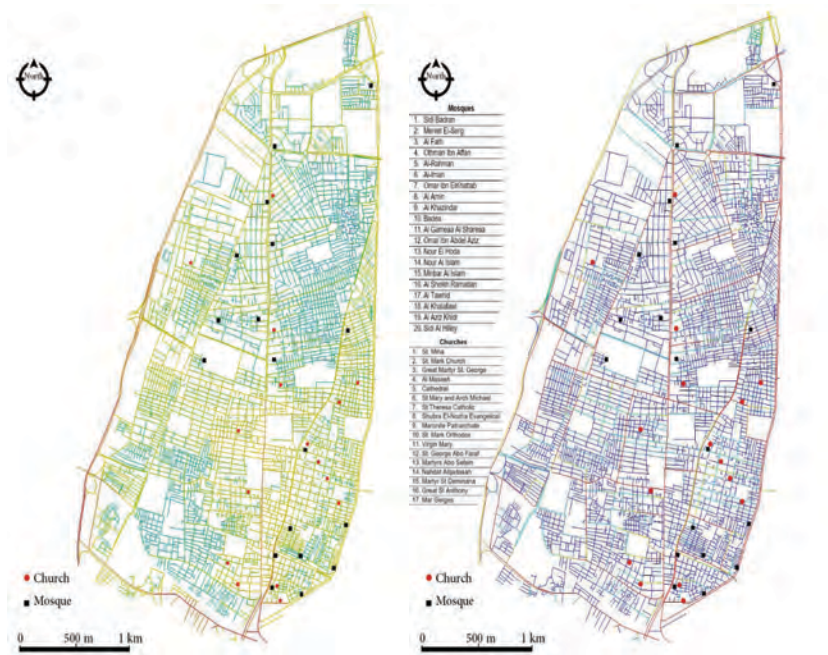
Church of the Angel in Tussun (1937)

Figure 5 – Collection of the Main Religious Monuments of Shobra.

Shobra Syntactical Analysis:

Twenty mosques and seventeen churches were identified and included in the analysis from the Shobra district. Independent sample t-tests were performed to test if locational properties differ between mosques and churches in Shobra, namely integration and choice (Figure 6).

Integration: At the city level, the average integration (we may call it global integration) value for Shobra streets was 30,460, slightly higher than the city's average of 29,122. Average integration value of streets with mosques is 31,716, and average integration value of streets with churches was 32,528, slightly higher than that of the mosques, yet both quite above the district average. The t-test, however, indicated no significant difference between mosques and churches. This is an indication that both mosques and churches, on average, occupy equally accessible destination locations at the city level.



Figures 6 Main religious monuments on the analyzed maps of Choice (left) and Integration (right).

At a more local level, the district level, integration within a radius of 10 km was 14,543 for mosques and 15,677 for churches.

The t-test indicated a significant difference ($\text{sig} = 0.029$) between mosques and churches, as churches were found to be located at more integrated locations than mosques (effect size was $\text{Eta}^2 = 0.163$, and since it is <0.3 , it can be considered a weak effect).

As for integration within a radius of 5 km, it was 5,529 for mosques and 6,398 for churches, with the t-test indicating a significant difference ($\text{sig} = 0.018$) between mosques and churches, as churches were also found to be located at more integrated locations than mosques at that radius, although the effect size $\text{Eta}^2 = 0.159$, which is <0.3 , can thus be considered weak. No other significant differences were found between mosques and churches at smaller radii, or at more local levels.

The previous findings suggested that churches occupy slightly more prominent locations than mosques at the district level, indicating a slight locational advantage for churches over mosques; that is, churches are located at a slightly more accessible destinations compared to mosques at the district level.

Choice: At the city level, the average choice value for Shobra streets was 110,656,000, quite lower than the city's average of 172,689,058. The average choice value of streets with mosques is 212,473,720, and the average choice value of streets with churches was 31,733,066, quite lower than that of the mosques, and the district average and city average. The t-test, however, indicated no significant difference between mosques and churches regarding choice value. This is an indication that both mosques and churches occupy locations with very similar traffic potentials at the city level.

At a more local level, the district level, integration within a radius of 10 km

was 64,254,423 for mosques and 12,038,008 for churches. The t-test indicated a significant difference (sig = 0.035) between mosques and churches, as mosques were found to be located at locations of higher traffic choice than churches (Effect size was $\text{Eta}^2 = 0.109$, and since it is <0.3 , it can be considered a weak effect).

As for choice within a radius of 5 km, it was 12,333,925 for mosques and 3,601,746 for churches. The t-test indicated a significant difference (sig = 0.04) between mosques and churches, as mosques were also found to be located at locations of higher traffic potential than churches at that radius, although the effect size of $\text{Eta}^2 = 0.107$ is <0.3 , and can thus be considered weak. No other significant differences, on average, were found between mosques and churches at smaller radii, or at more local levels.

2. Heliopolis

Edouard Empain (1852-1929), a Belgian investor, and Boghos Nubar Pasha, the son of the previous prime minister for several of the previous khedives, formed a consortium to acquire 25 km² of land 8 km north east of Cairo. The desert land was sold for one Egyptian pound per feddan (4200 sq.m). Two companies, Cairo Electric Railway and Heliopolis Oasis Company, were formed in 1906, to construct a new suburb and to connect it with the tramway lines. The Heliopolis Oasis Company, the developer, parceled the land as buildable land plots, and also built several villas and apartment buildings. The company built a large hotel and established several recreational activities, such as Luna Park, a horse racetrack, a golf course, and several recreational sports fields, to attract both residents and tourists (Figure 7).



Figure 7

Aerial View of Heliopolis (1929) and its Conceptual Urban Design.

Source: Elazzazy (2020) on a 1913 map of Heliopolis from (CE Alex).

The neighborhood quickly became a melting pot for different races, genders, and religions. The design and distinct character included an integrated interfaith complex (mosques, archaeological churches, and a synagogue).

Abbas Mosque (1911) was the first mosque (currently called Jamal al-Din al-Afghani Mosque), followed by Hafizah al-Alfi Mosque on Beirut Street (1930), the second mosque in Heliopolis, named after Lady Rustum Helmi al-Alfi, wife of Youssef Bey Naguib. The Sultan Hussein Kamel Mosque near the Palace of Sultana Malak, was the third mosque built, Its name has since been changed to *Al-Thawra Mosque*, and it contains inside it a pulpit bearing the name of King Ahmed Fouad the First. (Figure 8)

As for churches and cathedrals, the most famous landmark is Our Lady of Heliopolis (known as the Basilica of the Holy Virgin) was the first and opened in

1913 and is the burial place of Baron Empain. This was followed by Saint Mark Coptic Orthodox Church, opened in 1930, and Saint George Coptic Orthodox Church, Saint-Rita Maronite church, Theotokos Greek Orthodox Church, Sainte Therese Armenian Catholic Church and the Jewish Vitali Madjar Synagogue (1927) at Al Missalah Street. There are 16 major mosques and Islamic charities located within Heliopolis, including the Imam Hassan, Revolution, and Omar bin Abdul Aziz mosques.



Basilica of the Holy Virgin -1913



Abbas Mosque -1911



St. Rita Maronite Ch.-1910



Al-Gamee Mosque



Hafazah alAlfi-1930



Al-Thawra Mosque



Saint Mark Coptic-1930

Figures 8

Main Religious Monuments of Heliopolis.

Heliopolis Syntactical Analysis:

Sixteen mosques and eleven churches were identified and included in the analysis from the Heliopolis district. Independent sample t-tests were performed to test if locational properties (integration and choice) differ between mosques and churches (Figure 9).



Figures 9

Main religious monuments on the analyzed maps of Choice (left) and Integration (right).

Integration: At the city level, the average integration value for Heliopolis streets was 31,413, slightly higher than Shobra's average of 30,460 and the city's average of 29,122. The average integration value of streets with mosques was 31,929, slightly above the district average. Yet the average integration value of streets with churches was 29,812, not quite different from the district average, yet, significantly lower than that of the mosques ($\text{sig} = 0.045$). Effect size however was $\text{Eta}^2 = 0.215$, which can be considered a weak effect. It can be concluded that mosques occupy, on average, slightly more accessible locations than churches at city's level.

At the district level, average integration within a radius of 10 km was 13,070 for mosques and 10,659 for churches. The t-test indicated a significant difference ($\text{sig} = 0.035$) between mosques and churches, as churches were found to be located, on average, at less integrated locations than mosques with effect size ($\text{Eta}^2 = 0.255$) which still is a weak effect. It can be concluded that mosques occupy, on average, slightly more accessible locations than churches at district's level.

As for average integration within a radius of 5 km, it was 4,580 for mosques and 3,339 for churches. The t-test indicated a significant difference ($\text{sig} = 0.003$) between mosques and churches, as mosques were found to be located at more integrated locations than churches at that radius. The effect size ($\text{Eta}^2 = 0.38$) is a moderate one. No other significant differences were found between mosques and churches at smaller radii.

Choice: T-test analysis indicated no significant difference between mosques and churches in terms of choice at all radii.

However, at the city level, the average choice value for Misr Al Gadida streets was 317,537,947, which is quite higher than the city's average of 172,689,058,

or Shobra's average of 117,250,340. Surprisingly, the average choice value of both streets with mosques and streets with churches were (27,760,994 and 10,735,178 respectively), quite lower than the average choice value of district's streets (317,537,947). This finding is quite surprising, since streets of Heliopolis in general have a higher potential of through traffic than the city's average or Shobra's average. Yet, both mosques and churches seem to be located on streets with quite low potential of through traffic. How is this possible? A closer look at the Heliopolis map showed the presence of service roads alongside main streets, meaning that access to most buildings is from the service road, not from the adjacent main street. Service roads have quite low choice values compared to main streets. In other words, mosques and churches alike can be easily seen from main streets but can only be accessed from service roads. This unique property implies that both mosques and churches enjoy being seen from main streets of high choice values, but can only be accessed from the service roads, which help avoid traffic congestion on the main streets.

Result Analysis and Discussion

The previous syntactic analysis of Shubra suggests that at the district level, churches tend to be located on streets of slightly higher integration values than mosques, whereas mosques tend to be located on streets of slightly higher potential of through traffic than churches.

This interesting, yet puzzling finding, suggest that churches have an advantage in terms of their location as a destination. Mosques on the other hand are located along streets of more through traffic potential.

This suggests that the difference is not related to a form of deliberate spatial injustice. In fact, it may indicate just the opposite, that spatial equity is practiced to the letter definition of "need" as mentioned above, where every group gets their choice of location based on need. That is, the placement of each church and mosque is related to the nature of religious rituals of each religion.

Christian rituals commonly take place once a week. Followers of a denomination are usually attached to a particular church. Thus, it is logical and important for churches to occupy prominent symbolic destination locations, vistas. Muslim rituals, on the other hand, take place five times a-day. It is less important for Muslims to pray at a specific mosque, rather, to catch the prayer at the nearest mosque. For that reason, it is logical – and "fair" – for mosques to be more frequent, more accessible by attempting to occupy locations of more through traffic to fill coverage gaps and become easily reachable at prayer time.

One puzzling observation remains, which is the concentration of Christians and churches in Shubra more than elsewhere in Cairo. Is it an imposed "ghetto" or a self-declared one? Apparently, it is neither when historical context is analyzed. The Christian population at the 18th Century was usually concentrated in the Christian quarter close to Azbakīyya Lake where the papal seat was at the time. With the modernization of Cairo, during the reign of Khedive Isma'īl, the Azbakīyya area was converted into a central park. Houses to the north of the lake, where the Copts lived, gradually disappeared to become replaced by modern European-style buildings. At the same time, the Nile ports in Būlāq and the Raw' al-Farag coast started to come to life, so it was only natural that the Azbakīyya Copts employed in these fields should be drawn to settle there (Affifi 2016). This was in addition to those employed in the railway and postal services, particularly Copts, as well as migrants from the countryside and Upper Egypt looking for factory work.

The syntactic analysis of Heliopolis on the other hand suggests that mosques

occupy slightly more prominent locations than churches at both the city and district levels. One possible explanation of the prominence of mosques in Heliopolis is that some of the important mosques lie at the service road of important streets. So they are visible from the important streets but are not directly accessible from the accessible streets. Another explanation is related to how the district was planned and how it evolved. Heliopolis is more organized and planned, with fewer lots available to choose from. The location of mosques and churches was not determined naturally, but was determined by authorities which followed a distribution logic not related to accessibility of through traffic potential.

CONCLUSIONS

This study was concerned with measuring spatial equity from the perspective of "Equality of locational opportunity" using "Space Syntax" Depthmap measures of Choice and Integration. The question has been to investigate whether there was any evidence to suggest that churches and mosques are not equitably distributed along space in the two case studies examined. Based on Tallen's definition of spatial equity which emphasizes a "need" base measurement, there has been no indication of spatial inequity in Shubra, the district most known for Christian concentration, nor was it conclusive in Heliopolis the quarter designed by Baron Empain. Whatever variations existed in the syntactic measures used are easily explained by the ritual-needs paradigm rather than any deliberate form of spatial discrimination. The main contribution of this research is providing a model for quantifying spatial equality that can be applied to any neighborhood under investigation. Further research is recommended, however, to cover more sets of religious facilities in other neighborhoods before generalized conclusions can be made.

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THE ARCHITECTURE OF MOSQUE INTEGRATION OF DECORATION, FUNCTIONALITY, AND SPIRITUALITY: AN OVERVIEW OF NAJD REGION MOSQUE ARCHITECTURE SYNTAX

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Abstract

Mosques are among the most advanced forms of religious architecture. With the Muslim community's rapid expansion through modernity along with clearly defined Islamic life needs activities, setting aside an enclosed area in small settlements or large towns became necessary for established communal worship. The purpose of this study is to analyze and develop the structure, structural decoration, and material and design choices made by mosques during the traditional period of Najd, Saudi Arabia's central region. While mosque architecture during the traditional Najdi Muslim period demonstrates its religious identity, as is frequently noted, secular architecture's ideas are not spiritually motivated in a cosmic sense. Indeed, the architectural concept and material selection and the functional and aesthetic uses of an object all contribute to determining what it expresses. A process that incorporates standard materials, skilled labor, innovative ideas, and socioeconomic and geographical factors may be used to construct any magnificent architecture. Thus, this study provides an overview of the historical architecture of the current syntax of "Najd Mosques Architecture" to facilitate knowledge and comprehension when designing contemporary mosques that incorporate elements of history, culture, religion, the environment, and sustainability.

Keywords: mosque; syntax; traditional; Najd; Saudi Arabia

Introduction

Heritage is the accumulation of a society's experience in its dialogue with nature, the mutual experience between a person and his or her surroundings, whether at the individual or group level. Heritage incorporates every concept related to human history in the experiences of a person's past, their life in the present, and their outlook on the future. Civilization and cultural heritage are the possessions and treasures bequeathed to future generations by the ancients. They are the material and immaterial bonds that form nations and peoples. Through civilization and cultural heritage, a society derives its roots as well as its originality or uniqueness. Civilization and cultural heritage are in continuous development over time, preserving a society's identity and originality.

Architecture and urbanism are fundamental components of heritage. They are distinguished from other elements of heritage by their physical presence, which directly and unquestionably resurrects the civilizations of previous generations (Heath, 2009). Heritage also recognizes and notes a generational continuum of cultural, social, and religious experiences and values. Therefore, architectural heritage is one of the fundamental manifestations of human development throughout history, and an expression of the capabilities that humanity has achieved in overcoming the surrounding environment and defining spaces to meet the desired goals of inhabitants.

The primary role of any mosque is to unite the Muslim community around the world in its worship of Allah (God, YHWH). After setting up a mosque in the city of *Al Madinah Al Munawwarah* ("the enlightened city", or more simply, *Madinah*, "The City", previously named *Yathrib*) to serve the newly formed Muslim community, Prophet Muhammad (PBUH) began this custom. For many centuries, no other religious or spiritual institution has been able to rival the mosque's purity, sanctity, and allure in the world. It is a place where Muslims contemplate their relationship with Allah, and a place where they can pray and reflect (Raeisian, and Badreh, 2014).

Over time, there are a variety of ways in which Muslim society has made use of mosques, aside from their primary religious function. To put it another way,

mosques went from serving simple, individual roles to serving more complex, institutional ones (Omer, 2012). Muslims' daily lives are so intertwined with their religious practices that Islamic society, which bases its decisions on Islamic principles, has had to consolidate the roles of mosques in order to meet the demands of both the religious and the political spheres (Saniei, and Delavar, 2012). Muslims and non-Muslims alike benefit from mosque architecture because it provides a platform for interfaith communication and fosters Muslim unity (Asif, and Utaberta, 2016). Mosques play an important role in helping to resolve social issues and build a more cohesive community, especially in areas where Muslims make up the majority of the population (Hillenbrand, 2004).

Increasing levels of urbanization and population growth have led to a wide range of physical, social, economic, and even moral challenges for urban communities. Because of this, urban entities, such as mosques, must be assessed in light of the current environment. Thus, this research aims to explore the various traditional Najdi Mosque designs to assist modern approaches for appropriate use by and application to modern Najdi Mosque design.

Here, it is important to note that the basic elements of early mosques, such as the trellis covering the part of the mosque next to the Qibla (*direction*) wall, and the *sufra* around a place in the mosque and the pulpit, remained intact. The historical mosques have maintained a consistent pattern, with only minor changes over time, if we take the time to study all their components. In this regard, a comparative study of Najdi historical/traditional mosques will be conducted in this study, which will help us understand the region's mosque architectural syntax.

The Traditional Mosque

Traditional mosques include mosques built in accordance with local conditions, such as their geographic location, their climatic environment, and other aspects of their local area. Four main factors influence traditional architecture in Saudi Arabia:

- the climate,
- locally sourced building materials,
- already-existing skill sets, and
- the sub-cultural background of the builder.

Typically, traditional architecture refers to weather-sensitive dwellings in the Arabian Peninsula. Key features of traditional architecture include creative solutions for rainwater drainage, multiple openings to enable ventilation, and wall carvings or openings for cross-ventilation. Traditional architecture makes use of locally available building materials. In the Najd region, these include timber, tamarix tree (*tamarix tetrandia*, also known as 'tamarisk' and 'salt cedar') log beams, stone, clay, and thatch. Nadj region architecture has a unique style that includes openings, carved wall panels, an arcade element, and a well-designed 'mihrab' with intricate floral gypsum motifs. Therefore, the observer may distinguish Najdi architecture from the architecture of other Saudi Arabia regions by the Najdi architecture's highly detailed craftsmanship that expresses the uniqueness of the Najdi architectural style.

Mosque Case Studies

It is uncommon to find mosques in the Najdi region that are autonomous or separate from the context of their surroundings. Rather, traditional mosques in this region are frequently incorporated into the urban landscape. Additionally, we could say that the mosque is the origin, or starting point, of the development of urban communities and that it forms the center of these communities,

setting the architectural tone for its surroundings: the architecture of the built environment that surrounds each mosque takes its architectural cue from the mosque. For the purpose of analyzing and comprehending the mosque architectural syntax in the Najd region, this study selected three Najdi Mosque case studies as its subjects (Figure 1).



Figure 1.

The location of the three mosques study cases.

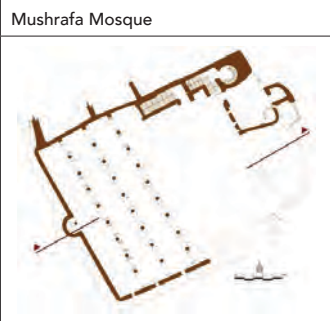
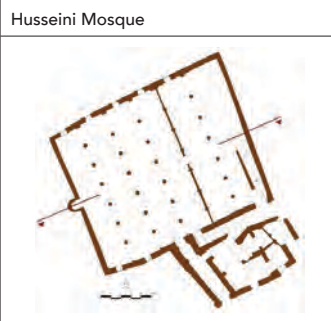
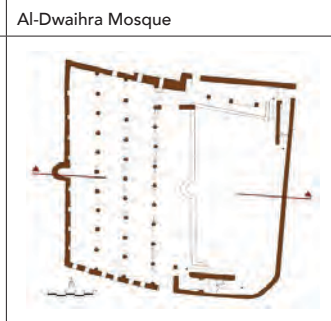

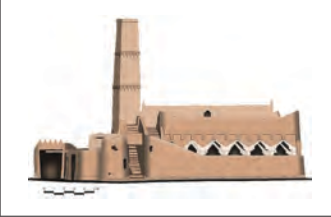
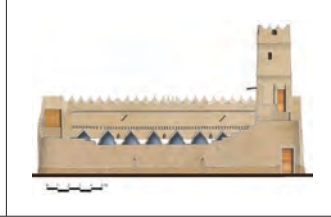



The Mushrafa Mosque (case 1) in the town of Raudat Sudair in Al Majma'ah, and the Hussein Mosque (case 2) in the town of Shaqra in Riyadh are two of the most significant mosques in the region. There is also a 'Friday' mosque (*masjid al-juma'a*) in residential neighborhoods of each town that serves multiple residential neighborhoods. Smaller mosques surround these Friday mosques. The smaller mosques serve population groups that reside within the residential neighborhoods. One example of this is the (3) Al-Dwaihra Mosque, which is located in the Al-Bujairi neighborhood of Diriyah (Table 1).

The historic Mushrafa Mosque can be found in Raudat Sudair, Majma'ah Governorate, Riyadh. The mosque has a history that dates back to the early twelfth century A.H. (*Anno Hegirae*, or eighteen century A.D., *Anno Domini*). The mosque is notable for its Najdi-style construction, and it is considered one of the most prominent historical buildings in Raudat Sudair; however, due to its significant historical importance and for safeguarding the building, the mosque does not currently offer prayers.

The Hussein Mosque is placed in Riyadh's Shaqra Governorate. The establishment of the mosque also dates to the twelfth century A.H. The mosque is notable for its Najdi-style construction. The mosque is one of the most prominent historical buildings in Bashqara's old town, and it is still in use and open for communal prayer. The Al-Dhawairah Mosque is located in the Diriyah Governorate's Al-Bujairi neighborhood. The mosque's history dates to the establishment of the first Saudi state. The mosque is distinguished by its distinct Najdi style, and it is currently in use and open for prayer.

Table 1. The study's three traditional Najdi mosques.

Source: Redeveloped from (Saudi Commission for Tourism and Heritage, 2019).

Mushrafa Mosque	Husseini Mosque	Al-Dwaihra Mosque
		
		
		

Methodology

Understanding the processes that generate mosque architectural form in Saudi Arabia and its impacts on heritage value present significant methodological challenges due to the underlying interdisciplinary nature of the topic. These challenges are compounded by the fact that the topic itself is interdisciplinary. As a result, the present research utilized a multifaceted methodology that includes an ethnographic approach, as well as a literature search, an investigation of archival databases, and an examination of photographs and maps.

Mosques and their Influence on the Najdi Built Form

In addition to its role as a place of worship, the mosque is an important architectural element that contributes to Najd's overall built form. It is, by far, the most important religious building in Islam; in addition to being a place for Muslims to come together in worship of Allah, it also fulfills a variety of other functions for a Muslim community (Mizan & Anuar, 2005). The placement of a mosque within a built environment influences its shape and form as well as influencing the shape, form, and usage of the buildings that are adjacent to it. As a result, the mosque is an essential component of the traditional Najdi built environment, which plays an important role in the organization of the relationship between the public and semi-private spheres. The fact that a mosque may serve both religious and secular purposes while still maintaining the spatial order that separates the two spheres demonstrates how well the

local community understands and values both the religious and socio-cultural functions of mosques. Even though the placement of a mosque as a physical form within the built environment is done with care to ensure a reasonable walking distance for all inhabitants, a number of forces at the urban level influence the production of mosques.

Mosque architects consider the social needs of the community in developing a mosque and its components in such a way that the mosque may serve a variety of purposes at various times. Consequently, whether a mosque is large or small in size, it not only serves to accommodate a large number of people praying to Allah or God, but it also serves as a learning space for the community. This is and has been true regardless of the size of a mosque. This is significant because it indicates that there is sufficient flexibility that leads mosque design to accommodate two distinct, but closely related, needs in one place, supporting religious and socio-cultural requirements. These requirements include the need to have a place where people can worship and a place where they can socialize (Table 2).

The Mushrafa Mosque is notable for its construction in the Najdi style, with mud and stone walls and a roof made of timber and palm fronds (14.9 m by 10.66 m). The mosque also has a basement (14.40 m by 11.42 m) and a minaret of approximately 13.17 m (5.37 m by 4.10 m) to the northeast of the mosque. The mosque has three entrances, which are located on the mosque's southern and eastern façades.







The Al-Hussaini Mosque is constructed of mud and stone, with a roof also made of tamarisk wood and palm fronds (14.62 m by 10.93 m) and the mosque also has a basement (14.65 m by 13.11 m), and its minaret, a tower in which the call to prayer is sung¹, is located south of the mosque along with a well, a basin, and a washing room near the prayer hall and courtyard.

The architectural style of the Al-Dwaihra mosque is one of simplicity and beauty. The mosque's primary building material is clay, and it has an area of about 190 m² and its minaret is in the mosque's northern wing. The mosque consists of three corridors parallel to the *Qibla wall*, the wall in a mosque facing Mecca, with a *mihrab*, a niche architectural element on the Qibla wall that indicates the Qibla wall and provides space for the *Imam* to lead prayers, and an open courtyard (16.5 m by 7.5 m) located in the eastern part of the mosque (18.5 m by 7.5 m) for women. In addition, the minaret, which stands approximately 13.5 meters high, is located near the middle and to the north of the mosque.

Having said that, this pattern is not exclusive to the region of Najd; rather, the pattern is repeated in other regions of Saudi Arabia, such as the city of Hofuf in Al-Ahsa, located in the eastern region of Saudi Arabia. There are Friday mosques in the primary neighborhoods, such as the *Al-Jabri Mosque* in the *Al-Kut* neighborhood and the *Imam Faisal bin Turki Mosque* in the *Al-Naathel* neighborhood. In Jeddah, the *Al-Shafi'i Mosque* and the *Al-Mimar Mosque* are both incorporated into their respective urban environments. An observer can only differentiate each mosque from its surroundings by the mosque's minaret.

1 A "muezzin" sings the call to prayer. Minarets also serve as landmarks for inhabitants and visitors as well as subtly indicating an area in which Muslims make their home.

Table 2. The built form of three Najdi Mosques.

Mushrafa Mosque	Husseini Mosque	Al-Dwaihra Mosque
		
		

Najdi Mosque Components

The functions and components of Najdi mosques are typically the same; however, the presence or absence of certain components can be contingent on the mosque's geographic location and the size of the building. Additionally, the distribution and orientation of these components may be affected by the location of the mosque and the context in which it is situated, such as the presence of private residences. As a result, the findings of this research indicate that the typical Najdi Mosque is comprised of the following four primary components (Table 3):

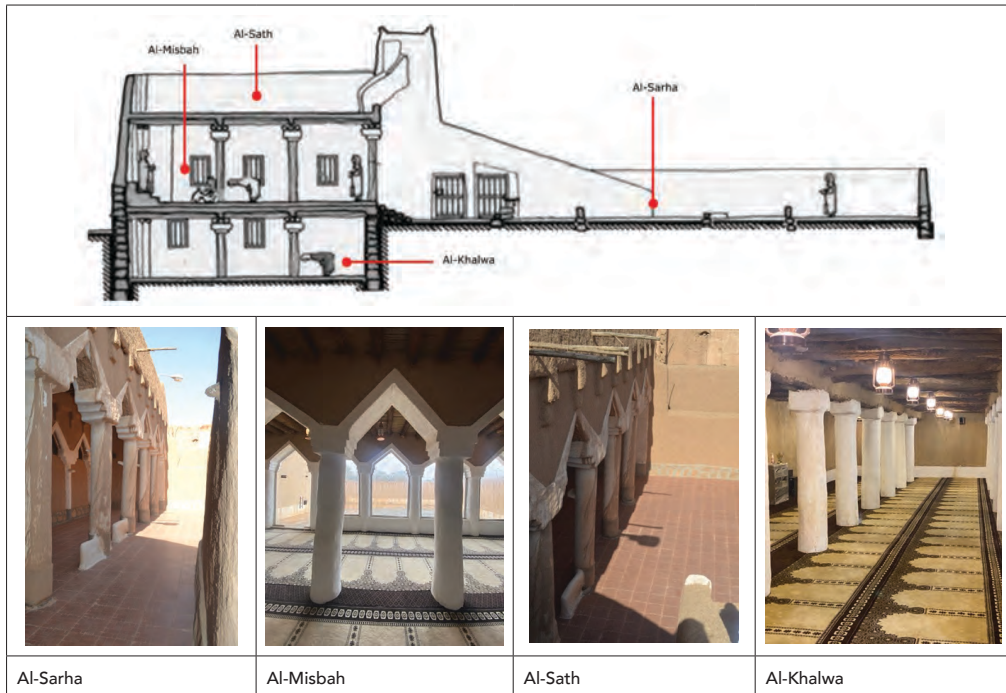
- *Al-Sarha* (courtyard),
- *Al-Misbah* (prayer hall),
- *Al-Sath* (roof), and
- *Al-Khalwa* (basement)

Looking at the three Najdi Mosque case studies, all three mosques contain the four components. They vary in their location of the Qibla wall as well as how the adjacent urban context has influenced their formation. The key insight is that whatever the mosque size and wherever the mosque is located, the community found ways to implement these four components in their local mosque to represent the Najdi Mosque identity. Also, the size of each component depends on the climatic forces of each geographic mosque. In Abdul Salam's *Al-Mashiqh* study, Salam examined the traditional Najdi Mosque, analyzing the climatic changes experienced by mosques during the year and how those changes impacted mosque usage.² He concluded that the local community tends to use the different four spaces in a *masjid al-juma'a* (Friday Mosque) to practice their rituals in different ways, depending on the season. He mentions, for example, that the *Al-Misbah* (prayer hall) space is the most used space during the year. It is more occupied in the summer as it the main covered area in the mosque. Meanwhile, in the winter the *Al-Khalwa* (basement) space in the basement is the most active space. The *Al-Sath*, or roof space, is the most used

² High temperatures are characteristic of the central region's climate during the summertime with low temperatures for three or four months in the winter. There is a significant difference in daytime and nighttime temperature throughout the year.

space in the fall and the *Al-Saraha*, or courtyard space, is the most used space in springtime (Al-Mashiqh, 2019). It is worth noting that individuals use three of these spaces at any season and time during the year. The *Al-Khalwa* space is the exception, as typically the space is locked, and the space is only open during the winter for security purposes and under certain conditions.

Table 3. The distribution and location of the Najdi Mosque components.

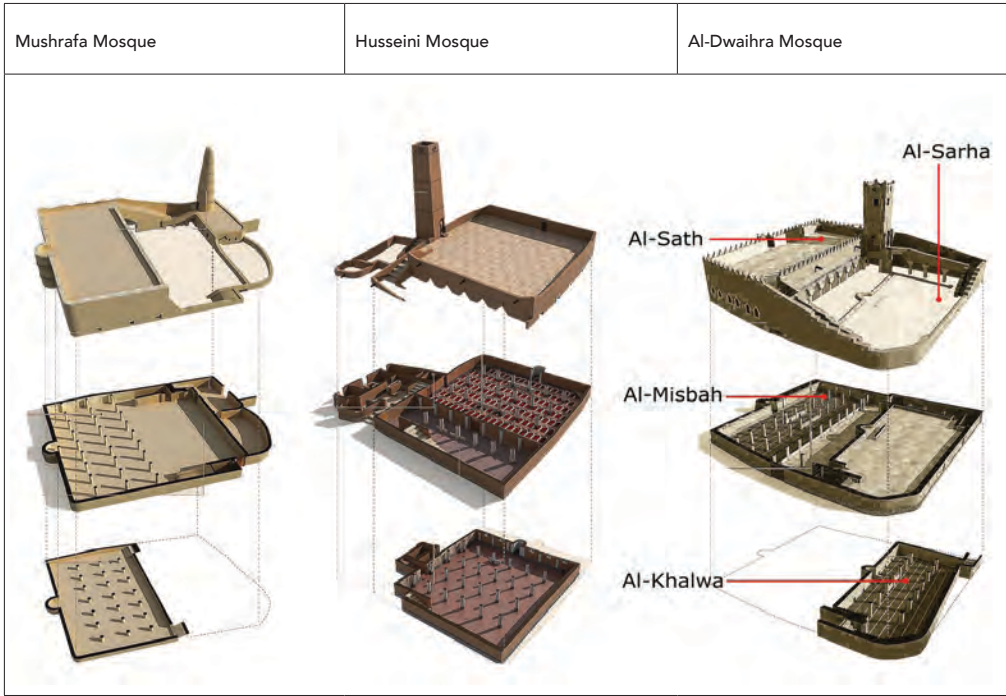


The prayer hall (*Al-Misbah*) is the mosque’s most important component. It is usually rectangular in shape and has an area of about 180 m². The prayer hall of the Najdi Mosque is usually parallel to the Qibla wall, and arcaded and arcuate columns and arched stone walls support the roof. The number of pillars is mostly determined by the size of the mosque; however, there are usually two to four parallel corridors of pillars. The courtyard (*Al-Sarh*) is located mostly on the mosque’s east side, in front of the prayer hall. It is essentially an open rectangular courtyard surrounded by three walls. It frequently houses the mosque’s main entrances, the *Al-Khalwa* entrance, and the staircase leading to the rooftop and minaret. In the winter, this open space is usually used as an open prayer hall and for social activities (Table 4).

Al-Khalwa is located at the bottom of the mosque (basement) and is typically rectangular in shape, with corridors similar to those found in the prayer hall and running parallel to the Qibla wall. Its roof is supported by round stone columns with a rectangular stone capital (*qanaya*). It has a mihrab in the center of the qibla wall, and *Al-Khalwa* typically has two entrances, one from inside the prayer hall and the other from *Al-Sarh*. The roof of the *Al-Khalwa* usually has ventilation openings and, as mentioned previously, the space is usually used to pray in the winter when it is extremely cold. The roof (*Al-Sath*) is the polar opposite of *Al-Khalwa*, where the space above the prayer hall is used for praying in moderate weather conditions during the summer.

Table 4. The mosque component locations of the three cases.

Source: Redeveloped from (Saudi Commission for Tourism and Heritage, 2019).



It's interesting to see how different mosques place their minarets. This is likely a result of the numerous urban contexts that act as constraints on this behavior and the resulting response to the severe weather. We contend that the minaret's placement is a direct response to neighboring homes, eliminating any potential for privacy invasion. Abdal-Majeed Daghistani provides support for this view by stating, the traditional organization and urban design represents a design solution that is environmentally efficient, which has evolved and responded to the social and economic needs of the resident, and which satisfies the moral and religious requirement[s] of Saudi Islamic society (Daghistani, 1985). Islamic law permits people to build as tall as they like so long as they don't hurt anyone else, but the Najdi local society created a novel method of organizing urban form through the development of a set of local customary laws (Urf's).

The manner in which communities distribute the four components of Najdi mosques has an effect on the structure's final shape and form. The final form of each mosque emerges as a local response to the requirements of the community and is determined by the Qibla direction as well as the forces of obstruction that come from the adjacent physical context. Because of this, this research found, based on its preliminary findings relating to the topology of the Najdi Mosque, that the four primary components are arranged in a variety of ways and in a variety of locations that directly respond to the physical context, community needs, and climatic challenges of each mosque and its users (Figure 2).

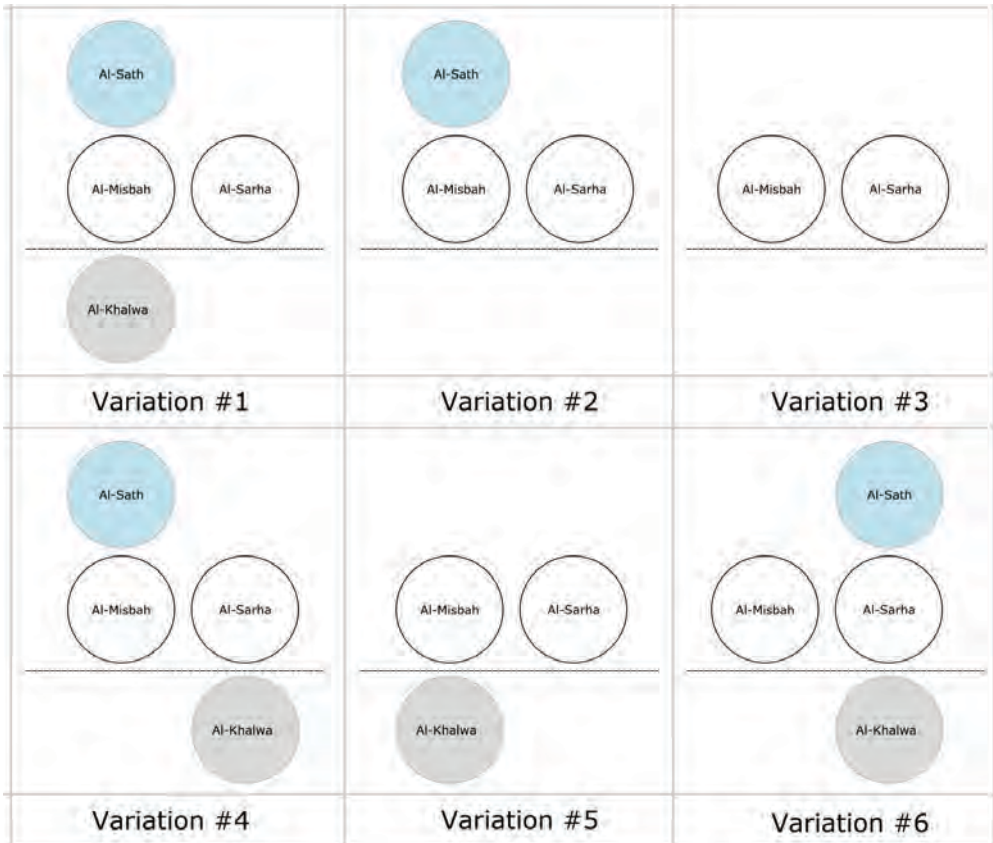


Figure 2. Possible variations in component location of a Najdi Mosque.

These variants aren't arbitrary; rather, they're the result of creative problem-solving by dwellers who want to make sure that the mosque's design features won't cause a privacy conflict with the surrounding urban environment, as well as responding to climatic solutions to enhance the space's thermal comfort. In this way, significant buildings can be recognized by their height. They stand out more, are close to public areas, and are separated from more intimate spaces. People can find their way from the area's deep, private masses to its public spaces with the aid of landmark buildings (Alnaim, 2021). This pattern of behavior is especially evident in mosques, where minarets serve as both a symbol of public space and a means of orientation in dense urban environments. As a result, the heterogeneity of the traditional built environment is not challenged by the numerous component variations found in mosques; rather, all components and elements converge to represent a unified visual appearance that supports this homogeneity.

Najdi Mosque Architectural Elements

The Najdi Mosque is primarily composed of round stone columns, which serve the function of supporting the mosque's roof. Stone beads are stacked atop one another and then plaster of clay and plaster are used to cover each column, which can be seen from the prayer hall, the basement, and a portion of the courtyard. Typically, the prayer hall is composed of a group of columns that are laid out in a pattern determined by the number of existing prayer rows. These columns are then adorned with stone crowns and knots in the shape of triangles (Figure 3).

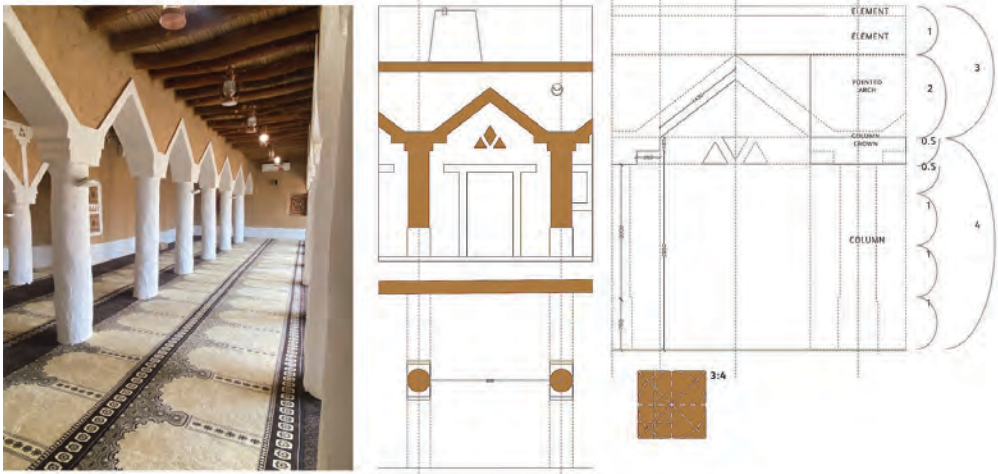








Figure 3.
The detail and ratio of the Najdi arcade element.

In all three instances, the crafting of the columns and arcade elements is strikingly similar in terms of their general appearance.

The only difference across the cases is the number of columns and arcade rows, which affects the level of congestion in the prayer hall. In addition, the arcade application may display some subtle differences depending on the column height and width. In general, the columns and arcade elements formed in the Najdi Mosques are representative of the traditional mosques found in the central region and express their identity in a way that is distinct from those mosques in other Saudi regions (Table 5). For example, in the typical Najd Mosque, the roofs of the mosques are constructed out of wooden beams that are made from the trunks of tamarisk trees and stacked horizontally with a precise distance of between 20 and 40 centimeters. A layer of palm leaves and a layer of mud that is 15 centimeters thick holds up the roof, and the palm leaves and mud are supported on the edges by the walls and also receive support by the round stone columns with stone capitals and triangular vaults.

Table 5. Najdi mosque arcade element.

Mushrafa Mosque	Husseini Mosque	Al-Dwaihra Mosque
		
		

In general, Najdi Mosques are less ornate than other types of mosques and have a very straightforward appearance, with only a few small openings and wall recess shelves. Because of this, the existence of columns is significant because they serve as a decorative element by forming the arcade pillars. With the utilization of white plaster, a textural contrast is produced with the application of adobe material. Because of this, the arcade element component can be found in virtually every Najdi Mosque.

In Najdi mosques, the minaret serves multiple purposes: as a place for the muezzin to sing the call to prayer, as a symbol of craftsmanship, clearly identifying the mosque's location in the urban context, and as a decorative element to enhance the mosque's overall architectural form. Minaret configurations and placements varied among the three case studies, a reflection of the differences in their immediate surroundings. However, the minarets of the Najd region have a distinct look and feel that is influenced by the extruded triangular strip known as the "*afrieze*," as well as the clear and plain walls all of which contribute to the architectural identity of mosques in the region as well as other built forms in the Najd region (Table 6).

The mosque's final visual shape was determined by the construction techniques and materials used. This is not to say that they shaped the masses or decided where the elements should be placed, but they did contribute to the mosque's visual identity. The complementary processes that brought together socio-cultural, natural environment, and construction techniques to generate the final mosque forms aided the Najdi people in reproducing similar mosques without necessarily copying each other (Alnaim, 2022). As a result, the height and shape of the mosque minaret varies across mosques depending on each mosque's significance within its urban context, as does each mosque's placement and proximity to other private dwellings. As a result, the three study cases differ in terms of mosque form and minaret design.

Furthermore, the addition of various decorative elements may improve the mosque's built form identity as well as the quality of the living space. Recessed openings in the walls serve as shelving areas for the Qur'an. A band of white gypsum motifs, also known as 'nora,' added to the adobe wall can add another level of contrast to the overall appearance. The 'mihrab' area of Najdi mosques is decorated with a variety of motifs that distinguish it from the rest of the building's design (Figure 4).

Table 6. The architecture of Najdi Mosque minarets.

Mushrafa Mosque	Husseini Mosque	Al-Dwaihra Mosque

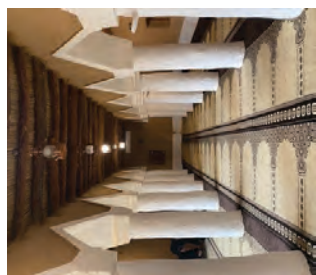
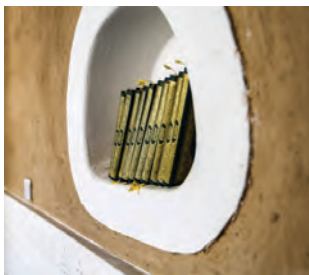


Figure 4. Samples of decorative details inside the Najdi Mosque.

Conclusion


Historic mosques are one of the most visible elements of the Kingdom's national urban heritage. Urban planners should preserve and protect historic Najdi Mosques from demolition or insensitive remodeling. Given their symbolism and importance to Islamic society, historic mosques are an important destination for learning and socializing in addition to being a place of worship. Najdi communities built mosques with openness, flexibility, clarity in mind, and simplicity and this is evident in their design and construction. We contend that the process of creating spatial and physical forms expresses two meanings that are understood through practice and collective forces (social production), as well as their material manifestation (construction know-how). In this sense, the Najdi people understood their needs at the urban and building levels, and as a result, the mosque components and various variations were formed. They then applied the same principle logically to organize the internal spatial order of their mosques. As a result, residents in the Najdi region adopted some of the same concepts within their mosques, albeit modified and reproduced to fit the settings of their mosques. The Najdi Mosque was a multi-purpose space, as this study reveals. In addition to performing religious rites, Najdi Mosques served other functions. The prayer hall and its surroundings were able to accommodate a large number of people for social activities due to their multi-functionality. While the traditional mosques of Najdi may at first appear simple, even provincial, they are actually highly aligned with the simplicity and multi-purpose nature of the very first mosque, in which the Prophet (PBUH) provided hospitality to others, held meetings, provided instruction, and, most importantly, conversed with Allah through regular prayer, walking humbly with Allah (cf. <https://www.soundvision.com/article/remembering-the-prophet-and-his-masjid>).

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IMPLEMENTATION OF ISLAMIC VALUES AND PRINCIPLES ON CONTEMPORARY MOSQUE ORNAMENTATION



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Abstract

Ornamentation plays a significant role in mosque architecture; it embodies Islamic spirituality and faith. Applied ornaments were essential in any religious building in the world because they often have a symbolic meaning. After the first Hijrah century, ornamentation became the most appreciable feature of Islamic architecture, including within places of worship. Nowadays, a mosque is typically built with excessive ornamentation, making beautification become a significant factor in comparison to the functional purpose of a mosque. This research aims to assess the Islamic value of mosque ornamentation from two perspectives. Firstly, the principles of Sharia contained in the holy Qur'an and hadiths. Secondly, the perspectives of scholars on Islamic ornamentation. A content analysis was performed by using NVivo12 software through thematic coding and descriptive analysis. From this analysis, the findings show that the selection of design principles and formal qualities – such as motifs, materials, colours, and techniques – are the main architectural design choices associated with Islamic values. Meaning that, the implementation of Islamic values on mosque ornamentation is important to meet the requirements of Islamic Sharia' so that its existence does not violate the boundaries of religion. Thus, this approach could inform or influence a basic strategy for redefining the 'beauty' of a mosque in terms of its functional, physical, and spiritual roles.

Keywords: Ornamentation, Mosque architecture, Islamic values, Beautification, Aesthetic, Sustainability

1. INTRODUCTION

Mosques are important structures in Muslim architecture. The early mosques were built in a fairly simple style, serving the needs of the Muslim community at the time. Ornamentation was forbidden throughout, in keeping with the Prophet's teaching; peace be upon him. However, attitudes and practices changed dramatically after the first *Hijrah* century came to an end. As a result, ornamentation has become a permanent and, for many, a highly appreciated feature of Islamic architecture, including Islamic places of worship.

Ornament plays a role in Islamic spirituality as a symbol of *Tawheed*, a reminder to Allah, the Almighty. According to historians, ornamentation is not only an element added to a building's surface. Ornaments only work if they are perfectly made, whereby these ornaments are not just made to satisfy and beautify a building. Ornamentation also has clear and definite functions, such as the importance of having doors and windows. The existence and style of these ornaments – in terms of scale, colour, placement, materials, and techniques – will only work if they are created in harmony with their roles and functions (Taufik, 2016).

Mosques are places where Muslims go to worship Allah. Therefore, they should be clear and straightforward in principle. However, too much ornamentation in mosques is not only a waste of resources, but it also robs the mosque of the peaceful environment that generally comes with simplicity (Al-Haj, 2017). Nevertheless, in most mosques that exist today, beautification is a major factor compared to the functional purpose of the mosque. This can be seen from its massive ornamentation, which sometimes uses luxurious and expensive materials, such as genuine gold and silver (Yulia and Atik, 2012).

An interesting subject that will be tackled during a mosque's construction is the high building costs that can often exceed what can be classified as waste. This waste might be prevented if extra components like ornamentation and work on the mosque were eliminated and simplicity was adopted alternatively (Utaberta, 2012). The right placement of ornamentation and motifs, on the other hand, will draw in more believers to animate the mosques. Ornamentation should

be considered a part of the mosque's elements, determined during the design stage, rather than considered retrospectively or as a means of covering-up gaps (Othman and Abidin, 2011).

Ornaments in modern architecture have evolved beyond mere ornamentation to become an additional means for communication and cultural observation (Opincariu, 2011). Moreover, ornaments are now functional (Fairhurst, 2007). Ornamentation has evolved as an intricate medium of production and consumption in contemporary architecture, thanks to recent instruments, approaches, and procedures (Balik and Allmer, 2016). The main issue for an architect designing a contemporary mosque is interpreting the wide spectrum of aesthetics that characterise the religion, its character, and its sacred space while being inventive without sacrificing legality or ideals (Kahera et al., 2009).

In meeting the needs of the mosque as an Islamic centre as well as a place of worship, this study is important in explaining the process of decorating the mosque because there is no clear prohibition on decorating the mosque. Ornamentation is allowed in Islam, but the design application should be selected carefully to follow Islamic principles guided by the holy Qur'an and Sunnah¹. Ornamentation of the mosque is one of the additional elements that are considered necessary as an 'instrument of worship': instruments that help worshippers appreciate, glorify, and praise Allah. Therefore, mosque design principles and characteristics should be explained in relation to achieving mosque ornamentation in keeping with Islamic values, which honor Allah and His will.

It is natural to seek out and appreciate beauty. This promotes the realisation of tranquillity, sheer delight, and pleasure in the world made possible by our Creator, allowing one to focus on the things that will ensure contentment in the afterlife. As a result, Islam is a religion with a fair and balanced approach (Omer, 2015). However, suppose it does in an appropriate and enlightening way. In that case, mosque ornamentation could inspire believers, appreciating the beauty of Islam, bringing them closer to Allah the Almighty, and adapting their lifestyle to align with Islamic values. In other words, it promotes Islam and invites people to it. This research aims to contextualise the aspects of Islamic ornamentation design principles by emphasising Islamic beliefs as the foundation for creating balanced and purposeful mosque ornamentation.

2. BACKGROUND

2.1 Mosque Ornamentation from The Principle of Sharia

The origins of Islamic art and ornaments are based on the values and ideals of Islam, which delivered this artwork to the world. It has to do with Islam's viewpoint, with Islamic revelation, whose indirect as well as direct ramifications include Islam's sacred art and the entirety of Islamic art. Furthermore, the organic rapport between Islamic worship and Islamic art supports the causal relationship between Islamic art and Islam, in between the Qur'an's recommendation for God's contemplation and the contemplative nature of this art, between the recollection of God, which is the ultimate objective of all Islamic worship, and the significance of Islamic art in the lives of individual Muslims and the general community. This art could not have a spiritual purpose unless intimately connected to the Islamic revelation's style and substance (Nasr, 1990).

1 That is, teachings of the Prophet, actions of the Prophet, and contemporary practices at the time of the Prophet which the Prophet did not oppose, peace be upon him.

Moreover, Omer (2016) stated that the subject of ornamentation had been mentioned in the Qur'an and in the hadiths.

Based on the Quran and hadiths mentioned above, the practice of ornaments did not prohibit altogether, as in the hadith said; "Allah is beautiful and loves beauty" (Sahih Muslim). The verses of the Quran and hadiths, according to Al-Ghazali, promote the realisation of beauty because beauty with its ultimate shape is drawn from the attributes of God Almighty, and earthly beauty is personified in what God has made (Ali, 2001). Furthermore, (Omer, 2015) further emphasised that while moderate adornment is permitted, the Mihrab (imam's praying niche) should be left unadorned to avoid disturbing the worshippers, as the mihrab region is the focal point of communal prayers.

2.2 Mosque Ornamentation from the Perspective of Scholars

Ornamentation is regarded as embellishment and part of Islamic art (Handryant and Utaberta, 2014), according to some Islamic architectural works, for instance, those by Spiers (1905), Hill (1967), and Ettinghausen (1987). In Islamic art, the ornament is defined as a type of surface ornamentation. It can take the form of a figural, vegetal, or calligraphic representation (Holod, 2014). In comparison, Anca (2012) stated ornament is a feature incorporated into a piece of art to enrich its aesthetic qualities as well as the complexity and readability of its meaningful implications. Due to the ban of figural form in Islamic art, the majority of Islamic motifs are inspired from floral or vegetal, geometric shape, and calligraphy borrowed from a Qur'an passage or a hadith from the Prophet (Kassim et al., 2012).

The purpose of Islamic ornamentation is not only an embellishment but also a language that can be learned, read, and understood. Islamic ornamentation translates spiritual ideas, represents local customs and foreign influences and was susceptible to variations in taste throughout the Islamic world. Most Islamic art scholars, including Critchlow, Golombek, Lee, Hossein, Grabar, and others, argue that Islamic ornament, in its different expressions, is inextricably tied to and profoundly founded in religious and mystic notions of Islam's spiritual realm (Baer, 1998). In the meantime, in Islamic architecture and design, adornment is a fundamental uniting feature. It has brought together structures and items from throughout the Islamic world (Yusuf, 2013).

As per Al-Faruqi (1986), the exquisite and elaborate designs found on art artefacts from all over the world and throughout Islamic history serve four distinct and significant functions: structural transfiguration, material transfiguration, *Tawheed* reminder, as well as beautification. Islamic ornamentation serves a variety of purposes. They can be religious, educational, social, or psychological in nature (Norhayati et al., 2014). As a result, Islamic art transcends religion, offering serenity and calmness to the individual observer and imbuing the soul with a spiritual experience. Instead of being identified by material or colour, Islamic art has a specific uniting principle that has provided consistent features to this art throughout the place, time, and culture (Nasr, 1990, Doaa et al., 2018).

2.3 The Elements and Design Principles in Mosque Ornamentation

Motifs in ornamentation can be categorised into four basic elements, namely: calligraphic, vegetal, geometric, or figural. In ornaments, Muslim artisans rely on these elements following the Islamic prohibition on depicting human forms, animals, or even living beings. Thus, a Muslim artisan chooses an abstract style

in presenting their personal philosophy about their relationship with Allah, glorifying Him and contemplating the greatness of His creation (Al-Obaid, 2005).

Calligraphy is considered as one of the most prominent elements in Islamic ornamentation (Al-Obaid, 2005, Hamzah, 2007), where calligraphy is an element that distinguishes between Islamic architecture and others. The existence of calligraphy in the architecture of a mosque can give a spiritual impact to the congregation through beautiful inscriptions decorated with the word of God that surround them (Al-Obaid, 2005). The harmony, majesty, flow, and rhythm of calligraphic forms have encircled Muslim life and revealed their splendour on mosque walls, the pages of Qur'ans, and other kinds of architecture have rejuvenated the heart and spirit of all Muslims (Shafiq, 2014).

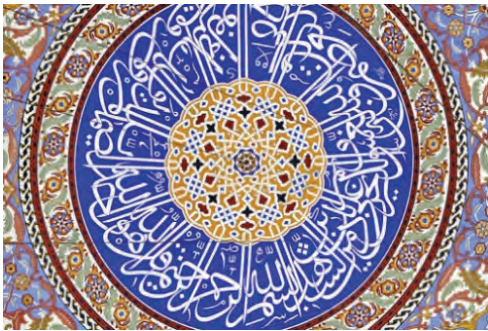


Figure 1:
Arabic calligraphy on the ceiling of Selimiye Mosque in Edirne, Turkey.
Source: Raimi, 2019

On the other hand, vegetal motif ornaments are also widely used where various art objects are created according to the aesthetic tastes of the artist and abstracted from natural forms (Al-Obaid, 2005). Idealised vegetal forms or arabesque are tied to the form of foliage as well as two-dimensional abstraction. On the contrary, the structure of its entity contains the aesthetic principles in Islamic ideology (Al-Faruqi, 1986). The arabesque is rational and rhythmic, musical and mathematical, simultaneously, which is particularly crucial for the spirit of Islam in its balance of love and intellectual sobriety (Burckhardt, 1967).



Figure 2:
Arabesque patterns of Sheikh Lotfollah mosque dome.
Source: Khataei, 2016

Meanwhile, geometric elements became among the most recognisable elements in Islamic architecture. In every culture, geometric elements are processed according to local influences making geometric specialities a force of creativity and imagination of a particular culture (Broug, 2008). Islamic artists' preoccupation with the visual concepts of repetition, symmetry, and pattern formation is seen in geometric patterns (Jones, 1995). Geometry is an abstract art form. The act of developing and incorporating these designs was

thought to embody visually distinct formations that develop out of the same spiritual root to reflect the divine's many manifestations (Sobh and Samy, 2018).

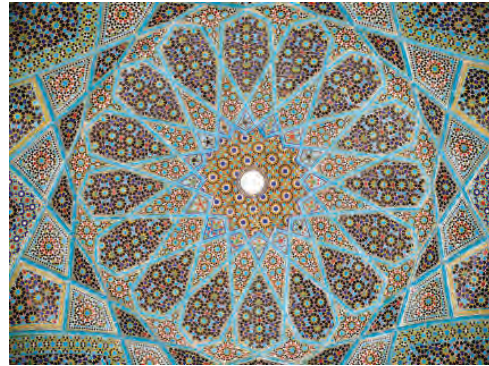


Figure 3:

The geometry motif in Islamic ornaments that compose the principle of unity, eternity, recurrence, and rhythm.

Source: Shafiq, 2014

These elements, including materials, colours, and techniques, are composed based on the basic principle of ornamentation. Moreover, Shafiq (2014) concluded five principles in Islamic ornaments; the principle of unity and unity in multiplicity, abstraction, eternity, symmetry, as well as recurrence and rhythm. *Tawheed*, or belief in the awareness of divine unity, lies at the heart of Islamic art. Eternity is defined as an endless state of existence with no beginning or end (Baer, 1998, Shafiq, 2014). As a result, as per Nasr (1987), Islamic art does not just focus on the inner reality of the Qur'an but also on insight or understanding that represents religious ideals and explains spiritual attributes (Khudori, 2010).

Formal qualities are the elements of art or components used by the artist to create a work of art. Aside from that, design principles outline how artists apply formal features in a work of art (Getty, 2011). The elements of motifs, materials, colours, and techniques with the composition of design principle will produce an artwork depending on the artist's or designer's creativity. The power of Islamic features to convey important messages stems from their portrayal of Islamic values and ideals, which are a necessary component of the construction of these patterns or motifs. Furthermore, the ability of Islamic patterns not just serves as a way for the transmission of Islamic ideas but also as a source of beauty and aesthetics (Doaa et al., 2018).

Thus, all of these elements and principles of design were all associated with the upbringing of Islamic values of ornamentation. In this setting, this study's goal is to provide a design strategy based on Islamic values through formal quality choices and design principles. This means that ornamentation design has to be taken into consideration while planning the entire mosque architecture to accommodate meaning, beauty, and functionality.

3. RESEARCH METHODOLOGY

This study aims to evaluate the Islamic value of mosque ornamentation from two perspectives; first, the principle of Sharia contained in the Qur'an, hadiths, and fatwas. Secondly, the perspectives of scholars on Islamic ornamentation. For this objective, a content analysis was conducted using thematic coding by NVivo 12. A thematic content analysis of a literature review from the two sources was performed; a primary source from the Qur'an, hadith, and fatwas and secondary sources of the collective perspective from the scholars' opinion on Islamic ornamentation.

As this methodological approach aims to identify a relationship between ornamentation and Islamic values, the data coding was categorised into three (3) themes: formal qualities, principles, and Islamic values. In summary, categories are frequently used in the first analytic phase of a study to construct a taxonomy for discovering links between data points. The topic, on the other hand, is generated gradually over time, when such goal is to extract meaning and value from the data (Krishnarao, 1961).

The analysis of this theme is extended with descriptive analysis to identify the elements, characteristics, and descriptions that represent Islamic values in ornamentation. Descriptive analysis is important for analysing a research result (Sugiyono, 2005). The descriptive approach of the research, according to Whitney (1950), is "fact-finding with accurate interpretation." The two scientific thinking elements are the procedures of description and analysis (Krishnarao, 1961). In the literature review, there are many terms which are similar to each other and repetitive. Therefore, various writing sources with similar words are coded into a theme and description to facilitate categorising the content text into the theme.

Therefore, this analysis is intended to deepen the importance of Islamic values in terms of the implementation of ornamentation that meets the requirements of Islamic Sharia' so that its existence does not violate the boundaries of religion. Figure 4 illustrates the process of categorising and coding in content analysis from the literature review to analyse the relationship between the variables.

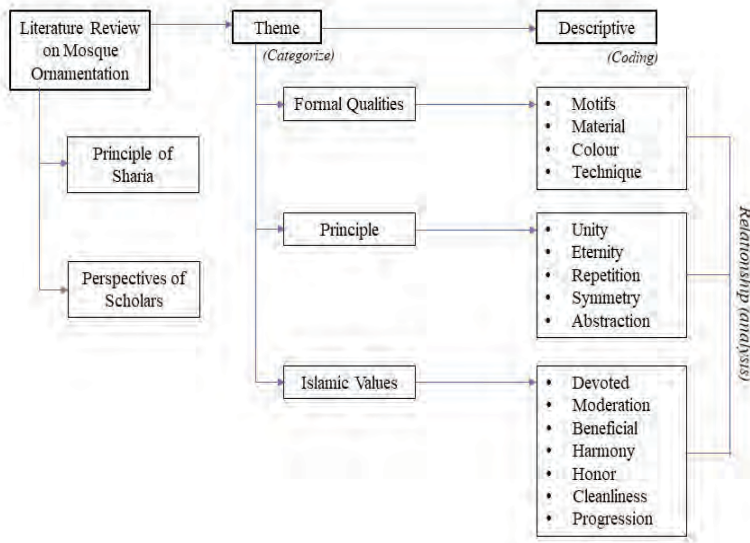


Figure 4: The process of thematic content analysis to descriptive analysis.

4. RESULT AND DISCUSSION

4.1 Relationship between Ornamentation and Islamic Values

Basically, mosque ornamentation is necessary to comply with the Islamic principles itself, as the main function of a mosque is spiritual: bringing each worshipper closer to God. The definition and application of ornamentation from various writings show that formal qualities are a key aspect of ornamentation. However, architecture has something beyond function, which is formal qualities. Motif, colour, material, technique, and principles of design are the subjects in ornamentation that contribute to the values of ornamentation. From these, the work of ornamentation can define the function of ornamentation, such as ventilation, glare treatment, transfiguration, spiritual, structural, and aesthetics. The functionality of ornamentation is a key aspect of mosque architecture, as the function of a mosque is not limited to spiritual purposes. It also serves as a public building that should be conducive for its user and sustainable for a longer period.

Figure 5 shows the association between ornamentation, formal qualities, and design principles directly contributing to Islamic values. Moreover, seven (7) Islamic values are obtained from the thematic analysis, namely: devoted, moderation, beneficial, harmony, honour, cleanliness, and progression. The result shows that the selections of formal qualities and principles of design into ornamentation are associated with specific Islamic values.

Briefly, architectural ornamentation is a decoration or surface modulation on a building produced through a combination of several formal qualities such as shape (line), scale, colour, material, and technique with a combination of composition or design principles to form a motif or work of art. From these formal qualities and principles, a function of ornaments can be explained as a value-added to a work of art.

Geometry is a motif that is considered the universal element because it consists of five design principles in Islamic ornamentation. Due to its diversity and being unbounded by certain principles, this motif is suitable in every era of architecture, exhibits timelessness by its simple form, and can be explored in various patterns. The calligraphic motif is a more spiritual element because it is a symbolic and unique form of Islamic ornamentation. It consists of the principle of eternity from the nature of God, repetition of holy verses, and the principle of abstraction, which they have no description of the nature of God.

The vegetal motif, on the other hand, has the principle of eternity and repetition from its circular, continuous form and being a representation of all the privileges of His creation. Meanwhile, the application of figurative motifs is applied in the form of abstraction because the work created should not depict any human or living beings that are considered idolatry. However, some artists want to take inspiration from the figurative element, which has the privilege of being manifested into their work.

Furthermore, the application of ornamentation materials made from natural elements such as wood, stone, and soil also convey the value of simplicity in terms of its natural colour as well as providing a calming effect. The application of industrialised materials such as concrete, iron, and glass also provide the value of benefits and progression if done appropriately. Through colour selection, bright and soft colours provide the value of simplicity and cleanliness, while the colours that are contrasting and polychrome also convey the value of harmony in terms of the colour combination.

In terms of the use of ornament-making techniques, carvings represent the value of simplicity and are beneficial in terms of a process that is so delicate and meaningful. Likewise, plaster and tilework techniques provide a simple and clean finish. Along with technological advances, new techniques designed to speed up the construction process are also very practical, such as casting, ironwork, and cladding techniques. In addition, the building component is made in advance in a factory, thus saving construction time.

Islam encompasses one's way of life and all areas of life, for instance: cultural, social, and economic factors. All the formal aspects that have been explained contain seven (7) essences of Islamic values that enliven the soul and spirit of mosque architecture. These Islamic values are the elements that support the entire system of ornamentation that should be applied and combined so that the function and role of ornamentation can be fully utilised in the architecture of the mosque. Therefore, to develop ornamentation that meets the requirement in Islamic sharia', it is important to deepen the basic process in terms of implementation of design so that the existence does not violate the boundaries of religion.

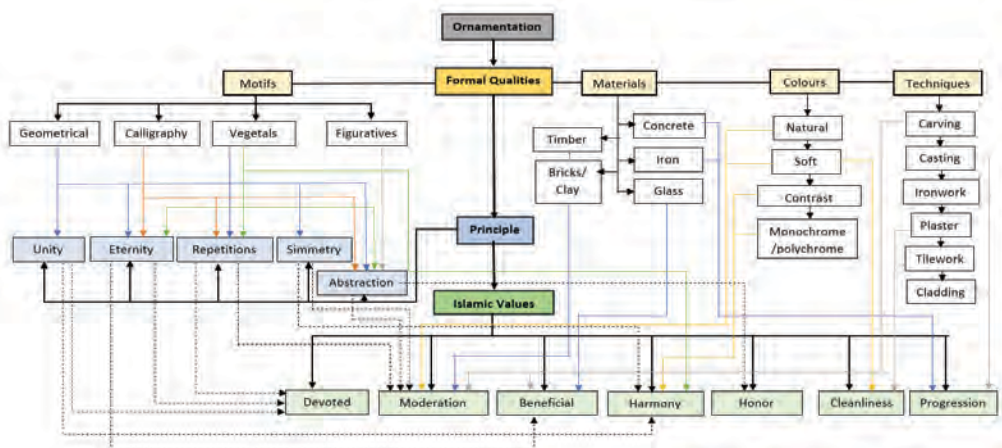


Figure 5:
The relationship between ornamentation and Islamic values.

To further elaborate on the formal qualities and characteristics that represent each of the Islamic values in ornamentation, the description of the characteristic of mosque ornamentation based on Islamic values is shown in Table 1. This study specifies the key aspect of ornament design to achieve the principle of Islamic Sharia' on the application of mosque ornamentation.

Thus, this fundamental is a basic design strategy for the implementation of mosque ornamentation between moderate and meaningful. Moreover, as stated by Omer (2016), the Prophet did not forbid the idea of ornamentation but harshly condemned inappropriate decoration, such as wastefulness, arrogance, disturbance in concentration, and most importantly, the extravagant ornamentation that will surpass the primary function of the mosque, which is a place of worship. This means that mosque ornamentation design and placement need to be decided during the planning of overall mosque design to comply with the Islamic values of ornamentation, thus fully optimising the functionality of mosque ornamentation. Not simply just by afterthought. Nonetheless, each mosque building should have a symbolic yet optimal function. Or, to put it another way, ornamentation should be seen as part of the mosque's elements.

Thus, this result expectantly gives insight into the selections of appropriate mosque ornamentation regarding the formal qualities and Islamic values explained.

Table 1. Characteristic and formal qualities of mosque ornamentation based on Islamic values

Islamic Values	Formal Qualities	Characteristic
Devoted (<i>Tawheed</i>)	Motif: Calligraphy, geometry, arabesque, floral Principle/ composition: Eternity, circumference, repetition, and recurrence	Bring the observer to the remembrance of God. Concentration on worship.
Moderation	Material: Natural (timber, concrete, steel) Colour: Natural, colour that is not too prominent. Motifs: Motif that is not too dense and prominent. Technique: Woodcarving	Simple, modest, and unobtrusive ornamentation that does not interfere with the solitude of prayer and supersede the primary function of a mosque. Avoid wastefulness and extravagance.
Beneficial	Motif: Have a good meaning, benefit (symbolism, spiritual) Function: Ventilation, lighting, façade/ glare treatment, safety, privacy, spiritual, cleanliness.	It is not causing any difficulties in the future. In addition to providing beauty, ornamentation can also bring benefits such as good ventilation, easy to maintain, remembering God.
Harmony	Motif: Symbolic meaning of harmony, prosper, peaceful (cultural symbolic) Colour: Natural and harmonious. Principle: Unity (universality, diversity) Function: Environmentally concerned.	Harmony with nature, concern for community needs (harmony in universality and diversity), and conformity to the rules of Islamic principle.
Cleanliness	Placement: Easy to be clean, not too low, not too high. Material: Clean, easy to be clean, not easy to be dirty. Function: Very good ventilation, hygiene.	Proper placement of ornamentation as well as materials and tools should be clean, and ornaments are easy to clean.
Honour	Placement: detailing of ornament above the eye level. The placement of calligraphy should be proper. Motif: Symbolic meaning of honour, love.	Not an expression of arrogance, boasting. Not excessively ornamented to show arrogance.
Progression	Material: Updated technology of the era/ civilisation. Technique: Industrialised system that uses the more innovative technique. Motif: Symbol of Islamic civilisation. Star and crescent, arabesque and geometrical	Progressive construction and material. Up-to-date ornamentation.

4.2 Discussion on the Application of Islamic Values into Mosque Ornamentation

The study is to appreciate the Islamic values in the Qur'an and Hadiths for a true and beneficial Islamic ornamentation, namely: simplicity, moderation, beneficial, harm avoidance, cleanliness, and harmony as set by Allah the Almighty. As a result, ornamentation must be considered an expression of the beauty of art in architecture, which is employed to decorate the structure and

provides other advantages, as illustrated in Figure 6. Ornamentation on the wall also functions as an opening element that enters light and the airflow into the room.



Figure 6: Ornamentation of the screen wall from the veranda area of National Mosque has function as ventilation and also natural lighting to the space. Source: www.pixshark.com

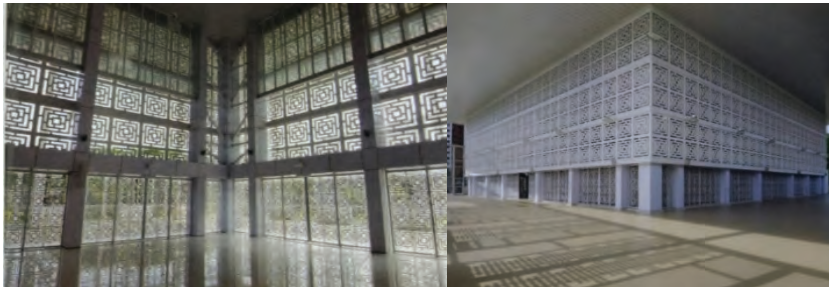


Figure 7: Perimeter wall with a geometrical motif that advocates natural lighting and glare treatment of the main prayer hall in Ara Damansara Mosque. Source: ATSA Architects, 2016

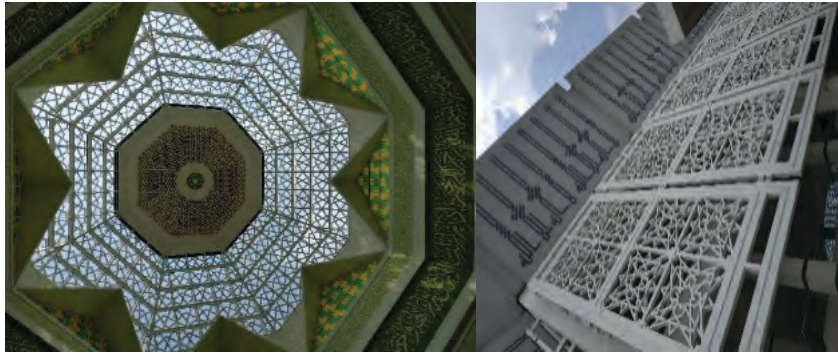


Figure 8:

Arabesque motifs of external façade that promotes natural lighting, ventilation, and glare treatment over the spilt area and geometrical motifs of the internal dome give natural lighting over the main prayer hall in Raja Haji Fisabillah Mosque.

Source: Author, 2019

Considering the design characteristics, integrating more than one Islamic value in one ornament can signify more than beautification. An ornament can fulfil multiple roles, such as spirituality, beautification, semiotics, and ecology. This can be seen from the example

shown above. While contemporary mosques nowadays have been continuously mixing various past Islamic architectural elements, according to Aziz (2016), therefore, this study proposes a design framework and strategy in the selection of design principles and characteristics to achieve a conceptual understanding of Islamic principles and to retain both functionality and aesthetic pleasure for a sustainable contemporary mosque.

Hence, it can be said that an ornament is not only for aesthetics or purposes of beautification. It is more than functional. Because a Muslim's duty to act in favour of what is fair is as much a part of his religion as his duty to resist wrong, contemporary mosque ornamentation must adhere to Islamic norms. The word "beauty" does not only satisfy a visible aspect as such can only be seen, but it must also collaborate with the invisible aspect so that it also can be felt. Furthermore, ornamentation adds value to a building's beauty by testifying to the surroundings, technology, and civilisation. All of these factors contribute to people's identities and religious beliefs.

CONCLUSION

Mosque and ornamentation are connected to each other physically, spiritually, and ecologically, joined together by the principles of Islam. Ornamentation is the symbol of religion and embodies the faith (*iman*) to the unique function of a mosque as a spiritual place of Muslims. Consequently, mosque ornamentation needs to be understood and appraised in terms of the beauty embodied therein. Mosque ornamentation is acceptable if it provides serviceability and gives added value, such as functional ornamentation. Through the analysis of Islamic values of ornamentation, the concept of Islamic principle should result in the innovation of mosque design, especially in the contemporary world. Thus, by implementing both functional (physical and ecological) and spiritual values on mosque ornamentation, it is more beneficial to the whole community of Islam (*ummah*). Thus, this became the ultimate reason for adapting legitimate ornamentation on the mosque as Allah is beauty and He loves beauty.

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**IS THE MOSQUE A MALE-
DEDICATED BUILDING?!**
**A CRITICAL VIEW ON
WOMEN'S PRAYER SPACE IN
CONTEMPORARY MOSQUE
DESIGN**



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ABSTRACT

Contemporary approaches to mosque design display a myriad of riches in expressing the sacred in Islamic culture and religion. Still, some foundational questions about the process of mosque design, particularly those regarding its dynamic functionality and the complex needs of its multiple users, have not yet been convincingly studied—a case in point is the design of space dedicated to women in mosques.

Other than a general rule that men and women should not pray in the same rows, evidenced by the Prophet Mohamed's Mosque in Medina, there is no specific Islamic guidance on how to design the praying space for women. In turn, different cultural conventions and interpretations of Islam in the diversified Muslim societies have produced some norms regarding the spatial organization for women-dedicated space in the mosque. These norms may include separating the ladies' prayer space with a barrier or allocating space on a top or bottom floor that is often accessed by a dedicated entrance away from the entrances to the men's prayer hall. While not directly derived from Islamic texts, these norms were absorbed by practitioners, becoming *de facto* expected and accepted approaches adopted by most architects and building regulators regarding how to design women's prayer spaces in contemporary mosques.

The prevalence of those norms has sparked various jurisprudential and socio-political debates about the role of women in Islam. Besides, many architectural questions can also be posed about the inefficiency of those rarely challenged norms to fulfil the needs of the female users of the mosque and to engage them in its broader spatial and participatory experience. In turn, the commonness of those norms in mosque design may have emphasised a certain perception that the mosque is a male-dedicated building. Setting this out, this paper aspires to interrogate the architecture of space dedicated to women in contemporary mosque design. With encouragement coming from the ongoing debates on the equality of women, the inclusion of women in various aspects of society, and the fairness of opportunity for women, debates that have been increasing in intensity for at least the past century in various places in the world, this paper will perform an architectural forensic analysis of the examples of women-dedicated spaces for prayer in conjunction with a review of some of the increasing – though still limited – literature analysing the issue of women's space in mosques.

The paper will conclude with speculations on new possibilities to incorporate the functional complexities associated with women's prayer space becoming an integrated part of the spatial and participatory experience of the mosque.

Introduction

Mosque design has become a rich pool for architects to express the sacred in Islamic culture and religion, and their associated symbolism. The architectural program of the mosque simply revolves around a large space for praying (a generic multipurpose hall, often dedicated to male users) with smaller adjunct spaces connected to it. This straightforward brief has encouraged many architects to put their energy onto the formal expression of the spiritual and symbolic meanings affiliated with the building, specifically the visually intriguing architectural elements of this typology such as: the main hall, the courtyard, the minaret(s), the dome(s), etc. In this popular architectural recipe, though, not much seems to be done in regard to tackling key questions related to how the mosque performs and how it fulfils its particular spatial and functional targets, particularly those regarding the underlying complexities of its dynamic functionality and the intertwined needs of its multiple users (Megahed, 2019). It can be argued that one key element that has not seen much development is the design of the women's praying hall in mosques.

In contemporary mosques, women's prayer spaces are often relegated to a screened space in the back of the main praying hall, a small room upstairs, downstairs, or allocated to an adjacent structure. It is difficult to confirm the

exact origin of this architectural tradition, but it is clear that this tradition has become an accepted practice from the early 20th century in many Muslim regions. This common practice has become an assumed solution in contemporary architectural approaches to the design of mosques, defining the expected and accepted norms about women's space in this architectural typology. The prevalence of those norms has sparked various jurisprudential questions about the place of women in the mosque and broader socio-political debates about the role of women in Islam. Aside from those broader debates, there are key questions that architectural designers need to ask themselves regarding their role in those debates and their responsibility for one of the key user-groups of this building typology. These may include questions about the quality of the spatial and participatory experience associated with common practice in designing prayer spaces for women (in comparison with those designed for other user-groups); let alone the ability of these spaces to engage their users in the broader objectives of the mosque: to act as a place for the Muslim community to share knowledge, interact, and facilitate the exchange of goodwill face-to-face under the wider umbrella of Islamic social inclusion (Nadwi, 2015).

Setting this out, this essay aspires to interrogate women's praying space in contemporary mosque design from an architectural point of view. The paper will narrate the story of women's praying space: its history, the evolution of its design, the religious debate about it, and finally its common practice as defined in the building regulations of different Muslim regions. The paper will then operate an architectural forensic analysis, reviewing examples of women's praying spaces in contemporary mosques, facilitating the development of a better understanding of the commonplace functional and spatial experiences of women users in mosques, and demonstrating how the accepted contemporary mosque design formula may have failed them in different ways. With shades from the debates about equality and inclusion, the paper will end with informed speculations on new possibilities to transform the functional complexities associated with women's praying space to enable women to become an integrated part of the spatial and participatory experience of the mosque.

The Story of Women's Prayer Space in Mosques

Women's Prayer Space—A Fragmented Chronology

The issue of the design of the women's prayer space is weighed down by many complex questions that carry historical, cultural, and jurisprudential facets, in addition to its architectural functional and spatial aspects. The literature addressing this issue is divided between scattered jurisprudential and Muslim feminist literature. The former has a long history of debate, with a particular focus on the rules regarding women's visits to mosques (Ouda, 2016; Rasdi, 1999, p. 19; Sadlan, 1999, p. 17). On the other hand, the latter, which has seen more increase in the last ten years or so, has concerned itself with issues around gender equality and rights in relation to the role and position of women in mosques and in Islam in general (Batuman, 2018; Eskandari, 2011, Sherwood, 2018). While those two different perspectives bring important insights to the debates around women's prayer space in mosques, still, not much has been done specifically to look onto this issue from the architectural point of view (Kahera et. al, 2009, p. 7).

The benchmark for evaluating the design and use of women space in mosques is the Prophet's Mosque in Medina. Hadiths do not describe an architecturally distinct prayer space for women in the Medina Mosque. They imply that in the

time of the Prophet, the mosque followed an open design approach in which men lined up in rows starting behind the imam, and women simply prayed in rows behind the men, starting from the back of the mosque – without a barrier separating men from women, as is customary in today's mosques (Tarim, 1999). It was also reported that women tended to come and listen to sermons and attend prayers even at dawn or dusk (Ouda, 2016, p. 42, 43). After the Prophet's time, there is very limited information that describe the evolution of women's prayer space from the time of the Prophet's Mosque to today. The available evidence suggests that women attended the mosque in Medina and other places under the Muslim's rule, and also, at times, gave sermons too, where both men and women listened (Katz, 2014, p. 76; Tarim, 1999, p. 166). There has been, however, some sparse and anecdotal evidence suggesting that there was some degree of opposition to women attending mosques by a few of the Prophet's companions, with the opposition mainly attributed to authoritative figures, such as Ibn Masud (Katz, 2014, p. 136).

Outside Medina, mosques in Damascus in the 7th - 8th Centuries under the Umayyad Caliphate seem to follow the same arrangement as the Prophet's Mosque (Tarim, 1999, p. 166). Besides, other resources suggest that Iraqi women frequented mosques for various purposes, including regular prayers, pious retreats, and during Ramadan, well after the first generation of Muslims had died out and new cohorts of native-born Iraqi Muslims had arisen to take their place (Katz, 2014; Tarem, 1999, p. 167). As the scholar J. Tarim (1999) states, the same arrangement was followed in the early Abbasid time in Iraq as seen in the Samara Grand Mosque, built by the Caliphate Al-Mu'tasim as well as in mosques of North Africa such as the Great Mosque of Kairouan under the Aghlabids rule (Tarim, 1999, p. 167). On the other hand, women's presence in mosques in Egypt was also evident in the first mosque of Fustat and under the early Abbasid caliphate, in the mosque of Ibn Tulun, and later under the Fatimid, as seen in the famous mosques of those eras: Al Azhar Mosque, Al Hakim Mosque and Al-Aqmar (Bosworth, 1996; Katz, 1999, p. 168).¹ This was still the case afterwards in the mosques and Madrasas of the Ayyubids and the Mamluks (13th – 16th century) (Gabr, 1992; Katz, 2014, p. 155). The researcher M. H. Katz (2014) supports those views in his book: *Women in the mosque: A history of legal thought and social practice*, where he mentioned cases where women appeared in Cairene mosques as an audience, and also as religious instructors and preachers (Katz, 2014, p. 155). These claims are supported by Egyptian Moroccan Maliki *fiqh* scholar and theologian writer Ibn al-Hajj Al-Abdari (737/1336), who strongly emphasized women's mass attendance at mosques on the occasion of major religious festivals (Katz, 2014, p. 147).

The references above imply that women have attended mosques from the birth of Islam and were part of the main mosque space without separation for a long time after the era of the prophet, though, the literature is often vague about exact venues and the activities of women are rarely detailed. However, the shift to a dedicated space for women in mosques can be seen in the following reports.

The first mention of a dedicated space for women in the mosque is found in the 8th century in a report transmitted from the early Medinian historian Ibn Zabala (a student of Malik ibn Anas). The report described the expansion of the Prophet's Mosque ordered by the Abbasid Caliph Al-Mahdi in 777–78

1 Katz states that at that time in Egypt, it is reported that the sister of the prominent scholar al-Muzani is said to have attended the study circle of al-Shafi, which was held in the main mosque of Fustat. There was no suggestion of a clear separation of the women space then. Also, the prominent preacher Umm al-Khayr al-Hijāziya, for instance, appears to have been active in the Friday mosque (Katz, 2014).

AD, and referred to as 'women's arcades' (ءاسنلا ءفيس) at the back of the enclosed courtyard of the mosque.² Moreover, in the 9th century in the Spanish Umayyad Caliphate, it is reported that a roofed arcade was built at the back of the Great Mosque of Cordoba specifically as a space for women's prayer called the 'Maqsura'³. The mosque also had doors specially designated for women, although fewer than those allocated to men. However, as Katz suggests, the use of 'maqsuras' to separate women from men in congregational prayer was still neither uniform nor completely uncontroversial (Katz, 2014, p. 137).

Under the Seljukian Kingdom in the early 11th century, the Great Mosque of Isfahan (Jame Mosque of Isfahan) has seen the construction of a dome behind the north-west wall. Anecdotes mention that this was the prayer hall dedicated to the wife of the Sultan Malak Shah, 'Turkan Khaton'. It is not clear if the dedication of this space intended to facilitate gender separation or it was implemented for security reasons (Tarim, 1999, p. 170). By the 14th century, some North African mosques offered women's space that appears to have been architecturally more separate from the main prayer space. Women were allocated some designated spaces in the mosques of Fez and the Kairouan's mosques. The Great Mosque of

had a women's prayer room (called bayt al-nisa' - ءاسنلا ءيب) at the back of the courtyard with its own exterior door; the mosque had two small doors reserved exclusively for the use of women, as compared to fifteen larger ones for men (Katz, 2014, p. 142). Similarly, in 15th century India, an enclosed platform known as 'zenana,' or ladies' gallery, started to be included in early Indian mosque architecture at Gujrat's mosques, such as: the Jami Mosque, the Rajapur Mosque, Ahmad Shah Mosque, and the Kapadwanj Jami Mosque (Imam, 2000, p. 23, 36).

In the 16th Century's Ottoman Egypt, clearly separating or removing the women's prayer space seems to have been a common practice in Cairo's Mosques. As Tarim (1999) argues, this new Ottoman architectural tradition may have been inherited from their ancestors, the Seljuk (Tarim, 1999, p. 171). This coincides with what some European visitors to Egypt in the Ottoman period stated: that women did not go to mosques in contrast to the evidence from the preceding period of the Mamluk sultanate. It is unclear whether this view reflects an overall change in Egyptian women's habits, the distinctive practices of the women of the predominantly Ottoman elite, or simply the misconceptions of ill-informed outsiders (Katz, 1999, p. 157).

A clear ban on women's attendance in mosques (or certain parts of the mosques) was seen in the 19th Century in India, Pakistan and Bangladesh with the decline of the Mughals and the coming of the British. Researcher Ziya Us Salam (2019) suggests that this phenomenon may be attributed to increasing conservative, orthodox influence that generally called for avoiding areas of doubt and suspicion in religious matters to avoid any possibilities for sin (i.e., there was a fear of immorality between the sexes as a consequence of women praying in mosques). To that point, many mosques in those regions are still out of bounds for women users (Salam, 2019).

2 Katz implies that the 'women's arcades' (ءاسنلا ءفيس) predated the Caliphate Al-Mahdi's enlargement of the mosque. It is unclear when these arcades began to be used specifically to accommodate women or how long this use remained customary; later descriptions of the mosque do not mention special spaces for women (Katz, 2014).

3 The space called 'maqsura' in general was understood as an innovation of the early Islamic period, introduced by Umayyad rulers to protect themselves from hostile subjects. (Katz, 2014).

Women's Prayer Space—Other Influences

In parallel, women's right of entry and use of the mosque has seen a number of meta-literary disputes and theological, legal claims among Muslim scholars after the time of the Prophet (Katz, 2014; Salam, 2019; Rasadi, 1999; Ouda, 2016; Kahera, 2009). The interpretation of a small number of hadiths concerning women's use of the mosque has dominated those debates (Ouda, 2016, p. 46). These often revolve around the Prophet's Muhammed's suggestion of assigning a special door for women in the Medina Mosque; others take clues from sayings attributed to Aisha, the wife of the Prophet, and Umar Ibn Al-Khattab (the Prophet's companion and the second Caliph in Islam) in certain situations related to women's mosque attendance and the preference for them to pray at home (Al-Khalifa, 2017; Al-Qasemy, 1979, p. 224; Ouda, 2016, p. 43; Sadlan, 1999, p. 17; Wanely, 1994). Key aspects of these different opinions are based on the assumption of difficulty that some women might face if they went to the mosque regularly, especially at the Friday congregation (Al-Jadid, 1999; p.120). Some were concerned with the safety of women on their way to the mosque, while others voiced concerns related to the idea of avoiding public mixing between the sexes as best for the general Muslim population (Al-Jadid, 1999; Katz, 2014, p. 89; Ouda, 2016, p. 37; Sadlan, 1999).

Briefly speaking from those fragmented references above, the evolution of women's prayer space in mosques seems to revolve around three main, distinct, mutually exclusive attitudes: 1) the desire to continue to adopt the model of the early version of the Prophet's mosque, 2) the preference to dedicate distinct, enclosed spaces for women in mosques, and, 3) the desire to eliminate all women's spaces in mosques. This evolution is noticeably non-linear and has shown many variations in different geographic regions under Muslim rule. It is not fully clear whether the evolution of women's prayer practices, and accordingly their spaces, reflects an overall change in Muslim women's habits in those regions, changes brought by the successive ruling kingdoms, changes in the cultural hegemony of those different societies, or whether the evolution of women's prayer practices is due to changes in religious legal views about women praying in mosques. The answers for these inquiries are far from conclusive, but it can be observed that from the early 1900s in many Muslim regions, it became a commonplace practice to have a clearly (often enclosed) dedicated place for women in the mosque fully separated from the men's prayer hall. This habit has become central to the mainstream approach to mosque design in the modern world and has become a key condition of contemporary mosque design and building regulation.⁴

The Contemporary Building Guidelines for Mosques

The practices that were developed since the Prophet's mosque in Medina for women's prayer space and the jurisprudential debates around them have amalgamated to make some degree of consensus about the contemporary standards of their design, which in turn have become evident in many of the building regulations and codes of various Islamic regions (Ibrahim, 1979; Al-Jadid, 1999, 2006; Qatar National master Plan, 2017; Saudi Mosque Building Code, 2020; UPC, 2013). The section below presents a synthesis of various contemporary guidelines for the design of women's prayer space in mosques.

4 A few Mosques are currently tending to fully prohibit women from attending mosques, especially in India, Pakistan, and Bangladesh due to certain socio-religious views, as Ziya Us Salam (2019) mentions in her book *Women in Masjid: A Quest for Justice*. While this runs counter to the experience of the many women who attended the Prophet's Mosque – with the Prophet himself in attendance – this is a development that is out of the scope of this paper.

It builds upon different planning guidelines for mosques in some Muslim regions including Abu Dhabi, Al Doha, and the Saudi mosque building codes as well as the works of the researchers: Mohamed Hassan Nofel (1999) and Ahmed Mokhtar (2010, 2019), which have been extensively used in informing those codes. The key points that those codes often iterate are: the segregated prayer hall, segregated access and facilities, as well as some guidance on the size of the space in relation to the main prayer hall.

a. The Segregated Prayer Hall:

Mosques building guidelines vary in different forms but often advise that males and females should pray in separate spaces or in separate zones within the same space (when praying in the same place, these guidelines often refer to this point as 'per Sunnah'). This advice is always followed by a guideline that women should be separated by a kind of barrier (a curtain/screen/mashrabeya) from the rest of the prayer room to ensure privacy (Mokhtar, 2019; Sadlan, 1999; Al-Jadid, 1999, 2006). There is also often a mention that in all cases, the women's prayer area shall not be visible from the outside, whether from outside the mosque or from the men's prayer area (Qatar National Master Plan, 2017; Saudi Mosque Building Code; 2020).

b. Segregated Access and Facilities:

The different guidelines almost all agree on the guidance that the entrance of the women's prayer area should be independent and away from the men's entrance (Mokhtar, 2010, p. 255). They advocate the principle that the worshippers' (men and women) movements to and from the mosque should be totally separated without any connection between them in order to provide gender privacy. In addition to segregated access, design guidelines often suggest clear separate facilities for each gender: ablution spaces, restrooms, shoe racks, etc. (Mokhtar, 2010, p. 254).

c. Size of Space:

On the other hand, these codes provide some guidance regarding the size of the space of the women's prayer hall. Building codes tend to advise that female prayer and ablution spaces may be relatively smaller than the main (male) praying space. The exact percentage varies from one guide to another, generally between 10% to a rare 40% of the total number of users of the mosque (often including in it the number of children attending the mosque) (Mokhtar, 2019). This guidance is based on the idea that females are assumed to come to the mosque less, based on the fact that attending Friday congregational prayer is not compulsory for women, that female users do not pray during menstruation, and a generally-accepted view that praying at home is more preferable for women, freeing them of the obligation of praying in a mosque, ensuring that they could remain at home to care for children without feeling discouraged (based on an understanding of a certain hadith with a similar meaning).

The guidelines above seem to provide the main recipe for contemporary mosque design. The repetition of the same guidelines in many building codes in various Muslim regions has helped in making a uniform formula for designing mosques and consequently the women praying spaces in it: a multipurpose hall, often dedicated to male users, where the women praying halls are usually regulated to a mezzanine, a basement, or to a screened space in the back of this praying hall. The next section will look at the application of this widely-


5 In the report 2017 (معايير بناء المساجد), the recommended ration is 5% of the total space to be allocated for women.

accepted design formula in some contemporary mosques, reading through them the commonplace functional and spatial experiences of the women users in the mosque.

Analysis of Examples of the Women Praying space in Contemporary Mosques




The chosen examples for this analysis combine a sample of contemporary mosques from different regions and scales as well as varied approaches to mosque design: some are more conventional while others are more radical (mainly in terms of form and aesthetics). The reason for this relatively broad range is to see a variety of approaches to the design of spaces dedicated to women and also to allocate any recurring patterns in these variant examples. The analysis looks at the different functional and spatial experiences of both men and women in the mosque: the approach and access experience, the entry experience, the transition and threshold⁶ experience, the spatial build-up to the centre of events in the building, the size of the women’s hall, and the general functional efficiency of the space.

Margaret Lloyd James/Mosque: A Cross-Cultural Building | 3rd International Conference on Mosque Architecture | Kuwait, 2022
 Women's space: Merzouba (Ref: <http://www.3moscultural.org/>)






	MALE EXPERIENCE	FEMALE EXPERIENCE
APPROACH AND ACCESS	Direct access from the outside to the main mosque structure through an arched semi-shaded porch Entering the mosque through one of 2 doors (one is central) direct from an arched porch leading to the main entrance lobby	Same approach through the semi-shaded porch Entering the mosque through one door on the side of the main entrance facade (accessed as well from the porch)
ENTRANCE LOBBY	A large entrance lobby accessed by 2 doors direct from the arched porch with shoes storage facilities	A small entrance lobby separated from the men's one by partitions and a door that works also as a stair lobby and also a lift waiting lobby
ABLUTION AND WET AREAS	Not clear in the available drawings but assumed to be in the basement	Not clear in the available drawings but assumed to be in the basement (in this case women are expected to go down first for the wet area, then go up for two floors to the designated praying room)
THE THRESHOLD EXPERIENCE	Stepping from the outside to a semi-covered double height porch Taking off shoes and storing them Entering the mosque through one of the 2 doors to a relatively wide entrance lobby that is around 2m high Stepping inside the main praying space through two other doors to a low height part of the main prayer hall with two central structural columns framing the aisle Moving then into a clearly geometrically defined space, a grand double height volume of the main praying space	Stepping from the outside to the same semi-covered double height porch Taking off shoes Entering the mosque through a side door in the main entrance facade leading to a small entrance lobby that also acts as a stair lobby and a lift waiting lobby The stair leads to another lobby with shoes storage The lobby leads to the women praying space through a side door to semi-geometrically defined mezzanine floor (a 1/3 of the main space) but still with a grand spatial experience looking to the main space (through a screen) but as part of the main spatial experience with a generous height above to the central aisle
EXIT, ENTRANCE LOGISTICS	Through the same 2 entry doors (which are few in relation to the number of people entering and exiting – a common issue in many contemporary mosque (ref. my other paper))	Based on the size of the stair, lift and waiting lobby, it can be argued that the entry and exit experience will see a lot of crowding especially if adding to it shoes storage/recollection as well as the extra circulation up and down from the wet areas in the basement
VERTICAL CIRCULATION	The main praying space is on the ground floor There is a side stair leading to the social facilities in the basement men extra praying area	A medium size stair with a central lift in the stairwell
SIZE & HEIGHT	Full ground floor and part of the basement. Generous (turbid height)	Around a third of the main praying hall size. Generous double height
RELATION TO THE MAIN HALL	Central to the main spatial and volumetric experience	Part of the main spatial and volumetric experience but not central to it
EXPERIENCE OF A DISABLED USERS	No clear data is available but it can be implied that disabled users can use either the main floor through direct access or the basement space through courtyard access.	It is expected that female disabled users will use the lift in the women entrance lobby. The placement of the lift, its size and the size of the stair/lift lobby raise a lot of questions about the practicality of this solution for disabled users

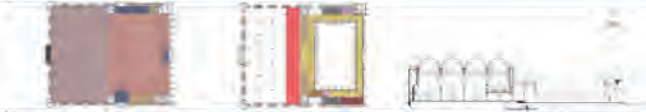
6 Threshold: the architectural elements that is associated with transition and sense of arrival that comes (Porter, 2004). This threshold has been represented in mosques historically in many different ways through its entry experience. Mosque entrances were usually located in a position to lead the people inside the mosque through a shaded entrance followed by the open court (sahn) and finally to the 'riwaq'. Later, the 'majaz' defined this relationship with its high cave-like ceiling and its bent orientation that morphs the city's grid into the qibla direction. Afterward, in the Ottoman era, this threshold has been expressed by moving the courtyard (the sahn) from its traditional central position to become an external transition leading to a domed praying hall (Fathy, 1960s; Gabr, 1992).

All Faith Mosques: Understanding the Spatial Experience - MO Architecture & Design www.moarch.com/2017/07/27/all-faith-mosques/		
		
	MALE EXPERIENCE	WOMEN EXPERIENCE
APPROACH AND ACCESS	Direct access from the outside to the main mosque structure through stair steps, entering through a heavy arcade and wide porch. Entering the mosque through one of 3 doors (one is central) direct from an arcaded porch leading to the main entrance lobby.	Direct entry from the outside to a small external entrance to a vertical core that has a stair and lift. The whole approach experience misses the arcade as the vertical core is at the corner of this arcade and accessed from the outside.
ENTRANCE LOBBY	a large external entrance lobby accessed through the arcade pillars and the main praying hall outer wall. The lobby is the same width as the main praying hall.	There is no proper entry experience. A very small entrance lobby that also acts as a stair lobby and also a lift waiting lobby.
ABLUTION AND WET AREAS	In the basement and accessed through wide outdoor single flight stairs.	In the basement and accessed through the same designated three-flight narrow stair (in this case, women are expected to go down first to the wet area, then go up for two floors to the designated praying room).
THE THRESHOLD EXPERIENCE	Stepping up from the outside on different steps into a heavily built arcaded entry lobby, then through the doors to a double height space to the centre of gravity of the main space under the geometric dome (triple the height of the women praying area at the centre of the main praying area). Moving then into a clearly geometrically defined space, a grand double height volume of the main praying space.	The threshold experience is very limited with the marginalised external entrance leading to the narrow and expectedly crowded vertical core leading directly to a low in height praying space without a transitional lobby. The praying space itself is on the edge of the main volume of the mosque (the main praying space) and away from its centre of gravity under the geometric dome.
EXIT, ENTRANCE LOGISTICS	Through the same 3 entry doors.	Based on the size of the stair, lift and waiting lobby, it can be argued that the entry and exit experience will see a lot of crowding especially if adding to it shoes storage/recollection as well as the extra circulation up and down from the wet areas in the basement.
VERTICAL CIRCULATION	The main praying space is on the ground floor. There are outdoor stairs leading to the basement near extra praying area.	A medium size stair with a central lift in the stairwell.
SIZE & HEIGHT	Ground and basement floors, height is generous in the main space, double height near the entrance and triple height in the main square shaped space under the dome.	Around a fifth of the main praying hall size, (single height).
RELATION TO THE MAIN HALL	Central to the main spatial and volumetric experience.	outside the main spatial and volumetric experience (at the edge of the main space under the entry arcaded area).
EXPERIENCE OF A DISABLED USERS	No clear data is available but it can be implied that disabled users can use either the main floor through direct access (though, they will struggle with the approach steps and the ones under the arcade).	It is expected that female disabled users will use the lift in the women entrance lobby (They will struggle as well with the approach steps). The placement of the lift, its size and the size of the stair/lifts lobby raise a lot of questions about the practicality of this solution for disabled users.

From: Mohammed Sami Alsharif, "The Arab Supporting Bureau, 2011"
Women Space/Masajid


		
	MALE EXPERIENCE	WOMEN EXPERIENCE
APPROACH AND ACCESS	From the street to an outside courtyard enclosed by an arcade, leading to an outside entrance lobby under the arcade into a hypostyle praying hall.	Sharing the same outside arcade but then leading to a side vertical core to the top floor.
ENTRANCE LOBBY	It can be argued that male and female users are sharing the same outside entrance lobby. Though, the female stairs can be accessed directly from the outside while avoiding the courtyard experience.	
ABLUTION AND WET AREAS	In the ground floor in one side of the courtyard arcade.	
THE THRESHOLD EXPERIENCE	Outside to a courtyard surrounded by an arcade, a covered outdoor entry lobby, leading to the main space through a series of doors, walking under the mezzanine, then ending with the generous volume of the hypostyle hall.	A non-central transition experience mainly from the side of the courtyard, leading to the stairs. The upper lobbies are not central to the space. The main praying space is central with a generous height and direct relation to the main volume.
EXIT, ENTRANCE LOGISTICS	A series of doors (11 doors, which is suitable for the expected number of worshippers).	Using the two side stairs to the outside.
VERTICAL CIRCULATION	Triple height, full ground floor.	Double height, a 1/4 of the ground floor size.
SIZE & HEIGHT		
RELATION TO THE MAIN HALL	Central to the main spatial and volumetric experience.	At one side of the main spatial and volumetric experience, (looking over the main space towards the qibla wall).
EXPERIENCE OF A DISABLED USERS	No clear data is available but it can be implied that disabled users can use either the main floor through direct access.	It is expected that female disabled users will use the lift enclosed in the centre of one of the women dedicated staircases. The placement of the lift, its size and the size of the stair/lift lobby raise a lot of questions about the practicality of this solution for disabled users.

Iman Mohammed bin Abdullatif Mosque, Riyadh, Kingdom of Saudi Arabia, Architectural Bureau, June 2011
 (Women Space: Mikzantala)




	MALE EXPERIENCE	WOMEN EXPERIENCE
APPROACH AND ACCESS	From the street to an outside courtyard enclosed by an arcade, leading to an outside entrance lobby under the arcade into a hypostyle praying hall.	Sharing the same outside arcade but then leading to a side vertical core to the top floor.
ENTRANCE LOBBY	It can be argued that male and female users are sharing the same outside entrance lobby. Though, the female stairs can be accessed directly from the outside while avoiding the courtyard experience.	
ABLUTION AND WET AREAS	In the ground floor in one side of the courtyard arcade.	
THE THRESHOLD EXPERIENCE	Outside to a courtyard surrounded by an arcade, a covered outdoor entry lobby, leading to the main space through a series of doors, walking under the mezzanine, then ending with the generous volume of the hypostyle hall.	A non-central transition experience mainly from the side of the courtyard, leading to the stairs. The upper lobbies are not central to the space. The main praying space is central with a generous height and direct relation to the main volume.
EXIT, ENTRANCE LOGISTICS	A series of doors (11 doors, which is suitable for the expected number of worshippers).	Using the two side stairs to the outside.
VERTICAL CIRCULATION	Triple height, full ground floor.	Double height, a 1/4 of the ground floor size.
RELATION TO THE MAIN HALL	Central to the main spatial and volumetric experience.	At one side of the main spatial and volumetric experience (looking over the main space towards the qibla wall).
EXPERIENCE OF A DISABLED USERS	No clear data is available but it can be implied that disabled users can use either the main floor through direct access.	It is expected that female disabled users will use the lift enclosed in the centre of one of the women dedicated staircases. The placement of the lift, its size and the size of the stair/lift lobby raise a lot of questions about the practicality of this solution for disabled users.

KAPSARC Mosque, King Fahad International Airport, Saudi Arabia, Architect HOK, / Built 2014
 (Women Space: Mikzantala) (Ref: <http://www.alfosaiswaind.org/>)



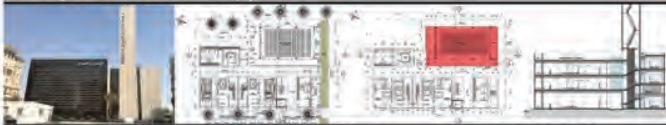
	MALE EXPERIENCE	WOMEN EXPERIENCE
APPROACH AND ACCESS	From an outside geometric plaza to a central entrance by crossing a bridge on an artificial ditch to a central lobby that leads to the main double height praying space.	A side approach crossing over the artificial ditch to an entrance lobby that leads to a stair to the top floor.
ENTRANCE LOBBY	A small lobby but could be considered of good size in comparison to the size of the mosque and centred to the main and side entry points.	A different lobby separated from the main lobby, half in size and centred with the other side entry access.
ABLUTION AND WET AREAS	Outside and separated from the main building.	Outside and separated from the main building.
THE THRESHOLD EXPERIENCE AND PRAYING SPACE	The transition from the worldly experience to the spiritual through the plaza to the bridge, the lobby then the grand volume of the main space.	The transition is more lateral with a side access and entrance lobby to a small stair that leads to the women praying hall that floats like an object in the bigger volume of the mosque (though the visual continuity is cut by a high latticed screen).
EXIT, ENTRANCE LOGISTICS	Through the same 2 entry doors.	Based on the small size of the mosque, the stair - while narrow - can be suitable for the task of entry and exit specially that the wet area is separated outside the main structure.
VERTICAL CIRCULATION	No.	A small stair that seems fitting the small number of users expected.
SIZE & HEIGHT	Full ground floor space, the height is around three times the height of the entrance lobby.	A third of the size of the main hall. And half the height but still generous above (around 2 times the entrance lobby).
RELATION TO THE MAIN HALL	central.	Part of the main hall experience.
EXPERIENCE OF A DISABLED USERS	Access to the main praying area through side ramps leading to the side entrance.	No lift seems to be available for disabled users.

KAPSARC Mosque, King Fahad International Airport, Saudi Arabia, Architect: HOK, Built: 2014
 Women space: Mezzanine / Ref: <https://www.alfouad.com/jah/>




	MALE EXPERIENCE	WOMEN EXPERIENCE
APPROACH AND ACCESS	From an outside geometric plaza to a central entrance by crossing a bridge on an artificial ditch to a central lobby that leads to the main double height praying space	A side approach crossing over the artificial ditch to an entrance lobby that leads to a stair to the top floor
ENTRANCE LOBBY	A small lobby but could be considered of good size in comparison to the size of the mosque and centred to the main and side entry points	A different lobby separated from the main lobby, half in size and centred with the other side entry access
ABLUTION AND WET AREAS	Outside and separated from the main building	Outside and separated from the main building
THE THRESHOLD EXPERIENCE AND PRAYING SPACE	The transition from the worldly experience to the spiritual through the plaza to the bridge, the lobby then the grand volume of the main space.	The transition is more lateral with a side access and entrance lobby to a small stair that leads to the women praying hall that floats like an object in the bigger volume of the mosque (though the visual continuity is cut by a high latticed screen)
EXIT, ENTRANCE LOGISTICS	Through the same 2 entry doors	Based on the small size of the mosque, the stair – while narrow – can be suitable for the task of entry and exit specially that the wet area is separated outside the main structure
VERTICAL CIRCULATION	No	A small stair that seems fitting the small number of users expected
SIZE & HEIGHT	Full ground floor space, the height is around three times the height of the entrance lobby	A third of the size of the main hall. And half the height but still generous above (around 2 times the entrance lobby)
RELATION TO THE MAIN HALL	central	Part of the main hall experience
EXPERIENCE OF A DISABLED USERS	Access to the main praying area through side ramps leading to the side entrance	No lift seems to be available for disabled users

Sara & Me'raj Mosque, Saudi Arabia, Architect: Sarah Allouziqam, Built: 2014
 Women space: a full floor in the second floor




	MALE EXPERIENCE	WOMEN EXPERIENCE
APPROACH AND ACCESS	Direct entry from the outside to the male praying room in the ground floor, other floor is accessed from a covered walk through a side access from the outside	The women praying zone is in the second floor, accessed from a covered walkway in the ground floor through a side access from the outside
ENTRANCE LOBBY	An entry lobby that is part of the praying space, accessed directly from the outside and separated visually and in materiality from the main praying space	An entry lobby that is part of the praying space, accessed directly from an outer generous lobby from the stair, and separated visually and in materiality from the main praying space
ABLUTION AND WET AREAS	A wet area designated for each floor and accessed through a wide lobby and adjacent to the stair	
THE THRESHOLD EXPERIENCE	The threshold experience is relatively limited as the access to the ground floor is direct from the outside. The transition feel happens through the deep entry walls and the entry lobby that shares the same space of the praying hall.	The same threshold experience, only differs in its location on the second floor that is accessed through the stair and a wide corridor
EXIT, ENTRANCE LOGISTICS	two shared stairs (relatively narrow), shared with users of other floors and services	
SIZE & HEIGHT	The ground and first full floors	The second full floor
RELATION TO THE MAIN HALL		Exactly above, same size
EXPERIENCE OF A DISABLED USERS	Direct in the ground floor	Through a lift

KAFD Grand Mosque, Saudi Arabia, Architect: Oricaria Office, Built: 2017
 Women space: Mezzanine (Ref. <https://www.aifosaward.org/>)





	MALE EXPERIENCE	WOMEN EXPERIENCE
APPROACH AND ACCESS	Same experience for men and women users: From the outside plaza to a cave-like outdoor covered arcade that makes the entry lobby leading to a series of double doors to the main praying space.	From the outside plaza to a cave-like outdoor covered arcade that makes the entry lobby leading to a series of double doors to the main praying space.
ENTRANCE LOBBY	Each is at one sides of the mosque in the ground floor accessed from the inside.	Each is at one sides of the mosque in the ground floor accessed from the inside.
ABLUTION AND WET AREAS		
THE THRESHOLD EXPERIENCE	The initial transition from the outside to the inside starts from the plaza to a cave-like outside covered arcade leading to the main praying hall with a lower height that leads to a generous double-height space.	The initial transition/threshold experience is similar. It changes inside where women users are directed to use the side two stairs. The dramatic threshold experience is a bit lost when exiting the main praying hall to the stair/lift lobby spaces leading to the mezzanine floor.
EXIT, ENTRANCE LOGISTICS	Direct from a vast amount of entrance as well as two extra exit doors in the qibla wall.	Through the two main stairs in addition to two extra exit stairs as well as two lifts.
SIZE & HEIGHT	Full ground floor, generous height.	Half the size of the ground floor, half the height.
RELATION TO THE MAIN HALL	central	A mezzanine overlooking the main space, sharing the same geometrical experience of the ceiling.
EXPERIENCE OF A DISABLED USERS	Direct access and use of the ground floor.	Two lifts with generous lobbies are available.

Sancaktepe Mosque, Karagöçü Mithatpaşa Mosque, Turkey, Architect: İsmail Arslan, Built: 2014
 Women space: Ground floor (side) - (Ref. <https://www.aifosaward.org/>)




	MALE EXPERIENCE	FEMALE EXPERIENCE
APPROACH AND ACCESS	stepping gradually from the ground level through a lower level path where the main praying space is allocated. The main praying space is accessed by two distinct doors.	Same experience - though there is a direct access from the beginning of the path to the ladies praying space through a designated door.
ENTRANCE LOBBY	A stepping down (theatre like steps) inside the mosque taking the visitor from the entry level to the lower level of the main praying zone.	Very small transition space from the designated door to the ladies praying space.
ABLUTION AND WET AREAS	Available - accessed from the outside	As the farthest end from the women designated door, next to the men's wet area.
THE THRESHOLD EXPERIENCE AND MAIN SPACE	The threshold effect is created by the change of level from the street level down to the entry level through the stone clad/bed promenade then entering the mosque through the doors to the theatre-like steps down to the main praying space that is higher and more lit from the skylights at the qibla wall. The main space is highly articulated with minimalist sculptural concrete walls and contrasting materiality and natural light drama.	Very limited transition feels from the street level through steps down direct to the ladies' entrance, which is enclosed by two projecting walls, direct to the praying zone - does not have the stepped down approach like the one in the men's zone. The zone is almost fully separated from the main hall experience (except for two small windows in the partition wall) - the space is narrow, secondary and relatively lower in height.
EXIT, ENTRANCE LOGISTICS	Through the same 2 entry doors (which seems plausible in comparison to the size of the mosque).	Same entrance (they also have access to the male doors which will be a longer exit path).
SIZE & HEIGHT	Generous and amplified more by the skylights.	Relatively shorter height as it shares the same roof but higher floor slab. The size of the space is around 1/6 of the male praying zone.
RELATION TO THE MAIN HALL	Central to the main spatial and volumetric experience.	Ancillary to and separated from the main hall but does not share its spatial experience.
EXPERIENCE OF A DISABLED USERS	The available data does not show clear design interventions towards disabled users.	

AL-SAWDA MOSQUE (Jordan, Architect: Sameh Alkhatib Unique, Women space: Mezzanine)		
		
	MALE EXPERIENCE	WOMEN EXPERIENCE
APPROACH AND ACCESS	Access from the outside through a small enclosed outside plaza, leading to a bent entrance direct to the centre of gravity of the main praying room under the dome	Outside access to a side door in an enclosure, leading to a stair lobby
ENTRANCE LOBBY	Bent entrance lobby leading to the main praying space	An outside enclave leading to a narrow stair lobby
ABLUTION AND WET AREAS	In the ground floor, accessed from the outside	In the first floor, accessed from the stair lobby
THE THRESHOLD EXPERIENCE	A gradual experience, magnified by the bent entrance, leading to the central praying space under the dome	A marginal transition experience from the outside to the small entrance and the stair. The transition experience improves slightly on the top floor with a bent entrance lobby leading to the praying zone.
EXIT, ENTRANCE LOGISTICS	The entrance door and an exit side door	Through the stairs to the ground floor
VERTICAL CIRCULATION	The male praying area is only in the ground floor	Through a stair
SIZE & HEIGHT	Full ground floor with a generous height (triple the height of the women space) in addition to the height of the dome in the centre	A third of the main space, and a third of the main space height
RELATION TO THE MAIN HALL	central	Side and marginal, given that the women praying space is on one side of the qibla wall. The women praying hall is overlooking the volume of the main hall from the side
EXPERIENCE OF A DISABLED USERS	Direct in the ground floor	Not available, given that the space is in the first floor with no lift available

Sana @ the Taj Mosque, Saudi Arabia, Architect: Saleh Alkhalidan, built: 2019 (Women space: a full floor in the second floor)		
		
	MALE EXPERIENCE	WOMEN EXPERIENCE
APPROACH AND ACCESS	Direct entry from the outside to the male praying room in the ground floor, other floor is accessed from a covered walk through a side access from the outside	The women praying zone is in the second floor, accessed from a covered walkway in the ground floor through a side access from the outside
ENTRANCE LOBBY	An entry lobby that is part of the praying space, accessed directly from the outside and separated visually and in materiality from the main praying space	An entry lobby that is part of the praying space, accessed directly from an outer generous lobby from the stair, and separated visually and in materiality from the main praying space
ABLUTION AND WET AREAS	A wet area designated for each floor and accessed through a wide lobby and adjacent to the stair	
THE THRESHOLD EXPERIENCE	The threshold experience is relatively limited as the access to the ground floor is direct from the outside. The transition feel happens through the deep entry walls and the entry lobby that shares the same space of the praying hall.	The same threshold experience, only differs in its location on the second floor that is accessed through the stair and a wide corridor
EXIT, ENTRANCE LOGISTICS	two shared stairs (relatively narrow), shared with users of other floors and services	
SIZE & HEIGHT	The ground and first full floors	The second full floor
RELATION TO THE MAIN HALL		Exactly above, same size
EXPERIENCE OF A DISABLED USERS	Direct in the ground floor	Through a lift

Sancaktepe Mosque, Karagöze, Mithatpaşa Mosque, Turkey, Architects: Emre Arolat, Built: 2014
 *Women space: Ground floor (side) – (Ref: <https://www.algasmaword.org/>)



	MALE EXPERIENCE	FEMALE EXPERIENCE
APPROACH AND ACCESS	stepping gradually from the ground level through a lower level path where the main praying space is allocated. The main praying space is accessed by two distinct doors	Same experience – though there is a direct access from the beginning of the path to the ladies praying space through a designated door.
ENTRANCE LOBBY	A stepping down (theatre like steps) inside the mosque taking the visitor from the entry level to the lower level of the main praying zone	Very small transition space from the designated door to the ladies praying space.
ABLUTION AND WET AREAS	Available - accessed from the outside	At the farthest end from the women designated door, next to the men's wet area
THE THRESHOLD EXPERIENCE AND MAIN SPACE	The threshold effect is created by the change of level from the street level down to the entry level through the stone clad promenade; then entering the mosque through the doors to the theatre-like steps down to the main praying space that is higher and more lit from the skylights at the qibla wall. The main space is highly articulated with minimalist sculptural concrete walls and contrasting materiality and natural light drama	Very limited transition feels from the street level through steps down direct to the ladies' entrance, which is enclosed by two projecting walls, direct to the praying zone – does not have the stepped down approach like the one in the men's zone. The zone is almost fully separated from the main hall experience (except for two small windows in the partition wall) – the space is narrow, secondary and relatively lower in height
EXIT, ENTRANCE LOGISTICS	Through the same 2 entry doors (which seems plausible in comparison to the size of the mosque)	Same entrance (they also have access to the male doors which will be a longer exit path)
SIZE & HEIGHT	Generous and amplified more by the skylights	Relatively shorter height as it shares the same roof but higher floor slab. The size of the space is around 1/6 of the male praying zone
RELATION TO THE MAIN HALL	Central to the main spatial and volumetric experience	Auxiliary to and separated from the main hall but does not share its spatial experience
EXPERIENCE OF A DISABLED USERS	The available data does not show clear design interventions towards disabled users	

Observations

Looking at common practices of mosque design in the examples above, we will find that the majority of the designers tended to follow what can be called the pan-culturally accepted recipe of women-space in the mosque. The ingredients of this recipe includes separating the ladies' prayer space in an enclosed space allocated to a mezzanine or separate floor. It also assumes the need for segregated access by a dedicated entrance and facilities away from those to the men's prayer hall with a clear aim for the protection of privacy of female users. More specifically, in terms of approach and access: the men's experience can be described as direct and central to the main event in the building. The prayer hall uses architectural elements that create a gradual approach: stair steps, courtyard, porch, arcades, etc. In turn, the common practice in most of the examples was that the women do not have a grand approach and entry experience. They tended to access the building from the side or on an opposite end, that is often further away from the main entrance, and sometimes through a circuitous route to avoid interaction with the men's space and approach. Still, some mosques have deployed the same approach experience and access routes for both men and women and then divided them inside the entrance lobby. In some cases, the women's entrance was external, away from the main entrance and approach, and leads directly to a vertical core that ends at the women's zone. In those examples, the entrance lobby, when separate from the men's lobby (which seemed more common), tended to be smaller in size and shared its function with a stair landing and the lift waiting area.

In terms of the threshold and main space experience, the men's experience was grand and dramatic. Their experience often involved walking the worshippers through a series of spaces that bring many sensory changes to prepare the soul for the spiritual act of praying: coming from the worldly outside, stepping up through external steps to a courtyard or an arcade that changes the feel of light and shadow, then stepping up to an entrance lobby to the beginning of the main praying zone. This is curated by employing all the needed architectural

elements that can allow such spatial, sensory, and spiritual experience to happen such as: change in height, elevation, volumes, light and shadow, and materiality. Then the grand finale occurs when reaching the main prayer hall: the symbolic centre of gravity and the climax of the architectural experience. In comparison, unless the women's prayer space was in the same main space or approached from inside the main space, the female users of the mosque often missed the whole transition and threshold experience. Their experience was more direct and sometimes associated with circulation complications: narrow stairs, where those who are entering and exiting may clash, crowds at the stair and lift lobby, many steps to and from the wet areas, etc. Additionally, the transition from the outside to the inside in many cases ended with a disappointing climax: a narrow lobby leading to a less geometric space, away from the symbolic centre of gravity in the main volume, low in height, and shielded by screens from looking directly over the main space.

In terms of size, the women's spaces in those mosques were often smaller in their capacity, based on the idea that fewer ladies come to the mosque as they are not obliged by Islamic ruling to pray at mosques and especially Friday's congregation prayer. This, however, can be considered a kind of biased statistic as it also may imply that the design of the mosque is less inviting, which in turn discourages this specific user-group from attendance. In the small sample analysed, the women's prayer hall varied in terms of area from a sixth of the main space size to a rare 50% of the space in one of the examples. Accordingly, the women's prayer spaces in many of the examples appeared secondary or ancillary in the architectural composition in relation to the main praying hall that is dedicated to men, and marginalized to the experience of the dominant spatial quality that the architect created for the main hall.

In terms of wet areas, many of the mosques allocated the women's wet area outside the mosque, the ground floor, or in the same floor where the women's prayer area is located. Still, another common practice was to put the wet areas in the basement. In this case: women are expected to go down first to the wet area, then traverse up two floors to the designated prayer room. This experience becomes more complex if putting into consideration the needs of a disabled user.

In brief, while it is difficult to identify a generalised claim against the majority of contemporary mosque approaches, still, the analysis above brings some important insights about norms regarding the design of women's spaces in contemporary mosques and the implications of some of those norms on the experience of this key user-group. The clear observation that can be inferred from this analysis is that the whole experience of women in many of the common practices of mosque design can be described roughly as more inferior in quality and efficiency than the male experience. In many places, this experience was associated with functional complications, impracticality, as well as a lack of a grand spatial and sensory journey that can be found for the male users.

Other Factors

The issues above are magnified more when adding the everyday element to these spaces (Eskandari, 2011). In practice, the women's prayer space should fulfil the function of hosting the five daily prayers as well as the Friday congregational prayer. They also should provide space for other prayers such as 'taraweeh', 'tahajod', funeral prayers, in addition to study lessons, Ramadan breakfast (*iftar*), marriage ceremonies, and celebrations, to name a few. These different functions have their certain particularities as well; from the logistics of organizing the entry, movement, and exit of a large number of people in short

periods of time, specific requirements must be met, such as avoiding crossing in front of other praying people, the logistics of shoes storage, the proper egress out of the mosque after congregational prayers, as well as the management of certain prayer requirements, such as for those who may need special assistance (e.g. praying on a chair) or those who have children with them. These may also include the logistics of a second 'jama'ah' for those who came late to the formal praying time without interfering with other praying people, or accommodating those who want to leave immediately after the prayer.

However, incidents of large crowds and tightly-packed women's prayer spaces are often evident during Ramadan night prayers, Eid prayers (when done inside the mosque), and in many Friday congregations in places that women are used to witness (Suratkon, et al., 2017, p. 5, 6). These everyday instances are commonly provided for through improvised solutions developed by those who are praying or by a mosque's management—which obviously lack the ability to implement specialized architectural interventions to address these issues. In many cases, this leads to women praying in limited leftover spaces: hallways, balconies, anterooms, etc. that cannot either be extended if the privacy condition is to be fulfilled (Salam, 2019). Additionally, as it is a social convention in many Muslim societies that the responsibility of dealing with children in the mosque is often delegated to ladies, these spaces regularly exceed their rated capacity and become unsuitable for the use and safety of its users (Utaberta, et al., 2018, p. 6). Examining the women's prayer space from this perspective, we can see how the daily experience of this user-group is very different from the neat architectural design schemes and the sterilized photos of the built environment of contemporary mosques. These spaces are not designed to accept a large number of users, such as when many women decide to attend the mosque at the same time, and the complexities associated with the everyday use of a mosque (Eskandari, 2011).

Conclusions

The previous discussion raises clear questions about the suitability of the common practices of the design of women's prayer spaces to achieve the main goals and objectives of the mosque as a building for those dedicated users, in terms of functionality, spirituality and spatial equity. The observations above imply a clear issue of 'design equality' in regard to the common practices of the design of women's prayer spaces in contemporary mosques. While the entire issue arose and was quickly solved with an easy, straightforward architectural solution as seen in the Prophet's Mosque in Medina, which, with the Prophet's direction, facilitated spatial segregation; segregation has become now the norm and a central criterion in mosque building codes and guidelines in Muslim regions. The desire for spatial segregation seems to be the key issue that has led to many design complications. The word 'segregation' is multi-faceted and can be understood from different points of view which can carry both positive and negative connotations: privacy and protection on one side, and discrimination and excessive male-domination on the other. But, women's views about segregation also vary: some women are more accustomed to segregated arrangements or have a clear preference for them (believing that such arrangements are more private and secure); whereas some women's activists see segregation of women in mosques as a kind of discrimination and not following Sunnah's guidance, the activists regard spatial segregation as a form of discomfort, repression, and bias because it does not allow women to have a more complete level of participation in the congregation and does not encourage social inclusion, violating the Quranic injunction that men and women are equal; a third group favours partial segregation by means of a screen that has built-in flexibility (Kahera, 2009; Snijders, 2019, p. 37, 63).

In these debates, mosque architects find themselves in the middle of two main paths: 1) one path advocates the following of Sunnah, based on the configuration of the Prophet's mosque in Medina at his time, which assumes that women should worship in the main space of a mosque, praying at the back in rows, behind men and children without a barrier, and 2) the other path is based on the prevailing meta-literary views some by Muslim scholars and the prevailing social attitude in some regions that seek to 'protect' the women's prayer space from mixing with the men's space. The latter is more prominent in many of the building codes regarding mosques and therefore has manifested itself more in contemporary mosques. The repetition of the same guidelines in various building codes has given the impression that these are decisive directions for design and are based on conclusive wording of certain religious rules, which is not exactly the case. By following this recipe, a great deal of functional, spatial, and socio-political problems have arisen, bringing with them claims of inequality in terms of spatial quality, functional inefficiency, and a broader challenge to the idea of Islamic social inclusion. Those problems may have also emphasised a perception that mosques are designed as male-dedicated spaces, and hence may have helped in giving credence to certain claims, such as that Islam 'marginalizes' or 'isolates' women.

These disputes have put architects in a dilemma, having to make a choice between following the norms: the commonplace guidelines and socio-cultural practices on one side, or to take on their responsibility toward a certain user group of the building by clashing with those norms, breaking spatial stereotypes, and the issues of spatial discrimination those stereotypes may have given rise to. The straightforward 'architectural' answer to this dilemma seems to be in a new critical reading of the original Prophet's Mosque in Medina in the seventh century as the fundamental historical precedent which, in essence, transcends all mosque design, but in this new reading of the Mosque, looking for clues that point to social inclusion and spatial equality. This new focus should be based on making *all* the users of the mosque central to the mosque's spatial and functional experiences. Building on this new reading of the original model, mosque architects should review the actual contemporary needs of women's space and imbuing that space and the design of that space with a sense of the high priority it deserves when approaching any new mosque project, rather than the all too typical 'broom closet' treatment of the past, with notable exceptions such as the Prophet's Mosque, which the Prophet himself helped build, and other exceptions. In addition, it is also important to complement this critical reading with an understanding of actual contemporary requirements of female users of the mosque through consulting representatives of this user-group when a community decides to construct a new mosque, and involve them in the design and planning process. And finally, it is central to this new reading to incorporate the functional complexities associated with everyday routines of women in the praying space, so that any space dedicated to women becomes an integral part, not just for the functional approach, but also for the entire formal and spatial concept of the mosque.

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دور شبكات التجارة في تنقل الفنون والعمارة في بلاد الإسلام - عمارة المآذن نموذجاً

ابراهيم ابن يوسف
الجزائر

المقدمة

في ظل الإسلام نشأت حضارة قائمة على التبادل والتجارة جعلت من أرض الإسلام مركزا لعبور شبكات تجارية تربط أوروبا وأفريقيا غربا وآسيا شرقا. ومن ذلك : طرق الحرير وطرق التوابل وطرق الذهب. نظام التبادل وما جناه من ثروات أسس لحركة عمران وعمارة وعلوم وفنون قوية.

ولم يكن يقتصر التبادل على الاقتصاد وإنما كان يشمل كذلك التبادل الثقافي والعلمي والفني زيادةً على تنقل الدعوة. حيث نفعت تلك الشبكات لتنقل العلماء والدعاة والفنانين زيادةً على التجار. وكانوا كلهم من يصطحب تلك القوافل. كما أفاد التبادل علوم الجغرافيا والبحارة والفلك لما لها من ضرورة لضبط المسالك. كما نفعت تلك الشبكات ثقافة التفتح نحو الآخر وبناء الجسور مع الثقافات الأخرى.

وقد سهلت تلك الشبكات الكشف عن العمارة المحلية التي نشأت محليا في الأقاليم وعند الجماعات المحلية. وهي عمارة شعبية غير رسمية وبدون مهندس تتوارث من جيل إلى جيل، وتتمو في ظل المناخات القاسية والقاحلة، في جهد مستمر ومتواصل للتغلب على المناخ المتقلب والقاسي و على ظروف الجفاف ومنها: عمارة الجبال والصحاري والواحات، إلخ. حتى لو أولى المؤرخون أكبر قدر من الاهتمام للعمارة الرسمية الضخمة، فإن مساهمة العمارة المحلية تستحق الاعتبار والتوثيق ولها فضل إثراء العمارة الإسلامية لتمييز وتمتاز بالوحدة والتنوع.

في هذا السياق يندرج هذا البحث الذي ينطلق من تساؤل حول دور الشبكات التجارية في تنقل العمارة والفنون، من جهة وحول دورها في إبراز سياقات العمارة المحلية من جهة أخرى، من خلال نموذج عمارة المئذنة الهرمية. فهو شكل معماري نادر إلى حد ما يمكن العثور عليه مع بعض الاختلافات، في مناطق تقاطع مع الشبكات التجارية سواءً في واحات مزاب (جَنُوب الجزائر) و في إفريقيا (النيجر ومالي) و في واحات سيوة (جَنُوب شرق مصر) وفي واحات دومة الجندل بالمملكة العربية السُّعودية. وهي تختلف عن معظم أنماط المآذن، وهي عمارة ينفرد بها عالم الواحات والمسالك التجارية الصحراوية.

أهداف ومنهجية البحث

البحث ذو طبيعة تاريخية، يحاول الغوص في جغرافية المئذنة الهرمية وديناميتها في التاريخ، من أجل اكتشاف الروابط المحتملة بين جغرافيا التجارة وجغرافيا العمارة و الفنون.

المنهجية تقوم أساسا على المنهج التاريخي الوصفي والتحليلي للتعرف على المآذن الهرمية ووصفها وظروف نشأتها وتطورها. وذلك بالتنقيب على المصادر المؤهلة وخاصة كتب المسالك والممالك وأدب الرحلة التي تناولت الموضوع وخاصة منها ما تعلق بتلك القرون وبذلك البقع. وبعد التنقيب يتم التنقيب والمقارنة للتأكد من جدوى الرواية وبعدها ننتهي الى مرحلة التحليل واستنباط الخلاصات. تساهم كذلك بعض الدراسات الحديثة في الموضوع في منهج المقارنة. واعتبارا للبعد المكاني والشكلي للموضوع فقد تم الاعتماد كذلك على المراجع الأيقونة : ومنها الصور وكذا الخرائط، فيما يخص البيانات المكانية وكذا التوثيق الخرائطي.

وقد انطلقت الاشكالية بالتساؤل حول دور شبكات تجارة القوافل في انتشار الفنون وتبادلها في العالم الإسلامي، المأذنة نموذجا وعينة لذلك. نقترح بعدها فرضيات مفادها 1. أن لشبكات التجارة باع طويل ودور كبير في انتشار الفنون والثقافة، نظرا لكونها رسخت لثقافة التبادل وكانت تدوم رحلاتها طويلا، بما يسع الإنسان النهل من كل محطة يمر بها. وبما أن القوافل كانت تتكون علاوة على التجار، من علماء ودعاة، ولكل منهم وجهة وغرض. 2. تكون المآذنة الهرمية فد انتشرت في الأوساط الواحاتية وجاءت كلها في مسالك التجارة، ما يعزز فكرة انتشارها عبر تلك الشبكات.

صعوبة البحث في تاريخ الفن

غالبًا ما يواجه البحث التاريخي في العمارة مشكلة غياب التأريخ، ما يترك المجال للاجتهاد في ضبط ذلك، باستثناء العمارة الرسمية التي يصنعها المهندسون المعماريون تحت إشراف السلطان. كما يواجه البحث مشكلة التغيرات التي تطرأ على المبنى تحت تأثير تقلبات الطبيعة ودمار الحروب أو حتى التعديلات الناتجة عن المنافسة بين أهل السلطان. وكل هذا من شأنه تعقيد عملية التأصيل.

إشكالية التأريخ

إذا كانت العمارة الرسمية التي يصنعها المهندس المعماري وبأمر من السلطان مدعومة بتاريخ مكتوب، فإن العمارة العامية التي تملبها حاجة المجتمع وتتجهها الجماعات وفق معرفة متوارثة تعاني غياب التاريخ المكتوب وتجد الدعم بشكل حصري تقريبًا في التقاليد الشفوية، غالبًا على خلفية الأدب الأسطوري.

إشكالية التأصيل

تدهور البيئة المبنية تحت تأثير عاملين: تقلبات الطبيعة والحروب. العوامل الطبيعية هي أحد الأسباب الرئيسية لتدهور المباني على غرار الزلازل والفيضانات ولا سيما الطمي الذي جرف مدناً يرميها كانت مزدهرة ذات يوم في قلب الصحراء، عندما هجرها سكانها، إثر تحويل المسالك التجارية على وقع التقلبات السياسية، وأما العامل الثاني فهو الحروب التي تسببها صراعات القوة وتسبب في تدمير البيئة المبنية.

إشكالية المصادر

بالنسبة لتاريخ العمارة والعمران، تبقى المصادر الرئيسية بالإضافة إلى التاريخية والجغرافية منها هي أدب الرحلة.

لقد انتقل موضوع الجغرافيا عند المسلمين ابتداء من القرن التاسع من دراسة العالم كله: (صورة الأرض ورسم خرائط الأرض، بما في ذلك: دراسة المناخ وحميته وجوانبها الفلكية وطرق قياسها)، إلى رصد ووصف عالم الإسلام أو دار الإسلام! فأصبح وصف الأماكن والمسالك هو جوهر أدب الجغرافيين والرحالة. منذ القرن التاسع، اكتسبت المسالك والممالك أهمية خاصة، حيث تبرز المسالك كعناصر تربط بين أماكن شاسعة من أرض يوحدها الإسلام ولو تعددت سياسياً. أخذت المسالك أهمية كمرات للتجار والحجاج والدعاة والعلماء والفنانين ولعبور السلع والفن والإيمان والمعرفة. وسع الجغرافيون الأندلسيون والمغاربيون منذ القرن العاشر مفهوم دار الإسلام الذي كان يقتصر على الشرق سابقاً، ليضم الجزء الغربي الذي تم تجاهله حتى ذلك الحين، وإدراج الأندلس والمغرب الإسلامي

1 نشأ وازدهر علم الجغرافيا في بغداد العباسية. وقد ركز اهتمامه في البداية على دراسة نظام الأرض. نال دعم خلفاء بغداد، وسرعان ما احتضنته بيت الحكمة. وقد ازدهر علم الجغرافيا تزامناً مع حركة قوية لترجمة التراث اليوناني وظهور العلماء البارزين الذين برعوا في علم الفلك والقياسات والجغرافيا الرياضية، مثل الكندي (796/873)، الخوارزمي (850/934)، البيروني (973/1050)، إلخ. اهتم عالم الفلك والجغرافي الفزاري (806/746) بشكل خاص في كتابه المفقود والذي استشهد به المسعودي (956)، بحالة ممالك غرب السودان، في سجل حصر فيه المسافات بين الدول حزره في عهد إدريس الأول، مؤسس دولة الأدارسة في المغرب (793/788)

2 كتاب البلدان لليعقوبي وكتاب المسالك والممالك لابن خردادبة (منتصف القرن التاسع)، كتاب المسالك والممالك للإصطخري، كتاب صورة الأرض لابن حوقل وكتاب المسالك والممالك للمهلي، وكتاب أحسن التقسيم في معرفة العالم للمقدسي. وقد كان القرن العاشر هو عصره الذهبي.

ومنطقة الساحل في إفريقيا إلى أرض الإسلام³.

من ناحية أخرى، لم تكن سير الإباضية تهتم كثيرا بوصف الأماكن، باستثناء بعض فقرات في سياق المراسلات وتبادل الآراء في المسائل والمشاورات الفقهية أو في سياق السير الذاتية. نجد فيها معلومات عن التجارة عبر الصحراء من حين لآخر، على سبيل المثال ملاحظة نقلها الوسياني عن التبادل بين تاجرين⁴، أو الملاحظة المنسوبة إلى المؤرخين الإباضيين الوسياني (القرن الثاني عشر) والد رجيني (القرن الثالث عشر) بشأن إلغاء رحلة للإمام الرستمي الثاني أفلح إلى مدينة غاو (بأمر أو توصية من والده عبد الوهاب)، مما يكشف عن الأهمية الاقتصادية لغاو في بداية القرن التاسع⁵.

إشكالية الرواية

فيما يتعلق بالمعلومات الجغرافية المتعلقة بالحركة التجارية عبر الصحراء ووصف الأماكن، تغطي أدبيات الرحلة روايات وشهادات مباشرة للمسافرين الذين زاروا إفريقيا و جنوب الصحراء، بما في ذلك ابن حوقل (ولد قبل 943 وتوفي عام 988) وابن بطوطة (1304/1377). سلك ابن حوقل طريق سجلماسة السودان (أودغوست) عام 951⁶ تمكن مؤلفون آخرون من توثيق معلومات دقيقة بفضل المعلومات التي تم جمعها من التجار والمسافرين والحجاج، إلخ. كتب المؤرخ المصري المهلي (المتوفي 990) بين 975 و 990 عن منطقة كانم وطريقة حياة سكانها. لقد عاش البكري (1014/1094) في إسبانيا فقط لكنه حقق وصفا رائعا للسودان في كتابه المكتمل عام (1068) وذلك بالاعتماد على أرشيفات قرطبة الرسمية ومؤلفات مؤرخ القبرون محمد بن يوسف بن الوراق (ت 973/974)، الذي أنجز عدة كتب لم تعد موجودة⁷.

تبقى الحقيقة أن هؤلاء المؤلفين، بصفتهم حكاما أو أبناء حكام أو مسؤولين أو سفراء أو مبعوثين للأمرء، تأثرت كتاباتهم بولائهم السياسي⁸.

الحركة التجارية عبر الصحراء بين الجغرافيا والاقتصاد والسياسة

في الواقع، بالإضافة إلى أهميتها السياسية، فقد احتلت الصحراء مكانة مركزية في قلب نظام تجارة القوافل الذي ازدهر بين القرنين الثامن والسادس عشر في شمال إفريقيا. ربطت هذه الشبكة إفريقيا جنوبا بمواني البحر الأبيض المتوسط شمالا، مروراً بمدن العبور

3 على غرار: الرازي (في القرن العاشر) و الوراق و البكري (في القرن الحادي عشر) و الإدريسي (في القرن الثاني عشر)، إلخ.

4 راجع روجي بوت ، «شبيكات تجارة الذهب والرقيق عبر الصحراء في أوائل العصور الوسطى: القرنين الثامن والحادي عشر» ، المجلد السابع من عام المغرب ، ص 54. 2011 ، نشر عبر الإنترنت في 01 يناير 2013 <http://journals.openedition.org/anneemaghreb/1106> , DOI:10.4000/anneemaghreb.1106 <https://journals.openedition.org/anneemaghreb/1106#ftn10>

5 تاديوس ليفيكي، «دولة تاهرت بشمال إفريقيا وعلاقتها بغرب السودان في نهاية القرنين الثامن والتاسع». في Cahiers d'études africaines, vol. 2, n°8, 1962, p. 516-; doi : <https://doi.org/10.3406/cea.1962.3255> https://www.persee.fr/doc/cea_0008-0055_1962_num_2_8_3255

6 راجع روجي بوت، المرجع السابق. ص. 34

7 راجع روجي بوت، المرجع السابق. ص. 35

8 تحالف المهلي و ابن حوقل مع الفاطميين في مصر. عمل الوراق و البكري لامويي إسبانيا. كان الإدريسي (1100/1165) و هو عربي أندلسي في خدمة روجر الثاني. وبينما كانت انتقاداتهم للأمازيغ بشكل عام واضحة ، فقد أظهروا موقفاً عدائياً ضد الإباضية الأمازيغ، باستثناء اليعقوبي (ت عام 897). راجع في هذا الصدد: جاك تيري، في كتاب الصحراء الليبية في شمال أفريقيا في العصر الوسيط، لوفن، 1995، ص. 331/330.

الصحراوية سجلماسة وارجلان وتوات وفزان، وربطت المغرب الإسلامي والجزء الغربي من أفريقيا غربا بالمشرق عبر مصر. تقع جميع مدن الصحراء في العصور الوسطى ضمن هذه الشبكة. بفضل الثروة المتراكمة من الحركة التجارية والاقتصادية والثقافية، شهدت مدن الصحراء نموا وتطورا ملحوظا. تمكنت الصحراء أن تتغلب على ظروف طبيعتها القاسية، بفضل تلك الموارد التجارية التي سمحت ببناء البنى التحتية للري وتطوير الواحات. لم تكن طرق الذهب قنوات مناسبة لتتنقل الموارد البشرية والمادية والاقتصادية فحسب، بل كانت أيضا قنوات عبور ثقافية. ولقد فرضت المدن الصحراوية في العصر الوسيط موقعها كحصون للعلم والمعرفة.

بدأ نظام التبادل المزدهر هذا في الانهيار لأسباب عدة، من بداية القرن السابع عشر ليزول كليا تحت وطأة الاستعمار.

عودة الى التاريخ

شهدت تجارة الرقيق فعلاً في العصور القديمة حركة كثيفة نشأت بين الأجزاء الجنوبية والشمالية من إفريقيا، وخاصة عبر نهر النيل، وبعد ذلك عبر الساحل الصومالي⁹. لا تزال الأثار الرومانية في فزان تشهد في العصور القديمة على مرورها عبر المنطقة. أيضاً، تخبرنا الروايات التاريخية عن الجرمنيين (-500 / +600)، هذا الشعب الأمازيغي في فزان الذي تميز فعلاً في الألفية الأولى قبل الميلاد¹⁰. ولكن في العصور الوسطى على وجه الخصوص، تطورت تجارة حقيقية عبر الصحراء بين الأجزاء الشمالية والأجزاء الواقعة جنوب الصحراء من إفريقيا. في عصر التوسع الإسلامي، نالت هذه المنطقة اهتمام الفاتحين. خلال الفتوحات الإسلامية الأولى للمغرب الإسلامي، أفاد المؤرخ ابن عبد الحكم أن قائد جيش المسلمين عقبة بن نافع تمكن من التوغل من مدينة ودان إلى منطقة كوار عبر فزان عام 670¹¹. ولكن لم يتم إنشاء شبكة تجارة حقيقية عبر الصحراء حتى ظهور الدول المحلية ذات السيادة في وقت مبكر من القرن الثامن.

سرعان ما تولد في ديار الإسلام هذا الميل للسفر والتجارة مدفوعاً بالاهتمام بجمع ثروات منطقة شاسعة ومتنوعة ثقافياً وطبيعياً. الرغبة في التجارة دفعت شعوب أفريقيا للوعي بضرورة عبور الصحراء، وتحدي عقباتها وجعلها منطقة عبور ملائمة. من أجل التجارة، تمكنوا بفضل الجمل من تحدي وعبور واحدة من أكثر الصحاري حرارة في العالم، والتي يبلغ عمرها فعلاً عدة آلاف من السنين.

بالرغم من وجود بعض دوائر التبادل المحلية¹²، إلا أنه منذ القرن الثامن تم إنشاء شبكة حقيقية من طرق تجارة القوافل، والتي تربط مدن إفريقيا جنوبا بموانئ البحر الأبيض المتوسط في الشمال، والبحر الأحمر والمشرق شرقاً¹³. شهدت شبكة التجارة عبر الصحراء طفرة حقيقية بين القرنين الثامن والسادس عشر، قبل أفولها في القرن السابع عشر لمصلحة التجارة البحرية الأطلسية وعبر سواحل البحر الأحمر وشرق إفريقيا¹⁴. كانت هذه

9 في الألفية الثانية قبل الميلاد، كان الأسرى السود من بين الهدايا المنتظمة من النوبة إلى فرعون مصر، راجع في هذا الشأن، روجي تيري، المرجع السابق.

10 راجع شيرمر هنري، كتاب الصحراء، باريس، منشورات هاشيت، 1893، ص. 320.

11 راجع كتاب المسالك والممالك للبكري، وقد طبع منه البارون دي سلين قطعة باسم «كتاب المغرب في ذكر بلاد إفريقية والمغرب»، بالجزائر سنة 1857م

12 خاصة تلك المرتبطة بحركات الترحال المنتظمة التي يمارسها السكان الرحل وتبادل التمور التي يتم جمعها في الواحات في فصل الشتاء، بالبذور والمواد الغذائية الأخرى القادمة من التل، والاستفادة من هذه الأسواق لبيع منتجاتهم من الصوف والدهون واللحوم.

13 راجع مارسيل دوريني، كتاب أطلس العبودية، أوترمينت، 2006، ص. 10 و11

14 راجع برنارد نانتي، تاريخ الصحراء وسكانها: من البداية إلى نهاية الإمبراطوريات الأفريقية العظمى، إبيس برس، 2008. و برنارد لوجان، الأطلس التاريخي لأفريقيا، لو روشيه، 2001

التجارة مزدهرة ومفيدة لكل من التجار، والناقلين الرحل والسعاة ولتطور المدن والعمران وبرز الدول. كما كانت أيضاً عاملاً لنشر الإسلام وعاملاً للتبادل الثقافي والفني.

جغرافيا شبكات تجارة القوافل عبر الصحراء

فيما يتعلق بالتجارة عبر الصحراء، فإن المعلومات الواردة في رواية ابن الصغير¹⁵ والمكتوبة لاحقاً حوالي 903/902، حول العلاقات التجارية بين تاهرت وغرب السودان حوالي 780/776 (في عهد مؤسسها والإمام الأول الرستمي)، تكون الأقدم حسب الترتيب الزمني عن التجارة بين المغرب الإسلامي وغرب أفريقيا في العصر الوسيط، سابقة بقرن المعلومات التي وردت عن اليعقوبي حوالي (892/891) في كتابه «كتاب البلدان» عن التجارة بين سجلماسة وغرب السودان، والتي كانت حتى ذلك الحين تعتبر الأقدم¹⁶.

تم إنشاء شبكة كثيفة من مسالك القوافل والسيطرة عليها في بدايتها، بين القرنين الثامن والحادي عشر من قبل الأمازيغ الإباضيين¹⁷. تتكون الشبكة من ثلاث طرق رئيسية في اتجاه الشمال والجنوب، في الجهات الشرقية والوسطى والغربية، تربط موانئ البحر الأبيض المتوسط في الشمال بأفريقيا جنوب الصحراء الكبرى، تتقاطع مع خطوط عرضية تربط المغرب الإسلامي غرباً بمناطق المشرق¹⁸.

الطرق الرئيسية بين الشمال والجنوب

1. الطريق الذي يعبر من طرابلس إلى زويلا و إلى فزان، وينتهي في بحيرة تشاد والنيجر عبر منطقة كوار وكانم¹⁹. وقد يكون أقدم نحو المشرق²⁰.
2. في الوسط، يمر محور تاهرت/كاو (غاو) عبر مدن تنس ومليانة ومسيلية، وكذلك عبر منطقة الزاب، بسكرة ثم ورقلة، ثم عبر وادي ريخ وأخيراً عبر تادمكة (وهي مدينة في حالة خراب، تعرف اليوم باسم السوق) وينتهي الخط إلى غاو²¹.

15 ابن الصغير مؤرخ مالكي عاش في تاهرت في عهد آخر أئمة الرستميين. كتب كتابه حوالي 903/902، بناءً على الشهادات التي يرويها.

ابن الصغير، «تاريخ الأئمة الرستميين في تاهرت» حقق موتيلينسكي منه جزءاً، في أعمال المؤتمر الرابع عشر للمستشرقين، باريس، 1908. وهو يعتبره أقدم وثيقة في تاريخ تاهرت. راجع أخبار الأئمة الرستميين، لابن الصغير، تح: د. محمد ناصر و د. إبراهيم بحاز، دار الغرب الإسلامي، بيروت، سنة 1986.

16 راجع تاديوس ليفيكي، المرجع السابق، ص. 515/516.

17 راجع تاديوس ليفيكي، المرجع السابق، ص. 513.

وراجع شاخت جوزيف، «حول انتشار أشكال العمارة الدينية الإسلامية عبر الصحراء»، مجلة معهد البحوث الصحراوية، العدد الحادي عشر، 1954، ص. 11/27.

وراجع كذلك فيرجيني بيرفوست، «المساجد السودانية، تعبير عن الإسلام الأفريقي»، أكتا أورينتاليا بلجيكا، العدد السابع عشر، دور العبادة في الشرق، بروكسل، 2003، ص. 114.

18 راجع جاك تيري، المرجع السابق، ص. 293.

19 تعود النواة الأولى من هذه الشبكة إلى زمن الجرمنيين (-500 / +600) وهم شعب من الأمازيغ البنائين المشهورين والذين سكنوا أراضي فزان الشاسعة. اجتازوا القسم الذي يربط طرابلس بكانم عبر فزان، الذي يقال إنه واحد من أقدمها فوق عربات تجرها أربعة خيول.

20 ذكر اليعقوبي 872 هذا الطريق الذي يمر شرقاً عبر الزويلة في فزان للوصول إلى السودان والطريق الآخر في الذي يربط غرباً بسجلماسة بأوداغوست. كما ذكر خط عبور آخر من مصر إلى غانا عبر الأبير وكاو (غاو)، تمّ التخلي عنه بعد نصف قرن (راجع ابن حوقل، 1964، 1، ص. 58). راجع كذلك تيري، المرجع السابق، ص. 447؛ وليفيكي، المرجع السابق، ص. 527.

21 ويكون هذا ثاني أقدم طريق تجاري معروف، تم افتتاحه حوالي 776/780 في عهد الإمام الرستمي الأول عبد الرحمن بن رستم، حسب رواية ابن الصغير. راجع ليفيكي المرجع السابق، ص. 531/534. ذكر اليعقوبي (حوالي 891/892) كذلك طريقاً يربط تاهرت بغانا مروراً بسجلماسة وأوداغوست. عُرف هذان المساران بفضل اليعقوبي وابن حوقل والبكري. راجع ليفيكي المرجع السابق، ص. 527.

3.22 في الناحية الغربية، يوجد الطريق الذي يربط سجلماسة بأوداغوست ثم غانا.

الشبكة الفرعية

مع الطرق الرئيسية الأفقية شمال/جنوب تتقاطع مسالك على خط العرض، في اتجاه الغرب والشرق: أولاً على الجهة الشمالية، ثم في الوسط من الصحراء وفي الجهة الجنوبية. تقع على الخط الشمالي للصحراء (سجلماسة، تلبالة، المنيع، ورقلة / سدراته، واحات سوف، واحات وادي ريغ، واحات جنوب تونس، غدامس. في منتصف الطريق بين الشمال والجنوب يأتي خط (أدرار، توات، عين صلاح، فزان وكوفرة). على الخط الجنوبي تأتي مدن (أوداغوست، تادمكة، بيلما، إلخ).

كانت تتغير مسارات المسالك حسب الأوضاع السياسية وقدرة الدول على السيطرة عليها وحمايتها. تخضع وضعية هذه الطرق للظروف البشرية أكثر منها للظروف الجغرافية. فغالباً ما أدت القدرة على حماية الطرق والدفاع عنها إلى إنشاء مدينة أو انقراضها.

لتوفير ظروف الراحة عند العبور، تم حفر الآبار وإنشاء الواحات وبناء المدن. هذا هو العصر الذهبي للمدن / الموانئ الصحراوية، مثل سجلماسة و وارجلان وما إلى ذلك في الشمال وأوداغوست وتادمكة وتوموكتو وغاو وغيرها في الجنوب.

تخلل هذه الشبكة مجموعة من المدن والواحات تؤدي مختلف الأدوار : موانئ استيراد وتصدير في الشمال والجنوب و واحات ومدن وأسواق للعبور

التدفق الثقافي والفني

كانت هذه التجارة مربحة للتجار وحراس القوافل والعلماء و أهل الدعوة وأصحاب الجرف، إلخ. كما كان مفيداً للمدن والاقتصاد والسياسة. من الناحية الثقافية والدينية، تشهد معظم المصادر على مساهمة وتأثير الأمازيغ الإباضيين، الذين كان لهم دور في أسلمة إفريقيا الساحلية²³.

مرت أسلمة إفريقيا عبر هذه الشبكة²⁴. وتمت بشكل سلمي، لأن من قادوها تجار ودعاة وعلماء .

22 ذكر ابن حوقل الذي قام بالرحلة عام 951 هذا الطريق كما ذكره اليعقوبي أيضاً. كانت أوداغوست مدينة كبيرة، وعاصمة مملكة بربر صنهاجة 961/971. كانت لفترة طويلة مفتوح طرق تجاري مزدهر، كان يسكنها التجار العرب وقبائل الإباضية البربرية (فزاوا ولواتا ونفوسة) سابقاً. راجع ليفيكي المرجع السابق، ص. 530. كانت بلدة مبنية على سهل رملي محاطة بأشجار النخيل والحدائق، عند سفح جبل خال من النباتات، اكتشف لانفورغ أطلالها عام 1939. راجع مقالة بيار لانفورغ ، «ملاحظات على أوداغوست، العاصمة السابقة لبربر لمتونة» في مجلة بيفان، يناير / أبريل 1940، عدد2، ص. 217/236.

23 ذكر العديد من المؤلفين موضوع أسلمة إفريقيا على يد الإباضيين، راجع في الموضوع ليفيكي وفراي، إلخ. ذكر الزهري أسلمة مدينة زافون في وقت مبكر من القرن الثامن، حسب مذهب مهمش، بحسب قوله. ويتحدث عنها أبو زكريا في سيره (1106/1107) ويخبر عن أسلمة ملك مالي من قبل داعية إباضي من جنوب تونس. يذكر شاخت أن الإباضية كانت أول شكل من أشكال الإسلام في مالي ودولة السودان. راجع في هذا الصدد: جوزيف شاخت ، المرجع السابق، ص. 22؛ فيرجيني بريفوست (2003)، المرجع السابق، ص. 114.

يشهد معظم المؤرخين على المساهمة الناجحة للأمازيغ الإباضيين في تأسيس هذه الواحات المزدهرة في الصحراء، راجع أيضاً مارسيل مرسييه، الحضارة الحضرية في مزاب، الجزائر، مطبعة فيستر، 1922، ص. 35.

24 جان لويس تريود ،«الإسلام والمجتمعات السودانية في العصور الوسطى». دراسة تاريخية ، باريس / وأغادوغو، منشورات المركز الوطني للبحث العلمي، 1973.

«توسع الإسلام في إفريقيا» ، في مجموعة جارشين جان كلود وآخرون حول موضوع الدول والمجتمعات والثقافات في العالم الإسلامي في العصور الوسطى، في القرنين العاشر والخامس عشر. نشر المنشورات الجامعية الفرنسية 1995، (الفصل الرابع عشر)، ص. 429/397

طاديوس ليفيكي، «دراسات شمال إفريقيا الإباضية. « قائمة مجهولة من مشايخ الإباضية » ، وارسو ، في بانستووي ويدونكتو، 1960 / 1955 ، «بعض المقتطفات غير المنشورة المتعلقة برحلات التجار والدعاة الإباضيين من شمال إفريقيا إلى بلاد غرب ووسط السودان في العصور الوسطى» ، في فوليا الشرقية ، الجزء الثاني، ص.

27/1

أصبحت هذه الشبكة من المدن شبكة يلتقي فيها التجار من جميع الأصول، بل وفرت أيضاً مراكز استقبال لمن جاؤوا للاستقرار جنباً إلى جنب مع السكان الأصليين. يذكر المؤرخ اليعقوبي، في نهاية القرن التاسع (872)، مستوى التعايش في كعوار، بين مجموعة من السكان المسلمين من مختلف الأصول: من التجار الإباضيين الأمازيغ من فزان وجبل نفوسة و ودان، تجار من خراسان والبصرة والكوفة ، إلخ. برزت غاو من بين أقدم المراكز الحضرية في غرب إفريقيا منذ نهاية القرن الثامن، استقبلت السفير الرستمي (بين 864/868) وانخرطت في دائرة التجارة عبر الصحراء. قبل هذه اللفتة الدبلوماسية بوقت طويل، كان هناك فعلاً مجتمع كبير من تجار الإباضية البربر. كانت بلدة تادمكة في منطقة أدرار، التي يحكمها البربر من بني تادمكة، أيضاً واحدة من المراكز الرئيسية في قلب النشاط التجاري، الذي طالما جذب التجار والدعاة الإباضيين الأمازيغ. وُلد أبو يزيد، الزعيم الإباضي المنشق المشهور، هناك بين عامي 880 و885 من أم سودانية، زار والده غاو عدة مرات لأنشطته التجارية، قبل ولادته²⁵.

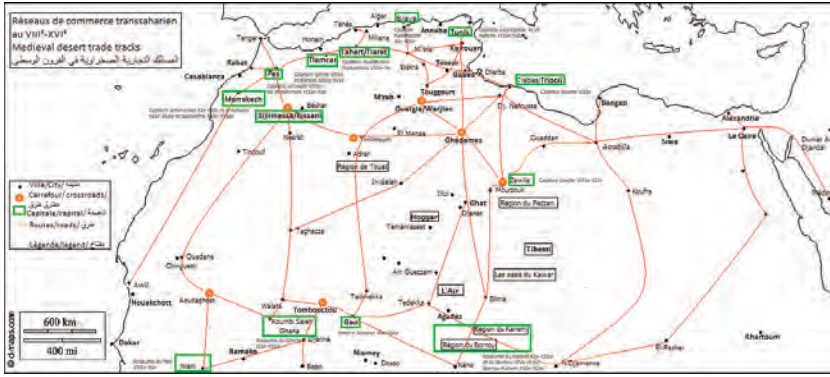
يلاحظ المؤرخ الألماني شاخت التأثير المباشر للإباضيين في نشر أشكال العمارة الدينية في إفريقيا ويستدل بها على أسبقية الإباضيين في نشر الإسلام في إفريقيا. ولدعم أطروحاته، قدم مثلاً على انتشار شكل المئذنة ذات الدرج الخارجي في بلاد السودان و القادم من جنوب تونس عبر ورقلة، و مثالا آخر لغياب المنبر في المساجد في بلاد السودان (لكونها خصوصية إباضية، والتي منذ سقوط إمامة تاهرت، علقت صلاة الجمعة بشرط وجود إمام معترف به، بل ذهب إلى حد استنتاج أن دولة صونغاي تحت إمرة صوني علي بير في القرن الخامس عشر قد تكون إباضية²⁶.

استمر تأثير الأمازيغ الإباضيين، حتى بعد سقوط الدولة الرستمية، من خلال مدنهم الرائعة، التي استمرت في العمل كمدن عبور في سياق التجارة الصحراوية. سدراته، التي يقال إنها الأهم من بين مجموعة من سبع قصور أقيمت في إقليم ورقلة، بلغت أوجها ومجدها في عهد أبو صالح قنون بن إمران في القرن العاشر. تعرضت لعدة هجمات حتى نهايتها في القرن الثالث عشر، أولاً على يد جيش المهدي الفاطمي في بداية الحادي عشر، ثم على يد الأمير الناصر من قلعة بني حماد عام 1075، لتهلك حين غزو حاكم المرابطين لمايوركا يحيى بن غنية لها عام 1229، وقد أضعفتها الخلافات الداخلية حينها. حملت بعدها مدن مزاب المشعل في هدوء وجذبت إليها علماء الإباضية، ولاحقاً في القرن السادس عشر احتضنت طرق تجارة القوافل، مما وضع تأثير مزاب ودوره في المقدمة، بعد مدة من سقوط الدول الإباضية²⁷

25 تتكرر الرواية في معظم الكتب المتعلقة بتاريخ العلاقات بين المغرب العربي والسودان. راجع روجي بوتين، المرجع السابق، ص. 46.

26 جوزيف شاخت، المرجع السابق، ص 11 ء 27

27 فيرجيني بريغوست، «محاولة في تاريخ مدينة سدراته الإباضية»، في ميلانج دي لا كاسا دي فيلاسكيز، 2/38، 2008 ، نُشر في 15 نوفمبر 2010، نشرة رقمية 822/mcv.revues.org



نشأة المئذنة

المئذنة عبارة عن برج مرتفع على جانب أو أكثر من جوانب المسجد، يستخدمه المؤذن للأذان للصلاة، تسمية المئذنة مشتقة من فعل أذن أي نادى إلى الصلاة، ويسمى أيضا بالصومعة، ويأخذ أيضًا تسمية المنارة و المشتقة من فعل أثار الذي يعني أضاء. فهل هي وليدة الحاجة إلى رفع صوت المؤذن عاليا حتى يُسمع في أطراف المدينة وقد اتسعت رقعتها؟ أم أنها تستجيب لضرورة أمنية لتزويد المسجد ببرج مراقبة كما تعنيه تسميتها بالأمازيغية لآساس؟ أم أنها تعبر عن ابتكار معماري؟ أم هي وليدة كل هذه الأسباب مجتمعة؟ المهم أنه في بداية الإسلام صعد بلال المؤذن الأول إلى شرفة المسجد في المدينة ليؤذن للصلاة. ولم تُبنى المئذنة إلا في وقت متأخر جداً خلال العهد الأموي، على ما تبقى من أبراج كنيسة دمشق، التي حولها الوليد بن عبد الملك إلى مسجد كبير، وهو أكبر مساجد الأمويين. (707/714).

نموذج المئذنة الأولى جاء على شكل برج مربع وهو على وجه الخصوص النموذج الذي كان يستخدم على نطاق واسع في شمال إفريقيا. من النماذج الأولى لهذا النمط من المآذن، على الأرجح مئذنة مسجد عقبة ابن نافع في القيروان الذي بُني عام 670، والذي بُنيت مئذنته عام 730. المئذنة على شكل برج مربع مبني من الحجر يتكون من ثلاث طوابق وارتفاع إجمالي يُقدّر بـ31.5 متر. ينخفض سمكها كلما زاد ارتفاعها لتتخذ شكل ثلاث أبراج متداخلة. تنتهي المئذنة في الطابق العلوي بقبة السقف، و يتم الصعود باستخدام درج داخلي.

وأصبح هذا النموذج هو السائد في جميع المساجد الأموية تقريبًا وفي الغرب الإسلامي حيث تطور وازدهرت عمارته. بغض النظر عن أسباب ظهورها، تظل المئذنة ابتكارًا استثنائيًا في العمارة الإسلامية، بمعنى أنها تشكل عنصرًا رائدًا وجديدًا في تصميم المساجد.

تظهر المئذنة الحزونية الملوية لأول مرة كعنصر خاص بالطراز العباسي ومنطقة بلاد ما بين النهرين. ومع ذلك، فهي أقل شيوعًا من المئذنة الأموية ذات البرج المربع. ظهرت لأول مرة في مسجد سامراء، الذي بني عام 848 في عهد المتوكل، في سامراء، وهي المدينة التي تمت تزيينها كعاصمة للعباسيين من 838 إلى 889. تمتاز المئذنة الحزونية كنوع جديد يعطي شخصية خاصة لمساجد بلاد ما بين النهرين. تمتد مئذنة سامراء من الجدار الشمالي بمقدار 27.25 مترًا، وتقوم على قاعدة مربعة طولها ثلاث وثلاثون مترًا وارتفاعها ثلاث أمتار، وترتفع خمسين مترًا فوق القاعدة، وهي مبنية بالطوب المحمص. يتم الصعود بواسطة درج خارجي يدور بشكل حلزوني حول المئذنة، ويبدأ بعرض 2.30 متر ويضيق حتى يصل إلى ما يقرب من متر واحد في الأعلى. على واجهات القاعدة المربعة للمئذنة كوات مجوفة منقوشة في عقود مدببة من الطراز الإيراني.

نجد نفس الشكل الحلزوني في مئذنة مسجد أبو دولاف التي بناها المتوكل عام 859/860، في البلدة الجديدة التي شيدها على بعد خمس عشر كيلومتراً شمال سامراء، على ضفاف نهر دجلة. كانت المئذنة أو الجعفرية بلدة تابعة بناها المتوكل للاحتفال بعهده و تشبه مئذنتها مئذنة مسجد سامراء. يقدم مسجد ابن طولون، الذي بني عام 848 في القاهرة في عهد أحمد بن طولون شكلاً من المآذن ذات التأثيرات المشتركة حيث تتكون من برج مربع ومئذنة لولبية. ترتفع المئذنة شمالاً بين البوابة الثالثة والرابعة بارتفاع 40.44 متراً. تتكون من ثلاث طوابق ذات مختلفة: قاعدة مستطيلة 13.69 متر (شمال- جنوب) و 12.76 متر (شرق -غرب) ومن جزء دائري ومن عمود مئمن. يربط ممر بعرض 3.20 متر المئذنة بسقف الرواق الشمالي للصحن. يتم الصعود بواسطة درج خارجي.

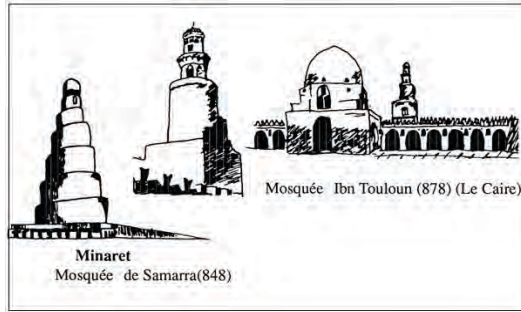
Figure 1. Minaret de la Grande Mosquée de Damas (© auteur)
Minaret of the great mosque of Damascus (© author)
مئذنة الجامع الكبير بدمشق (© المؤلف)



Figure 2. Minaret de la mosquée d'Okba, Kairouan, (© auteur)
Minaret of the Okba mosque in Kairouan (© author)
مئذنة مسجد العقبة بالقيروان (© المؤلف)



Figure 1. Minarets de Samarra et du Caire (mosquée Ahmed Ibn Touloun (© auteur)
Minarets of Samarra and Cairo (Ahmed Ibn Touloun mosque (© author)
مآذن سامراء والقاهرة - مسجد أحمد بن طولون (© المؤلف)



اللامركزية السياسية وظهور الفن المحلي

عقب عهد الخلافة الرشيدة خضعت كل بلاد الإسلام لحكم مركزي تحت لواء الدولة الأموية 661/750 ثم العباسية من بعدها 1258/745. بداية من القرن الثامن ظهرت في المشهد السياسي قُوَى ودول محلية تمردت على الدولة المركزية وفرضت استقلالها.

بدأ الانتشار السياسي بتشكيل دول مغاربية ذات سيادة وحكم ذاتي، أنشأها الإباضيون والصفريون بداية من القرن الثامن، وتشكيل الدولة الأموية الجديدة في إسبانيا بداية من 756. تواصل الانتشار في القرن العاشر بالاستقلال الذاتي لمصر تحت حكم الطولونيين بداية من عام 869، والذي تلاه حكم الفاطميين، ثم جاء الحكم الذاتي لإفريقية (الجزء

الشرقي من المغرب الإسلامي) تحت حكم الأغاليه (800/900). ترسخت اللامركزية بتعاقب الأجيال الجديدة من الدول ذات السيادة المحلية في كل الأقاليم خلال العصور الوسطى.

فبعد أن سادت طرز موحدة في ظل الدول المركزية التي كانت مراكز سياسية و أقطاب إشعاع ثقافي وفني، سمح الانشطار السياسي بظهور مدارس فنية محلية، حيث تم تصميم أنماط إسلامية مع مرور الوقت مشبعة بالثقافات والمتغيرات المحلية، بما في ذلك: المدرسة الأندلسية المغاربية، والمدرسة المصرية، والمدرسة الفارسية وبعد ذلك المدرسة التركية والمدرسة الهندية والطرز السوداني والعمارة العامية المحلية²⁸.

المئذنة بين المركزية والمحلية

المئذنة التي ظهرت في وقت متأخر في عمارة المساجد فسحت المجال للعقيدة المحلية للتعبير عن شخصيتها، وتقديم باقة من الأشكال المتنوعة النابعة من وسطها. يمكننا التمييز بين شكل البرج المربع الأموي، والشكل الحلزوني العباسي، والشكل المثلثي المصري، والشكل الدائري أو الأسطواني الهندي، والشكل المخروطي التركي، إلخ. زيادة على هذه الأشكال الأكثر انتشارًا وخاصة بشكل رسمي بدعم من السلطان، فقد تم تطوير أشكال أخرى من وحي العقيدة الشعبية والعمارة المحلية وبصمة الوسط. من هذه الأشكال: الشكل الهرمي الذي تطور بشكل رئيسي في أوساط الواحات الصحراوية، في مزاب وفي جزء من منطقة الساحل الإفريقي، الموجودة في أقاليم تجارة القوافل العابرة للصحراء.

Figure 2. Minaret de formes combinées tour carrée et spirale, mosquée Ahmed Ibn Touloun (© Golvin L.)

Minaret of combined shapes, square tower and spiral, Ahmed Ibn Touloun mosque (© Golvin L.)

المئذنة المكونة من برج مربع وأشكال لولبية مدمجة ، مسجد أحمد بن طولون (©قولفان)



Figure 3. Minarets maghrébins à dominante carrée, (© Golvin L.)

Maghrebian minarets predominantly square, (© Golvin L.)

المآذن المغاربية مربعة في الغالب (©قولفان)

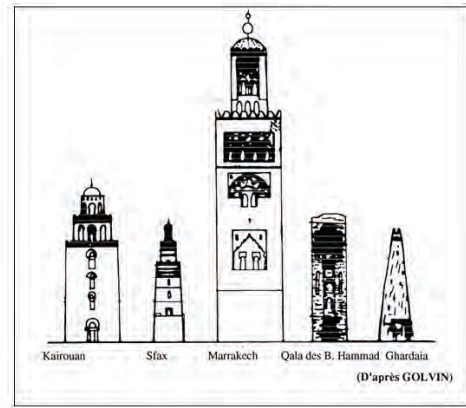


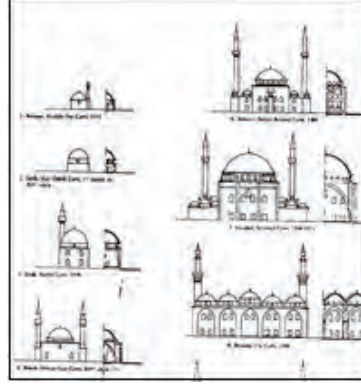
Figure 4. Minaret octogonal-El Azhar Égypte-(© Vogt-Göknil, Ulya)

Octagonal minaret-El Azhar Egypt- (© Vogt-Göknil, Ulya)
الشكل 6. مئذنة مئذنة الأزهري بمصر- (© Vogt-Göknil, Ulya)



Figure 5. Minaret rond conique de la Turquie (© Vogt-Göknil, Ulya)

Round conical minaret of Turkey (© Vogt-Göknil, Ulya)
الشكل 7. مئذنة تركيا المخروطية الدائرية (© Vogt-Göknil, Ulya)



تاريخ المئذنة الهرمية

مئذنة مزاب

تميز بهندستها المعمارية الأصلية التي تكون قد أثرت في عمارة المآذن السودانية، متشابهة شكلاً، ولكن متأخرة زمنياً. بنيت من كتل من الحجر الجيري، مدعم بالتمشنت ومغطى بالكلس. له شكل هرمي إذ ينقص عرضه مع ارتفاعه. يبدأ عرض جوانب مئذنة غرداية من القاعدة بست أمتار وينتهي في الأعلى بمترين. و يبدأ سمك جدران المئذنة بتر واحد في القاعدة ويتناقص تدريجياً لينتهي ب 30 سم في الأعلى. وهو مثقوب في جميع واجهاته بفتحات صغيرة، استخدمت قديماً كتغرات للدفاع بالسلاح. في الجزء العلوي من واجهته توجد فتحة نصف مقوسة كان المؤذن قديماً ينادي منها للصلاة.²⁹

تنتهي المئذنة بزخرفة مكونة من شكل أربع أصابع مرفوعة إلى السماء. درج داخلي يتكئ على الحائط ويدعمه عمود مركزي كبير يسمح بالصعود (درج مئذنة غرداية به 122 درجة). يتراوح ارتفاعها من ست أمتار إلى ثلاث وعشرين متراً. و المئذنة في سياق تاريخي دفاعي جمعت بين وظيفتين: الوظيفة الدينية للدعوة للصلاة، والوظيفة العسكرية كبرج للمراقبة والدفاع. الواجهات الأربعة مثقوبة بثقوب كانت تستخدم للحراسة ولإطلاق القذائف في وقت الدفاع، لذا فقد سميت بالأمازيغية المحلية: «أعساس» الذي يعني الحارس. البرج أو الأبراج المستخدمة كمباني للدفاع والمراقبة لها شكل مئذنة مقطوعة من الجزء العلوي منها، وتوزع في جميع الإقليم على المرتفعات وعبر الوادي. تنخرط كلها في شبكة من المباني الدفاعية، والتي يتم من خلالها الاتصال باستخدام رموز الضوء، للإشارة إلى وصول الصديق / العدو الطبيعي (سيل الوادي) أو الطوفان، أو إلى منع هجوم العدو البشري.

Figure 6. Plan de minaret (Source OPVM)
Minaret plan (Source OPVM)

الشكل 8. مخطط المئذنة (OPVM)

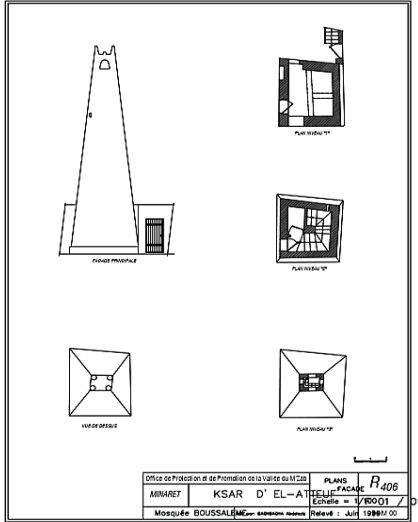


Figure 9. Minaret à El'Atteuf (© auteur)
Minaret at El'Atteuf (© author)

الشكل 9. مئذنة العطف (© المؤلف)



Figure 7. Bounoura, plan de mosquée et minaret
(Source OPVM)

Bounoura, plan of mosque and minaret
(Source OPVM)

بونورة مخطط المسجد والمئذنة
مصدر OPVM

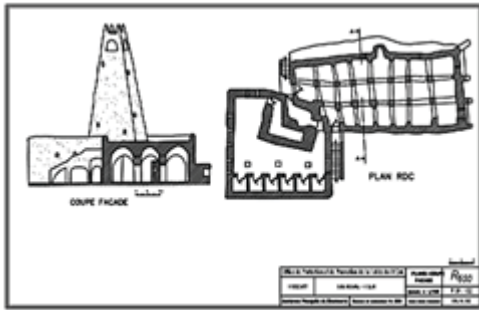
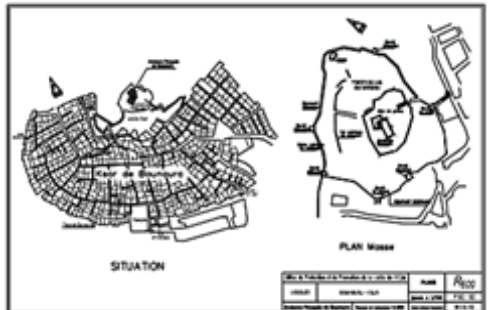


Figure 10. Bounoura, ancien minaret-plan de situation
Source OPVM

Bounoura, old minaret - site plan, OPVM source

بونورة ، المئذنة القديمة - مخطط الموقع مصدر
OPVM



المئذنة الهرمية في الأقاليم الأخرى

منذ النماذج الأولية للمآذن الأموية في سوريا ذات الأبراج المربعة والحلزونية العباسية في العراق، تطور شكل المئذنة لأول مرة في جامع ابن طولون بمصر نحو شكل يجمع بين الاثنين، ثم تطور تدريجياً نحو أشكال دائرية وثمانية ومخروطية جديدة، إلخ.

في المغرب الإسلامي، حيث تعايش النموذجان الأولان، اختارت الجماعات الإباضية في جنوب تونس وطرابلس شكلاً يجمع بين البرج المربع والسلم الخارجي الدائري، مع إضافة الفانوس. في مزاب، أصبح الشكل الهرمي هو الذي يميز العمارة الدينية للإباضيين في جنوب الجزائر.

إنه نوع غير مستخدم على نطاق واسع بين أشكال المآذن في التاريخ المعماري للإسلام³⁰. مما استخلصناه على ما يبدو من المصادر الأيقونية والتاريخية، فإن هذا النموذج الخاص موجود في واحة دومة الجندل (مدينة أدوماتو القديمة) في محافظة الجوف شمال غرب شبه الجزيرة العربية. هي مئذنة حجرية وهمية الشكل أقيمت في المسجد الذي بناه الخليفة عمر بن الخطاب في القرن السابع الميلادي في طريقه إلى القدس. ومع ذلك، يُقال إن النسخة الحالية من المسجد (التي أصبحت الآن في حالة خراب) تُنسب إلى الخليفة الأموي عمر بن عبد العزيز³¹، ويقال إن مئذنته أحدثت. كما أن هذا الطراز من المآذن موجود في إفريقيا جنوب الصحراء الكبرى (في النيجر في مساجد أغاديز³² و دوسو³³)، وفي مالي (في مساجد غاو و تومبوكتو)، وفي واحة سيوة الأمازيغية جنوب شرق مصر (بجوار المسجد الموجود في أغورمي في المعبد القديم لأوراكل آمون). كما يوجد في نسخة نادرة في واحة نسرط في جنوب شرق المغرب، في مسجد مدمر الآن³⁴. تشترك هذه المآذن الهرمية في طبيعة الوسيط، غالباً توجد في واحة و بيئة صحراوية. وغالباً ما تقع في قلب شبكة التجارة الصحراوية (طرق الذهب والملح) في حالة مآذن الصحراء المغاربية والإفريقية الساحلية، و في مفترق الطرق القديمة التي تربط بلاد ما بين النهرين و شبه الجزيرة العربية من الشرق إلى الغرب و تربط جنوب الجزيرة العربية بسوريا في الشمال، مما يعزز فرضية تأثير التجارة على تداول الفن والعمارة.

من الناحية الفنية، يكون هذا الشكل مناسباً لتقليل تأثير الرياح على البنية. يوصى بالشكل الديناميكي الهوائي لاحتواء حركة الرياح وتأثير الوزن المناسب للحمل الرأسي. يؤدي توسيع القاعدة إلى زيادة تحمل ضغط و ثقل الجوانب و يقلل التخفيض التدريجي لعرض القسم العلوي من تأثير الرياح لمقاومة سطح الضرب.

نحن نتحدث هنا عن المئذنة المكونة من قطعة واحدة والتي ترتفع مع انخفاض تدريجي لعرضها لتنتهي في شكل هرمي، بفارق بسيط مع الأشكال الهرمية المكونة من عدة كتل

30 ريتشارد ج. جوتهيل، «أصل وتاريخ المئذنة»، في مجلة الجمعية الأمريكية، المجلد 30، رقم 2 (مارس، 1910)، ص. 132/154.

إرق. بابلو ألفاريز فونيس، انعكاسات على الكلاسيكية المعاصرة، مقالة في نشرة رقمية: <http://otraarquitectura-raesponsible.blogspot.ca/2011/03/typologies-in-islamic-architecture-i.html>

31 لا توجد تفاصيل كافية، باستثناء المؤشرات الواردة في بعض المراجع، بما في ذلك تلك المتعلقة بمشاريع التنقيب عن الآثار راجع لهذا الغرض:

«مسجد عمر بن الخطاب في دومة الجندل (القرن السابع)» مقال نشرته هيئة تحرير صحيفة ضM ، جريدة المساجد في فرنسا، متاح على الإنترنت، <http://www.desdomesetdesminarets.fr/2018/01/01/la-mosquee-omar-ibn-al-khattab-de-dumat-al-djandal-viie-siecle/>

راجع أيضاً، «فتوحات خالد ابن الوليد المخزومي في العراق للطبري» مقال نشر في موقع: التاريخ الإسلامي، 1 تشرين الأول 2014 ، متاح على الإنترنت، على الرابط: <https://histoireislamique.wordpress.com/2014/10/01/conquete-de-khalid-ibn-al-walid-al-makhzumi-en-iraq-par-al-tabari/la-vielle-ville-antique-akka-dienne-de-adumato-dumat-al-djandal-ou-dumat-al-jundal-en-arabie-ou-le-califat-rashidun-la-pri>

32 في أغاديز، تم بناء المسجد في منتصف القرن السادس عشر حسب الرواية، على يد زكريا بن عبد الله ، وهو ورغ أصله من غدامس في فزان، والذي جاء إلى المنطقة حوالي عام 1530. أعيد بناء المئذنة حوالي عام 1844 أو 1847. وارتفاعها 22 متراً، ومبنية بالتربة الخام و لها نفس خصائص النوع السوداني.

باتريسي كريسيير وسوزان بيرنوس، «جامع أغاديز الكبير»، في مجلة الدراسات الإفريقية، 1984، المجلد 54، المزملة 1. ص. 5 إلى 40 ، عبر الإنترنت: https://www.persee.fr/doc/jafr_0399-0346_1984_num_54_1_2052

33 مسجد حديث بني بالطين حسب الملاحظة التي أيدناها خلال زيارتنا عام 2004 ؛ ولكن تم تجديده مؤخراً مع الحفاظ على نفس الشكل. يجب أن يكون بالتأكيد من فترة متأخرة، مثل مدينة دوسو

34 موريس دي لافوس، ينسب إلى المهندس المعماري والشاعر الساحلي، بناء مسجد جديد في غاو بمئذنة هرمية عام 1325، بأمر من الملك، وقد تكون أول نموذج سوداني للمئذنة؛ وفعل الشيء نفسه في مدينة تومبوكتو. موريس ديلافوس، فنون أفريقيا السوداء، باركستون الدولية، 2015، 441 ص.

وجون آرتشر ، المساجد: ألبوم صور على الإنترنت: <http://dcl.dash.umn.edu/highlights/exhibits/show/mali-mosques/title/minarets>

متراكبة وأقسام غير متساوية.

من ناحية أخرى تتميز هذه عن المآذن الإباضية في طرابلس وجربة والتي تكون عمومًا من برج منخفض مربع بدرج خارجي ينتهي بفانوس مخروطي الشكل. وقد يكون هذا الشكل الأخير أكثر تأثيرًا³⁵ في واحات وادي ريخ في جنوب شرق الجزائر وهي منطقة إباضية سابقاً، وفي بعض المساجد في إفريقيا جنوب الصحراء.³⁶

يسبب غياب التأريخ وأي بصمة مكتوبة في أعمال العمارة العامية يصعب ضبط أعمارها ويتم الاعتماد على مصادر شفوية. المصادر الإباضية الرئيسية، أي كتب السيرة الشهيرة ينقصها وصف الأماكن. وحتى علم الآثار يفتقر إلى المعلومات فيما يتعلق بمدن العصور الوسطى المنقرضة مثل سدراته وأوداغوست وتادمكة وغاو أو قاقواو، إلخ.

من وجهة نظر العمر، تعود مئذنة سيوة إلى الحقبة التي تلت أسلمة المنطقة، و قد تكون حديثة البناء، بالنظر إلى الزلازل التي تم الإبلاغ عنها على الأقل في القرن التاسع عشر، والأمطار الغزيرة لعام 1926 التي هزت المنطقة.

فيما يتعلق بمئذنة واحة مدينة نسرط في جنوب المغرب والتي تقع بالتأكيد على الطرق العابرة للصحراء، لا شيء يدعم تاريخ المسجد القديم، الذي أصبح الآن في حالة خراب.

مئذنة واحة مدينة دومة الجندل والتي أصبح الكثير منها الآن في حالة خراب، موجودة حاليًا في موقع أثري في انتظار الاستكشاف، ولكن يعتقد أن المئذنة بُنيت بعد المسجد.

مآذن مزاب قديمة جدا. يعود تاريخ أولها إلى بداية القرن الحادي عشر: مئذنة العطف القديمة ومئذنة مدينة بنورة القديمة، التي تم تجديدها مؤخرًا، والمئذنة القديمة لمسجد غرداية الكبير وهي قليلة الارتفاع: حوالي ست أمتار، بينما أحدثها أعلى (ثلاث وعشرون مترًا في غرداية)³⁷ ويبدو هذا النموذج أيضًا في مزاب أكز رسوًا. توجد أيضًا في عمارة الدفاع، المستخدمة على نطاق واسع في مزاب، والتي هي في شكل مآذن مقطوعة من الجزء العلوي منها.

في إفريقيا السودانية، باستثناء مآذن إقليم الفولاني المتأثرة بمئذنة الدرج الخارجي الشائعة في جربة، التي أشار إليها المؤرخ شاخت³⁸، فإن معظم المآذن الواقعة شمال حوض النيجر (تومبكتو، وجنه، وأغاديز، وما إلى ذلك)، هرمية الشكل على غرار مزاب و قد يكون ذلك تحت تأثير التجار والعلماء الإباضيين الذين سعوا كثيرًا في نشر الإسلام في إفريقيا الساحلية المسماة ببلاد السودان سابقًا كما نجحوا أسلمة بعض الملوك وقسم من السكان وخاصة التجار و ذلك بداية من القرن العاشر.

35 بدون مزيد من التفاصيل، باستثناء الصور القليلة التي نشرها مدونو السفر، راجع لهذا الغرض: محمد ف. راضي، معبد أوراكل آمون، ألبوم صور، <https://www.trover.com/d/1HRdP-temple-of-the-oracle-of-amun-siwa-oasis-egypt>

«معبد أوراكل (معبد آمون) بواحة سيوة في مصر» في دليل سياحي. <http://egyptour1.blogspot.ca/2012/03/le-temple-de-loracle-temple-damon.html>

معبد آمون، واحة سيوة، مصر، تم نشره في 8 مارس 2015 في الموقع. <http://makemytripvisit.blogspot.ca/2015/03/temple-of-amun-siwa-oasis-egypt.html>

36 بدون مزيد من التفاصيل، باستثناء الصور القليلة التي نشرها مدونو السفر، راجع: روجي ميمو، التراث المعماري لجنوب المغرب، نسرط. عبر الإنترنت: <http://www.rogermimo.com/fr.in22-Nesrat.htm>

37 فيرجيني بريغوست، «المساجد الإباضية في المغرب العربي»، مجلة العالم الإسلامي والبحر الأبيض المتوسط عدد 125 | يوليو 2009، نُشر في 02 يوليو 2012 في الموقع <http://journals.openedition.org/remmm/6253>

ومع ذلك، يذكر بيار بينتا، في كتابه في الصفحة 191، مئذنة هرمية في جادو قد يكون تم بناؤها حوالي القرن الثالث عشر. راجع بيار بينتا، ليبيا: من المدن القديمة إلى واحات الصحراء، جنيف، طبعات أوليزان، 2007، ص. 301.

38 الجامع الكبير في طولقة، الصورة محملة في أكتوبر 2016، متوفر في: http://alger-roi.fr/Alger/tolga/pages/4_tolga_grande_mosquee.htm

مآذن النيجر على وجه الخصوص (أغاديز ودوسو) مطابقة لمآذن مزاب³⁹. يعود تاريخ مئذنة أغاديز إلى القرن السادس عشر⁴⁰ ومساجد مالي وغانا و تومبوكتو، يعود تاريخها أيضًا إلى حقبة أسلمة إفريقيا وتأسيس الممالك الأولى. تعود مئذنة دوسو إلى الفترة التي تلت تأسيس مدينة دوسو، أي بعد القرن السابع عشر⁴¹.

من وجهة نظر البناء، فإن مباني مزاب مبنية من الحجر الجيري المتكتل، المركب بالتمشنت والمغطى بالجير، بينما بنيت مئذنة دومة الجندل بالحجر⁴²، أما مئذنة سيوة فقد بنيت بالحجر المتكتل وبنيت في نسراط بالطوب. مآذن مالي والنيجر مبنية من الطين المقوى بإطار من عوارض خشبية تبرز وتثقب الجدران الخارجية، لتكون بمنزلة سقالات دائمة للصيانة ضد تآكل المطر. تُجمع كويرات من الطين الخام الممزوجة بالقش، وتجفف في الشمس في طبقات، لتشكيل الجدران، ثم تُغطى بطبقة من الطين الطازج المغطاة بالزيت لمقاومة المطر⁴³.

من حيث الزخرفة، تتميز زخرفة مآذن مزاب بأربعة أصابع في أعلى المئذنة مرفوعة نحو السماء، مطابقة للزخارف الموجودة في بعض مقامات العلماء المتميزة. تتميز واجهات أغاديز وغانا و تومبوكتو بالقضبان الخشبية الموضوعة في صفوف على الأسطح الخارجية لتدعيم الهيكل الهش فعليًا ولتسهيل صيانة الواجهات الخارجية، كما تتميز واجهات مآذن مالي بالكوة المخروطية التي تلوها، من ناحية أخرى، تحتوي جميعها على فتحات مثقوبة في واجهات المئذنة الأربعة. من الضروري أيضًا التأكيد على الوظيفة الدينية والعسكرية المزدوجة للمآذن في جميع هذه المناطق.

يتميز النوع الهرمي الموجود في نسراط في جنوب شرق المغرب ودومة الجندل بتاج على الواجهة في أعلى كل مستوى، من خلال متانة البناء، تكون مآذن مزاب هي التي تم الحفاظ عليها إلى اليوم، نظرًا لطبيعة موادها وقلة حالات الدمار.

خلاصة

فهذا هذا يسمح لنا بالمضي قدمًا في تأكيد فرضية أن انتشار هذا الشكل في إفريقيا من تأثير الإباضية المزايين؟ وهذا من شأنه أن يرقى إلى تقدير مساهمة الشبكات التجارية التي ازدهرت في بلاد الإسلام خاصة في العصور الوسطى في نشر وتقل العمارات و الفنون إضافةً إلى الدعوة الدينية ونشر الثقافة والعلوم. ومن شأن هذا البحث كذلك تقدير الدور الذي لعبه التجار والدعاة الذين استخدموا شبكات التجارة عبر الصحراء الشهيرة في نشر الإسلام والفن والثقافة.

ومع ذلك، فإن هذا المقال يمثل لفتة في منظور البحث حول التأثيرات الفنية المحتملة

39 راجع جوزيف شاخت، المرجع السابق. وفيرجيني بريفوست (2009)، ص 116 / 118

40 روجيه ميمو، التراث المعماري لجنوب المغرب، نسراط. في الموقع:

<http://www.rogermimo.com/fr.in22-Nesrat.htm>

جيفري كينغ، «مسجد منسوب إلى عمر بن الخطاب في دومة الجندل بالجوف، المملكة العربية السعودية»، مجلة الجمعية الملكية للتاريخ لبريطانيا العظمى وأيرلندا، العدد 2 (1978)، ص. 109 ع 123، الناشر: مطبعة جامعة كامبريدج، <https://www.jstor.org/stable/25210953>

غيوم شارلو وغومولو لوريتا، دومة الجندل تحويل أماكن العبادة والتغيرات الأثرية المرتبطة بقدوم الإسلام، جامعة لورينتال في نابولي، <http://www.labex-resmed.fr/dumat-al-jandal-al-jawf-arabie>

41 ديوان حماية التراث بمزاب، الموقع الرسمي عبر الإنترنت: http://www.opvm.dz/10_Articles/15_Le_secteur_sauvegardé/83_Ksar_de_GHARDAIA/92_La_grande_mosquée_de_Ghardaia/d

42 جوزيف شاخت، المرجع السابق، ص 19 / 20

43 فيرجيني بريفوست (2003)، المرجع السابق، ص. 114 / 119

للشبكات التجارية في العصور الوسطى، وتاريخ العمارة الشعبية التي ظلت مهمشة من تاريخ العمارة الرسمية. يقدم المقال لمحة إلى ما فتحة هذه الرؤية في إثراء البحث التاريخي للفن والعمارة، خاصة وأن التجارة وشبكاتها احتلت في تاريخ العصور الوسطى في بلاد الإسلام مركزاً قوياً، فقد تغلغت في جميع قطاعات الحياة الاجتماعية والاقتصادية وبالتأكيد الفنية أيضاً. وقد يكون أفيد توسيع دائرة البحث إلى الشبكات التجارية الأخرى كمسالك الحرير و التوابل للتنقيب عن دورها في تاريخ العمارة الإسلامية.

لفتة الى الرهانات الحالية وجدوى البحث عن حلول لرفع التحديات

بعد ما كانت تقتصر وظيفتها على رفع الآذان جاءت تكنولوجيات إخراج الصوت كي تغطي هذا الدور بأشكال أخرى خارج المآذنة، فهل بذلك تتخلى عن المآذنة أم بقيت لها وظيفة تمنح مشروعية للحفاظ عليها؟ طبعاً مع الزمن اكتسبت طابعاً آخر وقيمة أخرى وهي كمعلم معماري تألق المعماريون عبر الزمن في هندسة وتصميم أشكاله، فلا يكاد يفصل عن المشروع المعماري العام. ومن ناحية أخرى انتهى الزمن بالمآذن الى نحت صورتها في ذاكرة المكان وفي مخيلة المسلم فلا تكاد تكتمل صورة المسجد الا بالمآذنة فهي تلعب دوراً أساسياً ليس فقط كمعلم معماري لتبيان مكان المسجد بل كذلك كمعلم كامل الحضور في إدراك المسلم لمجاليه.

وظهرت مؤخرًا إشكالية المآذن وخاصة في الغرب حيث يرى فيها السكان رمزا للسلطة الدينية والسياسية للمسجد وهذا ما يتخوف منه الغرب على وقع بروز المجموعات المتطرفة في بلدانها. ولا زالت تثير جدلاً كبيراً وقلقاً كبيراً جعل السكان كما في سويسرا مثلاً يصوتون ضد المآذن في بلدانهم. وفي هذا السياق ما الذي يمكن فعله للحل محل الرمزية التي تشغلها المآذنة لتعويضها؟ وعلى وقع الإيكولوجية والبيئة ما الذي يمكن استحداثه للمساهمة في ترقية البيئة؟ في هذا السياق تبرز للوجود محاولات تستدعي المتابعة كمشروع تورينيات الرياح فوق المآذن، مثلاً. وقد يكون مجدي دراسة جدوى التغطية النباتية لواجهات المآذن، الخ.

وعلى وقع نقص العقار والحفاظ على إشغاله بما يحافظ على البيئة، كيف يمكن توظيف المآذن وتوسيع وظائفها وفق نظرة استدامة وعقلنة استغلال المجال؟ وهل يمكن ادماج بعض الوظائف الملائمة كالي تتصل بالثقافة والمكتبات والمتاحف والتكوين، الخ؟

تلکم جملة من التساؤلات على وقع التحولات تحتاج الى تفكير جدي لإيجاد حلول مناسبة.





Figure 1.

Les deux minarets de la grande mosquée de Ghardaïa, M'zab, XIe et XVIe siècle.

© auteur 2018.

The two minarets of the great mosque of Ghardaïa, M'zab, 11th and 16th century.

مئذنتا جامع غرداية الكبير مزاب ، القرنين الحادي عشر والسادس عشر.



Figure 2

L'ancien minaret de Bounoura, M'zab, Xe siècle, après sa rénovation.

© auteur 2018.

The old minaret of Bounoura, M'zab, 10th century, after its renovation.

مئذنة بونورة القديمة مزاب ، القرن العاشر بعد تجديدها.

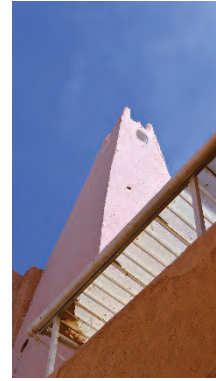


Figure 3

Le minaret de la mosquée d'en haut- El-Atteuf, M'zab, XIe siècle.

© auteur 1990.

The minaret of the upper El-Atteuf mosque, M'zab, 11th century.

مئذنة جامع العطف العلوي مزاب ، القرن الحادي عشر.



Figure 4

Minaret de la grande mosquée de Guerrara, XVIIe siècle (1670 p. 38 Motylinski).

Photo 2009 ©Blog de Mzab-Guerrara.

Minaret of the Great Mosque of Guerrara, 17th century (1670).

مئذنة الجامع الكبير في القرارة ، القرن السابع عشر (1670).



Figure 5

Tour-bordj à El-Atteuf, M'zab, XIe siècle, après sa rénovation

© auteur 2018.

Bordj in El-Atteuf, M'zab, 11th century, after its renovation.

برج في العطف مزاب، القرن الحادي عشر، بعد تجديده



Figure 6

Minaret de la grande mosquée d'Agadez, Niger, XVIe siècle.

Photo © 2018 www.traveladventures.org

Minaret of the great mosque of Agadez, Niger, 16th century.

مئذنة مسجد أعاذير الكبير النيجر القرن السادس عشر.



Figure 10

Minaret de la mosquée de Nesrat, sud-ouest marocain, XVI^e siècle.

Photo 2014 © Roger Mimó.

Minaret of the mosque of Nesrat, southwestern Morocco, 16th century.

مئذنة مسجد نسرط جنوب غرب المغرب القرن السادس عشر.



Figure 11

Minaret de la grande mosquée d'Okba, à Kairouan, Tunisie. Le plus ancien conservé au Maghreb, daterait du début du IX^e siècle.

Photo © Qantara 2008.

Minaret of the Okba's Great Mosque, in Kairouan, Tunisia. The oldest preserved in the Maghreb, dates from the beginning of the 9th century.

مئذنة الجامع الكبير بالعقبة بالقيروان بتونس. أقدم ما تم حفظه في المغرب العربي يعود إلى بداية القرن التاسع.



Figure 12

Minaret de la mosquée de Tombouctou, Mali, XIV^e siècle.

Photo Ranveig © 2018 Kashgar.

Minaret of the mosque of Timbuktu, Mali, 14th century.

مئذنة مسجد تومبوكتو، مالي القرن الرابع عشر



Figure 13

Minaret de la mosquée de Tolga , sud-est algérien.

Photo ancienne prise en 1926.

Minaret of the Tolga mosque, south-eastern Algeria.

مئذنة مسجد طولقة جنوب شرق الجزائر.



Figure 14

Minaret de la mosquée de Talakin Ghizen, Djerba, Tunisie.

Photo Virginie Prevost.

Minaret of the Talakin Ghizen Mosque, Djerba, Tunisia.

مئذنة مسجد تالكين غيزن، جربة، تونس.



Figure 15

Minaret de la mosquée Tajdit Djerba, Tunisie.

Photo Virginie Prevost.

Minaret of the Tajdit Djerba mosque, Tunisia.

مئذنة مسجد تاجديت جربة تونس.

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استراتيجية السرد في عمارة المساجد المعاصرة – ما بين النظرية والتطبيق

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المستخلص

تعد العمارة نتاجاً حضارياً يعبر عن الفكر والمعتقدات، وعن الإنسان ومجتمعه وحضارته، وتسرد العمارة كل ذلك، فهي تسرد حكاية بنائها، ومحتواها التاريخي والروحي، ضمناً " لتكشف عن نفسها في صورة معمارية بلغة تشكيلية مليئة بالدلالات والرموز، إن التوجه لدراسة السرد كاستراتيجية يتوافق مع توجهات العمارة المعاصرة الداعية إلى الانفتاح على مختلف الحقول المعرفية، ومنها: الحقول الأدبية (الروائية والقصصية)، بهدف توسيع أساليب التشكيل المعماري باستثمار طاقات تلك الحقول وتوظيفها في العمارة.

يستهدف البحث الحالي دراسة طبيعة العلاقة لإمكانات السرد في تمثيل الرؤيا المتبناة من قبل المصمم وتجسيد الفكرة عبر مجموعة إحالات وانتقالات فكرية، يتم التقاطها من قبل المتلقي، تحاكي منظومة القيم العقائدية والمجتمعية في ذهنه وتحيله باتجاه تجربة غامرة تؤثر في طبيعة انغماره الروحي ضمن الفضاء الداخلي للمسجد ، وبهذا فإن البحث يسعى لحل المشكلة البحثية التي تتعلق بالكشف عن طبيعة العلاقة بين الظاهرتين (السرد - التشكيل المعماري) في سياق ابنية المساجد المعاصرة لغياب وقصور المعرفة حول هذا التأثير والعلاقة بين الظاهرتين ، عبر تحليل عينة معمارية لمسجد مصمم تبني السرد كاستراتيجية إنتاج تصميمية بهدف توضيح إمكانات هذه الاستراتيجية .

الكلمات المفتاحية: (المساجد - العمارة الإسلامية - السردية - استراتيجية)

Abstract

Architecture is a product of a civilization that expresses thoughts and beliefs, and about man, his society, and his civilization. Architecture narrates all of this, as it narrates the story of its construction and its historical and spiritual content implicitly "to reveal itself in an architectural form in a formative language full of connotations and symbols.

The tendency to study narrative as a strategy corresponds to the trends of contemporary architecture calling for openness to various fields of knowledge, including literary fields (novel and narrative), in order to expand the methods of architectural formation by investing the energies of those fields and employing them in architecture.

The current research aims to study the nature of the relationship to the possibilities of narration in representing the vision adopted by the designer and embodying the idea through a group of referrals and intellectual transitions that are captured by the recipient that simulates the system of ideological and societal values in his mind and refers him towards an immersive experience that affects the nature of his spiritual immersion within the inner space of the mosque. The research seeks to solve the research problem related to revealing the nature of the relationship between the two phenomena (narration - architectural formation) in the context of contemporary mosque buildings due to the absence and lack of knowledge about this effect and the relationship between the two phenomena, by analyzing an architectural sample of a contemporary mosque that adopted the narrative as a design production mechanism, to illustrate the potential of this strategy

Keywords: (mosques - Islamic architecture - narrative - strategy)

المقدمة

ان العمارة الإسلامية كبنية شاملة تضم منظومات ترتبط بالمستويين الشكلي والمعنوي. وتتراوح جوانب المستوى الشكلي بين ثلاثة مستويات. بدءاً بعالم الفكر الذي يمثله النمط او البنية، ويتسم بكونه ذو طابع دينامي متأني عن ارتباطه بالجوانب الثقافية والاجتماعية التي يمثلها في حالة النمط. بينما قد تكون ماهية البنية ذات الخاصية التوليدية هي المسؤولة عن اكسابها السمة الدينامية، في حين تتعلق مقومات التشكيل الفيزيائي بمجموعة مقومات تشمل «الإمكانيات التكنولوجية بما تشمله من مواد بناءة او طرق انشائية ، ومقومات حضارية وطبيعية أما ما يتعلق بالمستوى المعنوي بالفضاء وكل ما من شأنه تعزيز التواصل والتأثير ضمنه ، فسيتناول البحث هذا الجانب المعرفي ويدرس إمكانية توظيف استراتيجية السرد بتشكيل طبيعة العلاقة بين النص المعماري الحامل لمنظومة الدلالات، والبعد الوجداني والذهني للمتلقي في عمارة أبنية المساجد كمنط من أنماط العمارة الإسلامية، واستكشاف صحة الفرضية الآتية : (يمكن توظيف السرد كإستراتيجية انتاج وتشكيل النص المعماري الإسلامي (أبنية المساجد نموذجاً) من خلال تجسير العلاقة بين المصلي وبنية التصورات الشكلية المعتمدة سردياً من قبل المصمم) .

المكونات الأساسية للعمارة المسجدية The basic components of mosque architecture

تكاد معظم المعارف التي اخصت بعمارة المساجد تطرح تصوراتها وتصنيفاتها لمكونات وأجزاء المساجد المتعلقة بالبعد الشكلي من خلال علاقتها بمجموعة من العناصر الأساسية. اظهرت هذه المعارف تبايناً في تحديد ماهية العناصر الأساسية وبما يؤكد مرونة تصاميمها التي تتبع من مرونة الإسلام. فلا وجود لتحديدات تتعلق بتصميم المسجد.

إذ حددت بعضها المكونات بمجموعة من العناصر الضرورية التي كان لا بد من توافرها في اي طراز للمسجد وتشمل «القبلة/المحراب/المنبر/بيت الصلاة /والصحن».

أ - بيت الصلاة يمثل الجزء المسقوف من المسجد ناحية القبلة وتختلف نسبة مساحته بمقارنته بالصحن باختلاف المكان والزمان. وفي الإنكليزية يسمى sanctuary وتطور مع الزمن حتى أصبح جزءاً رئيساً فيه القبلة والمحراب والمنبر، وفوقه القباب وتوجد فيه مقصوره او مجموعة مقصورات.

ب - الصحن يمثل الجزء غير المسقوف من المساجد ويعد في البداية امتداداً لبيت الصلاة ولا يعد جزءاً من المصلى ، كان متعدد الاستعمال ثم حرم الفقهاء القيام باي عمل لا يتصل بالصلاة في الصحن ومن ثم اعتُبر من الأجزاء الأساسية في المساجد. ان وجودها او عدمه ونسبتها ترتبط بسبب يبني بحت.

ج - القبلة تعد مكوّناً أساسياً أثر في البعد الشكلي للمسجد من ناحية التوزيع. والذي فرض اشتراطات هندسية شتى فقد أصبح لزاماً ان تكون بيوت الصلاة كلها ناحية القبلة. والذي يمثل ميزة انفردت بها المساجد عن غيرها من أماكن العبادة، فكل مساجد الارض تتجه وجهة واحدة.

د - المحراب ومعناه حنية، وليس من الضروري أن يكون المحراب حنية، بل يكفي تعيين موضعه في جدار صدر المسجد (جدار القبلة)، وفي بعض الأحيان كان يكتفي بوضع علامة مثل اللواء لتعيين المكان الذي يقف فيه الامام ولم تظهر المحاريب محنية الا في عهد الوليد بن عبد الملك ونماذجها الأولى تشبه المحارة المقلوبة. اما بقية أجزاء المسجد فتمثل أجزاءً غير ضرورية وتضم «مئذنة، قبة، مقصورة، العقد، العمود».

و - المنارة أو المئذنة أو الصومعة، وهو اسم آلة من الأذان، والأذان: هو الإعلام

عن طريق الأذنان. تسمى المثناة أيضاً المنارة والصومعة. المنارة مفرد وجمعها منائر.
(العبيدي، 2016، ص 123-124)

2 - السرد في العمارة Narratives in Architecture

بعد ان تم استعراض اهم المكونات الاساسية لتصميم المسجد كنوع وظيفي في العمارة العربية الاسلامية سيتم الخوض في تعريف الاستراتيجية السردية التي تتعامل مع هذه المكونات كأدوات لتجسيد الرؤيا الفكرية المراد إيصالها من قبل المصمم.

1-2 تعريف السرد Narrative definition

السرد لغويًا: «بمعنى التابع أو المتتابع، تأتي به متسقا، متتابعًا بعضه أثر بعض، فهو يدل على توالي أشياء كثيرة تتصل ببعضها، وسرد القرآن: وسرد الصوم: والاه وتابعه(ابن منظور، 2005، ص. 604). وتسرد الدر: تابع. ونجوم سُرد أي متتابعة، وتسرد الشيء أو الدمع أو الدر: تابع في النظام (سليمان، ميساء، 2011، ص11). وسرد الحديث: تابعه في سياق جيد (مصطفى، وآخرون، 1972، ص 426). ويشير المعنى اللغوي الآخر للسرد الى النسخ. فقد ورد في مختار الصحاح «س.رد» درع مسرودة، ومسرّدة، ومسرّدها: نَسَجَهَا وهو تداخل الحلق بعضها في بعض(الرازي، 1987، ص 195،194)

السرد اصطلاحًا: «إن السرد narrate بمعنى سرّد أو قصّ أو روى، في المنجز النقدي الغربي ومصطلح narrative يترجم الى المروي أو المحكي. والسرد، وفق قاموس كامبريدج، قصة أو وصف لسلسلة أحداث، أو طريقة معينة لتقديمها وفهمها، ويشير معجم Webster: إلى أن السرد طريقة تقديم سلسلة أحداث تروج لوجهة نظر معينة أو قيمة ما. وفي القاموس الإنجليزي يأتي السرد بمعنى أخبار أو حكي أو روي قصة واقعية أو متخيلة أو تدوين أحداث فقد عرف المرجع الأدي Harman & Halman السرد Narrative على أنه تدوين الأحداث. (Harmon ea.tl, 1996, P. 336)

السرد عند Gérard Genette لا يخرج عن ثلاث معانٍ: «قصة وخطاب وفعل السرد». القصة هي محتوى التعبير السردية، والخطاب، شكل ذلك التعبير، ويمثلان مستوي السرد اللذين حددا اتجاهين لدراسته: دلالي يعني بسردية الحكاية، دون الوسيلة الحاملة لها، ولساني يعني بالخطاب والمظاهر اللغوية له من رواة، واساليب وطرائق سرد ورؤى، وعلاقات الراوي بالمروي. والمعنى الثالث للسرد عند Genette هو فعل السرد ذاته (جينيت، وآخرون، 1989، ص27)، والله جل وعلا خير من قص القصص اذ يقول في كتابه المجيد»
تَحْنُ تُقْصُ عَلَيَّكَ أَحْسَنَ الْقَصَصِ بِمَا أَوْحَيْتَنَا إِلَيْكَ هَذَا الْقُرْآنَ وَإِنْ كُنْتَ مِنْ قَبْلِهِ لَ مِنَ الْغَافِلِينَ ﴿٣﴾ (يوسف)

يتبين مما سبق أن السرد عملية بناء تقوم على تبنى قصة او حدث ما وتجسيدها بمجموعة من الإشارات (التصورات الشكلية) أو العلامات اللغوية، لإحالتها لتكون نصًا، بتوظيف آليات سردية من قبل مدع النص لصياغة جسور التواصل مع المتلقي.

2-2 السرد أبعاد ومفاهيم Narrative dimensions and concepts

وفقا لـ(Barthes)، فإن السردية كجزء من اخبار القصة narration as storytelling هي أيضًا متغير لا حدود له، «السرد هو أولاً وقبل كل شيء مجموعة متنوعة من الأنواع genres الموزعة بين مواد مختلفة عابرة للتاريخ، عابرة للثقافات إنه ببساطة، مثل الحياة ذاتها». وهكذا يصبح من الواضح أن السرد، كصانع للمعنى من خلال سرد القصص، يمكن العثور عليه في أي موضوع، ((Barthes,2015,p190))

وبذلك فإن السرد هو آلية فعالة وقصدية مرتبطة بالكونولوجيا (ترتيب الأحداث أو التواريخ

حسب ترتيب حدوثها، أو التسلسل الزمني للحدث) والدراما، ولكنها مرتبطة أيضاً بالخيال التأويلي للمتلقين. (Thomassen, 2017, p6)

ويتضح من هذه الدورة التأويلية إن كان الهدف هو التفسير فإن أكثر الطرق الطبيعية للتواصل هو اخبار القصة عن طريق السرد، فالسرد هو الهيكل الذي يبني وينقل المعنى المقصود، و يتم هذا البناء من خلال اختيار وجمع وإعادة تجميع المعلومات والأدلة في إطار أفكار المتلقين الخاصة. قد يتم تلقي محتوى هذه الأفكار بهدف ترجمة وإرسال الرسائل المركبة بلغة متماسكة ومفهومة. حيث يأتي السرد في توفير بنية السياق التي تتبع قصة وسلسلة من الأحداث التي تشكل نمطاً ذا مغزى. ليتحقق التواصل المقصود بفعل التجربة المبنية، التي تنقل وتجسد المعنى. (Greenberg, 2012, p. 103)

وباستخدام تعريف (Barthes) للسرد كمجموعة من الأنواع المختلفة التي يمكن تضمينها من خلال مجموعة متنوعة من المواد المادية فإن الجزء المادي الذي يوصل هذه الرواية هو الفضاء، في حين أن تقنية رواية القصص، إضافة إلى روايات النص والشئ في العرض، هي إنشاء لقصة وراء السرد المكاني المتصل، spatial communicated narrative، ((Thomassen, 2017, p52

إن بناء السرد للهوية ليس له بعداً نفسياً واجتماعياً وجمالياً فقط، بل له بعدٌ بناي أيضاً، فلا يمكن فصل العلاقة بين السرد والهوية-الذات في زمن- والكيفية التي تُبنى بها، فالسؤال عن نوع البناء لا يمكن فصله عن السؤال عن نوع الهوية التي تتكرر في هذا البناء، أو عزله عن السياق الثقافي والتاريخي لهذا البناء فعملية صياغة السيرة الذاتية هي بحد ذاتها عملية تشكيل سردي للذات (الإنسان أو العمارة)، تعتمد مثل كل عملية «تشكيل عالم»، بشكل كبير على النظم الرمزية التي تم فيها، بوصفها بنى ثقافية. (بروكمير، 2015، ص 31- 35)

ارتبط مفهوم السرد بالقصة التقليدية والمحكية فالسرد يعني القص أو الحكى. وهو خطاب شفوي، أو مكتوب «يحكي قصة تشكل من مجموعة الأحداث المروية (أزر ويل، فاطمة، 1983، ص177). يستخدم المؤلفون الوصف في الكتابة للتأكد من أن جمهورهم منغمس تماماً في الكلمات الموجودة في قصصهم وكتاباتهم، ويتطلب هذا جهداً من قبل الكاتب لوصف عالمه من خلال استخدام «التفاصيل الحسية». لذا يعمل الوصف على التركيز في الحواس الخمس لأن البشر يعتمدون على هذه الحواس لتجربة العالم، كما يوفر استخدام التفاصيل الحسية أكبر إمكانية للتواصل مع المتلقين وبالتالي إشراكهم في الحكاية.

الا أن السرد حتى عندما يحدد نفسه بدراسة النصوص الأدبية، فإنه يدرسها من خلال أدبيته، فعلاقته بالدراسات الأدبية والشعرية هي علاقة اقتراب وتقاطع لا علاقة انتماء، فالسرد يعطي نفسه موضوعاً ليس النصوص في ذاتها، لكن نموذجاً من العلاقات التي تتجلى فيه، لذلك هو غير مبال للتمييز بين نص أدبي و غير أدبي، فكلها متساوية (الطريطر، ص36).

بفعل توسع مجال السرد من مجاله الأدبي الأول الى كافة مجالات المعرفة لم يعد يطلق السرد على النص الحكائي، أو الروائي أو القصصي برمته بل اتسع ليشمل بدلاته جميع مظاهر الحياة، ليشمل ما هو مروي وما لا ينطق به كالفنون البصرية المتمثلة بمتواليات من الصور كما في الرسم والنحت، ولاسيما العمارة باتجاهاتها وبيئاتها المختلفة وهذا ما دفع عدداً من منظريها ومفكريها والمشتغلين في حقل العمارة الى الانفتاح على مجالات اللغة، وخصوصاً الحقل السردي بهدف خلق عمارة كفن سردي قصصي شعري ذو مستويات من الاتصال. (دريدا، 1988، ص73)، ومنهم Jencks الذي أشار الى ضرورة استثمار أساليب التعبير الأدبية ولاسيما القصصية (السردية)، لتحقيق الشفرة الجمالية عن طريق « وفرة الرسائل مع الوحدة» من خلال آليات مختلفة تتعامل مع الشفرة المرسله، لتحقيق إمكانية التأويل الخفي، والتأويل المتجدد وتعدد القيم والمعاني. (Jencks, 1989, P.20)

3-2 سردية العمارة Architectural narrativity

تعد العمارة ظاهرة حضارية وثقافية ومرآة عصرها تعكس وتعبّر وتمثل أفكاره وتوجهاته ورؤاه الاجتماعية والمعرفية؛ والتي تحدد طبيعتها وربما تخرج عنها فهي تؤثر وتتأثر بها ضمن مخطط معقد من علاقات جدلية تعمل في كلا الاتجاهين. لذا فهي تسعى لسرد أفكار ومعتقدات ومبادئ عصرها، من خلال استراتيجيات بنائية المعنى، فالعمارة منظومة نصوص تسعى للحوار مع متلقيها، إذ عدت العمارة وسيطاً ورواياً للقصص، كونها حاملة للمفاهيم والأفكار، لا من خلال صياغة الحكمة الدلالية فحسب بل بإبداع تصورات شكلية تجسد تلك الحكمة كونها فناً سردياً، تحكي حكايتها التي نشي بروحيتها، حكاية بنائها ومحتواها المضموني وتاريخها، أو تكشف عن نفسها في عرض معماري بلغة تشكيلية مليئة بالرموز والدلالات، ليعبر الإنسان من خلالها عن نفسه ومجمعه وحضارته. ولذا يمكن النظر إلى العمارة من منظار سردي وعدها أفقاً من آفاق السرد المهمة والتي طالما اهتمتها الدراسات السردية بالرغم من ربط القصص والمباني معاً منذ بداية التكوين الواعي للفضاء والمحاولات الأولى لفهم العالم من حولنا، لتصبح هذه العلاقة، في الوقت الحاضر، أكثر وضوحاً وتعقيداً بفعل التطور التكنولوجي وتقنيات المعلومات التي أضافت إلى هذا الارتباط المعقد بالفعل علاقات مترابطة. ويشير ذلك إلى وجود تشابه بين السرد القصصي والسرد المعماري. فرواية القصص تدور حول بناء قصة من خلال تنظيم زمني للأحداث، بينما يعتمد التصميم على بناء رواية مادية من خلال تنظيم العلاقات المكانية، وتعد المباني رواية للقصص، وصائغة للحكايات من خلال تنظيم العلاقات الفضائية، لذا فمن الطبيعي أن تُفهم العمارة على أنها رواية للقصص ليس فقط كونها حاملة للأفكار والمفاهيم، أو لأنها مجموعة من الحكايات وحاوية لها، بل لأنها تصبح موضوعاً لتحليل تاريخي (Chi L. 1991, p. 84). لتصبح العمارة نموذجاً للذاكرة من خلال الأنواع المعمارية التي كانت بمثابة واسطة للتذكر (Psarra, S. 2009, p.68).

السرد في الأدب هو مفارقة، لأنه يسعى إلى نقل الحقيقة بإخفائها، حيث يقوم الراوي بترتيب عناصر المعرفة بطريقة يتم الكشف عنها تدريجياً، مما يعني في البداية التعتيم على الحقيقة وراء ما يقال، كي يخلق هذا التعتيم المتعمد شعوراً بالغموض أو التوتر، ويخلق رغبة لدى المتلقي لمعرفة ما يحدث في القصة وهنا تشترك العمارة مع السرد كونها تسعى إلى خلق التشويق ضمن الفضاءات المادية والرغبة في اختبارها .

يقول (تشومي): بالإضافة إلى كون السردية مصدرًا للإلهام، كشفت الروايات عن وجود علاقة أساسية بين الأدب وتصميم المباني والفضاءات: إن كشف الأحداث في سياق أبي يوحى حتماً إلى تطور الأحداث في العمارة. وهو ما يدعو لاستثمار الآليات السردية لمعالجة الشكل والبنية، كآليات التلاعب الفني بالحكمة والقواعد واللغة؛ التكرار أو التشويه أو التجاور أو التراكب juxtaposition بين الشكل والنشاط، والفضاء والحدث، وهذه الآليات والمشتقة من مقارنة بين الأدب والعمارة تعد مركزية في فكر تشومي. (Tschum, 1995, p171)

4-2 تجربة الفضاء السردية Narrative space experience

تم تعريف السرد وفقاً لمنظرته (ماري لوري رايمان) على أنه بناء ذهني أو صورة ينتجها المتلقي interpreter استجابةً لكائن سردي - وهو العمارة أو الفضاء المعماري. وطرح مفهوم «سردية العمارة» architectural normativity الخيارات الشكلية والمادية الجمالية، في مقابل سرد العمارة an architectural narrative الذي ينتجه المتلقي. وبذلك تعتمد درجة سردية تجربة الفضاء على الكائن السردية والمؤول، مما يؤثر الطبيعة التعددية للتجربة السردية، التي ترتبط ارتباطاً وثيقاً بالطبيعة التعددية وتعدد الأصوات وتعدد الأطوار للتجربة السردية التي تستلزم الجسم المتحرك. وبذلك يمكن فهم بناء السرد كعملية تفاعلية بين سردية معمارية ومتلقي يلعب دوراً مهماً في تحديد المعنى، وبناء التجربة، فبينما يتحرك

الجسد والعقل عبر الفضاء، يتم إنشاء التجربة السردية من خلال التفاعل بين ذلك الفضاء وتداييات وخبرات وتفسيرات المتلقي(المؤول)، ومن خلال هذا يمكن فهم وتحليل السرديات المكانية. وتعد التجربة المكانية تجربة سردية بطبيعتها ومن ثم فالعمارة وتصميم الفضاء لديه القدرة على تعزيز أو إضعاف تلك السردية.

إن المعماريين مفتونون بالسرد، كما الكتاب مفتونون بالعمارة في أماكنها المتخيلة ومدنها غير المرئية. ومثلما غدّت العمارة الخيال الشعبي بقائمة لا حصر لها من المنازل المسكونة والممرات المرصوفة بالحصى، زودت الثقافة الشعبية العمارة ليس فقط بالفضاءات، بل كانت الثقافة بمثابة صرح فكري للعمارة على مر القرون، والذي تقاطع فيه قنوات الفكر من الرياضيات وعلم الكونيات والموسيقى والرسم والأدب» (Psarra, S. 2009, p.67,68). لذا يمكن القول إن العمارة قادرة على سرد القصص عن الماضي والحاضر، والتصميم المعماري وحكم تعريفه يروي قصة للمستقبل وبنائه، أي أنها بناء قصة تكشف عما تخيله منسق هذه العملية كمستقبل مثالي، الا وهو المعماري الذي يكافح من أجل التعرف على الجمال والمشاعر الأكثر مغزى التي ينبغي التعبير عنها في ظروف مثالية. إن العمارة لا تؤثر الى حكم جمالي بحت بل الى نمط حياة تروج لها العمارة وتتضمن التنظيم المكاني والحركة وحجم الفتحات وموضعها وحتى المفروشات. إن تصور المرء للحياة اليومية داخل الفضاء يدل على تعبير مادي عن المثل العليا لحياة جيدة (de botton,2007,p). ونظراً لأن الذاكرة مرنة تتحفز في اللحظة المناسبة، فهي ليست مرتبطة بالوقت أو الموقع انياً، وإنما بطبيعة العلاقة بين الحقيقة والخيال تلك التي تكون غير واضحة لحظة الإدراك (Duncan, McCauley,2007,p:293). إن الزهبة المعمارية داخل فضاء متحف مثلاً تكشف عن وجهات نظر متعددة، تجعل زائر الفضاء يتحول حرفياً إلى مستهلك للمشاهد، من هذا المنظور الحركي فإن المرء يؤدي أيضاً فعل اجتياز الخيال وهذا هو الحال أيضاً في المشهد السينمائي، بالنسبة للفيلم تم قراءته بقدر ما يمكن اجتيازه ويقول(Bruno):» من خلال المضي خلاله، فإنه يمر بنا وبالجغرافيا الداخلية الخاصة بنا.» (4-G. Bruno, 2007, p3)

ان الرغبة بتقدير الاستخدام التشغيلي والإمكانات الكامنة للسرد كأداة في صناعة العمارة، تتطلب فهمها كوسيلة للتأويل. اذ لا يمكن تفسير معنى ما الا عندما يتم اكتشاف وتصور وحي الدلالات من خلال إخبار او قص القصص. Story telling «فالقصة عبارة عن حادثة أو تجربة أو موضوع يقدم مثير لاهتمام السرد. اشار (Stanford Anderson) الى أن «العمارة حاملة للمعنى» architecture is... a bearer of meaning اذ يناقش كيف ان أجزاء من القصص محملة بالتفصيل، وكيف تكشف خصائص او ملامح المباني عن وظيفتها، وأن عناصر المبنى لها صفات مجازية: البوابات محملة بدلالة الوصول، والنوافذ كالعيون التي يتم من خلالها توفير رؤية مسيطرة للعالم، اذ عندما يكون للمعماري رؤية أكبر يعمل هذه الخصوصيات، وأحياناً ما تكون التفاصيل المجازية التي لا يمكن تجنبها، تصل إلى مستوى عالي من التنظيم قد يسمى انتاجه قصة. لذا على المصممين الاستفادة من قوة السرد والتأويل كأدوات بشرية فطرية تُستخدم للفهم وكمولدات للتصميم وكطرق لتجسيد المفاهيم والمواضيع ضمن الخبرة التجريبية والمكانية والمادية (J. Gadsby,2014, p18)

مما سبق يتضح أن العمارة « فن سردي» ناقل للرسائل وراو للقصص، وعملية التصميم بمثابة الفعل السردية، حيث يتم إنشاء التجربة السردية من خلال التفاعل بين ذلك الفضاء وتداييات وخبرات وتفسيرات المتلقي (المؤول) معتمدة على الذاكرة المرنة لكل من المصمم والمتلقي والتي تتحفز في اللحظة المناسبة، فهي ليست مرتبطة بالوقت أو الموقع انياً، وإنما بطبيعة العلاقة بين كلا من الحقيقة والخيال لحظة الإدراك.

5-2 الفضاء السردى متعدد الاستجابات الحسية space

يعد الفضاء الداخلي جوهر العمارة إذ يمكن أن يرتبط مفهوم الفضاء كتعريف للعمارة لتأثير نجاح تصميم الفضاء الداخلي على المفهوم العام للتجربة والقيمة المعمارية. وان فكرة الربط بين العمارة والفضاء الداخلي بديهية وقد جذبت العديد من المهندسين المعماريين ونقاد الفن، باعتبار ان وظيفة العمارة هي تشكيل أماكن وسياقات تستمر فيها الحياة الاجتماعية، كما إن طبيعة العلاقة بين العمارة والفضاء ترتبط بمفهوم القيمة والفهم المعماري للفضاء. (54-Sauchelli, 2012, p.53)

وعليه فإن الفضاء السردى هو فضاء دراماتيكي داخلي يشترط فيه الاتساق مع الفضاء المعماري الخارجي ليكون قادرا على إنشاء مشاهد مسرحية غنية حسيًا تصف الفضاء بكل قيمه المتنبئة من قبل المصمم سرديا وتؤسس لفهم النصوص التي سيتم تشغيلها والاستجابة لها. (Howard, 2003, p.6) كما ان العمارة التي تهتم بتجسيد السرد ورواية القصص والتكوين الدرامي الذي يشترط ارتباطا بين المتلقين والنص من ناحية الأداء يستند على ان التعامل مع الفضاء هو ادراك بصري وأداء جسدي معا وإن تقييم العلاقة بين المفهومين يساعد على فهم الطبيعة الأدائية للسردية. (Eeg-Tverbak&K.) (Ely, 2015, p.36)

ان قوة القصص تتمظهر في المكان والزمان باعتبارها تجارب منظمة ، وبالإستفادة من القوة النفسية للانغماس لخلق الفنانون المعاصرون فضاءات غامرة مكنت المتلقين من الهروب إلى عوالم أخرى وتجربة استجابات عاطفية حقيقية، إذ إن قوة الوهم الفني وكذلك الرغبة البشرية في خلق حقائق داخل الحقائق الواقعية تمكنهم من تعليق التصديق بالعالم المادي والقبول بالتركييب الاصطناعية ، لان الانغماس متعدد الحواس حل محل التأمل اللامبالي باعتباره اصبح هدفاً لكثير من الفن وقاد بدوره نقاد الفن والفلاسفة لتحدي السياسة الحسية التقييدية للفضاءات المعمارية .

ويشير (Pallasmaa,2005) الى دور الحواس في التجربة الروحية ويقول: «عندما يكون الفرد غير قادر على التكيف مع بيئته من خلال استخدام حواسه ، سيكون للانفصال الناتج آنذاك تأثير كبير على تجربته الروحية. وهذا يؤكد على أهمية تحفيز الحواس في البيئات المشيدة من أجل تسهيل الارتقاء الروحاني » . (322-Elizabeth K, et.al, 2010, p303) ان توظيف السرد في تصميم الفضاء الداخلي يؤثر في ما يدركه ويستشعره المتلقي من خلال حركته الجسدية ضمن الفضاء واثارة جميع حواسه مساهما في ارتقائه الروحاني.

6-2 الامتداد ضمن مفهوم البيئة السردية Extent within the concept of the narrative environment

الامتداد بصورة فيزيائية (المشهد الممتد) (Physical extent (prospect) هو المشهد الممتد من دون عائق على بعد مسافة بهدف المراقبة والتنظيم (William Browning et al,2014,p44)، يتيح هذا المشهد المستخدمين بحالة مناسبة من المسح البصري المحيطي للبيئة من حولهم (الداخلية او الخارجية)، ويمنح الفضاء الذي يحتوي على حالة من الأفق الممتد الشعور بالانفتاح والتحرر مع إضافة الشعور بالأمان والسيطرة. ومن الفوائد الصحية المقترحة لهذا النمط التقليل من الشعور بالتوتر، الملل، والضعف الإدراكي، فضلا عن تعزيز مستوى الراحة العام نتيجة لتفضيلات البشر الجمالية وتفضيلاتهم للمشاهد والعناصر الطبيعية. (639-Orians& Heerwagen, 1993, p623)

وعلى الرغم من أن فكرة الامتداد ترتبط بالجوانب الفيزيائية، إلا أنها تنطبق على الأحاسيس الأكثر مفاهيمية، أو الأكثر تخيلا أيضا. وبالتالي فإن تجربة الابتعاد بشيء من المسافة

أو البعد من حيث «المكان» يمكن أيضاً أن تتحقق بصورة دلالية مفاهيمية، عندما يغمر المرء في رواية أو أداء معين لتتحقق تجربة الابتعاد "being away" ليحقق انغماراً للفرد في إحساس وعالم مختلف ومغاير. تستحضر السمات التاريخية والثقافية للفضاء المبني تداعيات عاطفية وحسية خاصة وشخصية لدى الأفراد والتي تؤسس لخلق نوع من الإحساس بالمكان والامتداد الدلالي على المستويين الزماني والمكاني (التواجد ضمن مكان وزمان آخر). (140-Stephen Kaplan, 1992, p138)

يشير (Stephen Kaplan, 1995) إلى إمكانية تحقيق الامتداد بمستوى أكثر مفاهيمياً من خلال خلق الشعور بعالم مختلف تماماً ضمن الفضاء المبني عن طريق العناصر الداخلية (مثل التحف، الأعمال الفنية التاريخية) والتي تعزز من الشعور بالارتباط مع الحقب والبيئات الماضية بالتالي الارتباط مع عالم أوسع. وتناولت الطروحات (التوبوفيليا والبايوفيليا) مفاهيم (الهوية والإحساس بالمكان) كما وأشارت جغرافياً الصحة إلى القيم الرمزية، التاريخية، والثقافية المضمنة في المكان والتي تستحضر بدورها مشاعراً وعواطفاً خاصة لدى الأفراد لتساهم في تعزيز ارتباطهم النفسي والروحي والعاطفي بأماكن معينة خاصة دون أخرى. ركز (Lynch) على مصطلح "Sense of Place" أي الحس المكاني. ليتم تعريف الهوية بأنها مدى إدراك الشخص أو استذكاره لفضاء أو مكان معين لاختلافه عن غيره من الأماكن وامتلاكه لصفة حيوية، خاصة فيه. (Lynch, 1981, p. 132)

"Identity is the extent to which a person can recognize or recall a place as being distinct from other places—as having a vivid, unique or at least a particular character of its own..."

قد يصعب تحديد المعنى والدلالة الرمزية بصورة موضوعية إذ يختلف باختلاف الأشخاص والثقافات. إلا إن هناك معانٍ ورموزاً متفق عليها ضمن مجتمع معين وثقافة معينة والتي تتسم بكونها هذه الرموز عامة ومشتركة وتمثل عنصراً مهماً في تصميم البيئات إلا إن الهوية مع ذلك لها معانٍ أكثر أهمية وعمقاً من خصائصها الشكلية ووظيفتها النفسية، إذ إن هناك متعة حقيقية للإنسان في تحسس الأمكنة وتذوق التجربة المكانية بملامحها المتعددة (تأثير الأصوات، الأشكال، الألوان، الإضاءة، الخ). فالمكان الجيد هو الذي يصل إلى كافة الحواس وتمثل الأماكن المعرفة أوتاداً ملائمة تعلق عليها ذكرياتنا الشخصية ومشاعرنا وقيمنا الخاصة بنا. إذ يهتم المعنى الرمزي بالخصائص الرمزية التي يعمل المتلقي على ربطها بتلك العناصر داخل الفضاء، كأن تحمل دلالات ومعاني سياسية، اقتصادية أو دينية أو تاريخية. إذ إن هنالك نوع من الاتفاق الجمعي على الأبعاد الرمزية والتعبيرية لطرز أو عناصر بنائية معينة ضمن المجتمع المتجانس (رغم اختلاف الأفراد في تأويل تلك الرموز وفهم معانيها تبعاً لثقافتهم الفردية وتجاربهم الشخصية) (Schulz, 1980, p. 62).

وفقاً لما سبق تحدد تجربة الامتداد من خلال الإدراك الحسي والمفاهيمي أو المتخيل ضمن الفضاء، إذ لا بد للبيئة السردية من أن تتمتع بنطاق كافي لاشتراك العقل من خلال توفير ما يكفي من المشاهد والمعلومات المترابطة لاختبارها والتفكير فيها بالتالي تستنفذ جزءاً كبيراً من ذهن الفرد وتعمل على لإلهائه عن أفكار ومتطلبات الحياة اليومية المعتادة. وتسهم هوية الفضاء بخلق بيئة معرّفة ومتميزة ولها شخصية قوية ومتفردة تحفز شعور من يتواجد فيها بالراحة النفسية نتيجة لتحسسه وإدراكها وتفاعله معها. عليه وبالتكامل مع أهم المفاهيم المطروحة ضمن الطروحات النظرية ذات الصلة والتي تتناول هذه التداعيات العاطفية والنفسية سيتناول البحث كل من المؤشرات الثانوية التالية لتحقيق « امتداد المفاهيم » ضمن الفضاء:

1-6-2 الفضاء الروحاني Spiritual space

يعود أصل كلمة الروحانية إلى جذور لاتينية (spiritus) والتي تعني « النَّفْس » "breath". حيث يشير النَّفْس إلى الحياة. يعرفها (Locktin, 2011): « تطوي الروحانية على فتح قلوبنا وصقل

قدراتنا من أجل تجربة الشعور بالرهبة، الخشوع، والامتنان. هي القدرة على رؤية المقدس في العادي، والشعور بعاطفة وانفعال الحياة، من أجل معرفة وإدراك عاطفة الوجود، لمنح أنفسنا ما هو أكبر منا بكثير»، تهدف الروحية إلى تعزيز الصحة البدنية والعقلية.

كما ويعرف كل من (Love & Talbot,1999) الروحية بأنها الانفتاح المتزايد لاستكشاف العلاقة مع القوى المنتشرة وغير المادية، وجوهر أو مركز القيمة التي توجد وراء الوجود الإنساني ومعرفته العقلانية. يُعتقد في كثير من الأحيان أن الروحية تدور حول النمو الشخصي واكتساب الفهم الصحيح لمكان الفرد في الكون. ويجادل كلاً من (Brich & Sinclare, 2013) أن المصممين والمعماريين مشغولين في توفير الحلول الحديثة لحاجات البشر الأساسية (الجسدية والنفسية) من دون التفكير في احتياجات البشر الأخرى كالـ «الارتقاء - الذاتي "Self-Transcendence" (الروحانية من الداخل spirituality from inside) التي يجب أن تكون أولوية. يوجد عدد من الأماكن والعناصر التي تعد مقدسة من قبل البشر منذ آلاف السنين كالمنصات، المذابح، الأهرامات، أو المنشآت والإعدادات العقائدية كالمساجد والكنائس، المعابد والأبنية الأخرى المصممة لتكون إعدادات مخصصة لإجراء الطقوس أو المراسيم الاحتفالية. (هند الشهري، 2018، ص 84) وهذا يمكن تحقيق الفضاء الروحاني من خلال معالجتين رئيسيتين:

روحانية الفضاء المقدس تناولت الدراسات تعاريف عدة ومختلفة لهذا الفضاء ، وفي هذه الدراسة تم اعتماد تعريف (Parse,2009) الذي ينص على ان الفضاء المقدس هو الفضاء الذي يمتلك صفتي الخشوع والروحانية "Reverence and Spirituality"، ويصف (Parse) الخشوع «هو ميزة وخاصة تركز بصورة أساسية على المحبة المطلقة . وهو الوقوف بشكل جلي وضماني بشيء من الرهبة أو التقوى بطريقة الكلام، الصمت، الحركة والسكون» .

"Reverence is a virtue, a quality that is primordially grounded in unconditional love. It is standing explicitly-tacitly in awe of something with speech, silence, movement, and stillness"

يختلف تفسير الفضاء المقدس ما بين التوجهات الدينية والروحية المختلفة كل حسب فلسفته الخاصة، ما بين المفاهيم الإسلامية الروحية والتي ركزت على التعبير عن روعة الله، وفي نفس الوقت تذكير الإنسان بتواضعه)، فيما يثير المقياس الكبير للفضاء (كأبنية الكاتدرائيات) في الفلسفة المسيحية فضلاً عن الإضاءة الطبيعية المتغلغلة ضمن الفضاء شعوراً بالروحانية والخشوع والتي غالباً ما تعزز الشعور بالارتقاء والروحانية ، اما الفكر الياباني فيصور الفضاء المقدس بمقدار عال من البساطة) وهي تقنية تسمح للمشاهد بالتواصل مع الجوانب البسيطة والنقية من العناصر أو الاشياء في الطبيعة وفهم المشاعر الروحية والترابط مع الطبيعة . تتمثل المبادئ الأساسية السبعة لتصميم الـ (Shibitsu) بـ: البساطة (simplicity) ، التضمن / الحالة المطلقة (implicitly) التواضع (modesty) ، الهدوء (silence)، الطبيعية (naturalness) ، الروتينية/ العامة (everydayness) أو عدم الكمال (imperfection) ، وتستند على تعبيرات العناصر نفسها في توفير التجربة الجمالية التي تشجع على التأمل والتفكير العميق ، والبحث بصمت عميقاً بذات الفرد.. ونتيجة لذلك فإن المباني التي تحقق هذا تكون في كثير من الأحيان مبهجة ومقدرة عبر الأجيال بصورة متواصلة ومتواصلة لأنها تحدى مشاعر الوحدة وتعزز من الشعور بالرهبة والمحبة في آن واحد. (السابق، 2018، ص 85)

روحانية الاتصال بعناصر الطبيعة : يعتقد الكثير من الفلاسفة بارتباط الطبيعة مع الجانب الروحاني للبشر وتظهر التواصلية الروحية مع الطبيعة نوعاً من التقديس والتبجيل للأشياء الأكبر من الأفراد أو تلك العناصر التي تمتلك طاقتها الخاصة واتصالها الخاص مع الأرض والأشجار، أصوات المحيط الهائج ، وغروب الشمس والجمال التي تمثل وسيلة يمكن

للإنسان أن يقدرها ويقيم بواسطتها علاقته مع الطبيعة، حيث كان الإنسان القديم غير محمي وله فهم قليل عن العالم الطبيعي والقوى الطبيعية التي واجهها في حياته اليومية والتي شكلت العبادة الخرافية للبشر لأشياء مثل البرق والرعد والرياح، والقمر والنجوم. من هنا تطور تقديس للطبيعة التي يمكن للمرء أن يقول بأنها أصبحت جزءاً من تركيبتنا الجينية.

كما أشارت نتائج دراسة (Sogol Pedram,2015) إلى أن الأفراد يشعرون بالروحانية في الفضاء من خلال ارتباطهم مع عناصر الطبيعة كالمواد الطبيعية، عناصر المياه، والألوان المستمدة من الطبيعة، وتنبه الدراسة إلى أن السمات الحسية كالملمس يمكن أن تجعل الأفراد أكثر تواصلًا مع العالم الطبيعي، كما أكدت نتائج الدراسة على أهمية تضمين عناصر الطبيعة بأقل معالجة ممكنة داخل الفضاء لتحقيق الارتباط الروحاني مع الفضاء، وإلى حقيقة تباين الأفراد في إدراكهم لجوانب الطبيعة ضمن عناصر الفضاء الداخلي (المواد الخام، اللون، الشكل أو الهيئة) فكل عنصر من عناصر الطبيعة يجسد شيئاً خاصاً أو قيمة خاصة مختلفة لكل فرد. (السابق، 2018، ص 87)

ويرى البحث أن تقديس الطبيعة في الفكر الإسلامي جاء من تعظيم قدرة الخالق وتعزيز ارتباطهم بنتاج خلقه والدعوة إلى التفكير في الآيات الكونية وتذكيرهم بالجنة إذ ورد في القرآن العظيم ذكر الشجر والنبات والماء والظواهر الطبيعية في عدة مواضع والذي كثيراً ما يكون مقترناً بالجنات والنعيم، يقول تعالى في سورة البقرة «أيود أحكمم أن تكون له جنة من نخيل وأعاب، تجري من تحتها الأنهار، له فيها من كل الثمرات، وفي سياق آخر يذكر القرآن الكريم في سورة الأنعام، وفي معرض إقناع الناس بوحداية الله وتذكيرهم بنعمه يقول عز وجل: «هو الذي أنزل من السماء ماء فأخرجنا به نبات كل شيء فأخرجنا به خضرا نخرج منه حبا متراكبا ومن النخل من طلعها قنوان دانية وجات من أعاب والزيتون والرمان متشابها وغير متشابه انظروا على ثمره إذا أثمر وبعه إن في ذلك لآيات لقوم يؤمنون». وما تسمية سور القرآن بأسماء الكائنات الحية والظواهر الطبيعية والقسم بها إلا تبيها للعقول على أهميتها في الدين والدينا مثل: السماء، النجم، الطارق، الشمس، القمر، الأنعام، النحل، السماء والنجوم، الخ ولفت الانتباه إلى ما فيها من دلائل باهرة على قدرته عز وجل.

2-6-2 الملجأ / الملاذ Refuge

هو مكان للانسحاب من الظروف البيئية أو الجريان الرئيسي لنشاط ما «the main flow of activity»، حيث يكون الفرد محمياً من فوقه وخلفه. الفضاء الذي يتمتع بخصائص الملاذ هو فضاء فريد من نوعه، منفصل عن البيئة المحيطة به ويلتمس منه الأمان، كما أنه يوفر الشعور بالاعتزال والانسحاب - سواء أكان الشاغل فريداً أو كمجاميع صغيرة. هو فضاء تأملي، احتضاني (embracing) موفر للحماية (protective)، من دون تحقيق حالة من الانقطاع. تشير الدراسات إلى إن تحقق سمة الملجأ / الملاذ مهمة لتجارب التجديد والحد من التوتر، والتي يمكن أن تتحقق من خلال خفض ضغط الدم ومعدل ضربات القلب، بالإضافة إلى التقليل من التهيج والتعب والضعف الحسي وفضلاً عن تحسين مستويات التركيز والانتباه والإدراك الحسي للأمان. (William Browning et al,2014,p46)

هذا وتلعب مفاهيم عدة دوراً في تعزيز فضاء الملجأ منها مفهوم التطويق، يتمثل مفهوم الاحتواء / التطويق Enclosure بأي من عناصر التطويق «enclosing elements» والحواجز المتضمنة داخل الفضاء والتي تؤثر على مدى الرؤية والحركة وهو أحد السمات الفضائية المؤثرة بقوة على الإدراك الفضائي. كما وجد (Stamps,2011) عند المقارنة بين ارتفاع حدود الفضاء وحجم المساحة الأفقية داخل حدود الاحتواء المدرك، أن الارتفاع أثر على مستوى الضميمة المدركة إلى حد أكبر من مساحة الفضاء الأفقية. ومن هنا اختير تأثير ارتفاع المباني حول الساحة المفتوحة على الاحتواء المدرك حيث وجد أن زيادة الارتفاع يزيد من مقدار الشعور بالاحتواء. (Pall Jakob,2013, p19p-21)

3-6-2 Character within space الفضاء ضمن الطابع

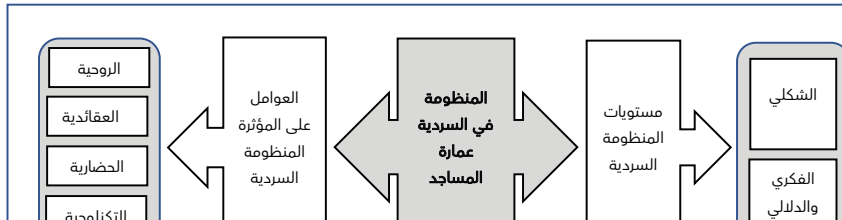
يخلق الطابع المغاير للفضاء شعوراً بالابتعاد (Being away) والتواجد ضمن عالم آخر متميز ومختلف عن التجربة المعتادة، ويمكن أن يتحقق طابع أو شخصية الفضاء من خلال (إضفاء الطابع المحلي أو الشخصي) حيث يعرف (Lawrence,2006) العمارة المحلية « Vernacular Architecture» بأنها «منشآت الإنسان التي تتجم عن العلاقات المتبادلة بين العوامل البيئية، الاقتصادية، المادية، السياسية والاجتماعية» (Lawrence, 2006, p110). هذه الهوية والارتباط قد عبر عنه في كثير من الأحيان من خلال استخدام المواد المحلية، التواصل مع مشاهد الطبيعة المحلية، وعن طريق عقد المعنى الروحي (C. Cleveland, 2014, P38). يرتبط الإحساس بالمكان بخبرات الطفولة، الرابط الخاص الذي نشأ بين الأطفال وبيئات طفولتهم، وهو ما أطلق عليه «بالمشهد البدائي primal landscape» من قبل علماء الجغرافية البشرية، والذي يشكل جزءاً من هوية الناس ويؤسس نقطة مقارنة رئيسية للنظر في الأماكن التالية في وقت لاحق في الحياة. يميل الأفراد البالغين عند تحركهم إلى النظر في الأماكن الجديدة بعلاقة مع هذه المشاهد الأساس "baseline landscape" والتي قاموا باختبارها خلال مرحلة الطفولة. كما ويشير كل من (Susie & McKellar), (Penny Sparke) إلى أن عملية التواصل ما بين الأفراد والفضاءات هي عملية ديناميكية، يشكل الأفراد الفضاءات من أجل التعبير عن أنفسهم أو عن الآخرين وبالمقابل يشكل هؤلاء هوياتهم كاستجابة لهذه الفضاءات التي وجدوا أنفسهم داخلها. العلاقة ما بين الأفراد وفضاءاتهم الداخلية ليست بالساكنة، إذ إن عملية تشكيل الفضاءات والسمات الشخصية التي تمثلها هذه الفضاءات في تغير دائم. (McKellar, 199,p2)

أشار (Schulz) إلى مفهوم الهوية وارتباطه بالمعاني المتضمنة داخل الفضاء وكون الهوية لا تعتمد على التكوين الشكلي والمادي للفضاء فحسب، بل ترتبط بمفهوم المعنى بشكل كبير. فهي حاصل التفاعل ما بين القيم الإنسانية والخصائص المكانية، إحساس الفرد بالانتماء للمكان وإحساسه بالتوجيه فيه. (Norberg-Schulz,1980,p.19).

ويشير (Walter1988) بأن الفضاء كموقع للخبرات يعمل على استدعاء وتنظيم الصور الذهنية، الذكريات، العواطف والمعاني. فأى إحساس يتولد اتجاه المكان أو الفضاء هو بالتأكيد إسقاطات ذهنية معينة وخاصة بالأفراد من خبرات متراكمة، لتحدث في مكان ما دون مكان آخر (Walter, 1988, p.15). وأضاف Lynch بأن الهوية المكانية «هي مدى الملائمة التي يمتلكها الفضاء للفرد وثقافته والتي تجعل منه واعياً ومدركاً لمجمعه، ماضيه، حياته، وعالم الزمان والمكان الذي يتواجد فيه» (Lynch, 1981, p. 132).

7-2 السرد و عمارة المساجد Narrative and mosque architecture

إذا كان السرد يؤسس للتواصل فإن العمارة تسعى لتحقيق التواصل، ان المساجد والمتاحف أنواع وظيفية معمارية يمكن ان يتم استثمارها لتأويل المحتوى الثقافي كتعبير فني معزول، كنصب مدني، كمصدر لفخر المجتمع، ككيان قابل للتأويل، بتوظيف قصص مرتبطة بالإنسانية وتناجات البشر المادية الاصيلة للعلوم الطبيعية عبر التاريخ.



شكل (1)

يوضح المنظومة السردية في عمارة المساجد (الباحثون)

ويرى البحث ان المسجد كفضاء ذو إمكانات سردية كامنة يستند على فجوات زمنية بين الحاضر والماضي وفجوات جغرافية بين المواقع المختلفة للعناصر الشكلية المتبناة من قبل المصمم وفجوات ثقافية بين وجهات نظر العالم المختلفة وفجوات مجتمعية بين مجموعات مختلفة من المصلين وفجوات مهنية بين المهن المختلفة المشاركة في صناعة الفضاء السردى وعليه يمكن توظيف السردية كآلية للتعامل مع هذه الفراغات في الفضاء واستكشاف بؤر العلاقات بينها لملء الفجوات المذكورة أعلاه.

3 - مناقشة الأدبيات السابقة Discussing previous literature

سيتم في هذه الفقرة مناقشة بعض الأدبيات السابقة التي تطرقت الى مجموعة من المفردات التي تناولت مفهوم السرد بهدف استثمارها في صياغة الإطار النظري الخاص بتوظيف مفهوم السرد في تصميم ابنية المساجد.

1-3 دراسة Marco Frascari , -THE tell – the tale detail 1995

يعزو Frascari مصدر المعنى في العمارة الى الأثناء «ولاسيما المفصلات الشكلية» بين الفضاءات، ويعطي Frascari الأهمية للتفاصيل كونها مولدة للمعنى، ويضيف ان التفاصيل الخفية يمكن أن تشهد كتعبير جمالية للتركيب والتوظيف عبر تصميم التفاصيل وطريقة حلها. أن قراءة Frascari السيميولوجية تؤكد على أن التفاصيل هي أصغر وحدات للدلالة والمعنى في العمارة، تحكي القصص؛ قصص صناعتها وإبعادها الدلالية وتعد نصوصاً أولية pretexts لتوليد نص جديد. واذ كانت العمارة كنظام، فهي تصوغ حبكة ما ، وتفاصيل العمارة حكاية ، ومن وجهة النظر هذه يمكن ان تصبح العمارة كفن الاختيار المناسب للتفاصيل لسرد الحكاية، والحبكة مع التفاصيل المناسبة، تصبح قصة مطورة كلياً وناجحة. وتتشهد الدراسة بتعريف Alberti للجمال بأنه مجموعة العلاقات الدقيقة بين التفاصيل والمعاني المرتبطة فيها (514-P.500).

يتضح مما سبق أهمية ودور المفصلات الشكلية والتفاصيل في صياغة المعاني الدلالية وفي توليد النصوص السردية وتعزيز حبكة الحكاية في الفضاء.

2-3 دراسة Jennieffer Gadsby, «Scenography in Museum Design» 2014

تأولت هذه الدراسة استخدام السينوغرافيا¹ في تصميم المتاحف وتبحث في كيفية استخدامها وكيف يمكن أن تؤثر على تجربة الزائرين، وتقيّم بشكل نقدي إمكانات المتاحف وصلات العرض ومساحات المعارض لتكون بمثابة بيئات سردية متكاملة، وتؤكد الدراسة ان التصميم المدع للفضاء الداخلي يوفر حافزاً يثير الحماس والاهتمام بالنص من قبل المتلقي، ويهتم المصممون بإنشاء أحداث مثيرة وتحولية توفر انطباعات وتجارب لا تُنسى، حيث تركز معظم التصاميم المعاصرة في المتاحف على التفاعل والتفسير السردى والتصميم التشاركي مع المتلقي. (p.15)

يقوم كلا من المتاحف والأداء المسرحي على ميزة واحدة هي سرد القصص واستخدام السرد (p.12)، حيث ان الأداء المسرحي يوظف التواصل دائماً باستخدام السرد ليس فقط بسرد القصة بل استكشاف الشخصيات والمعاني المخفية ، ونقل الحالة المزاجية أو النغمة

1 تهدف السينوغرافيا إلى خلق إطار معين وتحديد فراغ ما ، وإضفاء طابع على مكان ما من اجل شخص معينة، وحكاية ما، وصياغة وجهة نظر أو أكثر وعلى ذلك فهي " الفن الذي يرسم التصورات من اجل إضفاء معنى على الفضاء والسينوغراف الذي ينتج هذا الفن بين تقنية الديكور ، والإضاءة والأزياء ، فيشكل من معطياتها وفق رؤية موحدة، تكوينات بصرية - مشهدية تنطوي على علامات مكانية وزمانية ذات قدرة على التوليد الدلالي أو الدال على ما وراء الدلالة الحقيقية من دلالة ثقافية إضافية إيجابية (الدسوقي، 2005، ص17)

الكامنة بصريا visually conveying the underlying mood or tone في الوقت الذي أصبحت المناهج السردية أحدث بكثير في المتاحف، وواسعة الانتشار بسرعة مع إدراك مطوري المتاحف لدورها، واهتمام الزوار بمزيد من التجارب البشرية. إذ كانت مناقشة القطع الأثرية والسرد في معارض المتاحف في الماضي تُروى من خلال الصوت الفني. (p.16) بمعنى تضليل سرد القصة لما وراء المعروض المتحفي من خلال تصميم الفضاء المحيط سينوغرافيا ليتم فهم وإدراك وقراءة النص المعروض من قبل المتلقي وتفسيره. يرى البحث تشابه كلا من المساجد والمتاحف في التجربة الغامرة التي يوفرها للمتلقى، فعلى الرغم من اختلاف وظائفهما جذريا واختلاف أدائية عملية التلقي فالرائر في المتحف متحرك ، في حين يكون المتلقي بالمسجد في حالة استقرار وسكون حركي الى حد ما ، إلا ان كلا منهما يسعى الى خلق فضاءات غامرة تمكن المتلقين من الهروب إلى عوالم أخرى وتجربة استجابات عاطفية او روحية بتسخير مناهج وآليات سردية .

3-3 دراسة (Juhani pallasmaa)، «الصمت والوقت والعزلة Silence Time and Solitude «، 2012

أشارت الدراسة ضمن احد فصولها الى ان السكينة هي التجربة الصوتية الأكثر جوهرية التي تنشئها العمارة ، وان العمارة توضح دراما البناء التي يتم بث السكينة فيها من خلال المادة والفضاء والضوء ، وفي نهاية المطاف ان فن العمارة هو فن الصمت المتحجر، فعندما تتوقف فوضى أعمال البناء والتشييد، ويتلاشى صراخ العمال ، يتحول المبنى إلى متحف للصمت المنتظر ، ويعبر plasma عن ذلك بوصفه قائلا: « في المعابد المصرية نلتقي بالصمت والسكون الذي يحيط بالقرعة ، وفي صمت الكاتدرائية القوطية ، وفي تلاشي صدى خطوات الأقدام الرومانية بعيدًا عن جدران الباثيون ، اما المنازل القديمة فتعيدنا إلى الوقت البطيء وصمت الماضي .» ويضيف: « ان سكون العمارة هو استجابة وان تجربة العمارة القوية تصمت جميع الضوضاء الخارجية حيث يتركز اهتمامنا على وجودنا فيها» .

وهي بهذا تختلف عن غيرها من الفنون من خلال إمكانية التجربة لداخلها والإحساس والشعور به. لقد أدى التسارع للزمن خلال القرن الماضي إلى انهيار الوقت في الشاشة المسطحة للحاضر، فعندما يفقد الزمن مدته وصداه في الماضي البدائي، يفقد الإنسان شعوره بذاته كيان تاريخي ، وان العمارة تحررنا من احتضان الحاضر وتسمح لنا بتجربة تدفق الوقت البطيء حيث ان المباني والمدن هي أدوات ومتاحف للزمن اي إنها تمكننا من رؤية وفهم مرور التاريخ ، والمشاركة في الدورات الزمنية التي تفوق الحياة الفردية. العمارة تربطنا بالموتق أي الماضي من خلال المباني فأن وقت العمارة هو وقت محتجز ؛ في أعظم المباني يقف الوقت ثابتًا، ويتم تأمين الوقت والمكان في مسافات صامتة بين هذه الأعمدة الهائلة ؛ وأوضحت الدراسة ان المادة والفضاء والوقت تدمج في تجربة فردية فريدة اي بمعنى الوجود ، وأشارت الدراسة أيضا ان لكل مبنى أو فضاء صوته المميز في تفعيل المشاعر والأحاسيس أو الآثار . أي هناك مساحة لتقييمه من خلال قراءة شكله البصري في حين الإدراك الصوتي يبقى عادة كخبرة خلفية مساعدة، أي ان الرؤية هي الإحساس بالمراقب الانفرادي ، في حين أن السمع يخلق شعورا بالارتباط والتضامن الجمعي . (65-55.P)

يرى البحث ان مباني المساجد يمكن ان تشكل متاحف للزمن تسرد حكاية حية تمكن الافراد من رؤية وقراءة أحداث التاريخ، والانغماس في الابعاد الزمنية التي تتجاوز الحياة الفردية حيث يقف الوقت ثابتًا، ويتم تأمين الوقت والمكان إلى الأبد في المسافات الصامتة بين أروقة المسجد ؛ إذ ان المادة والفضاء والوقت المتوقف يندمجون في تجربة غنية غامرة . ولكل المساجد صوتها المميز في تفعيل المشاعر والاحاسيس ليجتمع تقييم المسجد من

خلال قراءة شكله البصري بالتعاون مع الإدراك الصوتي لهمسات الدعوات وصوت الاذان وصوت انسياب الماء من الميضأة والتي تبقى عادة كخبرة خلفية مساعدة تساهم بتحقيق شعور بالارتباط والتضامن الجمعي.

4-3 دراسة Christopher Day " , Places of the Soul, 2004

ركز Day على روح المكان في كتابه «Places of the Soul- الاماكن القريبة من النفس»، ويقول « محيطنا يؤثر فينا جسدياً وروحانياً، اذ يمكن أن يسهم في التوتر والشعور بالضيق العام أو يوازنا ويقوينا ، ويضيف على الرغم من اختلاف التفضيلات الشخصية بشكل كبير، إلا أن هناك مستوى من الاستجابة الجمالية نشاركه جميعاً. إذا نظرنا إلى هذا بموضوعية، يمكننا أن نفهم كيف يمكن لصفات البيئة المختلفة أن تغذيها جسدا وروحا ، حيث تبحث «أماكن الروح» في كيفية إعادة العامل البشري إلى معادلة البناء.

ويرى Day ان جميع الحواس تلعب دورا في تحسس الجمال، وهي عادة تؤخذ بنظر الاعتبار كلاً منها على حدة، ولكن عندما تعطي بمجموعها الرسالة نفسها عندئذ تقوم بوضع أسس وجوهر المكان . إذ تشترك الحواس جميعها بإعطاء الصورة الكلية للحقيقة ، اذ لا يمكن وصف الحقيقة بصورة كافية من قبل حاسة واحدة ، هذه الحقيقة يطلق عليها الروحية spirit ، انها روح الإنسان أو المكان أو الحدث . وهو شيء أكثر من المظهر الخارجي appearance أو الشعور بالراحة، بل هي تلك الروحية التي تؤثر فينا بعمق . (p.18)

يرى البحث ان المساجد يمكن ان تعد أماكن شافية للروح تسهم في تغذية الجسد والروح من اجهادات الحياة اليومية وتشجع على التأمل والتفكير لتشكيل المتجأ أو الملاذ بقدسيته.

4- منهجية البحث

تم تحديد منهجية البحث في ضوء المفاهيم والدراسات المطروحة في الجزء النظري للبحث ومحاولة الكشف عن طبيعة العلاقة بين السرد كاستراتيجية إنتاج للنص المعماري المعاصر وتأثيرها على صياغة التصورات الدلالية والشكلية لأبنية المساجد ، عبر تحليل عينة معمارية لمسجد مصمم تبني السرد كاستراتيجية إنتاج تصميمية بهدف توضيح إمكانات هذه الاستراتيجية وتوضيح طبيعة العلاقة بين مفردات الإطار النظري والتطبيق وصولا الى استعراض النتائج والاستنتاجات النهائية .

1-4 استخلاص مفردات الإطار النظري

من خلال التمهيد المعرفي أعلاه ومناقشة مجموعة من الدراسات السابقة المرتبطة بمفهوم السردية تم استخلاص ثلاث مفردات رئيسة للإطار النظري للسردية كاستراتيجية إنتاج للمسجد المعاصر وتفرعت هذه المفردات الى مجموعة من المفردات الثانوية والقيم الممكنة ليتسنى للبحث تطبيق هذا الإطار على عينة منتخبة في الفقرة اللاحقة والجدول ادناه توضح المفردات الرئيسية الثلاث للإطار النظري :

المفردة الرئيسية الأولى: ماهية النص السردية

المفردة الرئيسية الثانية: آليات السردية

المفردة الرئيسية الثالثة: سمات النص السردية

الجدول 1 يمثل المفردات الرئيسية والثانوية للسردية كاستراتيجية إنتاج للمسجد المعاصر

المفردات الثانوية	المفردة الرئيسية الاولى
منظومة عقائدية	ماهية النص السردية
مبادئ إسلامية	
منظومة مجتمعية	
منظومة تاريخية سياقية	
بنية قصصية إنسانية	
منظومة قيم سامية	
أفكار معاصرة	
منظومة تكنولوجية	

المفردات الثانوية	المفردة الرئيسية الثانية
<p>الترميز</p> <p>توظيف رمز إسلامي توظيف رمز سياقي (مكاني) توظيف قيمة رمزية ثقافية</p>	آليات السردية
<p>التحول</p> <p>تحول شكلي كلي تحول عنصر تحول تراكمي</p>	
<p>السينوغرافيا</p> <p>تصميم عناصر الفضاء الداخلي كمنصة للدلالات وكحامل للرموز توظيف تكنولوجيا السينوغرافيا توظيف العناصر المثيرة للاستجابات الحسية</p>	
<p>التجريد</p> <p>تجريد شكلي كلي تجريد عناصر أخرى</p>	
<p>الازاحة</p> <p>إزاحة نص ثقافي محلي إزاحة منظومة شكلية إزاحة عنصر أخرى</p>	
<p>الإحالة</p> <p>إحالة جزء إحالة فكرة إحالة سياق أخرى</p>	
<p>الإمتداد الدلالي المفاهيمي</p> <p>الفضاء الروحاني (المقدس /المتصل بعناصر الطبيعة) الملتجأ / الملاذ الطابع المحلي</p>	

المفردات الثانوية	المفردة الرئيسية الثالثة
<p>تفاعلي</p> <p>روحاني</p> <p>قيمي</p> <p>رؤيوي</p> <p>تصوري</p> <p>انفعالي</p> <p>صرحي</p> <p>دينامي</p> <p>سياقي</p> <p>معاصر</p> <p>وجداني</p> <p>حسي</p> <p>اصيل</p> <p>موضوعي</p> <p>متفرد</p> <p>تتابعي متسلسل</p>	سمات النص السردية

2-4 التطبيق

ان تجربة التنقل في فضاء المسجد واروقته مثل سرد فيلم ، إنها رحلة يتحرك فيها المصلي من بداية دخوله المسجد عبر تسلسل الفضاءات، حيث يكتشف التابع في العمارة والسرد عبر منظومة العناصر المستثمرة من قبل المصمم والتي تخلق المشاهد مجتمعة قصة تحكي عملية صنع العمارة والبنية الاجتماعية التي حدثت فيها، كونها تعتمد على الذاكرة الصورية التي تحيل المصلي الى مفهوم المكان بأبعاده الهوياتية وتزيحه باتجاه الزمن المعاصر بمعنى تشكيل صوري يقوم على تثبيت المكان كون المتلقي منتمي له وسيروية زمنية تنقله من ماض فات الى زمن الان ، من خلال التفاعل العاطفي والجسدي ليساهم السرد في تشكيل ذكريات شخصية دائمة خاصة بهم عبر التحول من منظور حسي إلى منظور تأملي شعوري يستحث القيم والمبادئ الاسلامية الاساسية بفعل السردية المتبناة من قبل المصمم .

وإذا كان فهم العلاقة المباشرة للغاية بين الذاكرة والرحلات المادية عبر طبقات من التاريخ يبلغ الكثير من الفصول، فهناك وعي أيضًا بالحاجة إلى وجود فجوات وتناقضات، إذ يتم تشييط السرد والفضاء والهوية من خلال الأجسام الموجودة في الفضاء، ويمكن قراءة الشعور بالحاجة إلى المساحات الثقافية التي تمكن الذاكرة والخيال من الاشتغال والترقب كطرق لتشكيل الهوية. فالمسجد مكان للاتصال الروحي كون المسجد كبنية وظيفية يرتبط ارتباطًا وثيقًا بمنظومة الخيال الذي يتيح للمتلقي في مساحات محددة إمكانيات القراءة والتفاعل مع منظومة الدلالات المرسله من قبل المصمم والتي تحفز خيالها من خلال إشارات شكلية وحسية يتم تلقيها وقراءتها وفق محكيات القصة الخاصة بفضاءات المسجد الداخلية وطبيعة سياق التصورات المستثمرة لتعزز التجارب الروحانية الغامرة للمتلقين ضمن الفضاء.

سيتم في هذه الفقرة التطبيق على مشروع: مسجد الخور المشارك في مسابقة تصميم مسجد لشركة إعمار الاماراتية للتطوير العقاري في منطقة خور دبي 2018 - المصمم : د. عباس الرويعي -العراق بغداد ، كان هدف المسابقة إقامة مسجد متميز بشكل علامة بصرية ضمن مدينة حضرية تحترم الثقافة والمناخ في دبي، حيث يمكن للإنسان العيش والعمل والتناغم مع الطبيعة ومليئة طموحات الأجيال القادمة في نفس الوقت .

3-4 الفلسفة التصميمية لمشروع جامع الخور في دبي

استندت الفلسفة التصميمية على إنتاج نص معماري معاصر لمسجد في دبي يستثمر ادائية فكرية تقوم على القراءة الروحانية للمصلي لسردية منظومة الرموز المجسدة في التصورات الشكلية المعتمدة في التصميم وتتسم هذه التصورات بكونها تجسد رؤيا للعلاقة بين المسجد والسياس المحيط أولاً وطبيعة التفاعل الروحاني والانغماس التخيلي للمصلي في علاقته مع الله سبحانه وتعالى اثناء ادائته لفريضة الصلاة بما يؤسس لمنظومة تشاعر وجداني بينه وبين الله بتحفيز من العناصر المعمارية الموظفة من قبل المصمم وهي كال تالي :

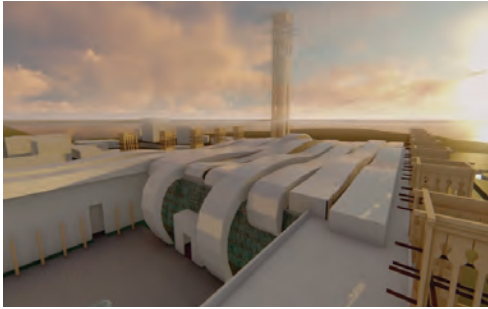
بيت الصلاة: تم استبدال شكل القبة التقليدية التي تسقف المصل عادة بمجموعة من الأمواج المتحركة بنعومة باتجاه جدار القبلة لتتفاعل معه وتؤكد عليه ، حيث حاك المصمم حركة المصلي الساجد ضمن صف كامل وإحالتها باتجاه حركات مطوية لتشكل هيكل سقف المسجد وبطيات متموجة على المستويين الخارجي والداخلي مع توظيف منظومة انارة صناعية في الفضاء الداخلي لتجسم وتؤكد على الإحساس بهذه الانحناءات لطيات السقف . كما سعى المصمم الى جعل فضاء المصل خالي من الاعمدة التي تعيق النظر وتعيق استمرارية التواصل مع الله ، ووزع احمال السقف المموج على جدار القبلة والجدار المقابل له. الشكل (2،3،7،12)

المنارة: توظيف (البرجيل) العنصر الشكلي التراتبي من وحي العمارة المحلية في الإمارات في مستويين : الأول يخص الإبراج الجانبية الحاملة والتي تعمل كأعمدة ضخمة خارجية وكأن التراث حاميا للدين والثقافة رغم وجود الأفكار المعاصرة. الشكل (4) والمستوى الثاني اعتماد احداها وتحويله ليكون جسد المنارة، حيث تم حفر وتجريد هيئة المنارة التقليدية لتكون فراغية ضمن جسد البرجيل الضخم المرتفع ، مشيرا لترابط كل من الثقافة والتراث مع المبادئ الإسلامية بجسد واحد . الشكل (8،10،11)

الواجهات: اعتماد الحروف العربية لتكون طبقات مغلقة للقشرة الخارجية للواجهات ، لتشكل الحروف سردية مكتوبة يفترض قراءتها من قبل المصلي والمتلقي معززة أهمية الحرف لكل من الدين والحضارة بإشارة الى الحروف التي رُكِّبت منها كلمات القرآن الكريم وأعجازه . الشكل (4)

الاروقة والفتحات: اعتمد سردية حركة الساجد في الفضاء الداخلي بتجريد منظومة الأقباس الداخلية وتفاعلها حسب علاقتها مع الانحناء الخاص بحركة المصلي ، هذا وتم اعتماد الاراييسك في تشكيل العناصر الخشبية للقوس التي تسمح بانسياب أشعة الشمس عبرها حسب طبيعة النقشة وحركة المصلي واقتطاعها من النقشة ، مما يعزز الشعور بروحانية الفضاء والشعور العام بالانغماس ضمن تجربة المكان. الشكل (5)

جدار القبلة والمحراب: توظيف الماء في التصميم الداخلي لجدار القبلة والمحراب ، إضافة لجدار الصحن الخارجي منسوبا على حروف آيات قرآنية مما ينتج أصواتا بحكم تصادم الماء بالحرف القرآني معززا خلق منظومة حسية شعورية تحيل المتلقي الى التفكير بعظمة الخالق وقوله (وخلقنا من الماء كل شيء حي) . الشكل (6،7)



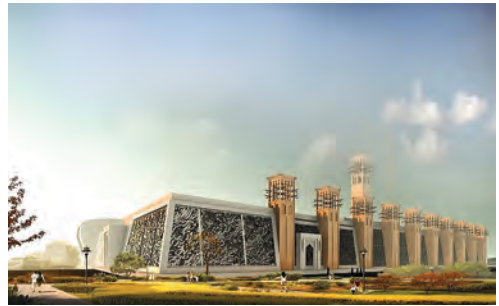
شكل (3)



شكل (2)



شكل (5)



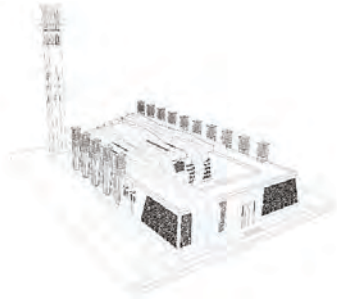
شكل (4)



شكل (7)



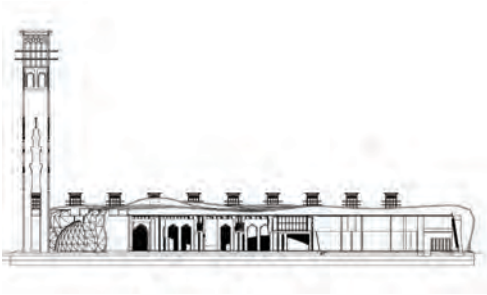
شكل (6)



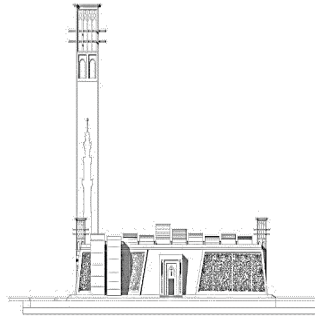
شكل (9)



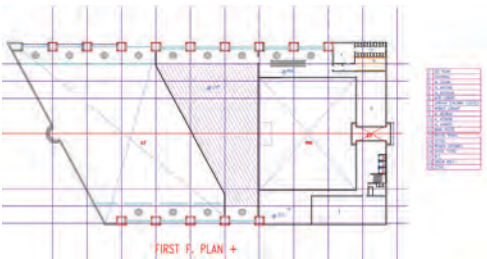
شكل (8)



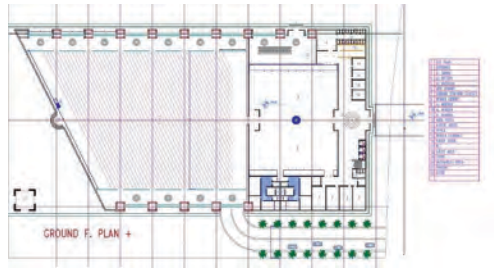
شكل (11)



شكل (10)



شكل (13)



شكل (12)

الاشكال (2 الى 13)

توضح المقترح التصميمي لمشروع مسابقة مسجد الخور في دبي 2018 ومفاصل التصميم باستثمار استراتيجية السرد (أرشيف المصمم)

5- التحليل والاستنتاجات

العمارة العربية الإسلامية «هي منظومة شاملة تشمل النصوص المعمارية المتفاعلة مع منظومة القيم والأعراف الاجتماعية للسياق المكاني الموجودة فيه محققة هوية خاصة ضمن المفهوم الإنساني في استهداف الجوانب النفعية والرمزية والجمالية تكتسبها بفعل تعبيرها عن منظومة بنيوية مؤلفة من مجموعة بنى تشير في مستوياتها المختلفة ، وبآليات إنتاج للنص المعماري مختلفة حسب المصمم وموقفه الفكري وخبرته ووظيفة المشروع وزمانه وسياقه المكاني ؛ لتكون السردية إحدى أهم استراتيجيات إنتاج العمارة العربية الإسلامية وتحديدًا المسجد كنوع وظيفي رئيس فيها»

يمكن تعريف السردية اجرائيا بكونها « استراتيجية تصميمية للفضاء الداخلي والشكل الخارجي المعاصر في العمارة المسجدية الاسلامية تترأى بمستويين شكلي ودلالي، في ضوء رؤيا المصمم وخطابه القصدي المبني على صياغة مجموعة من التصورات الفكرية المراد إيصالها للمتلقي(المصلي) وتستهدف إثارة تفاعله بمستويات موضوعية وذاتية لتأسيس معان جديدة عبر انغماره الروحي وتواصله الفكري داخل الفضاء السردى المعاصر .»

ان انغماس المتلقي في النص السردى يستلزم توظيفاً مبتكراً لعناصر وأدوات النص المحيطة بالمعروض وقصدية في تراتبية الشفرات المبتوثة من قبل المصمم بهدف تكامل الصورة الدلالية المتبناة لإيصالها للمتلقي.

افرز البحث وجود قاعدة شكلية تنص على ان «الشكل يتبع السرد» ، بحكم البحث عن هوية المكان كون المكان به مركز وحدود، وامتلاكه روح المكان. هاتان الميزتان تعبران عن هوية المكان وتأثيره على تفاعل المتلقي معه، فالسردية تسهم في صناعة هوية المكان المؤثرة على تفاعل المتلقي بفعل تشكيل الفضاء المعماري زمنيا بتصميم المنصة للفضاء المعماري والتأكيد على طابعه السردى وهل هو دائم ام مؤقت، وغالباً ما ينطوي على تغيير كامن او محتمل والتكيف مع الاحتياجات الحالية بحلول تتميز بالأصالة والتفرد.

بينت النتائج ميل المصمم الى تبني إطار صناعة المعنى الجمعي للحركة بداخله بفعل التفاعل مع المنظومة الدلالية المعتمدة من قبل المصمم في الفضاء الداخلى سردياً كون المعاني الجمعية او المجتمعية تضيف سمة الشمولية والموضوعية وليست ذاتية الانطباع والتأثير.

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Conference Track 3



Mosque

Multiple Design and Construction Techniques

المحور الثالث للمؤتمر



المسجد

التقنيات المتعددة للتصميم والبناء



ACCESSIBILITY AND SPATIAL INTEGRATION EVALUATION OF MASJIDS IN SAUDI ARABIA USING SPACE SYNTAX

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Abstract:

Besides its religious role, the masjid (mosque) has also played a significant role in Muslim society's social and economic life. That is, masjids act like a community center surrounded by public spaces and functions. Therefore, the movement around and inside a masjid was and still is vital. Due to the recent changes caused by the COVID-19 pandemic conditions, safety precautions have significantly impacted our life patterns. Knowing this fact, one may question the compatibility of a masjid as a building during the safety precautions in terms of circulation, proportions of major spaces, spatial arrangements, and utilization of entrances. This study presents case study findings that evaluate the accessibility and spatial integration of two central masjids located in Riyadh, Kingdom of Saudi Arabia, using Space Syntax software to perform syntactical analysis. Space evaluation is conducted on two typical scenarios: before and after COVID-19. This study considers the pre-COVID-19 scenario with a maximum occupancy of the physical space as opposed to the active-COVID-19 scenario of lower occupancy. Any physical space can be represented as a matrix of connected relationships leading to a matrix of mathematical properties that can be analyzed using computer simulations. It was noted in the study that the existence of a masjid *Sahan* (court) played a significant role in tying up the Masjid internally (within its function) and externally (within its context) before and after the COVID-19 pandemic.

Keywords: Space Syntax, Syntactical Analysis, Masjid, Accessibility, Spatial Integration, Pandemic, COVID-19, Saudi Arabia, Imam Turki Bin Abdullah Grand Masjid, Alkindy Square Masjid

Introduction:

Throughout history, Muslim communities have always been attached to masjids (mosques) in one form or another. The masjid was not restricted to only being a place to formally worship Allah, although that is its primary purpose. Instead, masjids have developed into institutions that provide Muslim communities with an extensive array of religious and cultural services (Abdel-Hady, 2010), (Al-Krenawi, 2016). From many narrations and hadiths, we know that there were at least five functions of the masjid during the time of the prophet Mohammed (peace be upon him), namely as a place of worshipping Allah, learning, deliberation, caring for the sick, and boarding (Fakriah, 2019). The masjid is the focal point of a Muslim community's political, social, cultural, and ritual life. These essential roles ascribed to the masjid are crucial to creating a dynamic society, both religious and mundane, spiritual and physical. Each role has a different significance depending on the different contexts of places and time. As far back as the Othman period, the functional efficiency of masjid layouts was significantly affected by spatial configuration. Nowadays, masjids are commonly designed to provide anything needed by people living around them since the masjids are the focal point of all activities linked directly to the community's needs (Laugu, 2007).

Space Syntax researchers aim to develop strategies for describing the configurations of occupied/inhabited spaces to articulate underlying social meanings. These meanings are represented in numerical and graphical forms, thus facilitating the scientific interpretation of masjid layouts (Ali and Sanusi, 2013). Space Syntax is a robust technique for describing and analyzing architectural space patterns at the building and urban levels. It attempts to explain human behaviors and social activities from a spatial configuration point of view. Space Syntax originated and developed in the 1970s at the Bartlett Unit for Architectural Studies, University College, London (Tarabieh et al., 2019). From an analytical point of view, the Space Syntax technique provides a comprehensive and consistent framework for understanding spatial arrangements and their likely human effects, which we can term as buildings'

social performance. However, the issues of 'plan layout' have mostly been addressed from various optimization points of views; most of which deem configuration as an order that can be 'found' through thousands of trials and errors in putting spaces together in different ways to maximize certain qualities (Nourian et al., 2013). Ali and Sanusi (2013) clarify adopting Space Syntax to deal with the syntactical characteristics of the spatial configuration of masjid layouts for the following reasons:

- This method combines physical and social indicators in explaining the spatial and functional systems to identify configurations in terms of similarities and differences, thus enabling the diagnosis of the strengths and weaknesses of structures, types, and patterning of masjid layouts.
- This method adopts spatial configuration's syntactic characteristics (i.e., symmetry–asymmetry and distributedness–non-distributedness) in interpreting different Masjid layouts' structures.
- This method facilitates the analysis, evaluation, and comparison of various systems.
- This method can assess, understand, describe, and model various formal and spatial systems, thus providing sufficient credibility and reality.

This paper explores the compatibility of a masjid as a building and its functions in terms of circulation, proportions of major spaces, spatial arrangements, and utilization of entrances before and after COVID-19. Using the Space Syntax technique, we will compare the compatibility of a masjid as a building with its functions using two case studies in Riyadh, Saudi Arabia. The case studies are 1) Imam Turki bin Abdullah Grand Masjid, and 2) Alkindy Square Masjid. The analysis of the collected results will help evaluate the accessibility and spatial integration of masjids in Saudi Arabia.

1. Literature review:

The masjid and its evolution in form have been the source of active discourse and debate for many years. Every masjid has a program that depends on the Muslim community where the masjid is built. A large community aims to serve a much bigger congregation, which in this case it translates into a brief of a masjid or a Jami masjid or a congregational masjid that can host Friday prayers. In any masjid, the central prayer hall is the spatial nexus; it is where the act of formal transformation begins. The spiritual space itself is extended from a point in the center and extends forward and backward. The key aim is to contain, celebrate and facilitate the acts of devotion and submission that occur mainly in the prayer hall. The masjid space layout functionality can result in two key syntactic characteristics: symmetry, asymmetry, and distributedness–non-distributedness (Ali and Sanusi, 2013), (Kassim, 2016).

Ezani et al. (2017) studied the complexity of three different masjid floor plans using Space Syntax. The masjid spatial integration and depth value (hierarchical transition among spaces) were analyzed to help imitate users' possible movement scenarios within the various masjids by topologically converting the plans into the axial line of respective nodes and links. It was shown that one of the masjids attained the most integrated ablution area, indicating that the designer has beforehand considered the importance of this space. Contrarily, other masjids obtained a more segregated ablution area, hindering user's navigation. Besides, a reduced depth value signifies easy access within the

space, whereas high depth causes inconvenient navigation through space. Thus, guiding designers in the design process identifies the suitability and accessibility of complex functional spaces (Ezani et al., 2017).

Tarabieh et al. (2018), in a similar study, analyzed a typical “static space” in terms of its spatial logic, considering a typical configuration for a prayer hall consisting of a bilateral symmetry space with four columns. This configuration is manifested in many religious buildings and assessed using visibility graphs, axial lines, and various ‘isovist’ field properties and measures. An ‘isovist’ gives a two-dimensional (2D) polygon corresponding to the viewshed¹ at that given point which is relevant for an in-depth exploration of a specific location. Tarabieh indicated how the most basic alterations to the plan’s configuration could affect the spatial experience and cognition of the place. Besides, special Space Syntax measures that are relevant to the design of the static spaces are extracted and discussed, and the consequences of an omni-visual observer of typical Space Syntax compared to the directional observer in a static space (Tarabieh et al., 2018).

Asif et al. (2018) substantiated the reason behind the development of the Space Syntax tool (syntactical analysis), which deepens the understanding of how syntactical analysis can extract social information embedded in traditional architectural practice. Space syntax is a simple form because of the proposition that human society holds integrated spatial information and that the spatial environment or inhabited space is embedded, or encoded, with social information. Therefore, the syntactical properties of a particular configuration within a particular region reflect the traditions of the people in that region. Space Syntax is useful in describing and analyzing architectural space patterns at both the building and the urban level in terms of spatial systems’ configuration properties, likewise the relationship between spatial cognition and configuration. Throughout history, the masjid has taken various forms from the hypostyle to the dome masjid. The most important space in the masjid is the prayer hall, which usually takes a square, or rectangular, form so that worshippers of Allah can line up in equally spaced rows during prayers. Accordingly, other forms of the prayer hall, such as a circle or a hexagon, are uncommon, resulting in lines of unequal length (Asif et al., 2018).

Tarabieh et al. (2019) proposed scaling of the Space Syntax field for the inclusion of other parameters, such as daylighting, and integration of the associated performative measures to syntactical analysis of the masjid typology to aid in the studying of overall space cognition, based on comfort and environmental parameters. The study presents a case study on a typical masjid layout using multi-objective optimization. The analysis presented implications for the architectural designs of spaces for glare management and daylight potential. Moreover, it is unique and builds on our previous work to explore comfort, visibility, and proximity thresholds for stationary observers (Tarabieh et al., 2019).

Many studies have emphasized the importance of prayer halls in the masjids. Despite the studies done on the masjids using syntactical analysis tools, there is still room for evaluating the accessibility and spatial integration of the masjid’s other public services and studying their relationship with the prayer halls. Though the form is fixed, the spaces’ functionality varies, especially with the world’s current changes (pandemic COVID-19). Thus, paving a gap to explore and compare two masjids in two typical scenarios: pre-COVID-19, and active COVID-19, via Space Syntax.

1 ‘viewshed’: The view of an area from a specific vantage point.

2. Methodology and Procedure:

This paper collects quantitative data utilizing a Space Syntax simulation technique to study accessibility and spatial integration of masjids in Saudi Arabia. It attempts to test and analyze the two different case studies to measure a masjid's compatibility as a building in terms of circulation, proportions of major spaces, spatial arrangements, and utilization of entrances before and after the COVID-19 pandemic. It should be noted that both case studies – the Imam Turki Bin Abdullah Grand Masjid and Al Kindy Square Masjid – are located in Riyadh, the most crowded city in the Kingdom Saudi Arabia, and have similar socio-cultural characteristics. Besides, both masjids have won local and international architectural prizes.

Evaluating the accessibility and spatial integration of each masjid will be accomplished by using 'DepthmapX' software. The masjid AutoCAD plans constitute the primary source of information for this analysis, taking into account only physical barriers that obstruct movement and vision (walls). After importing the layouts, we selected the areas to be analyzed then started making the graphical representation of visibility. Every visual field from each point of the analyzed layout is calculated, and the level of visibility is identified. The level of Connectivity, Visual Integration, and Visual Step Depth graph are measured accurately for the selected masjids (Table 1). The results obtained are represented by a color scale, ranging from red to blue. Red shades correspond to areas with the highest visibility, while blue corresponds to more restricted visual fields.

Table 1: Some of the terms used in "DepthmapX" software.

Term	Meaning
Visual Graph Analysis (VGA)	Visibility graphs analyse the extent to which any point in a spatial network is visible from any other. Where points are not directly visible, graph measures of a matrix of points can be calculated to test how many intervening points are needed for one point to see others (Desyllas & Duxbury, 2001).
Connectivity	The objective concept of connectivity means spatial connections, whose numerical value represents the number of accesses leading to space. It measures the number of immediate neighbors directly connected to space (Askarizad & Safari, 2020).
Visual Integration	The integration of space is a function of the mean number of lines and direction changes that need to be taken to go from that space to all other spaces in the system. Therefore, greater integration indicates that the spaces are more integrated (Askarizad & Safari, 2020).
Visual Step Depth	The visual step depth of space calculates how many 'steps' it takes to cover the entire area, where the 'steps' are measured by how far you can see.
Maximum Depth (MxD)	Maximum Depth is the total number of steps of the analyzed plan.

3. Analysis and result:

Both case studies have an open-plan layout surrounded by different spaces designated for religious, commercial, entertainment, or other purposes, for

different ages and genders². Further information about them can be found in (Table 2).

Table 2: General information about Imam Turki Bin Abdullah Grand Masjid, and Alkindy Square Masjid

	Imam Turki Bin Abdullah Grand Masjid	Alkindy Square Masjid
Location	Riyadh, Saudi Arabia	Riyadh, Saudi Arabia
Built year	1992	1986
Area	16,800 m ²	3,200 m ²
Capacity	17,000 worshippers	7,000 worshippers
Style	Contemporary design inspired by Najd traditional architecture	Contemporary design inspired by Najd traditional architecture
Accessibility to the Prayer hall	Linear movement	Central movement

The architectural layout of the masjid's context (Figure 1,2) is based on a functional schema of places. Yellow places are for the prayer area, light gray for the *Sahan* area and dark gray places are for circulation and public services spaces. It should be noted that both masjids have two main entrances with the addition of emergency exits used as entrances when needed. However, emergency exits will not be considered as entrances in the analysis.



Figure 1: The architectural layout of Imam Turki Bin Abdullah Grand Masjid.



Figure 2: The architectural layout of Al Kindy Square Masjid.

3.1 Imam Turki Bin Abdullah Grand Masjid:

The Imam Turki Bin Abdullah Masjid is considered one of the most famous masjids in Riyadh and was a meeting place for scholars and students of knowledge. Imam Turki Bin Abdullah Masjid's context consists of *Assafah* Square connected to the *Sahan* of 4,800 square meters, main prayer hall,

² From the inception of Islam, care has been taken to provide for the needs of women in masjids, ensuring their privacy, protection, and spiritual development. The Prophet (peace be upon him) took care in his mosque to have dedicated rows for women to pray in, conducted special teaching events for women, etc. as described in hadiths. While space may be dedicated to women in masjids for their privacy and protection, from Allah's perspective, men and women are equal: "Those who do good, whether male or female, and have faith will enter Paradise and will never be wronged; even as much as the speck on a date stone." (4:124)

library, school, and 50 shops.

The findings from the Visual Graph Analysis (VGA) were done by DepthmapX software, which calculated the Connectivity level, Integration level, and Step Depth of the Imam Turki Bin Abdullah Grand Masjid (Table 3) and (Figure 3).

Table 3: Quantitative numbers from analysis of Imam Turki Bin Abdullah Grand Masjid

	Minimum	Average	Maximum
Connectivity	1	5,352.47	12,057
Visual Integration	1.94618	11.1621	17.0365
Visual Step Depth	0	1.97613	7

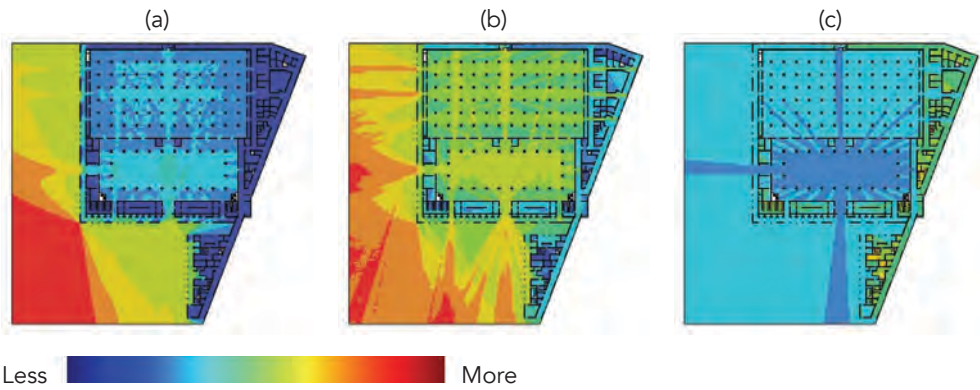


Figure 3: The syntactic analysis of the ground floor of Imam Turki Bin Abdullah Grand Masjid. From left to right, (a) Connectivity, (b) Visual Integration, and (c) Visual Step Depth graphs.

The red color at the right end of the color scale represents the highest value of connectivity and integration level, and the blue color at the other end of the scale represents the lowest value of connectivity and integration. According to the results, there is a linear gradation in connectivity and visual integration level on Imam Turki Bin Abdullah Grand Masjid. The Sahan serves as a distribution point, moving people from a public zone to a private zone. As shown in Figure 3 (a), Assafah Square has the highest connectivity level because it is visually connected to all other spaces in and surrounding the masjid. Figure 3 (b) shows that Assafah Square is well-integrated because the integration level is distributed equally in the space, providing fluency in the movement and prevents crowdedness in the masjid's gates. Figure 3 (c) shows the number of steps to cover the entire area, which clarifies the relationships between the masjid spaces. There is a direct relationship (one step away) between Assafah Square and the Sahan and the public services (school, library, and shops). The relationship between the Sahan and the public services is direct also. The relationship between the Sahan and the prayer hall is indirect (two steps away). That indicates the centralization of the Sahan and its role in distributing the movement in the masjid. Figure 4 shows the Maximum Depth (MxD) that will determine the relationship between Imam Turki Bin Abdullah Grand Masjid spaces according to the zone (private and public) and movement.

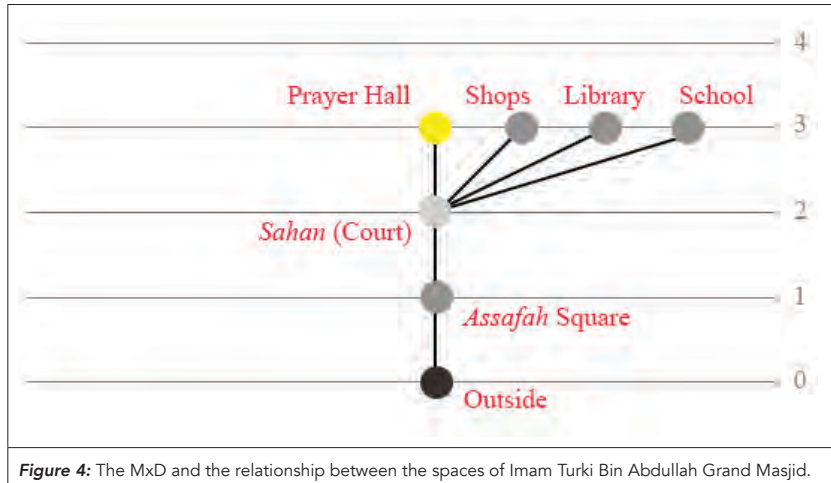


Figure 4: The MxD and the relationship between the spaces of Imam Turki Bin Abdullah Grand Masjid.

The other VGA was done during the active-COVID-19 period on Imam Turki Bin Abdullah Grand Masjid in two possible scenarios. The first scenario analyzed the Connectivity level, Integration level, Step Depth after closing the main entrance (Table 4) (Figure 5), and the second scenario analysis after closing the side entrance (Table 5) (Figure 6), noting that the emergency exits are closed in both scenarios.

Table 4: Quantitative numbers from analysis of Imam Turki Bin Abdullah Grand Masjid in the first scenario

	Minimum	Average	Maximum
Connectivity	1	5,255.47	12,056
Visual Integration	1.3831	7.84851	13.9666
Visual Step Depth	0	2.25978	9

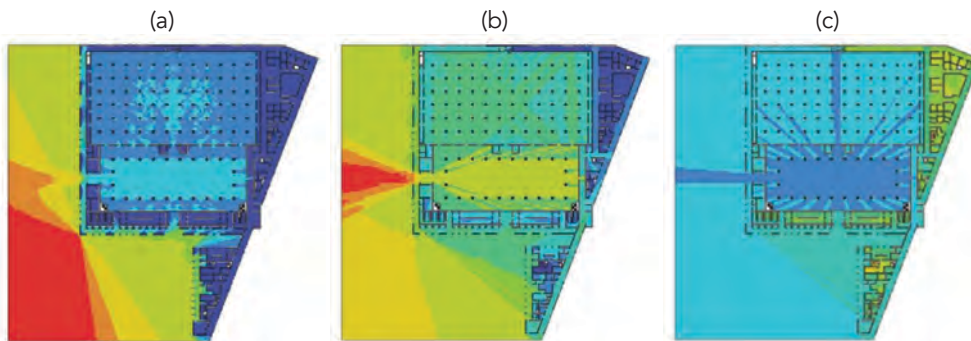


Figure 5: The syntactic analysis of the ground floor of Imam Turki Bin Abdullah Grand Masjid in the first scenario. From left to right, (a) Connectivity, (b) Visual Integration, and (c) Visual Step Depth graphs.

Table 5: Quantitative numbers from analysis of Imam Turki Bin Abdullah Grand Masjid in the second scenario

	Minimum	Average	Maximum
Connectivity	1	5,256.77	12,056
Visual Integration	1.34623	7.82284	12.8348
Visual Step Depth	0	2.25062	9

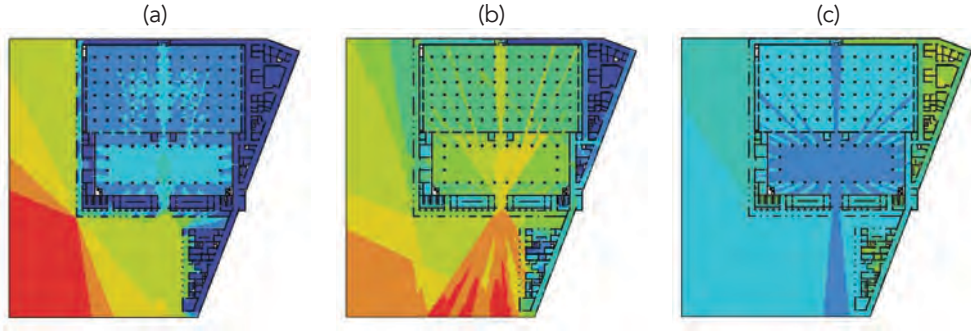


Figure 6: The syntactic analysis of the ground floor of Imam Turki Bin Abdullah Grand Masjid in the second scenario. From left to right, (a) Connectivity, (b) Visual Integration, and (c) Visual Step Depth graphs.

Assafah Square has the highest connectivity level in both scenarios, as shown in Figure 5 (a) and Figure 6 (a). Figure 5 (b) shows that after closing the main entrance, the integration becomes centered at the side entrance only. On the other hand, Figure 6 (b) shows that *Assafah* Square becomes the most integrated space after closing the side entrance. The level of integration is distributed unequally in the space. However, the unequal distribution lowers the crowdedness at the main entrance. There is a linear gradation in the visual integration level from *Assafah* Square to the prayer hall in both scenarios, emphasizing the importance of the *Sahan* in the masjid's design. Figure 5 (c) and Figure 6 (c) shows that the number of steps to cover the entire area has increased in both scenarios compared to the result of the pre-COVID-19 period.

The findings of the VGA of Imam Turki Bin Abdullah Grand Masjid in its initial status indicate that the average Connectivity level was 5,352.47; this amount was reduced by 1.8%, and the average of Visual Integration was 11.1621, reduced by 29.7% in the first scenario (Figure 7,8). In the second scenario, the Connectivity average was reduced by 1.8%, and Visual Integration saw a reduction of 29.9% (Figure 7,8). This result shows that closing the main entrance or the second entrance will have almost the same significant effect of decreasing the accessibility and spatial integration of Imam Turki Bin Abdullah Grand Masjid and its surrounding area. However, supporting the masjid with a *Sahan* played a significant role in organizing the movement when entering or exiting. Moreover, the availability of *Assafah* Square helps lowers the crowdedness at the gates. Figure 9 clarifies the level of accessibility and spatial integration of Imam Turki Bin Abdullah Grand Masjid before and after COVID-19.

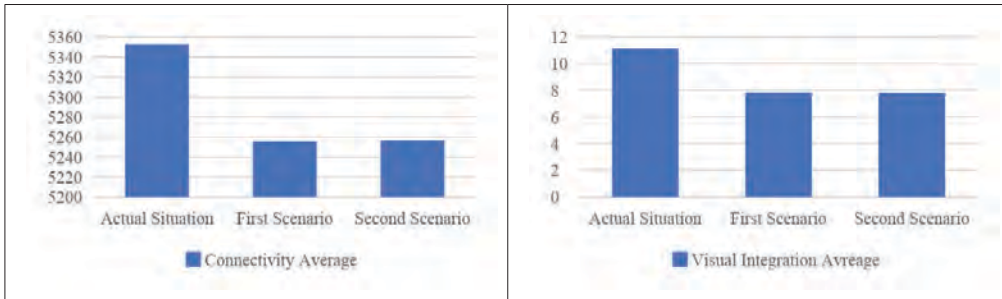


Figure 7: Comparison of Connectivity level before and after COVID-19 in Imam Turki Bin Abdullah Grand Masjid

Figure 8: Comparison of Visual Integration level before and after COVID-19 in Imam Turki Bin Abdullah Grand Masjid

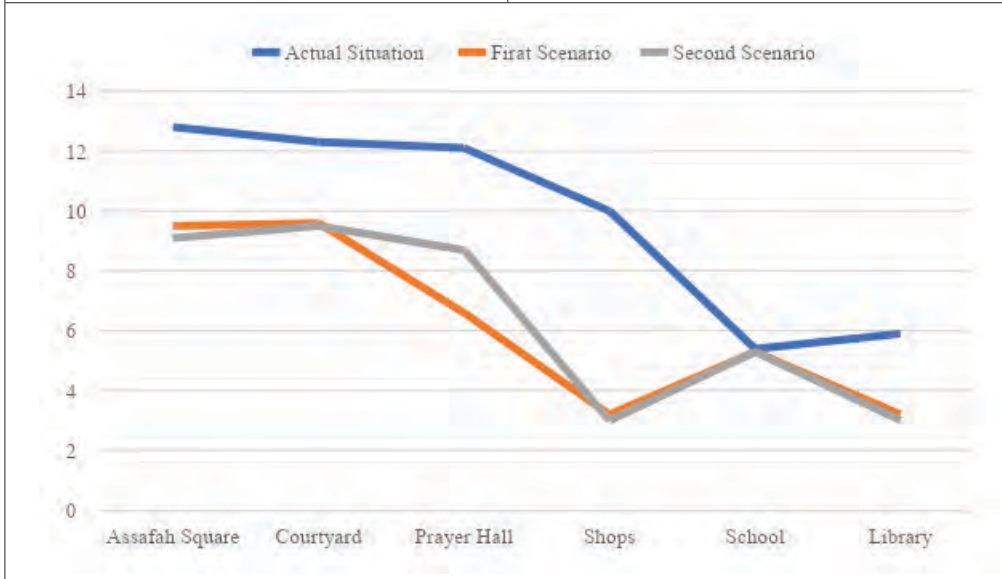


Figure 9: Comparison of the level of accessibility and spatial integration of the masjid before and after COVID-19 in the Imam Turki Bin Abdullah Grand Masjid

3.2 Alkindy Square Masjid:

Alkindy Square Masjid is one of the most prominent and vital built forms in the diplomatic quarter in Riyadh. The masjid’s design aims to preserve the traditional links of masjids to the community by connecting it with public services. Alkindy Square Masjid is a focal point for the surrounding residential area and is integrated with the fabric both socially and physically. Alkindy Square Masjid’s context consists of Alkindy square connected to the *Sahan*, main prayer halls, library, lecture hall, and shops.

The findings from Alkindy Square Masjid’s analysis done by DepthmapX software, which calculates the Connectivity level, Visual Integration level, and Visual Step Depth (Table 6) (Figure 10).

Table 6: Quantitative numbers from the analysis of Alkindy Square Masjid

	Minimum	Average	Maximum
Connectivity	1	1,953.41	6,792
Visual Integration	1.42541	5.13958	8.38587
Visual Step Depth	0	3.20932	8

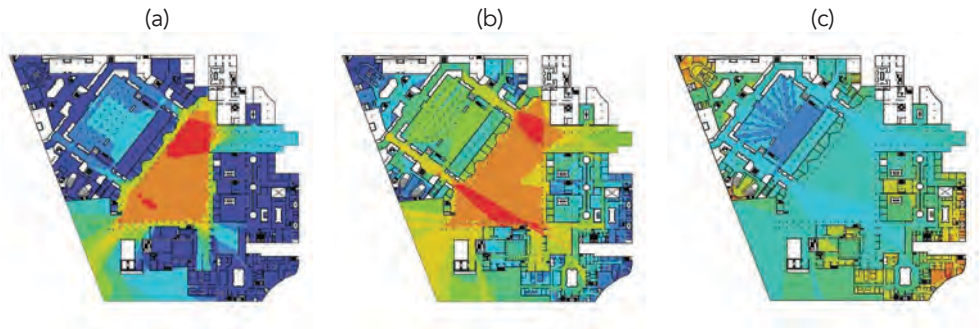


Figure 10: The syntactic analysis of the ground floor of the Alkindy Square Masjid. From left to right, (a) Connectivity, (b) Visual Integration, and (c) Visual Step Depth graphs.

According to DepthmapX software results, there is a central gradation in connectivity and visual integration level on Alkindy Square Masjid. Alkindy Square serves as a distribution point, moving people in and around the masjid. Alkindy Square has the highest connectivity level, which is centralized on the right side of the Square, as shown in Figure 10 (a). Also, Alkindy Square has a high level of integration distributed equally on both sides, right and left of the Square, as shown in Figure 10 (b). This distribution point helps to control the movement and prevents crowdedness at the masjid's gates. Figure 10 (c) clarifies the number of steps to cover the entire area, clarifying the relationships between the masjid's spaces. According to the results, Alkindy Square directly relates to the *Sahan* and shops (one step away). There is also a direct relationship between the *Sahan* and prayer halls (one step away).

On the other hand, the relationship between Alkindy Square and the lecture hall and library are indirect (from three to four steps away), and the relationship between the *Sahan* and the lecture hall and library are indirect (from two to three steps away). Also, the relationship between Alkindy Square and the prayer hall is indirect (two steps away). That indicates the centralization of the *Sahan* and its role in distributing the movement in the masjid, moving people from a public zone to a private zone. Figure 11 shows the MxD that determines the relationship between Alkindy Square Masjid spaces according to the zone (private and public) and movement.

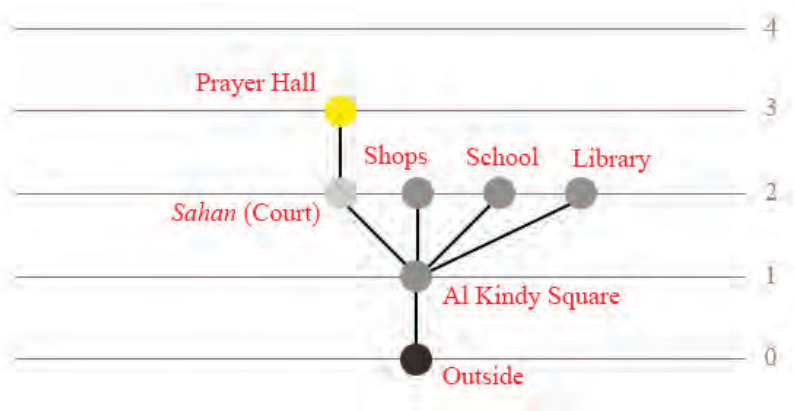


Figure 11: The MxD and the relationship between the spaces of Alkindy Square Masjid.

Likewise, the other VGA was done during the active-COVID-19 period on Alkindy Square Masjid in two possible scenarios. The first scenario analyzed the Connectivity level, Integration level, and Step Depth after closing the right entrance (Table 7) (Figure 12), and the second scenario analysis, after closing the left entrance (Table 8) (Figure 13), noting that the emergency exits are closed in both scenarios.

Table 7: Quantitative numbers from analysis of Alkindy Square Masjid first scenario

	Minimum	Average	Maximum
Connectivity	1	1,948.95	6,792
Visual Integration	1.37204	4.94	8.11499
Visual Step Depth	0	3.41377	9

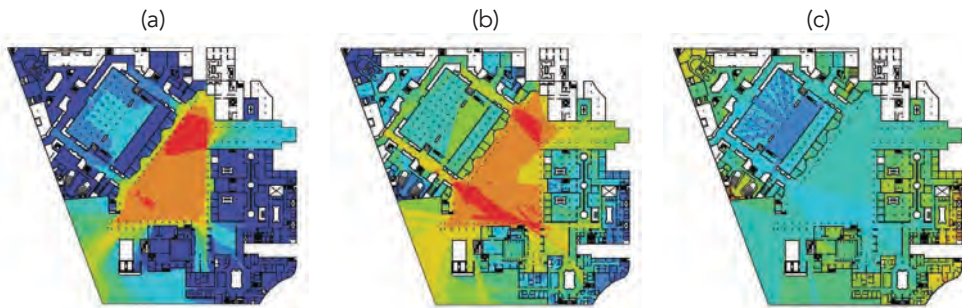


Figure 12: The syntactic analysis of the ground floor of Alkindy Square Masjid in the first scenario. From left to right, (a) Connectivity, (b) Visual Integration, and (c) Visual Step Depth graphs.

Table 8: Quantitative numbers from analysis of Alkindy Square Masjid second scenario

	Minimum	Average	Maximum
Connectivity	1	1,949.08	6,792
Visual Integration	1.36249	4.91002	8.00024
Visual Step Depth	0	3.5339	10

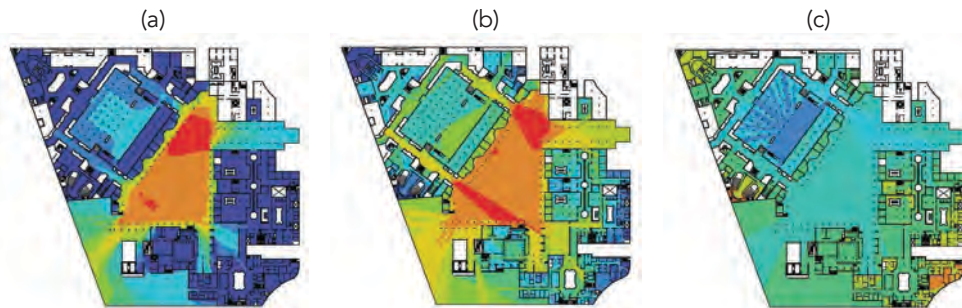


Figure 13: The syntactic analysis of the ground floor of Alkindy Square Masjid in the second scenario. From left to right, (a) Connectivity, (b) Visual Integration, and (c) Visual Step Depth graphs.

According to the results, closing the right entrance or the left entrance does not significantly affect the Connectivity, Visual Integration, or Visual Step Depth. As shown in Figure 12 (a) and Figure 13 (a), the right side of Alkindy Square still has the highest connectivity level in both scenarios. Figure 12 (b) and Figure

13 (b) show that the integration level is distributed equally on both sides of Alkindy Square, which helps to control the crowdedness at the entrances. There is a central gradation in the Visual Integration level from Alkindy Square to the prayer hall on both scenarios indicating the importance of the *Sahan* in the masjid's design. Figure 12 (c) and Figure 13 (c) shows that the number of steps to cover the entire area has increased in both scenarios compared to the results of the pre-COVID-19 period.

The VGA findings of Alkindy Square Masjid in its initial status indicate that the average Connectivity level was 1,953.41; this amount was reduced by 0.2%, and the average of Visual Integration was 5.13958, reduced by 3.9% % in the first scenario (Figure 14,15). Also, in the second scenario, the Connectivity average reduced by 0.2%, and Visual Integration reduced by 4.5% (Figure 14,15). Both scenarios have a low chance of affecting the accessibility and spatial integration in Alkindy Square Masjid. This result emphasizes the benefit of the centralization of the Square in the masjid context. Figure 16 clarifies the level of accessibility and spatial integration of Alkindy Square Masjid before and after COVID-19.

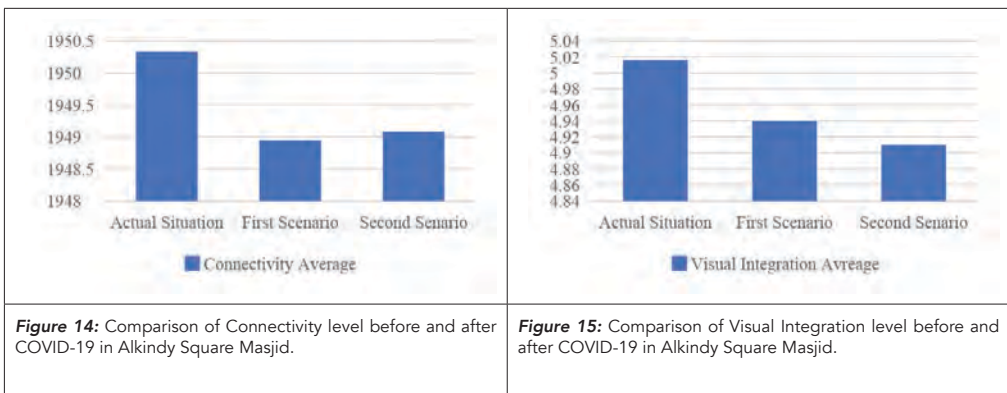


Figure 14: Comparison of Connectivity level before and after COVID-19 in Alkindy Square Masjid.

Figure 15: Comparison of Visual Integration level before and after COVID-19 in Alkindy Square Masjid.

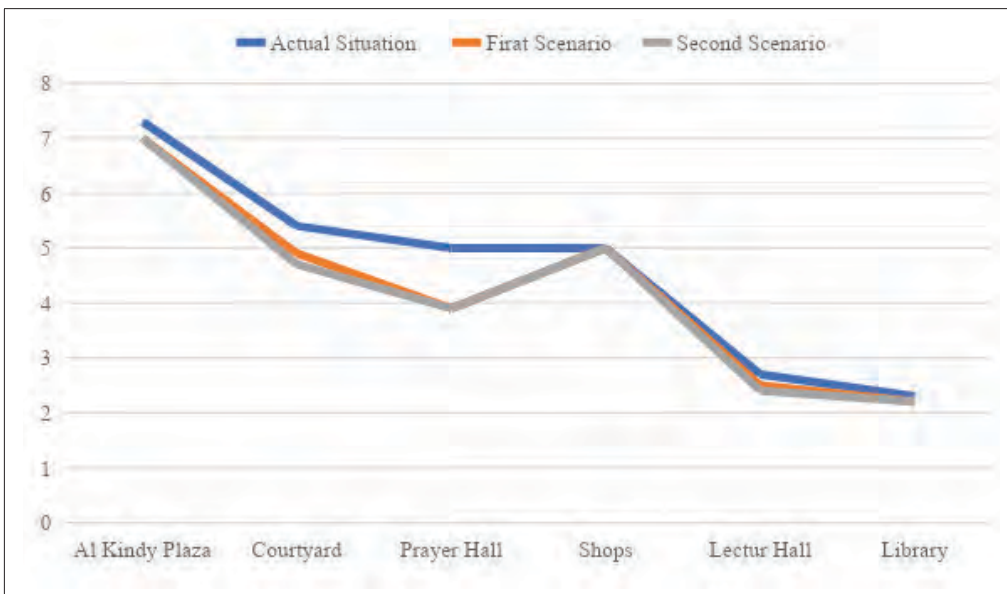


Figure 16: Comparison of the level of accessibility and spatial integration of the masjid before and after COVID-19 in Alkindy Square Masjid.

Based on the results from the VGA of the two case studies before COVID-19, we concluded that the Connectivity level in the Imam Turki Bin Abdullah Grand Masjid (linear movement) is concentrated in the middle of the Square. The Square, therefore, serves as a focal point controlling the flow of movement in one direction to the masjid. However, in Alkindy Square Masjid (central movement), the Connectivity level in the Square is concentrated in the areas leading to the services. In this design, the Square serves as a distribution point, diffusing the movement of people. The distribution of the Visual Integration level in both masjids aids in directing the movement toward the masjids' gates. The Visual Step Depth in Imam Turki Bin Abdullah Grand Masjid was lower than Alkindy Square Masjid because of the difference between the movement design (linear or central) (Table 3,6). Despite the fact that both Masjids have the same public services, Alkindy Square Masjid has a higher Visual Step Depth because of the central movement in the masjid.

The MxD of both masjids was at the same level (Figure 4,11). The *Sahan* in the linear movement design is a distribution point to the masjid and its surrounding area (Figure 4), but in the central movement design, the *Sahan* is a transitional point from the public area to the private area, providing more privacy to the prayer halls (Figure 11)

In the active-COVID-19 scenarios of Imam Turki Bin Abdullah Grand Masjid, the accessibility and spatial integration were significantly affected by COVID-19 safety precautions (Figure 9). On the other hand, COVID-19 safety precautions hardly affect the accessibility and spatial integration in Alkindu Square Masjid (Figure 16). The central movement design is more efficient with the implementation of the safety precautions during the COVID-19 pandemic.

In both scenarios, before and after COVID-19, the *Sahan* played a significant role in connecting the masjid spaces visually and physically. The *Sahan* is a fundamental element in the masjid, and therefore it must be taken into consideration when designing masjids with conditions similar to these two cases. The Square was a supporting element to the *Sahan*; it helped in minimizing the crowdedness and therefore facilitated better control of movement at the masjid's main entrances.

5. Conclusion:

This study evaluated the accessibility and spatial integration of masjids in Saudi Arabia using Space Syntax syntactical analysis. A simulation technique was applied to measure a masjid's compatibility with its surroundings in terms of circulation, proportions of major spaces, spatial arrangements, and utilization of entrances before and after the COVID-19 pandemic.

The results of the two case studies found that the gradation of movement between the areas due to the existence of a *Sahan* (courtyard) in the masjid has facilitated accessibility and spatial integration. To be specific, the results pointed out the importance of the *Sahan* area in masjids similar to these case studies. In addition to its role as a transitional point from one zone to another, it helped minimize the crowdedness at the prayer hall entrance and regulated the flow of people. It was also observed that the existence of the masjid Square helped in distributing the flow of people through the main gates of the masjid.

It is important to acknowledge that Space Syntax is a unique technique linking space and society. This technique helps to understand the environment in a particular context and analyze the flow of people in that environment by estimating where people are and how they move within the context of a built environment. The authors recommend the use of the Space Syntax technique during the design process phase to evaluate and enhance the design before the application phase.

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EVALUATING DAYLIGHT PERFORMANCE OF THE PRAYER-HALL IN THE GREAT MOSQUE IN HAMA



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Abstract:

The city of Ḥamā, located in the middle of Syria, is considered one of the oldest still-inhabited cities in the world. *The Great Mosque of Ḥamā*, also known as the *Upper Mosque*, is distinguished for being the oldest extant place of worship in the city as it was initially built as a temple in ca. 9th century BC, converted into a church, then finally converted into a mosque. This paper aims to evaluate the current use of daylight through analyzing it in order to measure visual comfort. To achieve these results and objectives, a descriptive-analytic method is used to study the considerations and conditions of reasonable indoor daylight in mosques, the usual tasks of mosques, climate data of the case study's location, and the geometrical features and optical properties of existing building materials of the mosque based on documents and previous site visits. Then, to assess the existing natural light condition, it's necessary to simulate the seasonal and daily variation of daylight in the building, using dynamic metrics based on the data above. Daylight performance of this building is evaluated in terms of daylight factor, luminance, illuminance level, uniformity, space proportions, and glare index. These calculations are conducted by computer simulation using DIALUX EVO 8.1 software. A comparative analysis is applied to test simulation outputs to determine to what extent the outputs match requirements. Finally, strategies and recommendations are proposed that mainly aim to: enhance daylight uniformity within the prayer hall, improve daylight level, and increase thermal comfort as needed.

Keywords: Daylight, Great Mosque, Hama, Ḥamā, Illuminance, Lighting level, Uniformity, Upper Mosque, Visual comfort.

1. Introduction

The city of Hamā [حماة] is located in the western center of the Syrian Arab Republic [الجمهورية العربية السورية], on the banks of the Orontes River [نهر العاصي] which flows through the city and divides it in two. The city of Ḥamā is one of the oldest still-inhabited cities on Earth; it started with primitive agricultural dwellings in the fifth millennium BC,¹ evolving into a walled city by the third millennium BC (Al-Mufti, 1969, 117-119).²

The Upper Mosque, al-Jāmi' al-A'lā [الجامع الأعلى], in Ḥamā is one of the earliest Islamic great mosques. It is now the grand mosque of the city, and has always been the religious center of Ḥamā (Fig. 01). It was constructed as an Aramean temple early in the first millennium BC.³ The pagan temple was converted into the 'Church of John the Baptist' early in the 4th century AD, then its name was changed to the 'Church of John Chrysostom' in 363AD (Nahhas, 2007, 37). In 636AD,⁴ the Islamic conquest reached the city of Ḥamā due to a peace treaty, which comprehended a term in the treaty to convert the great church to become the great mosque (Abul-Fida', 1958, 1: 109).

1 The Neolithic Age.

2 The late Bronze Age.

3 In 1812, J. L. Burckhardt observed a group of 'Hamathite stones' in the Great Mosque of Ḥamā, which are basalt slabs engraved with Hittites Hieroglyphic inscriptions. The inscriptions are about Urhulina the Aramean king of Hamath, who lived in the 9th century BC. See: (Hawkins, 2000, 6-7; Jijakli, 2014, 1: 5).

4 Corresponds to 15H.



Figure (01): The Great Upper Mosque in Hamā, Syria.

By: Salam Jijakli, 2010.

The Great Mosque of Hamā is located in Al-Madineh district [حي المدينة], west of Castle Hill, on the western bank of the Orontes River (Fig.02). Its water was driven to it by the historical and largest waterwheel on the Orontes: Al-Muḥammadiyah Noria [ناعورة المحمدية].⁵ The total area of the mosque is 4,358m². It contains many parts, inscriptions and antiquities that date back to different historical eras.

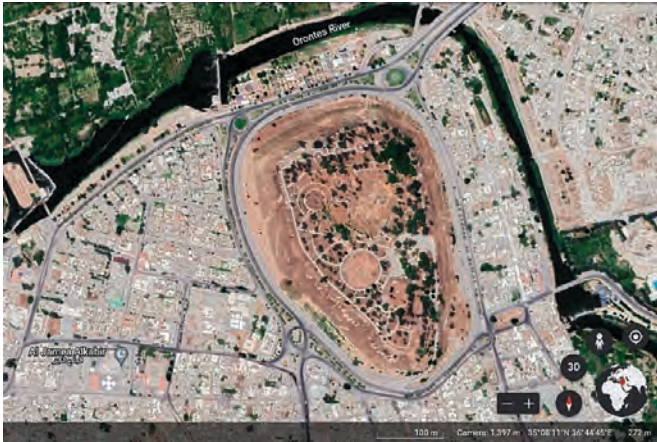


Figure (02): Aerial photo of the city of Hamā, showing the location of the Upper Mosque.

From: Google Earth, Syria, Hama. Available at: <https://earth.google.com/web/@35.13664589,36.7459657,7,272.26646855a,1124.94796253d,35y,0h,0t,0r> (Accessed: 27 July 2022).

The layout of the Upper Mosque follows the example of the Arabic Hypostyle mosque-type (Hakim, 2008, 46), consisting of three main elements: A Prayer-hall, place for ritual washing ('Haram' [حرمة]), and a Courtyard ('Sahn' [صحن]), that is surrounded by Arcades (Riwaqs [أروقة]) (Figs. 03, 04). This typology was originally set by the Great Umayyad Mosque in Damascus [الجامع الأموي بدمشق] and has been followed as the unit-model of mosques in the Levant [بلاد الشام] and other regions (Akili, 2015, 56; Hakim, 2008, 46). The Upper Mosque of Hamā

⁵ Al-Muḥammadiyah Noria: A Hydraulic wooden-waterwheel. Located in the Bab al-Nahr [باب النهير] district in the city of Hamā. It was previously named 'The Golden Noria' after the 'Golden Church' and the 'Golden Bath' which it was serving. It is 22 m in diameter and it is the largest Noria on the banks of the Orontes River.

contains two prayer-halls. The main and large one is located in the southern side of the mosque. It has a rectangular plan with a total area of 711.25 m² (Fig. 05). Its ceiling is 9.55 m in height, supported by eight square-section stone pillars. The ceiling bears five domes. The central dome's height is 5.5 m, whereas each of the remaining four domes are 4 m in height (Fig. 06). The main prayer-hall contains different types, sizes and shapes of apertures in its walls and domes, which serve as admission sources of illumination (Tbl. 01). The absence of large, low-rise windows in the eastern, southern, and western walls of the prayer-hall is notable. Due to the level-difference outside the mosque between the north and south sides, which causes inclination of the floors outside the eastern and southern walls of the prayer-hall (Fig. 07), it is normal not to open windows in the Qibla [إنيقة] wall that contains the Mihrab [المحراب] (Saad & Abdul Aziz Al Mousa Endowment, 2013, 123), which is the southern wall of the prayer-hall.

The Upper Mosque was listed as a historical monument estate due to decree no. 98, issued in the 02nd of September 1935 (Appxs. 01, 02). At present, it is protected by the Syrian 'Law of Monuments Protection' [قانون حماية الآثار السوري], issued in 1963, and the law is still in effect.

Table (01): The location, number and types of the existing apertures and recesses in the main prayer-hall in the Upper Mosque.

Wall	Length (m)	Apertures					Recesses
		Doors		Windows			Niches
		Single	Double	Large	Transom	Decorative	
Northern	33.3	-	3	2	2	7	-
Southern	21.4	1	-	-	-	3	-
Eastern	33	1	-	-	-	11	1
Western	21.6	2	1	-	-	-	-
Dome	Diameter (m)	Apertures					
		Dome's Body	Dome's Drum				
Northern	5.9	4					
Southern	6	4					
Eastern	5.9	4					
Western	6	4					
Center	6.4	-	10				

By: The researchers.

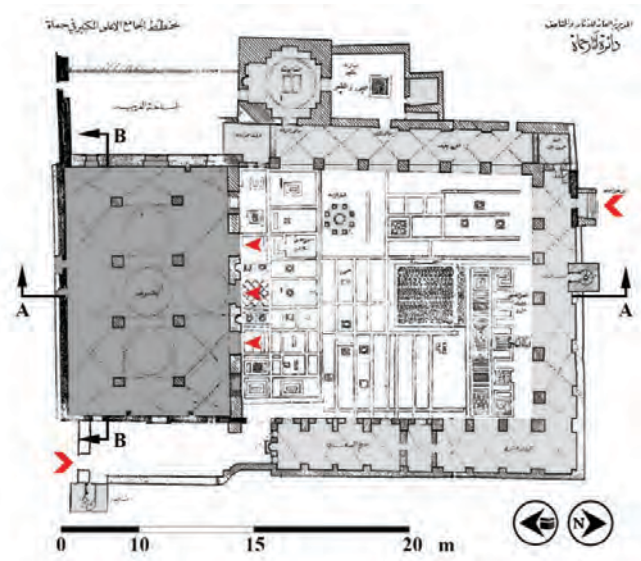


Figure (03): Layout of the Upper Mosque in Hamā.

Unroofed spaces. ■ Roofed spaces. ■ The main prayer-hall.
 (Shehadeh, 1976, 243).

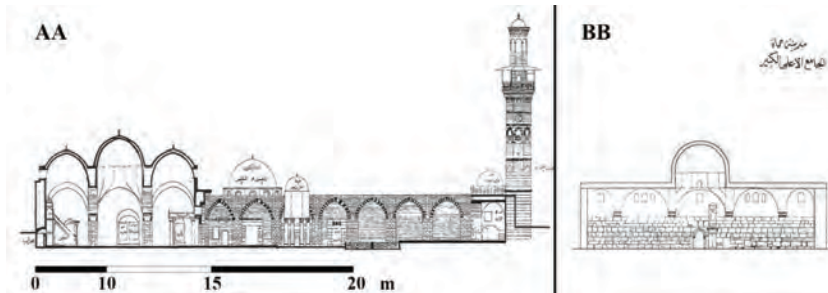


Figure (04): Sections AA and BB in the Prayer Hall of the Upper Mosque.
 (Shehadeh, 1976, 241, 244).

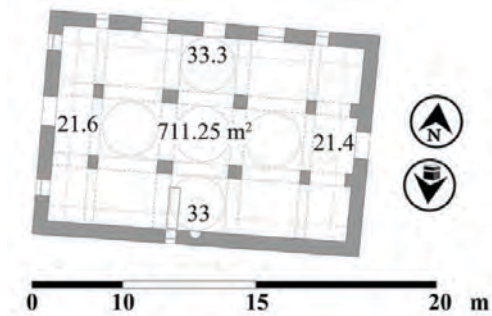


Figure (05): Detailed plan of the main prayer-hall in the Upper Mosque in Hamā.
 By: The researchers.



Figure (06): The interior of the main prayer-hall in the Upper Mosque in Hamā.

By: Ward Omaren, April, 2021.



Figure (07): The southern entrance of the Upper Mosque, located outside of the main prayer-hall's eastern wall.

By: Salam Jijakli, 2010.

It's inevitable that lighting is one of the important elements that influence the architectural and environmental design of space. Natural light plays an important role, influencing user experience within the built environment. Employing natural light in mosques as sacred places has been carefully taken into consideration in Islamic architecture (Arel and Öner, 2017, 423). Light had been used in pre-Ottoman mosques in a practical manner, to clearly portray the basic form of the prayer-hall rather than to indicate symbolic meaning. The even illumination on the open prayer-hall's floor allows it to be perceived as a united whole and a peaceful place (Kreuz, 2008, 66). Meanwhile, the alternation between light and shade emphasized on the walls due to the differences in their thicknesses as well as the presence of recesses and architectural elements, articulates the importance of light as a beauty-attribute (Shokrpour, Mahboubi and Fakhrian, 2015, 1626). The presence of both light and shade is acceptable and has references in the Holy Qur'ān; As God described Himself as the ultimate light (Al-Razi, 1981, 23: 230), in Sūrat Al-Nur [سورة النور] **35. God is the Light of the heavens and the earth ...**,⁶ the shade was mentioned in a positive manner in different sūras,⁷ and the Paradise, al-Jannah [الجنة], was distinguished for its numerous, long, and thick shades.⁸

One challenge of this research lies in identifying the efficiency of daylight illumination during operational periods, i.e., day-time prayers, in the main

6 " ۞ اللَّهُ نُورُ السَّمَاوَاتِ وَالْأَرْضِ • قُلُّ نُورِهِ كَمِشْكَاةٍ فِيهَا مِصْبَاحٌ • الْمِصْبَاحُ فِي زُجَاجَةٍ • الزُّجَاجَةُ كَأَنَّهَا كَوْكَبٌ دُرِّيٌّ يُوقَدُ مِنْ شَجَرَةٍ مُبَارَكَةٍ زَيْتُونَةٍ لَا شَرْقِيَّةٍ وَلَا غَرْبِيَّةٍ يَكَادُ زَيْتُهَا يُضِيءُ • وَتَوَّ لَمْ تَمْسَسْهُ نَارٌ • نُورٌ عَلَى نُورٍ • يَهْدِي اللَّهُ لِنُورِهِ مَن يَشَاءُ • وَيَضْرِبُ اللَّهُ الْأَمْثَالَ لِلنَّاسِ • وَاللَّهُ يَكُلُّ شَيْءٍ عَلِيمٌ ﴿35﴾." (سورة النور, 35).

7 See: Sūrat al-Ra'd [سورة الرعد], 15; Sūrat al-Nahl [سورة النحل], 48, 81; Sūrat al-Furqān [سورة الفرقان], 45; Sūrat al-Qaṣaṣ [سورة القصص], 24; Sūrat Fāṭer [سورة فاطر], 19-21.

8 See: Sūrat al-Nisā [سورة النساء], 57; Sūrat Yāsīn [سورة يس], 56; Sūrat al-Wāq'ah [سورة الواقعة], 30; Sūrat al-Insān [سورة الإنسان], 14; Sūrat al-Mursalāt [سورة المرسلات], 41.

prayer-hall of the Great Upper Mosque. This paper aims to measure, analyze, and evaluate the indoor daylight performance in the main prayer-hall and to diagnose the time of least lighting output, by measuring the Illuminance level, Uniformity, and Daylight Factor throughout the four seasons, and comparing the results against reference lighting requirements to determine compliance. The importance of this paper lies in the studied case as a building that is still functioning and has been serving as the great mosque of the city of Hama from the time of the arrival of Islam into the city up to this date. Also, the results of this study will support upcoming proposals for natural light enhancement and artificial lighting design for the Great Mosque's prayer-hall space.

It is worth noting that the Upper Mosque in general, and its main prayer-hall in particular, represent a collage of many historical eras, as several restorations and modifications have taken places (Fig. 08). Thus, it cannot be categorized under any one historical style. Two factors lead us to assuming the hypothesis of this study that 'the natural light of the main prayer-hall will just meet the minimum of light requirements': 1) due to its non-Islamic origins and, moreover, the limited number of changes applied to the building in the Islamic eras, and 2) it is was a common feature in the mosques of the Levant to allow only small amounts of light into them in order to achieve thermal comfort (Kreuz, 2008, 66).

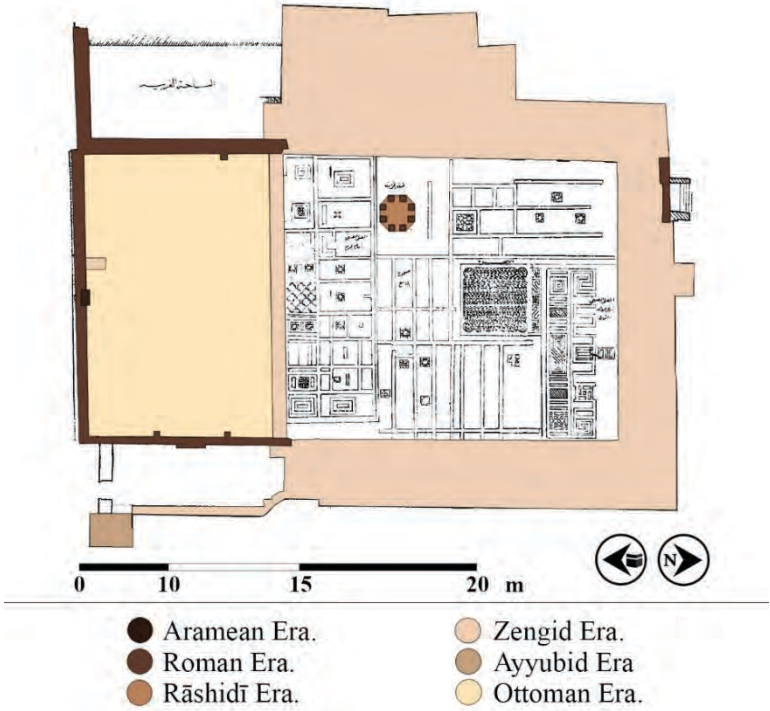


Figure (08): Historical plan of the Upper Mosque in Hama. (Jijakli, 2020, 6).

2. Terms and Definitions

Daylight: A combination of: Skylight, sunlight and the light reflected from the ground ^(Fig. 09).

Several factors influence the amount of penetrated daylight into a building:

- Geographic location.
- Latitude and longitude.
- Building orientation.
- The material and finishes.
- Glazing.
- The architectural forms of the building and its apertures (openings).
- The surroundings of the building (Alibaba, 2019, 9).

Sky Models: According to CIE S003, the standard for the spatial distribution of daylight, 'CIE Standard Overcast Sky' and 'CIE Standard Clear Sky' were established in 1996. Since then, further types of skies were examined, and an international consensus was reached on their luminance distribution and standardization. The luminance distribution of the sky depends on weather and climate, and it changes during a day with the position of the sun. This standard lists a set of luminance distributions, which model the sky under a wide range of conditions, from a heavily overcast sky to cloudless weather. This Standard incorporates both the: 'CIE Standard Clear Sky' and the 'CIE Standard Overcast Sky', which are treated as particular cases of the General Sky.

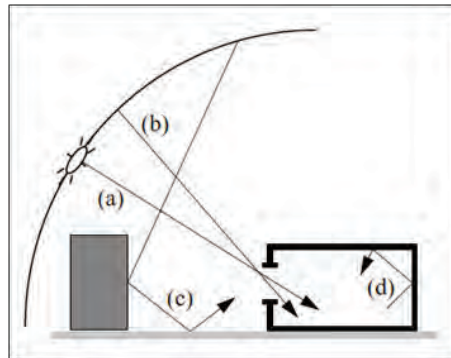


Figure (09): Components of daylight:

Direct sun; (b) Direct sky; (c) Externally reflected; (d) Internally reflected.

(Mardaljevic, 1999, 11).

The study is based on the terms and definitions established in the standard: EN12665 ^(Tbl. 02).

Table (02): Lighting terms and definitions.

#	Term	Symbol	Definition	Measuring		Formula
				Unit	Symbol	
1	Luminous Flux (Fig. 10)*	Φ	The total amount of light that is emitted by a light source	lumen	lm	-
2	Luminous Intensity	I_v	The spatial distribution of a luminous flux (Φ) radiating from a light source per solid angle (Ω).	candela lumen per steradian	cd	-
3	Illuminance Level (Fig. 10)*	E	The ratio of luminous flux (Φ) that falls on a certain area: Horizontal Illuminance (E_H). Perpendiculaire Illuminance (E_V).	lux lumen per square meter	lx lm/m ²	E =
4	Average Illuminance	\bar{E}	The average of the luminous flux (Φ) that falls on a given surface measured on a system grid of points.	lux	lx	-
5	Minimum Illuminance	E_{min}	The minimum luminous flux (Φ) measured on a point of the system grid of a surface.	lux	lx	-
6	Maximum Illuminance	E_{max}	The maximum luminous flux (Φ) measured on a point of the system grid of a surface.	lux	lx	-
7	Overall Uniformity	U_o g_f	The uniformity of the Illuminance over a surface as the ratio of Minimum Illuminance (E_{min}) to Average Illuminance (\bar{E}).	-	-	-
8	Luminance	L_v	The brightness of an illuminated surface, calculated as the ratio of luminous intensity of a given surface (I_v) to the projected area of the surface (A_p).	candela per square meter	cd/m ²	$L_{v=}$
9	Reflectance	ρ	The amount of luminous flux Φ that is reflected by a surface which is given by the reflectance properties of its materials and finishing.	percentage	%	-
10	Light Reflectance Value	LRV	Measure of the visible light that is reflected from a surface when illuminated by a natural or artificial light source.	percentage	%	-
	Reflective Index	R_x				
11	Daylight Factor	DF	How a point in indoor space is lit by daylight, thus it represents the proportion of daylight that penetrates a building as the ratio of daylight illuminance at a point in the interior (E_i) to the outdoor illuminance (E_o) from an unobstructed hemisphere of a standard: 'CIE' - overcast sky. ⁹	percentage	%	DF=100
12	Transmission Factor	τ	The ratio of transmitted light to incident light.	percentage	%	-

By: The researchers.

9 Diffuse light, for September 21st at 12:00 am, where the outdoor illuminance to be considered is 11921 lx.

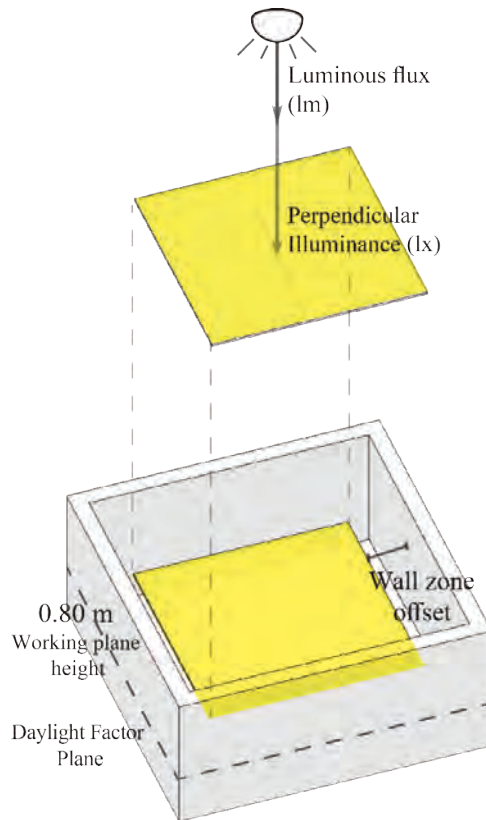


Figure (10): Calculation parameters.
By: The researchers.

3. Methodology

A descriptive analytical method was applied using computer simulation modelling for this research, to indicate and analyze the quality of daylight in terms of: daylight factor (DF), illuminance level (E), and uniformity (g_1).

Conditions of lighting needs was studied relying on resources of the reference standard for: illuminance level, uniformity, and daylight factor for indoor prayer halls. The lighting needs, for the praying task, is identified as a minimum overall illuminance level of $E \geq 100$ -150 lux (Saad & Abdul Aziz Al Mousa Endowment, 2013, 122; Antonakaki, 2007, 7). The task of seeing the Imam [الإمام], or lecturer, by the audience is addressed as a minimum of $E \geq 50$ lux, according to EN12464 as it was considered equivalent to 'casual seeing'. According to the BS8206-2:2008, a minimum daylight factor of $DF \geq 1.5\%$ is required for living spaces in a minimum of 75% of the plan area. The uniformity shall achieve a minimum of $g_1 \geq 0.10$, according to EN12461-1.

The simulation of natural light is performed for Hamā, Syria latitude 35.14° N, longitude 36.75° E. The building data are extracted utilizing the blueprints of the existing plan of the mosque (Figs. 03, 04), and modeled in three dimensions (3D) (Fig. 11), with materials and colors considered. In addition, the values for transmission factors (τ) (Tbl. 03) and the values for lighting reflection factors (LVR) (Tbl. 04) as well as values for the existing apertures and transennas are taken into account. The working plane in the mosque is considered the flooring, in reference to the nature of the Islamic prayer task: users look, sit, and prostrate

themselves on the floor. The calculation of the XY grid for perpendicular illuminance is 1.00×1.00 m.

Table (03): Transmission factors as per glass type.

Material (6mm Glass)	τ %
Clear.	0.87
Strongly reflecting.	0.78
Tinted (Bronze).	0.5
Tinted (Green).	0.75
Tinted (Gray).	0.44
Strongly reflecting.	0.78
Double clear glazed (2 × 6 mm)	0.76

From: (Energy Compliance Consultants, 2021; ABCB, 2019, 131)

Table (04): Lighting reflection values as per material.

Material	LRV %
Aluminum, matte.	55-75
Aluminum, Polished.	65-75
Body where no light is reflected (Black Body).	0
Body where all light is reflected.	100
Carpet (Patterned: Multi-colored).	5-12
Carpet (Plain: Dark to moderate shades).	2-12
Carpet (Plain: Moderate to light shades).	20-50
Limestone.	35-55
Marble, Polished.	30-70
Oak, Light Polished.	25-35
Paint, white.	75-85
Plaster, dark.	15-25
Plaster, light.	40-45
Sandstone.	20-40

By: The Researchers.

From: (Engineering ToolBox, 2012; Carpet Institute of Australia Limited, 2011, 2; Carpet Institute of Australia Limited, 2021, 3).



Figure (11): 3D white-model of the main indoor prayer-hall of the Upper Mosque.
By: The researchers.

The analysis was carried out to cover the daylighting performance during the utilization-time in the main indoor prayer-hall through the four seasons of the year ^(Tbl. 05)¹⁰ via proposing two main scenarios, in both sky conditions:

- The time of noon prayer, al- Zuhr [صلاة الظهر].¹¹ Conducted assessment on both: working plane, the flooring, and the surface of the Minbar's [منبر] façade. Due to the frequent use of the Minbar in Friday prayer, al-Jum'ah [صلاة الجمعة].¹²
- The time of afternoon prayer, al-'Aṣr [صلاة العصر].¹³ Conducted assessment on working plane only, the flooring.

Illuminance level (E) and the uniformity (g ,) were calculated to set the daylight scenarios under both sky conditions: Clear sky and Overcast sky, whereas the daylight factor (DF) was calculated in the overcast sky condition. These parameters were adjusted in the simulation tools to: 1) extract different scenarios of daylight performance, 2) distinguish the scenarios that achieved the standard requirements for indoor natural light, and 3) diagnose the scenarios with darker zones and higher contrast output.

10 In Syria, Summer Time, or Daylight-saving time (DST), is applied for about seven months, in which the clock is set forward by one hour; from the 25th of March to the 27th of October 2022. Thus, we will deduct the extra hour from this period. See: (Al- Silawi, 2022).

11 In the Islamic Fiqh, the Noon Prayer begins when the sun passes its meridian and it continues until the object's shadows is approximately the same length as the object itself (Sabiq, 1991, 1: 83).

12 In the Islamic Fiqh, the Friday Prayer is an obligation upon every free, adult, sane, resident male Muslim. Its time is the same of the noon prayer's (Sabiq, 1991, 2: 131-132).

13 In the Islamic Fiqh, the Afternoon Prayer begins in the afternoon when the shadow of an object is of the same length as the object itself, and continues until the sun sets (Sabiq, 1991, 1: 84).

Table (05): The times of daytime prayers in the med-days of the four seasons in Ḥamā, for 2022 AD/ 1443-1444 H, according to the 'Umm al-Qurā Calendar [تقويم أم القرى].

Season's Med-Day		Date				Pray Times	
Season	No. of Med-Day	2022 AD		1443-1444 H		Al- Zuhr (Noon)	Al-'Asr (Afternoon)
		M	D	M	D	Time	Time
Winter 1Dec.2021- 28Feb. 2022	45	January	14	Jumāda al-Tani [جمادى الثاني]	11	11:42	14:24
Spring 1March- 31May 2022	46	April	15	Ramaḍān [رمضان]	14	12:34*	16:13*
						11:34	15:13
Summer 1Jun.- 31Aug. 2022	46	July	16	Dul Hijjah [ذو الحجة]	17	12:40*	16:27*
						11:40	15:27
Autumn 1Sep.- 30Nov. 2022	45	October	15	Rabī' al-Awwal [ربيع الأول]	19	12:19*	15:31*
						11:19	14:31

DST.

By: The researchers.

From: (IslamicFinder, 2022).

4. Lighting Simulation Tools:

Simulation software is increasingly being adopted in architecture to anticipate buildings' environmental behavior. The software enables and facilitates corrections and enhancements in architectural design in many aspects, such as thermal, lighting, ventilation, and cooling. These tools have shown themselves to be an effective way to maximize building performance by means of computational design (Amoêda and Craneiro, 2020, 166). Examples of lighting simulation tools include Radiance®, Relux®, Dialux Evo®, Velux®, and Ecotect®.

4.1 DIALux® Evo 10.1:

DIALux® Evo is a free lighting simulation tool ('freeware') developed by DIAL, the German Institute for Applied Lighting Technology. It allows the user to plan, calculate, and visualise light in buildings, as well as preview scenarios, addressed as lighting scenes, for artificial and natural lighting. DIALux Evo allows the user to study both exterior and interior spaces.

Calculations to evaluate natural lighting performance can be made by choosing and adjusting the light scene, time, sky model and project location. The software database applies the norms of the standard EN12464-1 (Dx, 2022).

The accuracy of prior versions of DIALux® Evo has been verified against the analytical test cases of CIE 1717:2006, developed to allow practitioners to assess the Accuracy of lighting computer programs (Mangkuto, 2016).

In this research, version 10.1 of DIALux® Evo was used, as it was a recent software

release update, with the update released in 2021. It was utilized to calculate Illuminance level (E) and Uniformity (g_1), and to create visual renderings of the simulation output.

4.2 VELUX® Daylight Visualizer:

VELUX® is a tool dedicated to daylighting simulation and design. It is intended to simulate daylight transport in buildings and to aid professionals by predicting and documenting daylight levels and appearance of a space prior to realization of the building design. It allows users to calculate the amount of daylight in the space. It visualises the appearance of daylight with photo-realistic images, quantifies the amount and distribution of natural light under different standard sky models.

VELUX® 2 has been validated and verified against the analytical test cases of CIE171:2006 – for natural lighting (Labayrade, Jensen and Jensen, 2009, 1511). The software applies the norms of standard EN17037 for daylight design (VELUX, 2022).

The latest version of the product is VELUX® 3, the version utilized in this research for calculating and generating graphical charts of daylight factor (DF).

5. Simulation Output

5.1 Calculation results summary of al-Zuhr and al-'Asr times:

Illumination (E), Uniformity (g_1) and Daylight factor (DF) were observed and compared to the standards on the floor-level for the main prayer-hall of the Upper Mosque (Tbls. 06, 07), and the Minbar front (Tbl. 08). The results listed in the tables below of the comparison to standards can be interpreted as follows:

(✓) Conformity; (✓) Near Conformity; (✗) No Conformity

Table (06): Calculation results summary of al-Zuhr time.										
Season and Time	Sky Model	Illuminance (E) lx				Uniformity (g_1)		Daylight Factor (DF) %		
		\bar{E}	cf	E_{min}	E_{max}	g_1	cf	DF	DF_{min}	DF_{max}
Winter 11:42	Clear Sky	73.4	✗✗	13.7	444	0.19	✓	6.7 ✓	1.05 ✓	14.86 ✓
	Overcast Sky	33.5		3.29	370	0.1	✓			
Spring 11:34	Clear Sky	129	✓	20.2	797	0.16	✓			
	Overcast Sky	92.1	✓	9.04	1018	0.1	✓			
Summer 11:40	Clear Sky	127	✓	21.5	917	0.17	✓			
	Overcast Sky	115	✓	11.3	1268	0.1	✓			
Autumn 11:19	Clear Sky	121	✓	23.3	745	0.19	✓			
	Overcast Sky	75.8	✗	7.44	838	0.1	✓			

By: The Researchers.

Table (07): Calculation results summary of al-'Aṣr time.

Season and Time	Sky Model	Illuminance (E) lx				Uniformity (g ₁)		Daylight Factor (DF) %		
		\bar{E}	cf	E _{min}	E _{max}	g ₁	cf	DF	DF _{min}	DF _{max}
Winter 14:24	Clear Sky	205	✓	20.7	7625	0.1	✓	6.7 ✓	1.05 ✓	14.86 ✓
	Overcast Sky	52.3	✗	5.22	587	0.1	✓			
Spring 15:13	Clear Sky	249	✓	24.7	21889	0.1	✓			
	Overcast Sky	90.6	✓	9.04	1018	0.1	✓			
Summer 15:27	Clear Sky	155	✓	26.6	1658	0.17	✓			
	Overcast Sky	119	✓	11.8	1331	0.09	✓			
Autumn 14:31	Clear Sky	248	✓	28.6	15292	0.12	✓			
	Overcast Sky	66.3	✗	6.62	745	0.1	✓			

By: The Researchers.

Table (08): Summary of output results for the 3rd scenario: Minbar during Al-Jum'ah prayer.

Season and Time	Sky Model	Illuminance (E) lx				Uniformity (g ₁)	
		\bar{E}	cf	E _{min}	E _{max}	g ₁	cf
Winter 11:42	Clear Sky	41.7	✓	27	59.3	0.65	✓
	Overcast Sky	9.8	✗	5.7	14.2	0.58	✓
Spring 11:34	Clear Sky	71.6	✓	45.4	102	0.63	✓
	Overcast Sky	26.9	✗	15.7	39.1	0.58	✓
Summer 11:40	Clear Sky	67.7	✓	40.6	98	0.6	✓
	Overcast Sky	33.5	✗	19.5	48.7	0.58	✓
Autumn 11:19	Clear Sky	67.2	✓	42.6	95.7	0.63	✓
	Overcast Sky	22.2	✗	12.9	32.2	0.58	✓

By: The Researchers.

5.2 Overview; Visual Aesthetics:

The analysis reveals that the lighting of the mosque tends to be more functional than merely symbolic. In most cases, natural lighting has achieved efficiency at the minimum rate in reference to the requirements and has demonstrated its ability to displace artificial lighting.

Despite the measured functionality of natural lighting on the whole, the aesthetic factor is not absent. It is noticeable that the lighting of the place highlights the contrast in showing the architectural elements of the interiors. The high openings in the thick, load-bearing walls contributed to creating an aesthetically pleasing contrast between the strong light on the window reveal and its flow inward, and the projections of the window shapes through sunlight beams on the columns, which then cause the light to emanate from the white columns in a scattered fashion, causing the surrounding area to have a faint glow, as shown in al-'Aṣr time scenario (Fig. 12).

The gradient effect is clearly noticeable. How the illuminance level gradually fades vertically, from lower to higher levels, as well horizontally on the floor, from the entrance zone to the Miḥrab zone. This creates a spiritual value (Allah is light: Qur’an 25:35) in the shedding of the sun and highlighting the sun on the worshippers, and the gradation of shade towards the darkest zone at the top of the domes. This can be attributed to the vastness of the prayer hall, and the solid domes with small openings (Fig. 13).



Figure (12): Vertical and horizontal gradient of illuminance level (E) created contrast between the entrance zone and Minbar zone, as well through in the vast height of the structure. (Al-’Aṣr, winter, clear sky).

By: The researchers.



Figure (13): Contrast between the northern wall, entrance wall, and southern wall, Minbar and Miḥrab wall, effect of the thick window’s reveal reflecting high daylight level. (Al-Zuḥr, spring, clear sky).

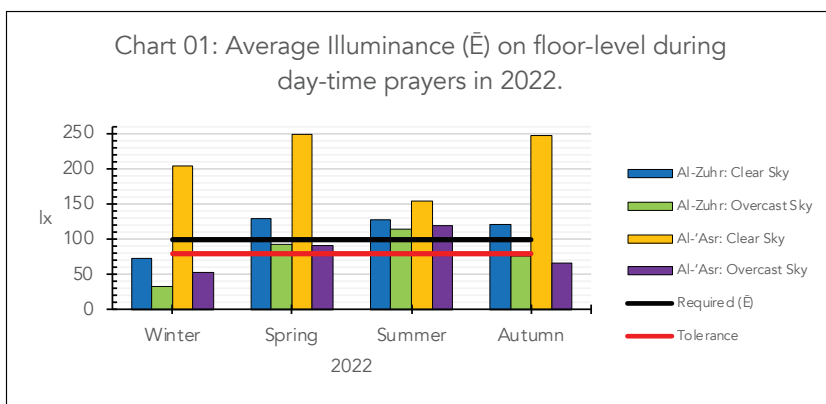
By: The researchers.

5.3 Output Discussion:

The output of the analysis revealed that in the al-Zuḥr scenario (Tbl. 06), approximately 63% of the results fell within 20% (higher or lower) of the required reference (100-150 lx) (Tbl. 09), whereas in the al-’Aṣr study (Tbl. 07), a total of 75% of the results fell within 20% of the required reference. Moreover, 50% of the illuminance levels’ best cases in the al-’Aṣr study have shown results that

are 150-200% above the target value. The highest illuminance level, at about 250 lx, occurred in the autumn and spring seasons under clear sky conditions (Ch. 01). Overall, 50% of the studied scenarios were found to achieve illuminance within 20% of the minimum illuminance requirement (Tb. 06, 07), which supports the proposed hypothesis of this research.

These results have shown the influence of direct sunlight on the value of overall illuminance level; the position of the sun during al-'Aṣr time allowed more direct light beams to penetrate the prayer hall, specifically through the apertures of the main façade. Sunlight infiltrates the mosque's interior just as well through the western façade, as noted in the clear sky scenarios of the simulations, and fades gradually to the east until the body of the Minbar (Tb. 10). The lowest illuminance values, detected as (E_{min}) 3.29 lx in the al-Zuhr scenario and 5.22 lx in the al-'Aṣr scenario, occurred in the zone adjacent to the Minbar mass (Tb. 6, 7), (Ch. 01) due to the shadow created by its remarkable height (Tb. 09- B; 10- B). This is acceptable, since this spot is never used for the task of praying; as the first row of worshippers always form after the Minbar and never next to it.



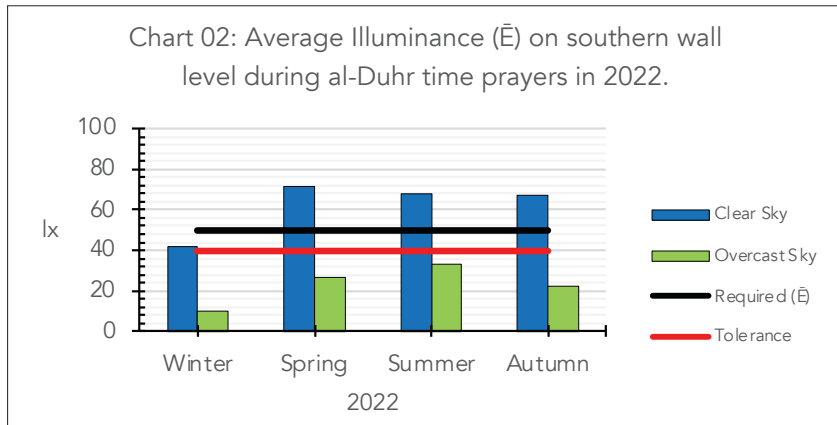
By: The Researchers.

The study of overcast sky conditions is performed to show the least cases of illuminance values; it's noticeable how the sunlight abates from the west, unlike in the clear sky scenario, and the source of daylight is almost confined to the entrance openings (Tb. 10 - B, D, F, H).

The illuminance in the overcast winter was recorded as the least level, in both al-Zuhr and al-'Aṣr times, at 33.5 lx and 52.3 lx, in addition to its approaching the required reference in autumn. This level is nearly acceptable for visual tasks that do not require visual accuracy. These scenarios can dispense with artificial light, since clear vision is not essential to perform the task of praying. Yet, utilizing artificial lighting is recommended in these seasons and weather conditions if the standards are to be achieved.

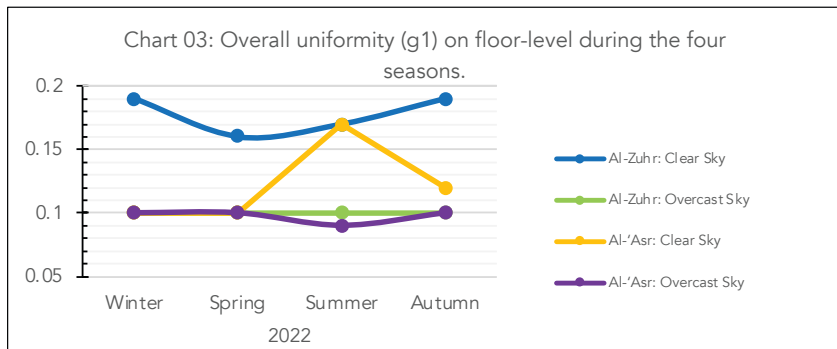
It's worth mentioning that this case of the Upper Mosque follows the typical layout and design of pre-Ottoman mosques in the Levant, in terms of proportion, size, and style of apertures as a response to the hot climatic conditions (Hakim, 2008, 46; Kreuz, 2008, 66). In addition, it is also typical for pre-Ottoman mosques in the Levant with pre-Islamic remaining parts to have limited later architectural interventions and modifications done to them (Jijakli, 2020, 6), causing the application of the hypothesis of the condition of least requirements for interior natural lighting to those mosques as well. Therefore, the results of this study should be of interest to similarly situated mosques in other areas of the Levant.

The calculation of illuminance level of the Minbar front at al-Zuhr time showed that the wooden body of the Minbar absorbed the light and showed less values than projected illuminance on the floor ^(Tbl. 08), and recorded highly uniformed lighting, the uniformity is almost 60 in all cases ^(Ch. 02). Under the clear sky condition, the highest value was predicted in the spring, 71.6 lx ^(Tbl. 11- C), as well in the other seasons, the illuminance values are still sufficient compared to within 20% of the standard of a casual seeing task, 50 lx ^(Tbl. 11- A, C, E, G). On the other hand, under overcast sky conditions, a significant reduction was noted, as the least case was recorded in the winter, under overcast conditions, predicted to be about 10 lx, pointing to the need for artificial lighting in these scenarios.



By: The Researchers.

The overall uniformity achieved an acceptable ratio – not less than 0.1, but not more than 0.19 – without an emphasis on matching the optimum level ^(Ch. 03).



By: The Researchers.

There is a slight increase in uniformity once the sun is positioned in the middle of the sky: it creates a more diffused light, with more darker shadows spread on the domes in the absence of horizontal openings ^(Fig. 14). Hence, the Uniformity ratio on the floor plane, 0.16-0.19, is slightly higher than at al-Asr time, especially under clear sky condition. Reduction in uniformity during al-Asr is attributed to direct sunlight beams that create sharper light and shadows, it was projected in most cases to be less than 0.15.

The daylight factor, as per the apertures' proportions and dimensions ^(TbIs. 06, 07), measured 'good' on average, 6.7%, whereas at the lowest point, 1.05% was recorded, which is less than the standard reference in some areas ^(Fig. 15).

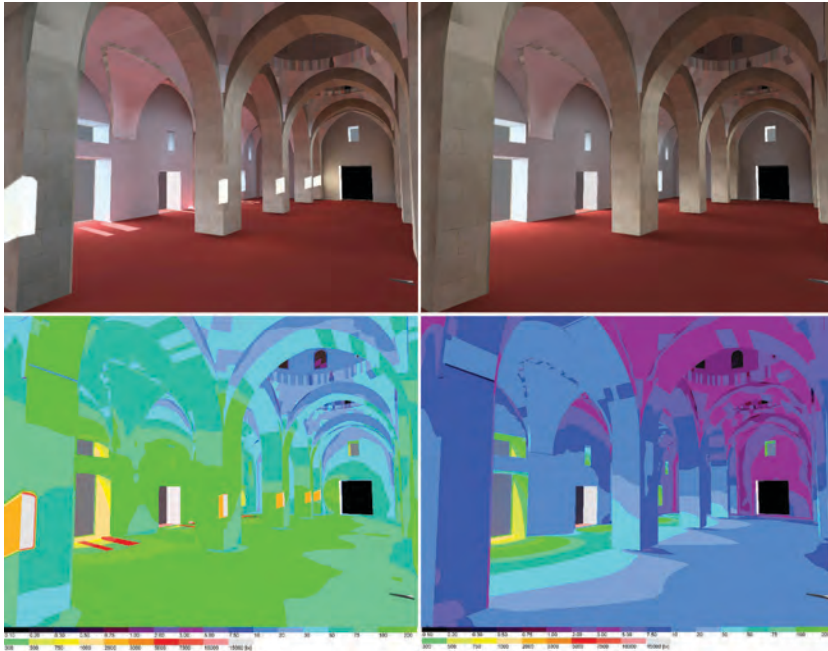


Figure (14): Natural lighting during al-Zuhr time (right side) seems more diffused, more gradient, and more uniform, whereas at al-'Asr time (left side) more sharp spots and window projections were created by sunlight. (Winter, clear sky). By: The researchers.

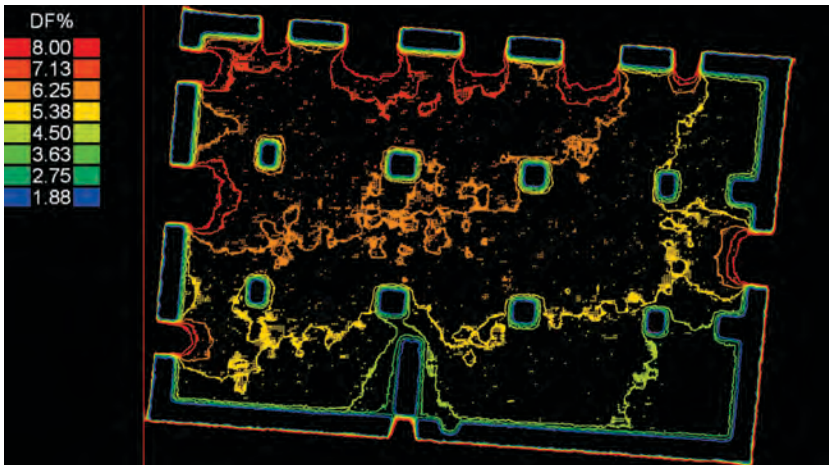


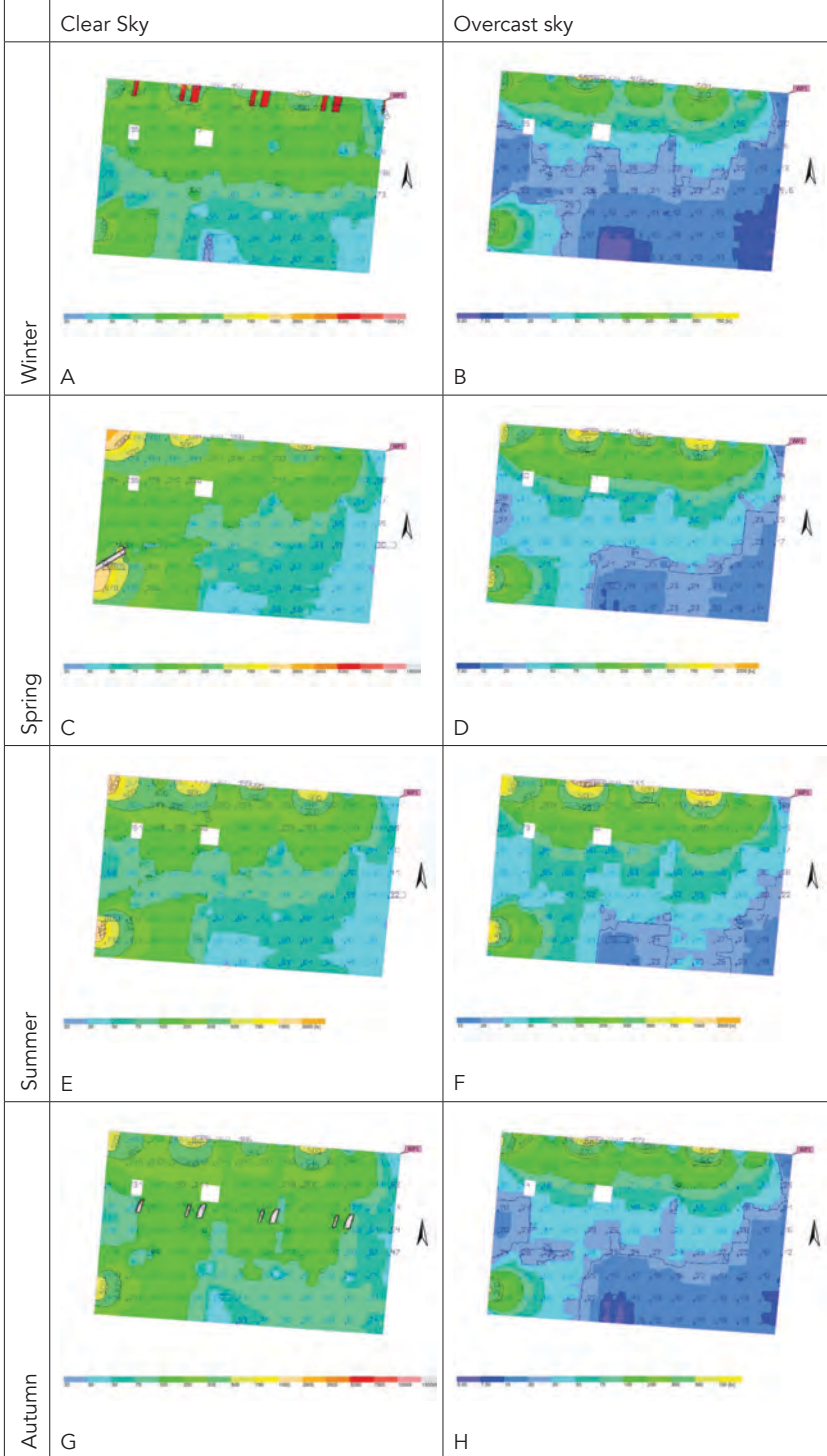
Figure (15): Daylight factor (DF) Analysis.
By: The researchers.

Table (09): Prayer-hall's flooring calculation output, al-Zuhr scenario.

	Clear Sky	Overcast sky
Winter	<p>A</p>	<p>B</p>
Spring	<p>C</p>	<p>D</p>
Summer	<p>E</p>	<p>F</p>
Autumn	<p>G</p>	<p>H</p>




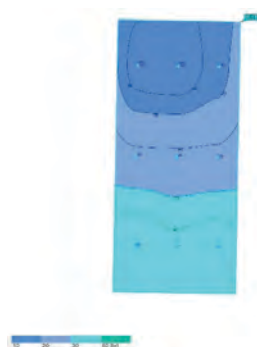


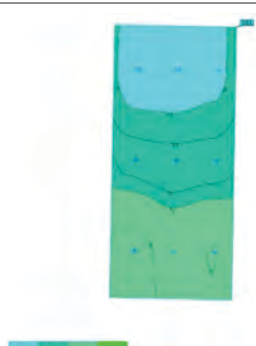

By: The Researchers.

Table (10): Prayer-hall's flooring calculation output, al-'Aṣr scenario.



By: The Researchers.

Table (11): Minbar’s façade calculation output, al-Zuhr scenario.

	Clear Sky	Overcast sky
Winter	 <p>A</p>	 <p>B</p>
Spring	 <p>C</p>	 <p>D</p>
Summer	 <p>E</p>	 <p>F</p>
Autumn	 <p>G</p>	 <p>H</p>

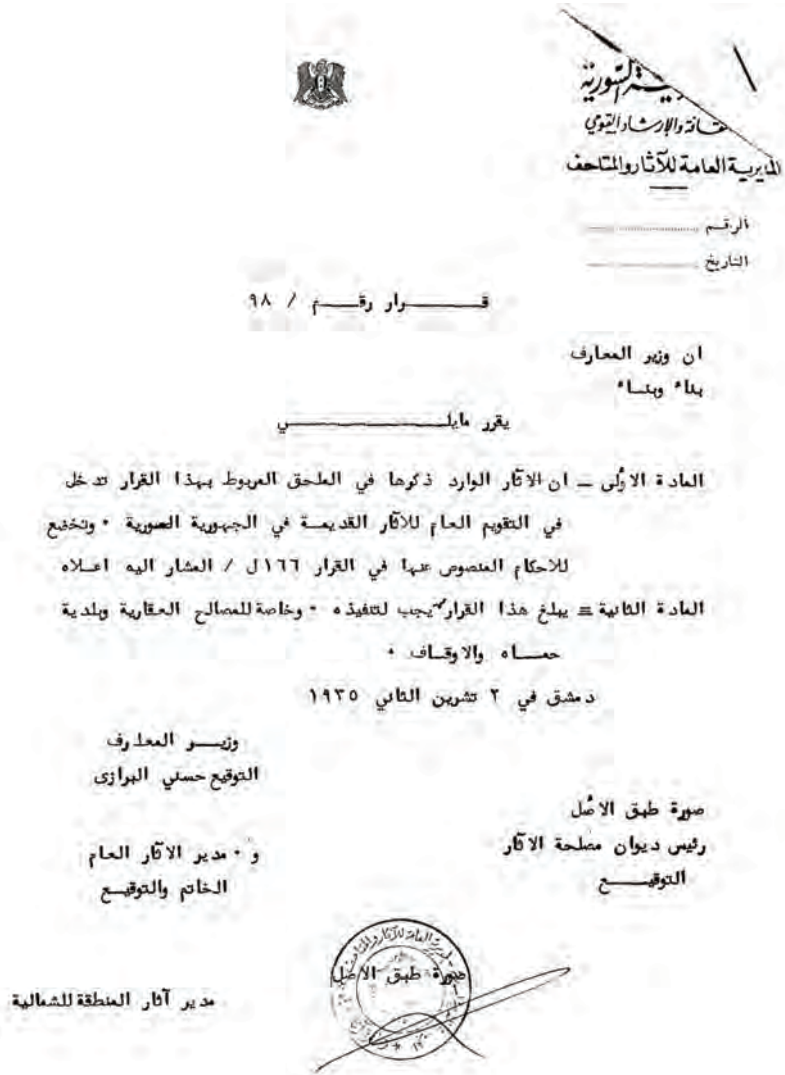
By: The Researchers.

Conclusion

This paper has conducted a study of the quality of daylight for the main prayer-hall in the Great Upper Mosque in Ḥamā, using lighting simulation software to identify the sufficiency of daylight illumination during operational periods. The research has achieved its aims, in terms of: measuring, analyzing, and evaluating the indoor daylight performance according to lighting requirements as determined by recognized internationally-accepted standards for various tasks performed in mosques. It has also confirmed, to a large extent, the proposed hypothesis; that is, the illuminance of the prayer-hall proved to achieve within 20% (more or less) of the minimum requirements in 50% of the studied scenarios, as it was accustomed in the pre-Ottoman mosques of the Levant. The research has reached a number of conclusions and recommendations, as following:

- The main prayer-hall in the Upper Mosque in Ḥamā achieved general acceptable readings in terms of illuminance (E), Uniformity (g1) and Daylight factor (DF) for the purposes it was designed to support.
- The natural lighting that enters the main prayer-hall serves functional purposes mainly, yet it also serves aesthetic and spiritual purposes, too.
- In most studied case scenarios, natural lighting was found to achieve the minimum sufficiency level and, thus, in most scenarios the mosque can dispense with its artificial lighting, relying on natural lighting and thereby reducing the operational costs of the mosque, as well as the mosque's impact on the environment, which is aligned with Islamic values and teaching.
- In the main prayer-hall, the highest daytime illuminance levels, at about 250 lx, are achieved in autumn and spring under clear sky conditions.
- The least illuminance values were predicted by the simulations to occur in winter in overcast sky conditions at both times of day studied: al-Zuhr and al-'Aṣr. In addition, the model points to illuminance values approaching the required reference in the autumn with overcast sky conditions for both time scenarios and in the winter under clear sky conditions at al-Zuhr time. In these scenarios, the utilization of artificial lighting is recommended but still dispensable.
- The lowest illuminance values were detected in both time scenarios at the zone adjacent to the Minbar mass, due to the shadow created by its height, which is acceptable as this spot is not typically used for the task of praying.
- The illuminance level of the Minbar's front was found to always be sufficient under clear sky conditions, while a significant reduction was noted under the overcast condition. It is highly recommended that the Minbar is equipped with artificial lighting in these scenarios.
- The overall uniformity in the prayer-hall achieved an acceptable ratio generally, and a slightly higher level of uniformity in the al-Zuhr scenario under clear sky conditions.
- The light uniformity on the front façade of the minbar has recorded stable readings on different scenarios and sky conditions.
- The distribution, proportions, and dimensions of the existing apertures in the main prayer-hall had a positive role in achieving a good Daylight factor, on average.

- The natural lighting design in the main prayer-hall in the Upper Mosque mostly fulfilled the minimum requirements, in order to combine: lighting sufficiency and thermal comfort.
- This Great Mosque sets a followable example for sustainability in terms of daylight consideration and the passive design of artificial lighting, which has become useful in the current situation of Syria in general, as evidenced by the electricity crisis and frequent power cuts.
- It is recommended that the Great Mosque take action to maximize daylight entry into the indoor hall, especially at the least lighting level times, such as: designing reflective horizontal light shelves to be placed externally on the high openings on the southern wall, bringing more light into the mosque at times when it's needed, enabling the reduction in artificial lighting usage and, as a result, a reduction in operational costs.
- It is recommended that the Great Mosque applies more design ideas that comply with the Syrian law of Monumental Protection and avoid conducting any architectural interventions on the building that are not in keeping with the law.




Appendix (01): Decree no. 98, dated 02 Sep. 1935, Issued by the Minister of education - Registration decree of the Great Upper Mosque in Hamā on the historical building list of the Syrian Arab Republic.

ملحق القرار ٩٨ L ١١/٢/١٩٣٥
قائمة الجرد العام للأبنية التاريخية
تلفظ الاحكام العامة ٢٠ سنة ١٩٣٣
مدينة جمهورية سورية
السجل العقاري

المحضر	رقم	الوصف
١٤٨١	٤٠٢	١- باب القبلي
٤٢١١٤٢٢	٢	٢- باب البلد
١٢١٥، ١٢١٧ (إسماحاً)	٢	٣- الجامع الكبير
٥٦٠ الى ٦٠٤٤٥٥٧٤٥٦٢	١٤٢	٤- الجامع النوري وجسر بيت الشيخ
١٢٣١	١٤٢	٥- الجامع النوري
١٢٠٩ الى ١٢١٣١٢١٣	٣١١	٦- جسر بيت الشيخ وواجهات
١٢٢١ الى ١٣٢٢٤١٣٠١	٦١١	٧- المقارنات الواقعة على الشاطئ
١٣١٧ الى ١٣٢٥	١٤٢	
١٣٢٤ ١٥٧٤١٢٥٥		
١٣٢٤ ١٥٧٤١٢٥٥	٥٤١	٨- جامع ابرو الفدا
١٢٥٦ الى ١٢٥٧		
١٢٥٨ الى ١٢٥٧	١٤٢	٩- بيت العظم والبرازي
١٢٦١	١٤٢	١٠- بيت العظم
١٤٧٤	١٤٤	١١- بيت البرازي
		١٢- كتفة قيدر خان رسم باشا
١٨٧٣		١٣- جسر باب الجسر
١٣٠٠	٥٤٢	١٤- ناعورة المحدية وجسر المسلخ
١٩١٦		١٥- ناعورة المحدية
١٢٩٠	١٤٢	١٦- جسر المسلخ
١٩٠٠	٢٤٢	١٧- ناعورة مأثورية
	١٤٢	١٨- جامع الحسنين
	٢٤٢	١٩- جامع الطوتان
	٢٤٢	٢٠- قبة العز
	٢٤٢	٢١- خان للا اسعد باشا
		٢٢- القلعة

مدير آثار المنطقة الشمالية
الخاتم والتوقيع



Appendix (02): Annex to Decree 98 – A list of registered buildings and real estate, including the Upper Mosque.

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THE HIDDEN MATHEMATICS AND GEOMETRY IN FORMATION OF MOSQUE ARCHITECTURE AND ITS MORPHOLOGICAL EXPRESSION



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Abstract:

Geometry is one of the foremost facial appearances in the formation of architecture. In mosque architecture, geometry is indiscernible without expertise in geometry. This paper strives to reveal the correlation between the progress of mosque architecture and the evolution of geometry in particular, and mathematics in general. The Muslim civilization is analyzed and chronologically ordered to establish its evolution and the impact of mathematics and geometry on the formation and development of mosque architecture. Present exploration is theoretical-fundamental, carried out in a historical-descriptive process. The aim of the present analysis is to evaluate art, mathematics, geometry, and the application of mathematics in architecture to achieve a definition and construal of module influencing mosque architecture from a geometric point of view. Through classification, mathematicians and architects influence mosque architecture, consider history, and elicit mathematical and geometric principles from prevailing designs and principles of drawing. It seems that developments in mathematics and, accordingly, in geometry, as well as the advent of new apparati during historical dynasties of Muslim societies have resulted in subjective developments of mosque architecture and its morphological expression. Islamic architecture has clearly been impacted by systems and relationships of mathematical and geometrical proportions, which are reflected in the design of mosques. At first, this paper presents the theoretical study of the relationship between the spatial configuration and functional efficiency of mosque layouts. This study highlights the key syntactical characteristics and consequences of spatial configuration related to functional efficiency, making use of space syntax analysis. This study also provides an analytical comparative picture of the changes and transformations in the configurations of mosque layouts and their three dimensional designs.

Introduction:

In architecture, geometry is used to create and derive spaces as well as draft detailed building plans. Architects and engineers rely on geometric principles to sustain structural safety. Designers apply geometry to make the aesthetical beauty of spaces inside. Applying geometry in design processes is unavoidable. Geometry, Algebra, and Trigonometry all take part in fundamental tasks of architectural design. Architects relate these math forms to plan their ideas or initial sketch designs. Geometric forms are forms that can be constructed using geometry, such as squares, rectangles, circles, cones, cubes, and so on. Geometric forms are commonly found in architecture, as well as structural and civil engineering. Geometric Shapes can be defined as figures or areas enclosed by a boundary which is created by combining the particular amount of curves, points, and lines.

Geometry is an unnoticed existence in Islamic art and architecture. It is the visual means by which the human mind can comprehend the order and harmony intrinsic in creation. It is the visual depiction of the mathematical patterns that permeate everywhere in man, nature, and space. These patterns, with their esthetic and philosophical values, are found within all aspects of the Islamic design progression. The indulgence of geometry as an essential part of our survival is nothing new. In detail, the golden mean and other forms of geometric magnitude can be seen imbedded in men, nature, and the universe, either represented as micro or macro spaces.

2. Morphological and functional categories of the Mosque in different periods:

Plans of the mosque were developed, through a course of alteration and modification, resulting in the appearance of four principal forms inconceivable the main periods of Islamic talent. In this reverse, the period of the early *Khalifs* and their progressive successors developed the first type of Mosque. This type had the form of a Hypostyle vestibule consisting of a main hall composed of

a number of parallel aisles, defined by arcades of columns and pillars. In a desire to create a beautiful and emotional atmosphere which envelops reality as one enters the sanctuary, the extension of rows of pillars and arcades in all directions emphasizes the limitlessness of the space, a symbol of the infinity of the Divine. The area near the Mihrab is defined with special treatment emphasizing its clarity. The use of a dome in the square (crossing) in front of the Mihrab and the widening of the nave leading to it, as well as the aisle closest to the Qibla wall, are some of the main spatial measures introduced to achieve this objective. Further differentiation of this area is also defined by stucco, as well as floral, geometric, and calligraphic embellishment with intentionally selected meditation messages. Ongoing in Medina from the Prophet's Mosque and urbanized in Iraq and Syria, the hypostyle mosque soon entered North Africa, Andalusia, Sicily, and Persia as well as the countries of South Asia.



fig: A. Al Azhar Mosque

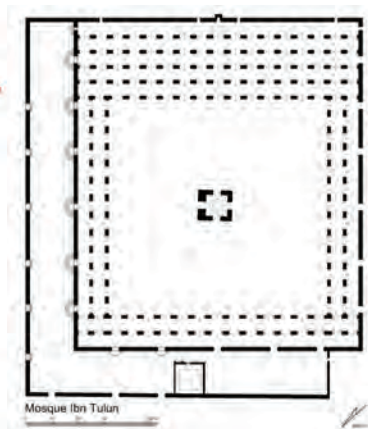


fig: B. Mosque Ibn Tulun

Under the patronage of *Suljuk* princes, Iran (Persia) developed a new approach to mosque design known as the 'Iwan' mosque. A lofty vaulted hall was built to function as a great doorway leading to the sanctuary, and a domed area was situated before the Mihrab and sometimes leading to the Sahn. The roof of the Iwan is vaulted and commonly covered with 'Muqarnas'. Historic sources established the first emergence of this technique in about 890 AD in a Friday Mosque (Masjid-I juma) of Shiraz as well as in a Friday Mosque in Niriz in Fars built about 970 AD. Persians traditionally knew the Iwan as they worn it under the *Sassanian* rule as a ceremonial forum. Later, it spread to the rest of the Muslim, world particularly to northeastern parts of Islam, which had strong ties with Persia. The Iwan was successfully applied to other building forms such as educational buildings identified as 'Madrasa', where it served as a lecture hall and on its side rooms were renewed if rooms for students. An added useful adaptation of the Iwan plan was in hospitals and caravanserais, which spread in Iran, Syria, and Anatolia. The popularity of this type of mosque in Persia reached its peak in the 11th century foremost to the introduction of the four Iwan mosque, which first appeared in the Isfahan Friday Mosque (11th century).



fig: A. Masjid-I-Jami (11th century), the first four Iwan, B. Sinan's Suleimaniye Mosque, Istanbul (1550-1557), C. Jami Masjid in Delhi, India (1644-1658), a combination of hypostyle and iwan styled mosque with bulbous domes.

The progression of the *Ottomans* to the Caliphate in the 14th century, at the hands of their founder Othman (d.1326), and its culmination in the 16th century, resulted in the introduction of new features to the design and construction of the mosque. Under the *Ottomans*, mosques evolved from conventionally horizontal spaces to vertical structures reaching to the sky through their domed rooves, which were arranged in a number of small domes rising progressively like steps, toward the main dome of the central nave. In this category, perpetuity is expressed through verticality and hence the dome became the dominating skyline feature of Muslim mosques, likely prejudiced by Hagia Sofia and its prominent dome, as many western academicians would suggest. In addition, this mosque stressed another important symbol linking the 'oneness of Allah', conceptualized by *Al-Tawhid*, which forms the essence of the Muslim faith. The perfect centralization of the space under the main dome affirmed its unity and established the symbol of one spirit. Ottoman domed mosques themselves displayed a variety, articulated in the style and number of domes in use. At first, the roof was completed by a number of smaller domes sometimes combined with a central, larger one. The earliest of these is the Yesil Cami Mosque (Bursa) which was founded by Mehmet I (1403-1421) in 1419. The Mosque was located in a complex that included a bath, a tomb, and a madrasa, emblematic of Ottoman mosques. Yesil Cami was subjugated by its domes, which roofed most of the interior space.

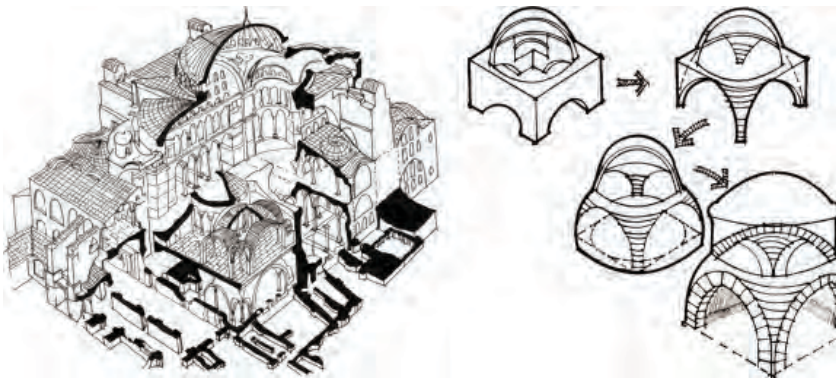


Fig: Pendentive dome construction: Hagia Sophia (left); types of pendentive dome construction (right).

The second characteristic of the typical Ottoman mosque is the pointed slender minaret, which differs notably from the rest of the Muslim world.

The fourth category of mosque is the one developed by the *Mugal* dynasties in the Indian subcontinent. An amalgamation of the three architectural styles evolved into a mesmerizing new style consisting of a horizontal hypostyle hall

area for the performance of rituals, covered with a flat roof incorporating a large onion shaped (bulbous) dome, and a large porch entrance recalling the Persian Iwan as seen in Delhi's Jami Masjid (India between 1644 and 1658) (Saoud, 2002).

2.1. Space syntax analysis of mosque layouts

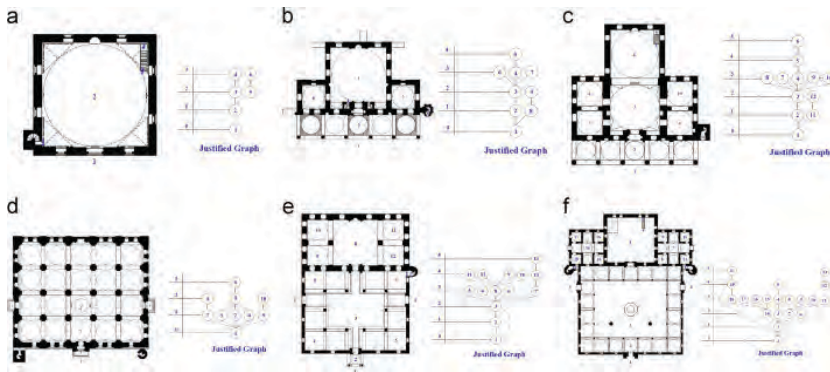


Fig: Justified permeability graphs of mosque layouts (six case studies/categories).

Space syntax defines the organization of architectural space in mosque layouts can result from two key syntactic characteristics, namely: symmetry–asymmetry and distributedness–non-distributedness, which are directly related to the functionality of the mosque arrangement.

The symmetry–asymmetry property expresses the kinetic-visual depth of various spaces within the spatial system (i.e., mosque layout) in terms of the main space (i.e., main gate/entrance). If the depth of the space within the mosque arrangement is lower than the complexity of the other spaces in the system, the space is more symmetric and vice versa. Space segregation increases when the number of kinetic-visual steps among the spaces in the mosque layout increases, thus resulting in the deterioration of the functional correspondence. This observable fact is caused by the inverse link between isolation and functional effectiveness. The connection refers to the degree of symmetry of any space in the spatial system (i.e., mosque arrangement). Therefore, if any space in the mosque layout moves away from the main space (e.g., the entrance) by one kinetic-visual step, space taking apart will not suggest itself. Still, the link will be expressed, and the space will be symmetrical. Increasing space symmetry decreases space segregation, resulting in an efficient functional affiliation. When the space moves away by more than one kinetic-visual step from the main space, the space will become asymmetrical (Hillier and Hanson, 1988, Hillier, 2007).

The distributedness–non-distributedness property reflects the available options for accessing all spaces in the system (i.e., mosque layout). By increasing the number of methods of accessing a particular space, the distributedness of a space in a system will increase, suggesting that the kinetic permeability of a space is at a high level with little segregation and vice versa. A non-distributed space has simple permeability, suggesting the existence of one kinetic method to enter another space. Permeability reflects the movement of prayer within the spatial system in terms of smoothness, efficiency, and flexibility, and it represents certain organizational activities of prayers and its circulation. Therefore, depth-maximizing plans (i.e., mosque layouts) are functionally inflexible and incompatible for most types of functional patterns compared

with depth-minimizing plans, which facilitate the efficient function of a mosque (Peponis, 1985, Hillier, 2007).

2.2 Morphological acquaintance for the Modeling of Ottoman Mosques:

'Category' and 'function' are the determining factors in the definition of the class of mosque and its architectural apparatus throughout Ottoman era. It is generally agreed that there were three types of Ottoman mosques, namely: *Small Mosques, Viziral Mosques and Imperial Mosques*, with each type assigned a 'class'.

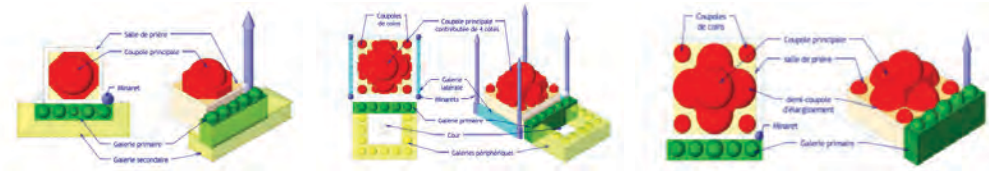


Fig: The components of a mosque in class 1 (Small), class 2 (Viziral) and class 3 (Imperial) (source: Bouhoula. 2014)

These three classes of Ottoman mosques are: class 1 Mosques were commanded by general or rich merchants. They are without a courtyard and the prayer space does not have side or façade elements. Class 2 mosques were commanded by nobles, viziers or princes and these mosques lack courtyards. The prayer space has side and façade elements. Class 3 mosques were commanded by Sultans. They have a courtyard (Mustafa, 2013).

Class 2 mosques were commanded by nobles, viziers or princes and these mosques lack courtyards. The prayer space has side and façade elements. Class 3 mosques were commanded by Sultans. They have a courtyard (Mustafa, 2013).



Fig: Different entities of Ottoman Mosque: Sectional View.

The Ottomans constructed several public buildings and edifices in various sizes and forms because of the growing needs of the changing Ottoman community. With regard to building architecture, this regulation influenced the construction of several new mosques because the Ottomans experienced Islam. The size and form of the mosques were determined by a number of factors, such as the Muslim population in a region. The increase in Muslim population required the construction of Jami Mosques, which are known as 'Cami' in the Turkish language. Believers meet in these mosques every Friday (Crane, 1993, Pasic, 2004).

3. Mathematical and geometric proportional systems hidden in the Iranian Mosque Architecture:

The building design clearly constitutes an amalgamation of both the geometry of the structural members and architectural form along with the selection of materials. Here one should explain that 'Geometric consciousness' is something that is generally approached by all application engineers to a very huge scope through spontaneous loom, and without the concept of proof with an accurate mathematical progression.

The transition of a square into a circle by using triangles is one of the characteristics of Iranian architecture from the pre-Islamic period. Later, Iranian architects used this procedure to create more complicated and elaborate forms in the design of their buildings. The center point of the square, marked by the intersection of two diagonals, is the most important point in the transition to a circle process. This called for a further geometrical solution in the corners in order to create the desired forms and volumes. In order to generate the vast varieties of forms which were achieved by the turning, rotating, and twisting of a simple square, the treatment of circles and triangles was common and widely used in much of medieval Islamic Iranian architecture.

Geometry was used not only to solve structural problems, but also in the details of the designs of various structures. The architects had to rely on mathematics in order to achieve the best results. The mastery of advanced mathematics among the architects, and the application of this knowledge to the various aspects of design led to the formation of astonishing and admirable architecture. There is no doubt that only those architects who were acquainted with an advanced knowledge of geometry, algebra, and astrology, as well as, poetry and philosophy, could design such architectural elements that sheltered the structural stability while achieving excellence of beauty that is characteristic of medieval Iranian architecture. This level of balance and grace would not have been attained without the mastery of mathematics by the designer.

Further use of advanced mathematics is apparent in medieval Islamic architecture of Iran, especially the period between the Seljuk and the Timur Dynasties, in the height of the towers and entrances, as well as the two shelled domes used in the mosques of various cities. The 'lofty' minarets, with their ambitious construction and rich geometric and epigraphic decorations were designed and constructed with immense skill, "Construction techniques have not been calculated thoroughly, but the continued skill of these slender towers to resist earthquakes suggests that their builders employed some refined method, perhaps wooden tie beams, to give tensile strength to the structure" (citation).

3.1 Islamic geometric proportions and patterns:

The word geometry refers to the science of properties and associations of magnitudes such as points, lines, surfaces, or solids in space and the way the parts of a meticulous object fit together. Geometry is well known based on two Greek words 'geo', meaning 'the earth', and 'metry', meaning 'to measure'.

Islamic art favors geometry because of its intelligible aspect. Geometry possesses abstraction and the capacity to express and reveal objectively immutable and spiritual truths. Geometry involves proportions and prime roots that are considered the most beautiful proportions (the proportions of beauty). As such, beauty, for the Muslim artists, is objective and a self-expression of truths, which is the essential nature of beauty as Plato stated, "Beauty is the splendor of the truth" (Burckhardt, 1987).

In prehistoric days, particularly in Islamic arts and architecture, the most important geometric proportional systems are: the proportions of the golden mean ("phi") and the primary three proportional roots $\sqrt{2}$, $\sqrt{3}$ and $\sqrt{5}$, on which all Islamic arts and architectural forms, especially their geometric pattern

design, are based¹. The golden mean proportion is a proportional system whereby two elements are related to each other by a set proportion. Two segments of a line not equal to each other are related in a proportion: $a/b = (a+b)/a$. It is this unique point that divides the single line into segments with qualitative proportions.

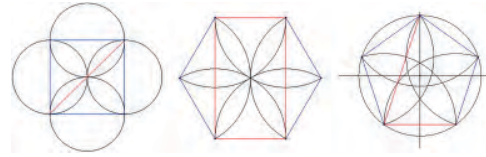


Fig: The root proportions based on the square. (Source: Dabbour, 2012)

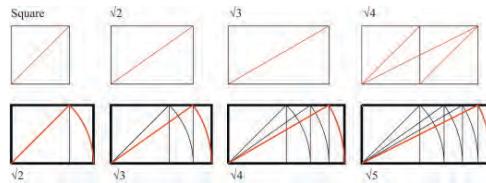


Fig: The proportional roots: (a) the $\sqrt{2}$ proportion, (b) the $\sqrt{3}$ proportion, and (c) the golden mean (Phi) proportion.

The Muslim artists created these geometric proportions from the circle of Unity. As one of the most common shapes in nature, it was reflected symbolically in the signs of the Creation. The circle is an obvious example of a basic geometry, constituting all the proportional geometries inherent in traditional architecture (Guenon, 1995).



Fig: Unity in multiplicity and multiplicity in unity primary circle symbolizing wholeness, completion, unity and infinity.

Geometric proportions are used by Muslim designers as the most valuable tool of design process to produce ordered patterns that govern esthetic beauty in designed spaces, surfaces, and objects. They present to us the 'Principles of Nature' in their own language. By applying the Golden Mean (Phi) and the root proportions, geometric patterns are produced to be applied to the fields of building crafts, such as tiles, mosaic, plaster and wood, as well as to the field of book art. By diminishing the polygon contained in the circle of Unity toward the center until the stars, which control the shape of the pattern, appear, the Muslim artists preserves the aesthetics of these proportions and grants them exquisite beauty at a higher level than direct, material expression. The system of geometric design starts from the circle (the basic unit), from which the pattern starts to unfold, creating harmonious divisions of the circle in four stages:

1) The planning stage: starting by determining the proportional systems based on the unit pattern structure within the circle of Unity. The decision is based

¹ The Golden Mean, or 'phi', algebraically is $(1 + \sqrt{5})/2$ or approximately 1.618. The square roots of 2, 3, and 5 are approximately 1.4, 1.7, and 2.2, respectively). These three numbers were considered "irrational" by the Greeks (and are called irrational today) because they couldn't find integer fractions for them, although they kept searching in vain.

on the symbolic meanings underlying the geometric pattern and its relation to micro–macro cosmos.

2) The division phase: construction of the basic geometric pattern.

3) Pattern order and structure: initiating the crossing lines to create the artistic shape of the pattern on natural junctions formed by those lines. This gives rise to a series of points that can be used in the development of patterns. This type of framework forms the driving geometry for the relatively simple Islamic patterns with which we are familiar.

4) Revealing the desired pattern: establishing the geometric variations of the pattern and defining its boarder lines. It is derived from all the vital proportion systems based on a single unit. The process can be repeated indefinitely, presenting the same center everywhere and nowhere. It is ratio, rather than measurement, that determines the relative lengths of crucial dimensions.

The infinitely repeating geometrical patterns and the rules of geometric construction are a reflection of the unchanging laws of God. They are based on aesthetic proportions as seen in the rhythm of the Creation and can be presented according to the design process in the following study models.

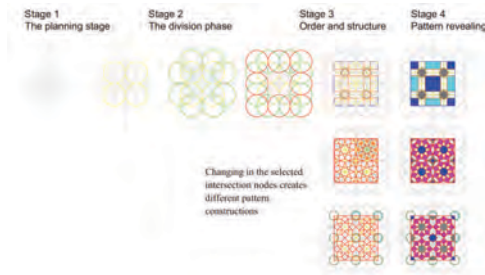


Fig: Construction stages of four pointed patterns



Fig: Construction stage of eight pointed patterns based on O2 proportions

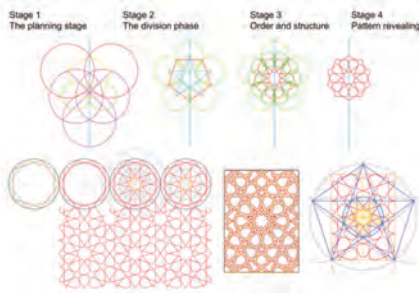


Fig: Construction of a five-to-tenfold pattern based on the golden mean proportion.

Fig: Design scheme of the arcades at the entrance to the hall of the Dār al-Gund at Madinat alZahrā', with measurements in cubits (1Cubit=46.3 cm) , (Arnold, 2018).

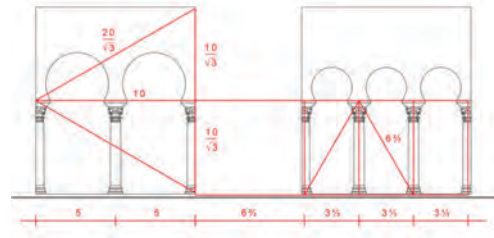


Fig: Schematic comparison of the design of arcades: Corinthian order of Roman architecture; arcade of horseshoe-shaped arches at Madinat al-Zahrā' (mid-10th century); arcade of multi-foil, pointed arches at the Aljaferia (11th century). (Arnold, 2018).



4. Domes in mosque architecture and the mathematical approach:

In architecture, the dome is a vaulted roof having a circular, polygonal, or elliptical base. Since it is difficult to count the various types of domes, this section will discuss only the most common types of domes used in Islamic architecture. From an architectural point of view, there are two types of domes that were used frequently in almost all Islamic buildings, the spherical dome (based on a perfect sphere) and the elliptical dome (based on a spheroid). Under these two main categories, many other types of domes can be classified, such as onion and shallow (saucer) domes. Mathematically, both spherical and globular, or vertically elliptical, domes originate from a complete rotation (360°) of a segment of an arch around its vertical axis. The type of dome (spherical or elliptical with their different types) is determined according to the rotated part of the arch and consequently, the position of the rotational axis Y and the horizontal axis X and the relation of both with the origin (0,0). In this context, there are two main possibilities, within which are three others, as listed as follows:

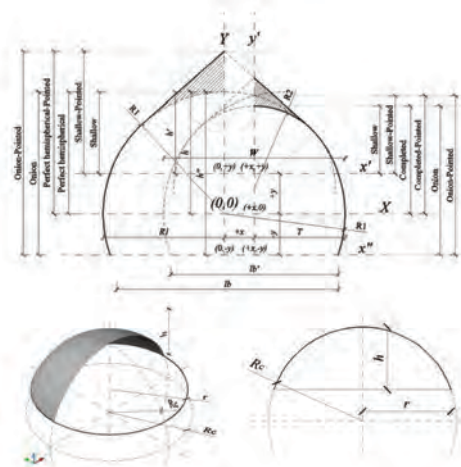


Fig: The origin of the domes and their types. A. The origin of the most famous domes; B. lower left, Spherical dome, perspective; C. lower right, Spherical dome, mathematical values. (Ekhatib, 2012)

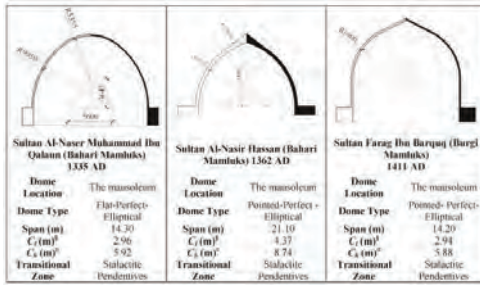


Fig: Domes supported on muqarnas (stalactite) pendentives in chronological order.

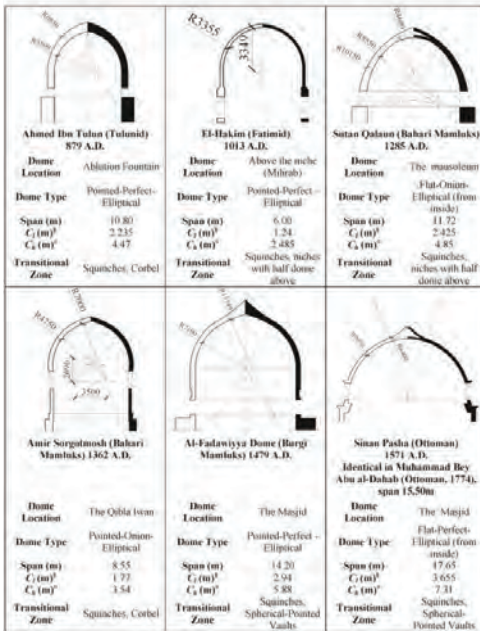


Fig: Domes supported on squinches in chronological order (Elkhatib, 2012).

Among the different methods to cover a space, the dome is the oldest and most distinguished. Although its development began some sixty centuries ago, it continues to develop still. This development enables it to cover a diversity of spaces and spans from a few to hundreds of meters. One of the most important problems that faced the architects of the old days was how to transform the square top of the cube to a circle where the dome rested, which is known as the transitional zone. For structural and aesthetical reasons, the architects hollowed the transitional zone, applying one of two techniques: squinches and pendentives. The first is a support carried across the corner of a room under a superimposed mass. In architecture, squinches can be one of any of several devices by which a square or polygonal room has its upper corners filled in to form a support for a dome (Elkhatib, 2012).

5. Conclusion:

Muslim craftsmen knew of the autonomy or 'inner laws' in creating spaces and patterns. The dealings among various parts can be seen everywhere in ancient mosque structures. In other words, buildings were designed with scrupulous concern, exhibiting mastery in pattern design of their spaces and surfaces. Geometric proportions legalize the order of patterns based on mathematical ratios, which are influential in understanding the universe, man and nature; these proportions are, by their nature, essential ingredients in sacrosanct

geometry. The geometry as well as its rhythm exposed in Islamic patterns illustrates an infinite diversity, they permit and even encourage thoughtful reflection. Islamic patterns are one of the most influential forms of sacrosanct art. They are a source of deliberation that allows our minds to roam and recall and consider the infinite, the Divine, Allah. Geometry, in combining forms and space into a single essence, not only facilitates purpose but also communicates meaningful organization of elements that can be achieved with the conscious use of geometrical ordering principles. Beyond these visual functions, these elements, by their relationships to one another and the nature of their organization, also communicate notions of domain and place, entry and path of movement, hierarchy, and order. The present study reveals the positive relationship between the process of spatial configuration and the level of functional efficiency according to different types and patterns of mosque layouts by using an analytical comparative approach in evaluating, discussing, and interpreting the resultant data. The indicators largely contributed to quantifying the level of functional efficiency of different mosque layouts. The results clearly show that the efficiency of mosque layouts changes over time because of the spatial configuration of varying layouts.

In addition, many of the architectural works that will exist in the future, we have not yet even imagined. Hence it seems that what is being sought internationally are those studies that will provide the necessary knowledge, skills, and abilities that are necessary for the challenges of the future and can ensure a relatively easy adaptation of architect graduates who have the knowledge of yesterday and today in tomorrow, at a time of dramatic change.

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ASSESSMENT OF ENERGY PERFORMANCE OF ADVANCED BUILDING THERMAL INSULATIONS IN THE MOSQUE BUILDINGS

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Abstract

This study investigates the energy performance of mosques in conjunction with the advanced thermal insulation materials available in the market. Building thermal insulation is well-known to provide support for the durability of a building's structure and to facilitate a reduction in the heating and cooling costs a building's interior. Through this study, we have evaluated the energy performance and potential energy savings associated with various building thermal insulation materials. Improper selection of thermal insulation in mosque buildings can contribute to an increase in the mosque's energy consumption. In the first phase of research, a detailed assessment was conducted to identify the most advanced thermal insulation materials available in the market. A typical mosque building located in hot and humid climatic conditions is modelled by using building performance simulation software. The advanced thermal insulation materials are modelled in the simulation program and their impact on energy consumption as well as energy savings is estimated. The focus of this research effort is aligned with Saudi Vision 2030, which emphasizes the Kingdom's vision to reduce greenhouse gas emissions in the building sector (which also includes mosque buildings). Thermal insulation plays a crucial role in reducing energy consumption and increasing energy savings in buildings. This study mainly focuses on promoting energy-efficient design of mosque buildings and nurturing more energy savings options for existing mosque buildings.

1. Introduction

Mosques are religious institutions that have a distinct collection of functional and operational standards. Muslims assemble in mosques five times a day for congregational prayers: Fajr (before sunrise), Dhuhr (after midday), Asr (afternoon), Maghrib (after sunset), and Isha (beginning of the night), as well as the weekly Jumu'ah prayer (Friday midday prayer). As a result, mosques are intermittently filled during the day, with occupancy times ranging from 30–45 minutes for each prayer. The maximum occupancy is seen during the mandatory Jumu'ah prayers, when the mosque is usually full, while regular prayers have a fraction of the full occupancy [1].

Mosques have a large, boundary free, multi-volume prayer hall to accommodate large congregational prayers. This prayer hall is usually rectangular in form, with the long side including the Qibla wall (the wall showing the direction of the Ka'bah in Makkah). Congregational prayers are held in closely spaced rows facing the Qibla wall. Since this is the primary practical necessity of mosques, the architecture of the prayer hall remains somewhat consistent across the globe, considering climatic and geographical variations or cultural factors. The functional requirement of such a large prayer space, combined with the operating conditions of intermittent and variable occupancy, carry a decisive role in the thermal comfort of mosque users, as well as the thermal energy efficiency of mosque buildings. Many mosques install an HVAC system (Heating Ventilation and Air Conditioning) to provide the necessary cooling/heating system for the prayer hall to keep people comfortable at prayer hours. These structures are the most energy-intensive aspects of the mosque, accounting for up to 80% of total energy usage. As compared to other buildings in the same region, mosques have a high energy

expenditure per capita and per unit area. Despite using an excessive amount of energy, most mosques struggle to attain the necessary comfort temperature levels during most of the prayers. According to previous studies, this high degree of energy consumption is attributed to inadequate building envelope efficiency, which requires the heating or cooling systems to be of greater size than required and requires longer operating times. This results in energy waste, which can be due to inadequate thermal capacity of mosque structures, inefficient administration, improper selection of building thermal insulation, or

ineffective organizational strategies. Mosques have a very low internal load, or occupancy load, and are classified as external load dominated or skin-load dominated structures. As a result, most of the internal thermal loads come from the exterior environment, as the thermal load from humans or equipment is small in comparison to the mosque's volume. Building envelope components such as walls, floors, windows, and openings thus have the greatest effect on the overall thermal efficiency of the building. This can have a major impact on consumer thermal comfort and, as a result, total energy consumption. As a result, poor thermal output of mosque buildings is a significant contributor to higher energy demand, resulting in higher energy consumption with reduced energy efficiency[2].

According to published statistics, there are an estimated nearly four million mosques worldwide [3], but there is no concrete evidence on their distribution. Since appropriate envelope design for optimum thermal efficiency is influenced by climatic influences, it is critical to establish the key context of this study in relation to climatic conditions and thermal comfort requirements. It is well recognized that the majority of mosques are located in hot, dry climates or hot, humid climates as that is where the majority of the world's Muslims reside. The hot, dry climate is distinguished by extremely high daytime temperatures, which can frequently exceed 45 degrees Celsius, but significantly lower nighttime temperatures, resulting in a wide diurnal range. These regions get very little rain

and have humidity levels that are usually less than 40%. The hot, humid climate, on the other hand, has high temperatures but also high humidity concentrations that are constantly above 60% and often reach 100%. Since the temperature drop only marginally at night, the diurnal variation is very small. Mosques' building thermal load is in the form of cooling loads because of heat gain from the building envelope in both climates because mosque buildings are skin load dominated. As a result, increased thermal efficiency of the building entails minimizing heat gain from the building envelope materials [4]. This research focuses on mosques located in the hot, dry climates such as Riyadh and hot, humid climates such as Dhahran, Saudi Arabia.

Adding building insulation is a simple and inexpensive way to save energy in the mosque building structures. The primary goal of installing insulation in a building is to minimize energy demand for heating and cooling by increasing the thermal resistance of the building envelope. External and internal thermal insulation both greatly minimize overall energy requirements, but they have different advantages in terms of wall insulation and mold formation. External thermal insulation installation is preferable. When thermal insulation is used in mosque buildings, the total building energy consumption is usually decreased drastically [5]. Thermal insulation of mosque building walls has a major impact on lowering total thermal energy demand, which reduces CO₂ emissions. Adding thermal insulation to a building's exterior wall can be seen as an investment from an economic standpoint. The cost of this investment is related to the procurement, transportation, and installation of the insulation, while the benefits are related to the reduction of thermal energy demand used to cool a mosque building. A critical consideration which needs the attention of building engineers is to determine the optimal thickness of the insulating layer that provides the highest net present value of thermal insulation expenditure [6].

2. Model Description

Mosques are geometrically very simple buildings: mostly rectangular in shape with their long side normally directed toward the Ka'ba (the Qibla wall). Based

on size and the number of occupants, Mosques can be classified into three categories:

1. Small size mosques that can accommodate 40-250 people, mostly used for daily prayer only.
2. Medium size mosques that can accommodate 250-750 people, most of these mosques are used for both daily and Friday prayer, while some are used for daily prayer only.
3. Large size mosques that can serve 750 or more people at the same time and are primarily used for Friday prayer but also for daily prayer. Large size mosques are usually zoned to be operated partially for daily prayers as the number of users is usually less than its maximum occupancy.

Mosques are typically characterized by high ceilings with a minimum height of 4 m to a maximum height of 12 m or more. To accommodate study of mosques that are used both daily and for Friday prayer, a medium sized rectangular mosque with a conditioned area of 470 m² and capacity of 500 occupants is selected to be modelled. The selected mosque is in Dhahran which is adjacent to Al-Khobar city in the Eastern Province of Saudi Arabia. The rectangular shape of the mosque has an aspect ratio of approximately 1:1.2 with its long length at an angle of approximately 25° from the East-West axis. This section shows the information on the characteristic of the modeled mosque which includes location, orientation, geometrical configuration, size, WWR (window to wall ratio), activity type, wall, roof and window thermal properties, lighting, infiltration/ventilation rates, HVAC system type and operation, and occupant density, which were collected from the survey [7-10].

Table 1: Mosque building characteristics.

Characteristics	Description of the Mosque
Location	Dhahran, Riyadh, Tabuk
Kabah Orientation	Dhahran = 245° from North Riyadh = 243.8° from North Tabuk = 156.3° from North
Shape	Rectangular
Floor to Ceiling Height	5.5 m
Floor Area	(24x20) 480m ²
WWR	15%
Infiltration	0.5 ACH
Occupancy	500 People
Metabolic rate	1 mat
Clothing Insulation	0.7 for Summer and 1 for winter
Windows U-value	2.7 (W/m ² °C)
HVAC System Type	Constant Volume system
Ventilation rate	2.5 L/s/Person + 0.3 L/s/m ²
Minimum supply air temperature	12°C
COP	2.6
Operation	Continuous
Set-Point Temperature	Summer 24°C
Lighting Power Density	12 W/m ²
Type of Lighting	Florescent Tube Lights

Computer simulation programs are powerful computational methods for creating architectural simulations that can be used to assess energy demand in buildings. A model was created by using all the data in **Table 1** and then simulated for the energy consumption pattern in the building simulation software “Design Builder”. Because of its unique features that enable complex buildings to be modeled quickly, Design Builder software is commonly used to conduct thermal comfort analyses in buildings of different occupancies [11]. The simulated results were validated for consistency with the data of an actual mosque building that were obtained from a survey of mosques in Al-Khobar city by Budaiwi et al. [12] in the year 2002, and it was observed that they were in agreement. **Figure 1-3** shows the mosque building models created in the software for three different climatic conditions, mainly Dhahran, Riyadh, and Tabuk.

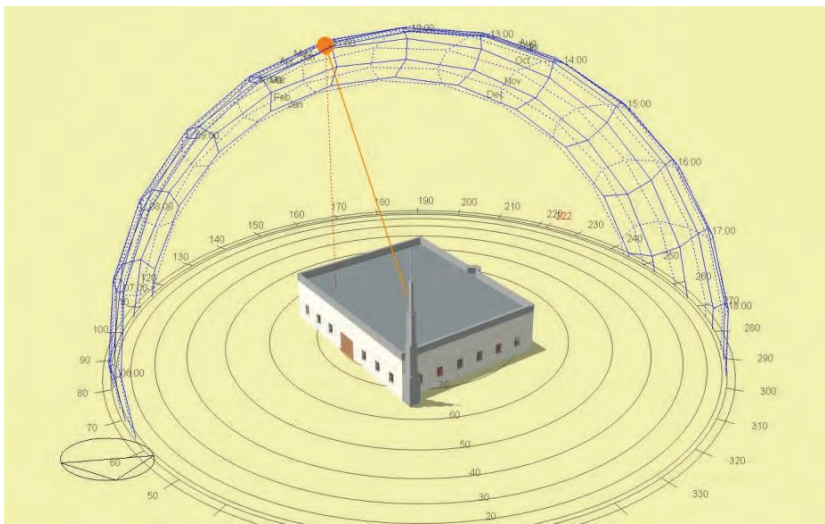


Figure 1: 3-D rendered Base Model in axonometric view (Dhahran).

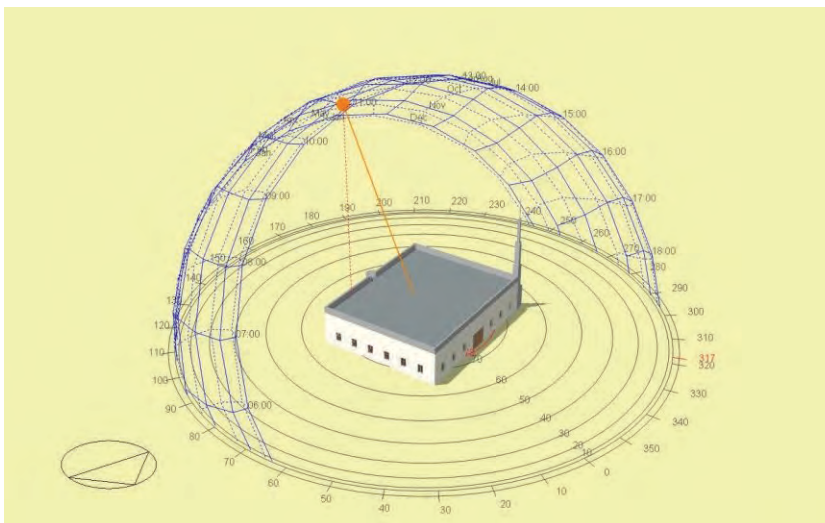


Figure 2: 3-D rendered Base Model in axonometric view (Tabuk).

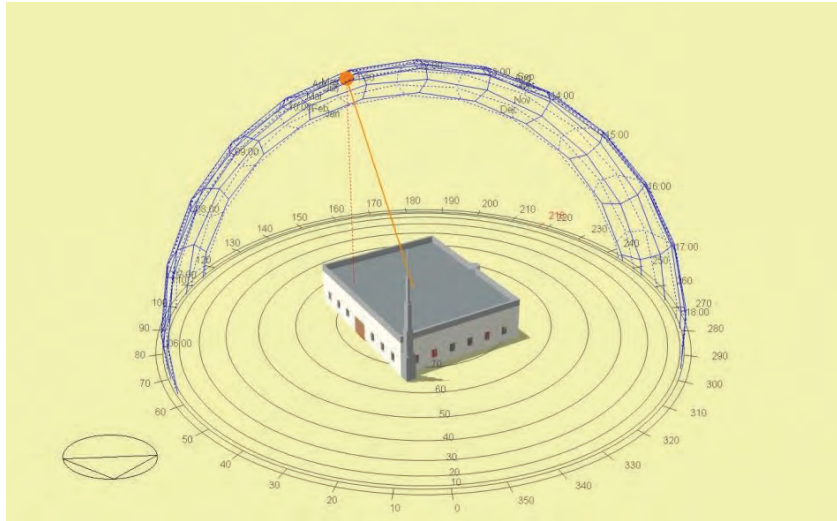


Figure 3: 3-D rendered Base Model in axonometric view (Riyadh).

2.1 Climatic Conditions of the Cities Selected for this Study

Dhahran has a tropical desert climate, with summers that are among the hottest and most humid in the world and winters that are nearly frost-free. Given the city's proximity to the Arabian Gulf, summer temperatures can reach more than 40 °C, with high humidity. The highest temperature ever recorded in Dhahran is 51.1 °C.

Riyadh has a tropical desert climate and dry weather, with long, exceptionally hot summers and brief, extremely mild winters. In August, the average high temperature is 43.6 °C (110.5 °F). The city receives very little precipitation, especially in the summer.

Summers in **Tabuk** are long, hot, arid, and clear, while winters are brief, cold, dusty, and often clear. Throughout the year, the temperature usually ranges from 40°F to 102°F, with temperatures seldom falling below 34°F or rising above 108°F.

2.2 Insulations Selected in this study

Polyurethane Insulation

Polyurethane is the most commonly used insulation and is viewed as a cost-effective, long-lasting, and risk-free method of reducing carbon emissions that contribute to global warming. In cold weather, polyurethanes can significantly mitigate heat loss in homes and workplaces. During the summer, they play a vital role in keeping buildings cold, requiring less air conditioning. **Figure 4** shows the modelled roof and wall assembly with polyurethane insulation boards switched in the mosque building envelope and **Table 2** shows the thermal transmittance values for different thickness levels of polyurethane insulation.

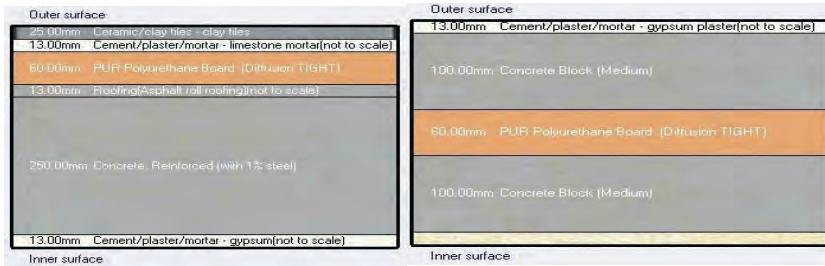


Figure 4: Roof and wall assembly with Polyurethane insulation

Table 2: Thermal transmittance value of Polyurethane for different thickness

Polyurethane (rigid boards)		
Insulation Thickness	U-wall W/m ² K	U-roof W/m ² K
0	1.607	2.797
10mm	0.995	1.353
20mm	0.72	0.89
30mm	0.564	0.663
40mm	0.463	0.528
50mm	0.393	0.439
60mm	0.342	0.376

Rockwool Insulation

With Rockwool exterior wall insulation, the interior spaces can be made energy efficient and compliant with building codes while still benefiting from acoustics, indoor comfort, and fire protection. **Figure 5** shows the modelled roof and wall assembly with rockwool insulation switched in the mosque building envelope.

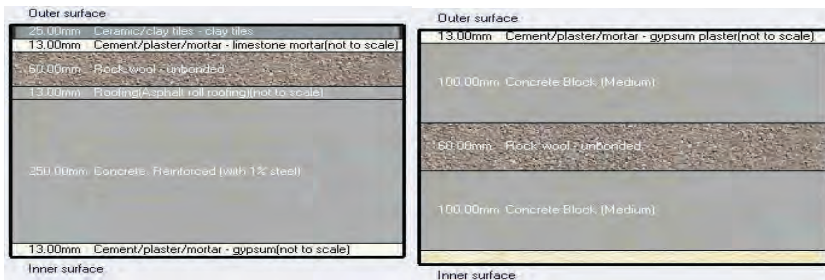


Figure 5: Roof and wall assembly with Rockwool insulation.

Table 3 shows the thermal transmittance values for different thickness levels of Rockwool insulation.

Table 3: Thermal transmittance value of rockwool insulation for different thickness

Rockwool (Batts)		
Insulation Thickness	U-wall W/m ² K	U-roof W/m ² K
0	1.607	2.797
10mm	1.201	1.762
20mm	0.956	1.282
30mm	0.795	1.007
40mm	0.68	0.829
50mm	0.594	0.705
60mm	0.527	0.613

Polystyrenes Insulation

Since polystyrene foams are excellent thermal insulators, they are often used as building insulation materials, such as in insulating concrete forms and structural insulated panel building systems. Grey polystyrene foam with graphite has excellent insulation properties. **Figure 6** shows the modelled roof and wall assembly with polystyrene insulation switched in the mosque building envelope.

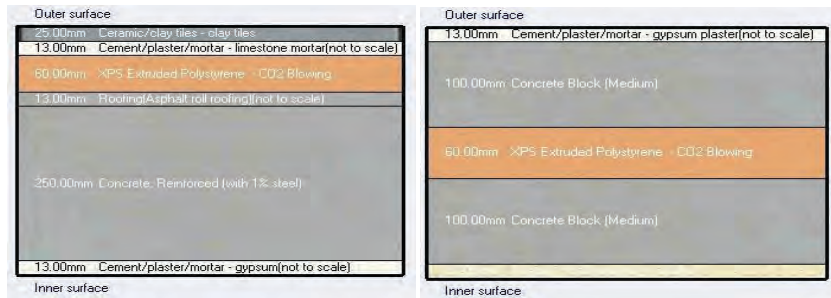


Figure 6: Roof and wall assembly with Polystyrene insulation.

Table 4 shows the thermal transmittance values for different thickness levels of polystyrene insulation.

Table 4: Thermal transmittance value of Polystyrene for different thickness

Polystyrene (rigid boards)		
Insulation Thickness	U-wall W/m ² K	U-roof W/m ² K
0	1.607	2.797
10mm	1.094	1.541
20mm	0.828	1.061
30mm	0.666	0.808
40mm	0.557	0.653
50mm	0.478	0.548
60mm	0.419	0.472

Table 5 shows the thermal characteristics of insulation materials selected for this study.

Table 5: Thermal Characteristics of insulation material

Properties	Polystyrene	Polyurethane	Rockwool
Thermal conductivity K (W/m.K)	0.034	0.026	0.047
Specific Heat (J/kg)	1400	1590	840
Density (Kg/m ³)	35	35	92

3. Simulations and Results

The building model is simulated by using the weather data file of Saudi Arabia which is saved as a library in the Design Builder software. The weather data file represents hourly solar radiation and meteorological elements for a period of one year.

Case #1

In the first case study, the mosque building model is simulated in the hot-humid weather conditions of Dhahran for a period of one year with the three different thermal insulations (Polystyrene, Polyurethane, and Rockwool) with different thickness values. **Table 6** and **Figure 7** shows the HVAC energy consumption in relation to the usage of polystyrene as thermal insulation for different thickness values over a period of one year. As evident from **Figure 7** as we increased the thickness of polystyrene the HVAC energy savings were increased gradually with the maximum HVAC energy savings (~26%) reached at the polystyrene thickness value of 60 mm.

Table 6: HVAC energy consumption (kWh) with polystyrene as thermal insulation

Insulation Thickness	0mm	10mm	20mm	30mm	40mm	50mm	60mm
Jan	184.70	195.91	214.33	227.54	236.34	241.93	246.58
Feb	257.39	255.39	268.89	281.17	291.68	296.46	300.92
Mar	1049.62	972.54	961.57	958.35	958.55	959.43	960.21
Apr	4795.53	4250.65	4026.65	3897.83	3813.42	3753.98	3708.43
May	12958.85	11446.08	10710.08	10270.61	9975.90	9762.59	9602.36
Jun	14760.46	12950.53	12091.58	11598.98	11265.89	11023.67	10840.53
Jul	19360.77	17622.01	16551.23	15389.37	14725.19	13957.25	13688.75
Aug	19311.05	17115.17	15768.78	14978.09	14374.55	14030.66	13709.94
Sep	12764.6	11076.06	10341.51	9931.06	9647.71	9446.21	9302.31
Oct	8817.42	7880.43	7425.048	7148.58	6961.69	6826.40	6723.80
Nov	2561.76	2416.61	2364.83	2335.81	2315.96	2300.99	2289.46
Dec	561.052	568.60	583.97	598.23	609.22	617.12	624.080
Annual	97383.22	86750.01	81308.49	77615.65	75176.14	73216.72	71997.41
% saving	0	10.91	16.50	20.29	22.80	24.81	26.06

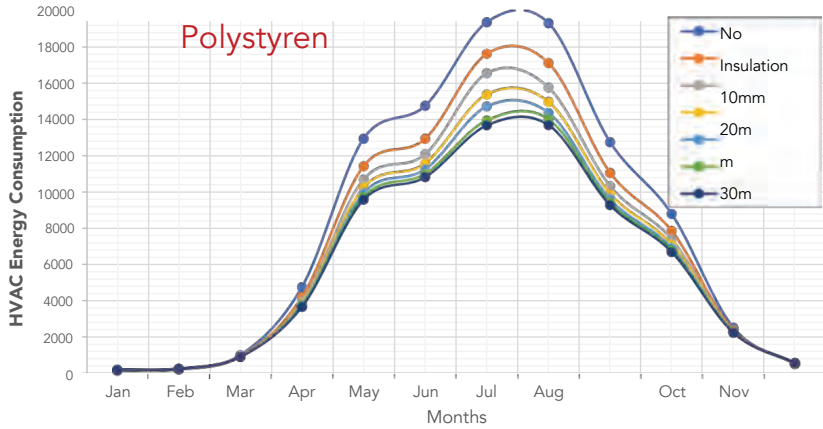


Figure 7: HVAC energy consumption over a period of one year.

Table 7 and Figure 8 show the HVAC energy consumption in comparison to the use of polyurethane as thermal insulation for various thickness values over a one-year cycle. As seen in Figure 8, as the thickness of the polyurethane was increased, the HVAC energy savings increased steadily, with the highest HVAC energy savings (~28%) achieved at the polyurethane thickness value of 60 mm.

Table 7: HVAC energy consumption (kWh) with polyurethane as thermal insulation

Insulation Thickness	0mm	10mm	20mm	30mm	40mm	50mm	60mm
Jan	184.70	202.00	222.36	235.81	243.31	249.42	255.23
Feb	257.39	256.83	278.35	291.20	297.58	302.99	305.70
Mar	1049.62	967.84	958.82	958.64	959.59	960.58	960.65
Apr	4795.53	4165.24	3940.75	3819.03	3742.72	3688.78	3648.97
May	12958.85	11170.91	10416.82	9995.21	9721.93	9531.71	9390.24
Jun	14760.46	12627.04	11777.48	11276.2	10976.31	10760.88	10611.88
Jul	19360.77	17117.83	15346.25	14753.12	13879.3	13586.05	13248.28
Aug	19311.05	16591.46	15141.43	14409.46	13963.38	13629.45	13132.71
Sep	12764.6	10805.9	10069.7	9666.56	9408.17	9232.87	9097.28
Oct	8817.42	7711.11	7241.19	6973.87	6800.26	6677.77	6587.08
Nov	2561.76	2396.23	2344.74	2317.35	2298.05	2284.22	2273.69
Dec	561.05	574.62	592.22	609.15	619.72	627.76	632.39
Annual	97383.22	84587.04	78330.14	75305.64	72910.35	71532.53	70144.14
% saving	0	13.14	19.56	22.67	25.13	26.54	27.97

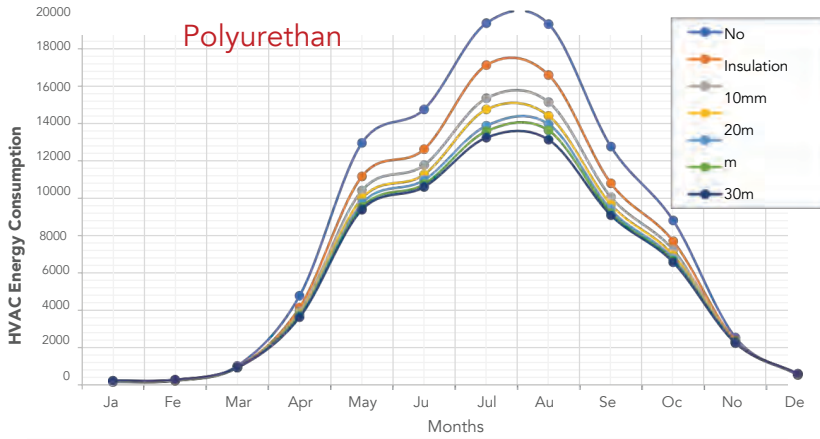


Figure 8: HVAC energy consumption over a period of one year

Table 8 and Figure 9 display the HVAC energy usage versus the use of Rockwool as thermal insulation over a one-year period. As seen in Figure 9, the HVAC energy savings increased gradually as the thickness of the Rockwool increased, with the maximum HVAC energy savings (~24%) reached at the Rockwool thickness value of 60 mm.

Table 8: HVAC energy consumption (kWh) with Rockwool as thermal insulation

Insulation Thickness	0mm	10mm	20mm	30mm	40mm	50mm	60mm
Jan	184.7035	191.5852	204.7422	217.0675	225.0941	233.8888	237.9241
Feb	257.3952	253.3625	260.7617	270.591	280.1959	288.6594	293.5217
Mar	1049.622	981.9235	966.144	960.0238	958.4946	956.8499	957.8965
Apr	4795.531	4348.112	4132.062	3999.646	3908.334	3841.376	3790.103
May	12958.85	11751.13	11061.96	10620.27	10308.78	10076.54	9896.002
Jun	14760.46	13323.37	12504.87	11993.66	11642.91	11378.23	11170.81
Jul	19360.77	17923.26	16821.65	16428.99	15425.57	15000.09	14268.73
Aug	19311.05	17641.33	16440.58	15786.55	15027.88	14446.15	14113.4
Sep	12764.6	11354.13	10705.72	10265.81	9968.99	9745.318	9566.525
Oct	8817.424	8066.407	7644.727	7369.2	7173.109	7026.096	6911.383
Nov	2561.768	2439.241	2388.302	2358.41	2338.278	2322.162	2310.721
Dec	561.0526	565.2538	573.9523	586.4627	595.5269	605.8675	611.6615
Annual	97383.22	88839.10	83705.4712	80856.681	77853.16	75921.22	74128.67
% saving	0	8.77	14.04	16.97	20.05	22.03	23.87

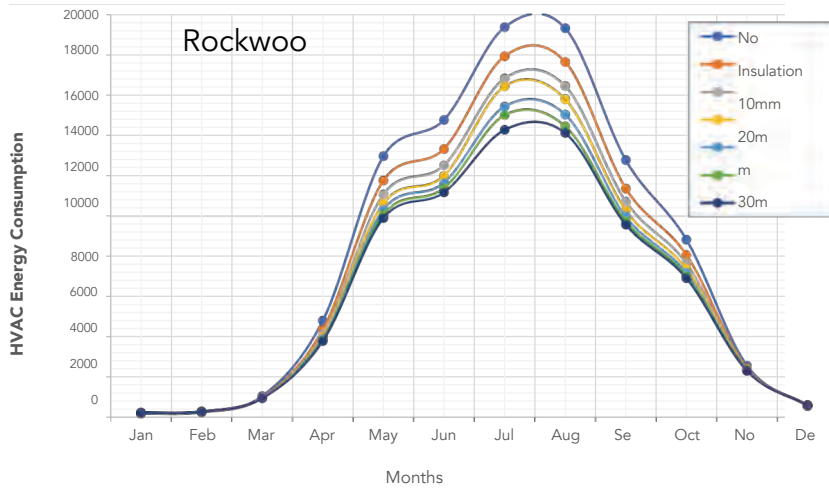


Figure 9: HVAC energy consumption over a period of one year

Figure 10 describes the percentage energy savings in HVAC by using various thermal insulations in the mosque’s building envelope located in Dhahran. Polyurethane thermal insulation has been found to be the most energy-efficient for the hot-humid climatic conditions in Dhahran.

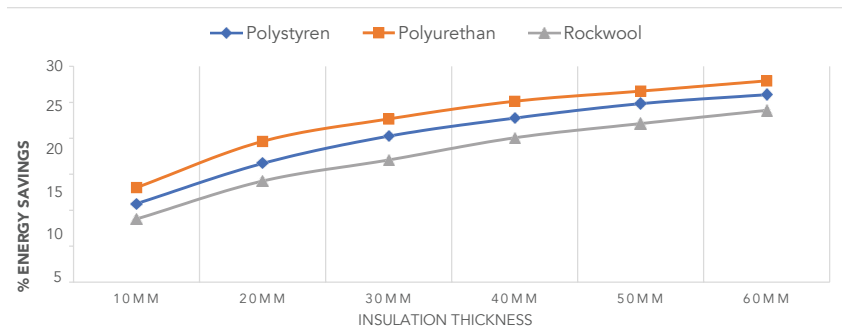


Figure 10: % Savings in HVAC energy consumption with various thermal insulations

Case #2

In the second case study the mosque building model is simulated in the hot-dry weather conditions of Riyadh for a period of one year with the same three thermal insulations (Polystyrene, Polyurethane, and Rockwool) at different thickness values. Table 9 and Figure 11 shows the HVAC energy consumption in relation to the usage of polystyrene as thermal insulation for different thickness values over a period of one year. As evident from Figure 11 as we increased the thickness of polystyrene the HVAC energy savings were increased gradually with the maximum HVAC energy savings (~28.5%) reached at the polystyrene thickness value of 60 mm.

Table 9: HVAC energy consumption (kWh) with polystyrene as thermal insulation

Insulation Thickness	0mm	10mm	20mm	30mm	40mm	50mm	60mm
Jan	6331.17	5479.9	5178.83	5011.24	4895.76	4814.17	4755.06
Feb	3853.16	3386.50	3307.17	3265.0445	3232.17	3204.82	3182.30
Mar	2782.307	2311.968	2275.45	2259.8656	2250.26	2242.028	2237.139
Apr	4782.26	4017.84	3791	3662.54	3578.667	3519.52	3475.24
May	11306.4	9508.578	8818.344	8409.055	8135.849	7939.947	7792.379
Jun	14067.7	11830.48	10971.75	10462.83	10123.05	9879.253	9695.482
Jul	14933.3	12610.65	11724.82	11199.83	10849.54	10598.37	10409.18
Aug	15619.9	13190.48	12237.24	11668.37	11287.53	11013.92	10807.53
Sep	11938.83	10103.42	9390.39	8964.295	8677.882	8471.313	8314.996
Oct	6632.011	5632.04	5295.16	5093.89	4961.19	4864.98	4792.04
Nov	2803.45	2368.41	2340.27	2327.94	2318.812	2313.77	2310.11
Dec	5778.42	4916.16	4677.13	4540.63	4455.27	4398.74	4358.37
Annual	100828.9	85356.45	80007.57	76865.56	74766	73260.86	72129.85
% saving	0	15.34	20.65	23.76	25.84	27.34	28.46

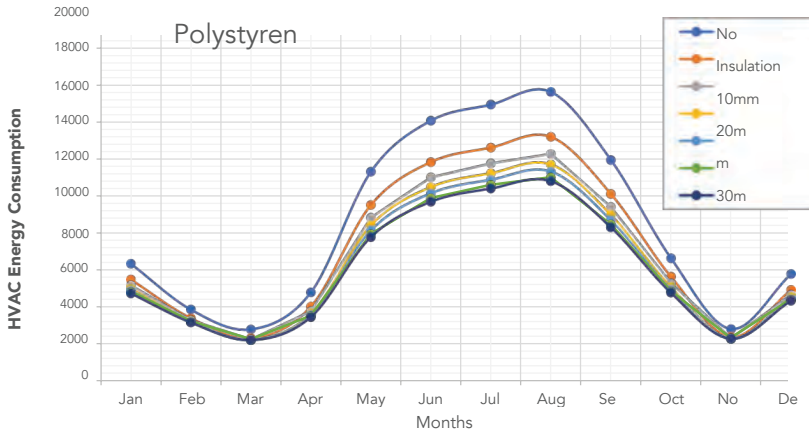


Figure 11: HVAC energy consumption over a period one year

Table 10 and **Figure 12** show the HVAC energy consumption in comparison to the use of polyurethane as thermal insulation for various thickness values over a one-year cycle. As seen in **Figure 12**, as the thickness of the polyurethane was increased, the HVAC energy savings increased steadily, with the highest HVAC energy savings (~30%) achieved at the polyurethane thickness value of 60 mm.

Table 10: HVAC energy consumption (kWh) with polyurethane as thermal insulation

Insulation Thickness	0mm	10mm	20mm	30mm	40mm	50mm	60mm
Jan	6331.17	5366.42	5066.81	4903.74	4799.27	4724.98	4677.40
Feb	3853.16	3358.20	3277.6	3235.0112	3198.50	3170.72	3151.57
Mar	2782.307	2296.328	2265.08	2250.697	2241.66	2235.0	2228.81
Apr	4782.26	3931.18	3705.24	3584.1762	3508.20	3455.46	3417.85
May	11306.4	9249.604	8545.43	8153.634	7902.34	7727.05	7597.6
Jun	14067.7	11508.13	10632.3	10145.14	9832.39	9614.02	9452.7
Jul	14933.3	12278.18	11374.7	10872.31	10550.1	10325.3	10159.
Aug	15619.9	12833.9	11858.1	11312.31	10961.3	10716.0	10534.
Sep	11938.83	9836.417	9106.58	8696.505	8431.44	8245.46	8107.5
Oct	6632.01	5504.84	5160.08	4969.33	4846.42	4759.59	4694.5
Nov	2803.45	2355.35	2332.73	2319.9481	2313.05	2307.33	2304.5
Dec	5778.4291	4823.1393	4585.3452	4460.6686	4388.3289	4340.38	4297.6
Annual	100828.94	83341.71067	77910.162	74903.48	72973.	71621.4	70624.4
% saving	0	17.34	22.73	25.71	27.62	28.96	29.95

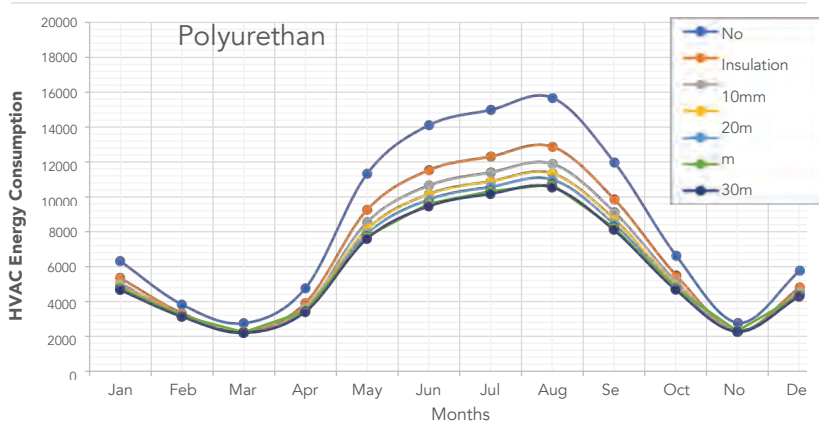


Figure 12: HVAC energy consumption over a period of one year

Table 11 and **Figure 13** display the HVAC energy usage versus the use of Rockwool as thermal insulation over a one-year period. As seen in **Figure 13**, the HVAC energy savings increased gradually as the thickness of the Rockwool increased, with the maximum HVAC energy savings (~26%) reached at the Rockwool thickness value of 60 mm.

Table 11: HVAC energy consumption (kWh) with Rockwool as thermal insulation

Insulation Thickness	0mm	10mm	20mm	30mm	40mm	50mm	60mm
Jan	6331.1781	5600.5624	5322.6	5143.6827	5025.154	4933.1561	4861.9135
Feb	3853.1672	3422.1082	3343	3297.2194	3268.577	3243.9911	3221.9987
Mar	2782.307	2333.941	2289.4	2271.3294	2259.169	2250.5378	2244.341
Apr	4782.26196	4116.94066	3898.1	3764.05144	3672.978	3606.14844	3555.11734
May	11306.4	9796.009	9148.5	8734.708	8444.601	8229.028	8062.209
Jun	14067.7	12188.64	11382	10867.89	10507.21	10239.19	10031.74
Jul	14933.3	12979.94	12149	11617.66	11245.59	10969.22	10755.41
Aug	15619.9	13584.4	12694	12121.33	11718.07	11417.79	11185.1
Sep	11938.83	10399.6	9732.4	9303.976	9001.941	8776.403	8601.109
Oct	6632.01112	5775.22807	5455.8	5254.808114	5111.482	5006.14638	4925.419436
Nov	2803.4574	2385.7946	2350.2	2336.485	2327.332	2319.8895	2314.6215
Dec	5778.4291	5025.6797	4790.1	4649.6242	4550.971	4483.9587	4432.6957
Annual	100828.942	87608.8436	82556	79362.76425	77133.07	75475.459	74191.67518
% saving	0	13.11	18.12	21.28	23.5	25.14	26.41

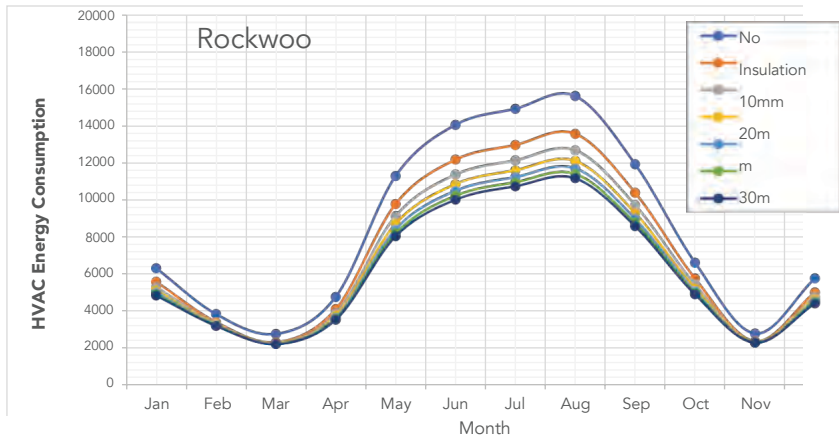


Figure 13: HVAC energy consumption over a period of one year

Figure 14 represents the percentage energy savings in HVAC by using various thermal insulation thicknesses in the mosque's building envelope located in Riyadh. **Polyurethane** thermal insulation has been found to be the most energy-efficient for the hot-dry climatic conditions in Riyadh.

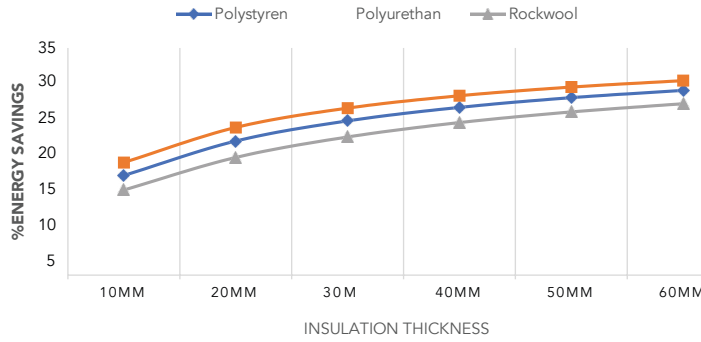


Figure 14: % Savings in HVAC energy consumption with various thermal insulation thicknesses.

Case #3:

In the third case study the mosque building model is simulated in the weather conditions of Tabuk for a period of one year with the same three thermal insulations (Polystyrene, Polyurethane, and Rockwool) at different thickness values. **Table 12** and **Figure 15** shows the HVAC energy consumption in relation to the usage of polystyrene as thermal insulation for different thickness values over a period of one year. As evident from **Figure 15** as we increased the thickness of polystyrene, the predicted HVAC energy savings increased gradually with the maximum HVAC energy savings (~23%) reached at the polystyrene thickness value of 60 mm.

Table 12: HVAC energy consumption (kWh) with polystyrene as thermal insulation.

Insulation Thickness	0mm	10mm	20mm	30mm	40mm	50mm	60mm
Jan	5625.66365	4986.1231	4711.725	4556.8426	4461.0453	4403.181	4356.85
Feb	3427.3065	3217.2655	3147.0243	3102.2537	3069.301	3042.124	3020.47
Mar	2693.294	2555.638	2513.885	2493.517	2476.539	2461.725	2452.25
Apr	3594.9853	3231.8629	3106.271	3038.9143	2996.3987	2966.327	2945.18
May	6674.358	5905.139	5557.36	5354.729	5220.399	5125.033	5053.15
Jun	10708.83	9400.486	8778.613	8406.156	8156.405	7976.843	7841.48
Jul	12606.72	10972.29	10208.63	9753.865	9449.442	9230.665	9065.59
Aug	12926.6	11368.55	10626.07	10181.63	9883.559	9669.149	9507.28
Sep	9753.307	8657.813	8128.278	7807.332	7590.266	7433.235	7314.22
Oct	5551.94533	5060.63734	4827.8463	4686.0559	4590.1334	4520.673	4467.09
Nov	2557.678	2405.9585	2366.0418	2350.0914	2332.9709	2322.491	2311.78
Dec	4470.9133	4047.0447	3879.1366	3792.5488	3741.5243	3702.431	3674.11
Annual	80591.60108	71808.80804	67850.881	65523.936	63967.9836	62853.88	62009.5
% Saving	0	10.89790117	15.808992	18.696322	20.626985	22.0094	23.0572

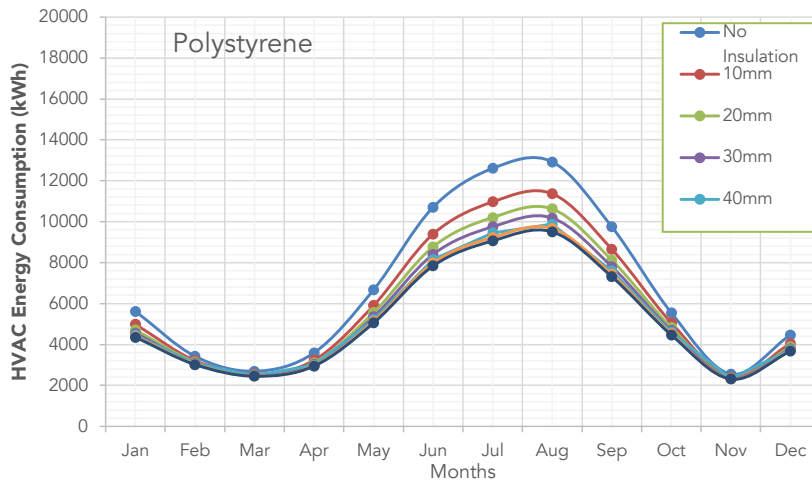


Figure 15: HVAC energy consumption over a period of one year.

Table 13 and Figure 16 show the HVAC energy consumption in comparison to the use of polyurethane as thermal insulation for various thickness values over a one-year cycle. As seen in Figure 16, as the thickness of the polyurethane was increased, the HVAC energy savings increased steadily, with the highest HVAC energy savings (~24%) achieved at the polyurethane thickness value of 60 mm.

Table 13: HVAC energy consumption (kWh) with polyurethane as thermal insulation

Insulation Thickness	0mm	10mm	20mm	30mm	40mm	50mm	60mm
Jan	5625.66365	4877.8647	4607.6231	4467.5965	4390.8691	4338.052	4300.36
Feb	3427.3065	3192.7025	3119.0403	3071.9115	3036.6086	3009.714	2986.36
Mar	2693.294	2539.277	2500.782	2477.426	2460.239	2448.176	2439.53
Apr	3594.9853	3182.0702	3060.8693	2999.2631	2961.152	2936.517	2919.71
May	6674.358	5773.858	5422.184	5229.186	5106.823	5021.787	4958.74
Jun	10708.83	9168.124	8530.514	8172.654	7942.288	7781.394	7662.32
Jul	12606.72	10686.19	9905.535	9469.231	9188.569	8992.359	8847.3
Aug	12926.6	11091.12	10329.99	9902.956	9627.885	9435.456	9293.12
Sep	9753.307	8460.841	7914.791	7604.399	7402.887	7261.248	7156.22
Oct	5551.94533	4974.38688	4733.4745	4596.5634	4507.35583	4443.93	4397.83
Nov	2557.678	2390.2322	2355.3139	2334.3721	2319.8481	2307.374	2300.25
Dec	4470.9133	3982.0474	3824.0298	3744.5301	3697.6589	3660.332	3628.87
Annual	80591.60108	70318.71388	66304.147	64070.089	62642.1835	61636.34	60890.6
% saving	0	12.74	17.72	20.5	22.27	23.52	24.44

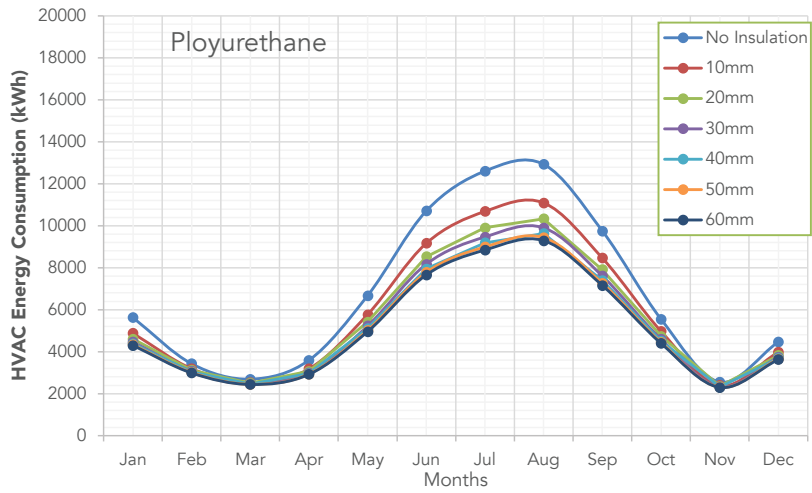


Figure 16: HVAC energy consumption over a period of one year.

Table 14 and Figure 17 display the HVAC energy usage versus the use of Rockwool as thermal insulation over a one-year period. As seen in Figure 17, the HVAC energy savings increased gradually as the thickness of the Rockwool increased, with the maximum HVAC energy savings (~21%) reached at the

Rockwool thickness value of 60 mm.

Table 14: HVAC energy consumption (kWh) with Rockwool as thermal insulation

Insulation Thickness	0mm	10mm	20mm	30mm	40mm	50mm	60mm
Jan	5625.66365	5106.6104	4837.7407	4677.1473	4570.0994	4493.091	4438.94
Feb	3427.3065	3253.3925	3179.6079	3138.2134	3106.3626	3081.152	3058.48
Mar	2693.294	2574.578	2532.561	2508.843	2494.583	2480.909	2467.82
Apr	3594.9853	3288.6799	3163.3611	3090.8828	3042.9596	3008.461	2982.59
May	6674.358	6051.367	5722.854	5515.47	5371.709	5265.668	5183.69
Jun	10708.83	9657.011	9077.228	8702.867	8438.8	8241.897	8089.25
Jul	12606.72	11289.45	10574.59	10116.09	9793.737	9553.729	9367.71
Aug	12926.6	11674.71	10982.59	10535.66	10220.56	9985.633	9803.39
Sep	9753.307	8874.181	8383.661	8063.464	7835.839	7665.086	7532.01
Oct	5551.94533	5155.72514	4940.4937	4799.1327	4698.40595	4623.018	4563.68
Nov	2557.678	2427.9894	2384.8255	2361.7497	2350.9347	2337.809	2327.58
Dec	4470.9133	4124.867	3957.8076	3859.5654	3800.2232	3758.429	3727.04
Annual	80591.60108	73478.56134	69737.321	67369.085	65724.2135	64494.88	63542.2
% saving	0	8.82	13.46	16.4	18.44	19.97	21.15

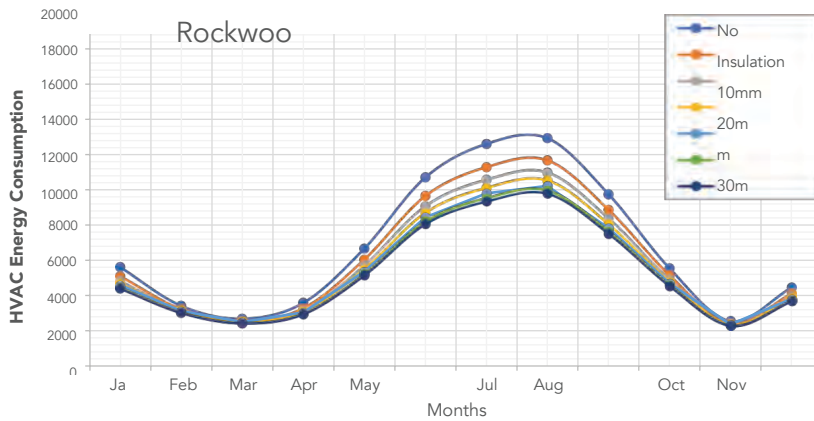


Figure 17: HVAC energy consumption over a period of one year.

Figure 18 represents the percentage energy savings in HVAC by using various thermal insulation materials at various thicknesses in the mosque's building envelope located in Tabuk. **Polyurethane** thermal insulation has been found to be the most energy-efficient for the climatic conditions in Tabuk.

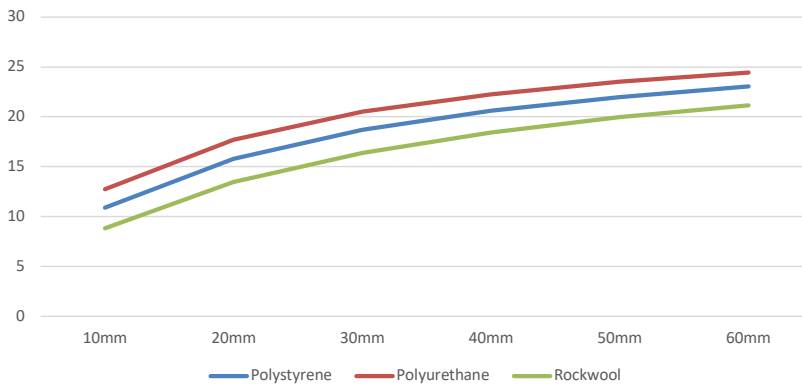


Figure 18: Savings in HVAC energy consumption with various thermal insulation materials and thicknesses.

Conclusion

Based on the findings from this study through building energy simulations, proper use of building envelope thermal insulation decreases the annual energy needs in mosque structures and will result in greater energy savings for mosques located in different climatic conditions. Furthermore, less dependency on HVAC for cooling will have a beneficial environmental effect for the planet. Proper building envelope treatment will greatly increase the energy efficiency in mosque buildings with low internal heat gains. As a result, it is critical to use the appropriate amount of insulation for the mosque building depending on the climatic conditions, as well as the optimal insulation form and thickness, as determined in this study. Polyurethane thermal insulation with the maximum thickness of 60mm was found to be best suited in terms of percentage energy savings for the climates of Dhahran, Riyadh, and Tabuk. With the further increases in thickness of thermal insulation beyond 60 mm, there was no significant increase in the HVAC energy savings. The authors have contacted the local construction material suppliers and it appears that the cost of the

insulation materials analyzed in the research is approximately the same. The cost of a thermal insulation panel with 10 mm thickness is approximately 20 SAR/ft² whereas the cost of insulation panels with thickness of 60 mm is 60 SAR/ft². The installation cost of the thermal insulation panels is approximately, 1.5-2 SAR/ft².

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مسجد
دايع الرحمن

MASJID DAING ABDUL RAHMAN



INDOOR THERMAL COMFORT ANALYSIS AT A MODERN VERNACULAR MASJID IN MALAYSIA



Siti Salwana Bt Mohd Nawayai

IIUM - Malaysia

Zuraini Bt Denan

IIUM - Malaysia

Aliyah Nur Zafirah Bt Sanusi

IIUM - Malaysia

ABSTRACT

In a hot, humid climate, especially in Malaysia, many masjids (mosques) should provide an acceptable level of thermal comfort enabling occupants to focus on worship. Masjids are partially or fully occupied five times a day and their maximum occupancy is expected to occur at Friday prayers. Masjids have a unique character, as intermittent occupancy may cause the space to not thermally perform the same as compared to typical commercial and residential buildings. This paper presents the results of user perceptions of masjid indoor thermal conditions. The purpose of this study is to investigate factors that influence the effectiveness of thermal comfort in selected masjids. Questionnaires were distributed to a total of 400 respondents at two selected masjids as part of this experimental study. Contents of the questionnaires consisted of items related to thermal sensation, thermal comfort, thermal acceptability, and their opinions on thermal performance in relation to building design. In addition to the questionnaires, data collection included field measurement to record air temperature, relative humidity, and air flow velocity at each building's façades and openings. For this purpose, air temperature and relative humidity were measured using an MIC-98583 sensor with ± 0.6 °C accuracy in temperature and ± 3 % accuracy in relative humidity. Wind speed was measured using an AVM-305 sensor with ± 0.2 m/s accuracy. Comfort parameters for indoor thermal comfort are predetermined based on ASHRAE 55-2010 and Malaysian Standard 1525. Given that this study provides data supporting two different research methodologies, it allows a comparison between the calculated data and perceived satisfaction of occupants. This knowledge can contribute towards the improvement of future masjid façades, addressing vernacular architecture as a design concept.

Keywords—Hot-Humid climate, Masjid, Thermal performance, User perception

1. INTRODUCTION

Thermal comfort is a key factor that might affect comfort, health, and occupants (Centers et al. 2013). It is influenced by a range of factors including air temperature, air movement, and relative humidity. Today, numerous investigations are carried out worldwide to improve comfort levels of occupants and building performance while in use. However, a limited number of studies have dealt with improving indoor climate comfort in masjids. Compared to research studies on other building typologies, user requirements and environmental comfort studies in modern vernacular masjids are limited. Furthermore, most of these research papers address thermal requirements of masjids and reducing cooling loads in an energy efficiency context for hot, arid climate regions conducted in the cooling season. This fact further supports the need for this research related to temperate climate regions. Previously, Al-ajmi (2010) performed an investigation on indoor environmental conditions of masjids in the dry, desert climate of Kuwait by collecting physical measurements and subjective questionnaires. Al-Homoud, Abdou, and Budaiwi (2009) assessed thermal comfort of occupants while monitoring the building's energy consumption in a hot, humid climate within Saudi Arabia. These details were later studied by Budaiwi and Abdou (2013) and they identified potential energy savings of HVAC system operational strategies and the impact of envelope insulation in masjids. Furthermore, Ormandy et al. and Sugini, Fitriani, & Anggoman (2017) mentioned that elements of building design can also contribute to indoor thermal comfort for users. So, this paper aims to investigate the effectiveness of vernacular approaches being adapted for indoor thermal comfort in Malaysia's modern masjids. The study consists of three main parts: i) literature review ii) evaluation of user satisfaction survey and field data collection, and iii) discussion of the research findings focusing on improving user perception of indoor comfort conditions. In the results and discussion part, the findings from research methodologies are presented. This knowledge can contribute towards the improvement of future masjid designs, enabling the optimization of the indoor thermal environment.

Study Area

This paper aims to investigate how effectively vernacular design approaches can be adapted to benefit thermal performance in Malaysia's modern masjids. Experiments were conducted on Malaysia National Masjid (Kuala Lumpur) and Raja Haji Fisabilillah Masjid (Cyberjaya). Elements such as the architectural approach, construction materials, as well as structural and non-structural components are discussed in this paper. Determining the significance of these elements in the scope of façade design is crucial to assess its impact on indoor thermal performance.

2. LITERATURE REVIEW

a. Modern Vernacular Masjid in Malaysia

Research on vernacular masjids in Malaysia from the Centre for the Study of Built Environment in the Malay World (KALAM) UTM, State Islamic Council, State Museum and past studies were carried out to identify traditional and modern vernacular masjids in Malaysia. A significant study by MA Shah, E Arbi, and N Inangda (2014) analysed six selected pieces of literature from five Malaysian academicians, historians, or architects on masjid classifications (Table 1).

MA Shah, E Arbi, and N Inangda (2014) mention that these publications present varieties of classification systems ranging from Abdul Halim Nasir's stylistic and cultural division between traditional regional influence and outside of the Malay World influence (1984, 2004); the more commonly encountered three periodic divisions into pre-colonial, colonial, and post-independence (Yeang, 1992), or the alternate division into vernacular, colonial, and modern (Abdul Ghafar Ahmad (1999), David Mizan Hashim (2005a,2005b,2005c); to Mohamad Tajuddin's (2007) expanded categorization of seven distinct stylistic divisions: traditional vernacular, Sino-eclectic, colonial, North Indian, modern vernacular, modernistic expressionism, and post-modern revivalism. Shah, Arbi, and Inanga's research also enlisted descriptive elements commonly used when writing or describing masjids in Malaysia found in the selected texts (Table 2). Forming the core of architectural vocabulary commonly employed in architectural history texts, these elements help define the formal characteristics of masjids.

Table 1. Selected literature on masjid architectural history in Malaysia by MA Shah, E Arbi, and N Inangda (2014).

No.	Author (Editor/Translator)	Year	Reference
1	Abdul Halim Nasir (Eds. Mohd. Ridzuan Tumin & Ahmad Sebi Abu Bakar)	1984	<i>Masjid-masjid di Semenanjung Malaysia</i> . Kuala Lumpur: Berita Publishing
2	Ken Yeang	1992	<i>The Architecture of Malaysia</i> . Kuala Lumpur: The Pepin Press
3	David Mizan Hashim (Ed. Chen Voon Fee)	1998	3 entries from <i>The Encyclopedia of Malaysia: Volume 5 - Architecture</i> . Singapore: Archipelago Press
4	Abdul Ghafar Ahmad	1999	<i>The Architectural Styles of Mosques in Malaysia: From Vernacular to Modern Structures</i> . Symposium on Mosque Architecture, King Saud University, Riyadh, Saudi Arabia
5	Abdul Halim Nasir (Translated by Omar Salahuddin Abdullah)	2004	<i>Mosque Architecture in the Malay World</i> . Bangi, Selangor: Penerbit Universiti Kebangsaan Malaysia
6	Mohamad Tajuddin Mohamad Rasdi	2007	<i>Mosque Architecture in Malaysia: Classification of Styles and Possible Influence</i> . <i>Jurnal Alam Bina</i> Jilid 9, no. 3. UTM

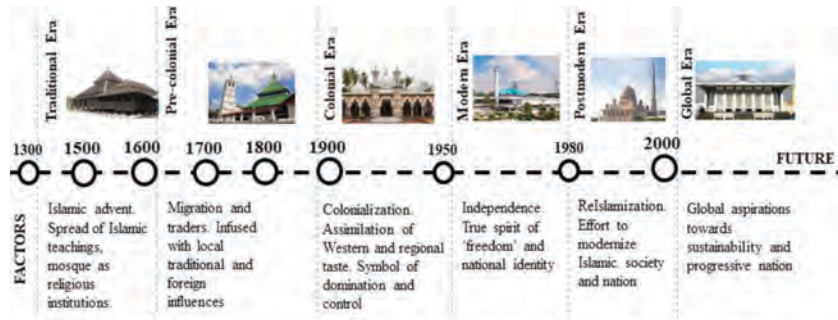


Fig. 1. Scenario of masjid architecture timeline in Malaysia by SDM Sojak (2019).

Table. 2. Descriptive elements used to describe masjid architecture from the selected literature and grouping according to components and characteristics.

Sample of Descriptive Elements	Components	Characteristics
Shape and dimension of floor plan, layout and arrangement of space, orientation, symmetry, functionality of space	Spatial Organisation	MORPHOLOGY
Types of roofs (pyramidal roof, domed etc.), interior volume, central roof over main space, decorations on roof, roof ridge	Roof Form	
Use of natural materials (timber, bamboo, nipa palm), masonry (brick, stone), plaster, marble, concrete, steel, glass, composite	Building Materials	TECHNOLOGY
Building traditions and craftsmanship, post-and-beam, stilts, plinth, structure, fenestration, technology, engineered	Construction Methods	
Carvings, motifs, patterns, decorations, Islamic calligraphy, geometry	Decorative Language	DESIGN ARTICULATION
Principles of decoration, visual impact, visual emphasis, proportions, scale, façade	Visual Order	

Findings by SDM Sojak (2019) narrow the typology of modern vernacular masjids in Malaysia by their design approach factors. The design approach factors are further elaborated on with the definition of architectural elements such as building form and architectural layout, building orientation, building height, building openings, façade shading, ventilation carvings and ornamentation, serambi, building materials, as well as construction technology. However, this study will not attempt to explain in more detail the design elements of modern vernacular masjids as they have been explained in detail by researchers in previous studies. The masjid architecture timeline in Fig. 1 includes a population of fourteen modern vernacular masjids that were constructed in Malaysia from 1965 to 2019.

Table. 3. Modern vernacular masjids constructed in Malaysia from 1965 to 2019.

No.	Modern Vernacular Masjid	Location	Year	Architectural timeline
1	National Masjid	Kuala Lumpur	1965	Modern
2	Negeri Sembilan State Masjid	Negeri Sembilan	1967	Modern
3	Raya Tawau Masjid	Sabah	1972	Modern
4	Kolej Islam Malayia Masjid	Selangor	1974	Modern
5	Sabah State Masjid	Sabah	1975	Modern
6	Sandakan District Masjid	Sabah	1985	Modern
7	TuanKu Mizan Zainal Abidin Masjid	Putrajaya	2009	Global Era
8	Surau Nusa Idaman	Negeri Sembilan	2011	Global Era
9	Surau Ali Bashah	Selangor	2012	Global Era
10	Al-Ikhlās Masjid	Selangor	2013	Global Era
11	Ara Damansara Masjid	Selangor	2015	Global Era
12	Raja Haji Fisabilillah Masjid	Cyberjaya	2015	Global Era
13	Cyberjaya 10 Masjid	Cyberjaya	2018	Global Era
14	Masjid Daing Abdul Rahman	Johor	2019	Global Era

b. Thermal Performance

According to Oscar et. al. (2015), thermal performance refers to how well a structure responds to changes in external temperature during daily cycles. It is a process of modelling energy transfer between a building and its surroundings. Thermal performance has become a critical consideration in building design. In hot and humid climates, elements of design can have a large impact on a building's level of heat conduction; higher levels of heat conduction allow more heat to pass through a building, providing a cooler interior environment.

Various heat exchange processes are possible between a masjid and its external environment. To evaluate thermal performance of modern vernacular masjids, knowledge of various heat exchange processes is required. This research aims to produce a relationship between two variables which affect the thermal performance of a modern vernacular masjid. The independent variables are design features (i.e building form and architectural layout, building orientation, building height, building openings, façade shading, ventilation carvings and ornamentation, serambi, building materials, as well as construction technology). The dependent variables are the thermal condition (i.e., air temperatures, mean radiant temperature, humidity, clothing, metabolic rate, and air movement preference of the occupant). Building façade of selected modern vernacular masjids in Malaysia is the moderator in this experimental research. A moderator modifies the form or strength of the relationship between the independent and dependent variables. Previously, Abdullah, Majid, and Othman (2016) presented a theoretical framework in their research and reviewed the issues related to thermal comfort control through urban masjid façade design in Malaysia. They focused on matters relating to urban masjid, façade design, and thermal comfort which expressed the quality of life in the urban environment, energy consumption, and implementation of passive design strategies. They stated that façade design is related to passive design that provide thermal comfort to the occupants. However, no testing was conducted to validate the relationship of urban masjid façade design to thermal comfort in their paper.

Vernacular masjids built in the tropics means an association of construction and function with climatic condition. Tropical climate regions are characterized by their high humidity, excessive rainfall, and considerable sunshine that provide significant impacts to building design. The impacts caused by tropical climate through its climatic parameters are temperature, solar radiation, relative humidity, rainfall, and wind.

In this research, the study focuses on evaluating indoor thermal performance. Conceptually, façade design has a significant impact on indoor thermal comfort with respect to total heat gain of the entire building and the overall heat transfer coefficient which determines heat gain through the building envelope. According to ASHRAE Standard 55, thermal comfort is defined as "The state of mind which expresses satisfaction with the thermal environment". Thermal performance is valued as acceptable when at least 80% of the occupants are thermally comfortable within a space. The comfort temperature is a result of the interaction between the users and the built environment they are occupying. Hence referring to ASHRAE Standard 55, there are three primary parameters to measure indoor thermal performance as impacted from the building façade of modern vernacular masjids in hot, humid climates: temperature, air velocity, and relative humidity.

Air temperature (T_a)

According to Nall (2004), air temperature (T_a) is the average temperature of air surrounding an occupant, with respect to location and time. Comfort range for air temperature varies depending upon the air velocity of indoor space. In 2007, the Malaysian Department of Standards published a guideline on standard indoor environment design for the Malaysian climate, recommending the indoor temperature be in the range of 23°C - 26°C. The estimation of indoor air temperature is essential for the evaluation of thermal performance. The indoor air temperature depends on multiple factors related to building elements. According to Gao (2011), Lechner (2009), and Szokolay (2014), an effective passive design strategy is the best alternative to moderate indoor temperature. However, the same result has yet to be evaluated to reinforce any theoretical effects on air temperature, relative humidity, or air velocity ratio at modern vernacular masjids in Malaysia.

Relative humidity (RH)

Relative humidity (RH) refers to the moisture content (i.e., water vapor) of the atmosphere, expressed as a percentage of the amount of moisture that can be retained by the atmosphere (moisture-holding capacity) at a given temperature and pressure without condensation. Relative humidity is strongly proportional to temperature and highly sensitive to temperature changes. When temperature increases, air becomes drier (RH decreases) and as temperature decreases, air becomes wetter (RH increases).

The importance of measuring relative humidity is related to the architectural elements of the vernacular approach found in building façades that influence indoor thermal performance. Humidity can have a harsh and expensive impact on building materials in hot and humid countries such as Malaysia. For example, metals used in construction such as iron and steel are susceptible to rust. Wood, even when cured, is still susceptible to moisture damage. Paint and glue are prime targets for moisture. When the temperature is low and the relative humidity is high, evaporation of water is slow. When relative humidity approaches 100%, condensation can occur on surfaces, leading to problems with mold, corrosion, decay, and other moisture-related deterioration. Condensation can pose a safety risk as it can promote the growth of mold and wood rot. The energy-efficient, heavily sealed architecture introduced in the 20th century construction industry sealed off the movement of moisture. This has resulted in a secondary problem of condensation forming in and around walls, which also encourages the development of mold and mildew. This may lead to building defects as well as hindering it from being a sustainable building.

Air flow velocity (V_a):

Air flow velocity (V_a) is the average speed of air to which the body is exposed, with respect to a specific location and time. Indoor air velocities affect the thermal comfort of people within spaces. The greater the air velocity, the greater the heat exchange between people in a space and the air around them; i.e., a higher air velocity may increase the rate at which the body is able to lose heat to its surroundings.

3. RESEARCH METHODOLOGY

In order to answer the research objective, it is not practical to collect data from all modern vernacular masjids in Malaysia. Thus, there is need to select a sample. A stratified random sampling approach was applied to the population of modern vernacular masjids to identify final sampling. The sample that been

chosen in this study is Malaysia National Masjid (Kuala Lumpur) and Raja Haji Fisabilillah Masjid (Cyberjaya). National Masjid represents the birth of Modernism in vernacular architecture and Masjid Raja Haji Fisabilillah has a Platinum rating of the Green Building Index (GBI) standard.

Two data collection methods were used: (1) a field measurement on parameters that influence thermal comfort conditions. Parameters for indoor thermal comfort are predetermined based on ASHRAE 55-2010 and Malaysian Standard 1525. Field measurement data were collected during every prayers time at allocated zones for 7 days. The data collected include air temperature (T_a) and relative humidity (RH) measured using an MIC-98583 sensor with ± 0.6 °C accuracy in temperature and ± 3 % accuracy in relative humidity. Wind speed was measured using an AVM-305 sensor with ± 0.2 m/s accuracy, and (2) a questionnaire survey was administered to measure user perceptions. The user perception and satisfaction with the indoor thermal comfort can be examined from the survey respondents. The survey aims to investigate the existing indoor thermal condition, ventilation, indoor air quality, assessment of the architectural elements/components of the building façade that contribute to thermal comfort in each masjid, and other issues, depending on the user responses. The survey was developed based on a 5-point Likert scale ranging from absolutely agree to strongly disagree. A total of 400 responses were collected from both masjids (200 each).

4. ANALYSIS AND FINDINGS

a. Questionnaire Survey

In the first section of the questionnaire, survey data consisting of respondent's background is requested. Gender and age of the respondents are given in the graphs below, respectively. Out of 400 participants from both samples, Fig. 2 shows that 83.5% of respondents are male and 16.5% are female which reflects that the majority of the respondents are male. Findings in Fig. 3, indicate that 19% of the respondents belong to the under 20 years old age group, 28% are between 21-30 years old, 40% are between 31-40 years old, 11% are between 41-50 years old and 28% of the respondents are above the age of 50 years old.

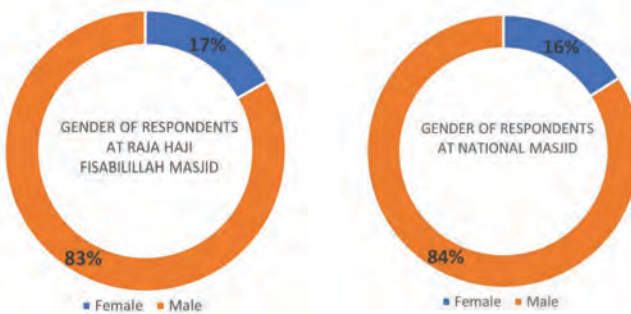


Fig. 2. Gender of respondents

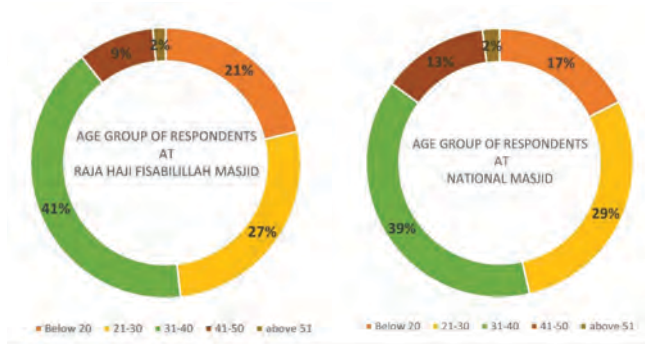


Fig. 3. Age group of respondents

Before filling out the questionnaire, respondents were informed of the objective of the survey and the survey team clarified the terminology used. The survey aimed to record occupants’ perceived thermal comfort and environment control strategy. The questionnaire content mainly involved basic information of the respondents and their perception on the indoor thermal conditions. The indoor thermal conditions were assessed by the masjid users self-identifying their thermal sensation, humidity sensation and draught sensation using the evaluation scale listed in Table 4.

Table 4. Index Scale of User Evaluation

Scale	Thermal Sensation Vote	Draught Sensation Vote	Humidity Sensation Vote
1	Cool	Strong Draught	Too dry
2	Slightly cool	Slightly draught	Dry
3	Neutral	Perfectly breezy	Neutral
4	Slightly hot	Gently breezy	Slightly humid
5	Hot	Stagnant	Very humid

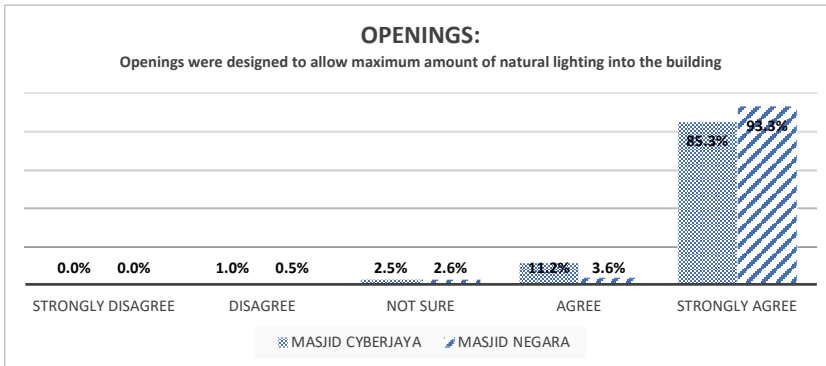
Respectively, the second section of the survey is about the user’s assessment on the masjid’s indoor thermal conditions. A mean (arithmetic average) result in the range of 2-3 is considered as within the acceptable range of thermal comfort. Table 5 presents mean results from respondents in both masjids. Slightly lower means of temperature and air flow satisfaction parameters at the Malaysia National Masjid indicates that, on average, users feel the indoor thermal conditions are a bit on the cool side of the comfortable level. The mean results from respondents on the relative humidity level indicate that users at both masjids are comfortable with the humidity level while occupying the indoor prayer hall. From the data collected, it can be concluded that users are satisfied with the masjid indoor thermal condition.

Table 5. Mean result of user’s satisfaction

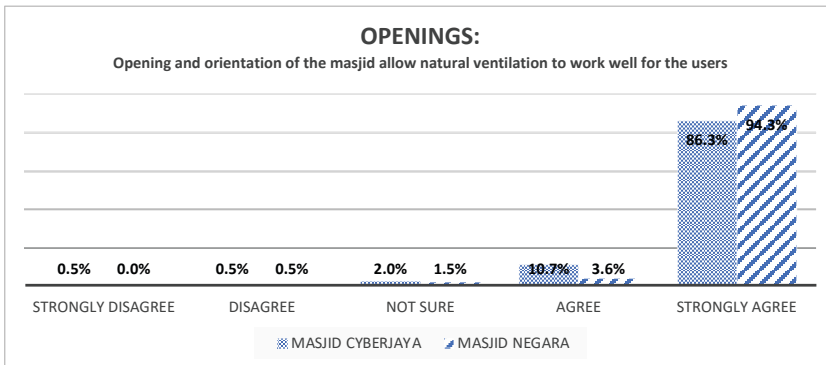
Parameter of User’s Satisfaction	Raja Haji Fisabilillah Masjid	National Masjid
	Mean	Mean
Respondents	197	194
Temperature at indoor prayer hall	3	2.9
Air Flow at outdoor veranda/serambi	3	2.9
Air humidity at indoor prayer hall	3	3

*2-3 is within the acceptable range of thermal comfort

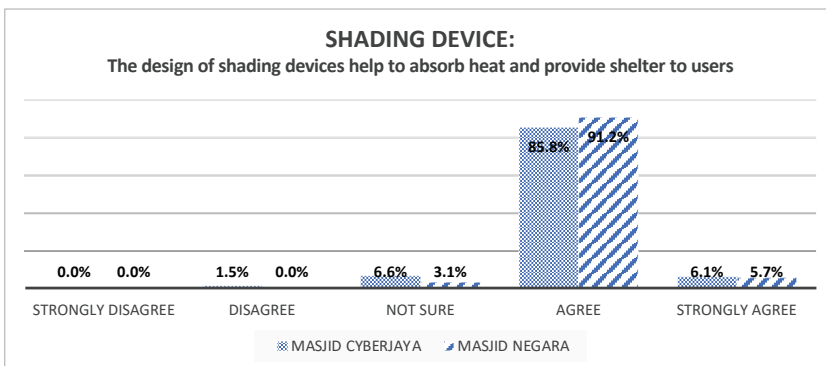
Third section of the questionnaire includes an assessment of the architectural elements/components of the building's façade that contributes to thermal performance each masjid. Six main architectural components are presented using a 5-point Likert scale with responses from 1-strongly disagree to 5-strongly agree. The responses are illustrated in the graphs below, reflecting the users' perceptions, particularly for indoor thermal comfort. Graphs 1 and 2 show the users' perceptions on two (2) separate questions about the façade openings. Graphs 3 and 4 present their perception on elements of façade shading at both masjids. Graphs 5 and 6 indicate the perception of users on variant elements of building height while Graphs 7 and 8 are the users' perceptions concerning materials used at both masjids.



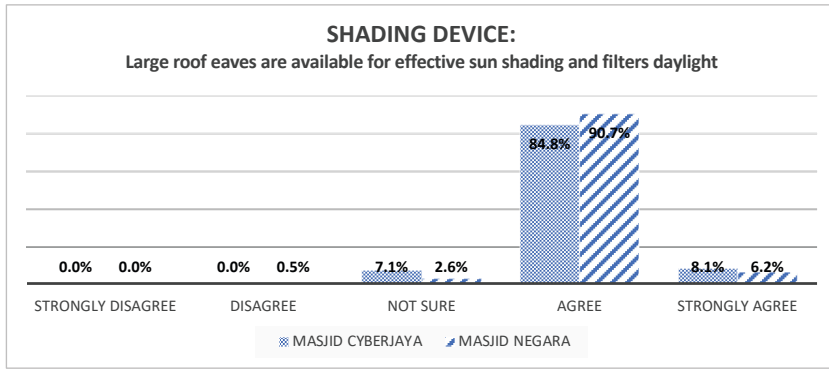
Graph. 1. Users' perceptions on the façade openings at National Masjid and Raja Haji Fisabilillah Masjid (Q1)



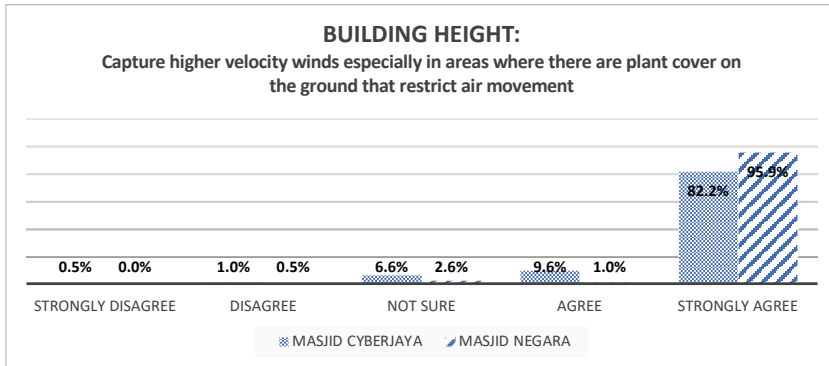
Graph. 2. Users' perceptions on the façade openings at National Masjid and Raja Haji Fisabilillah Masjid (Q2)



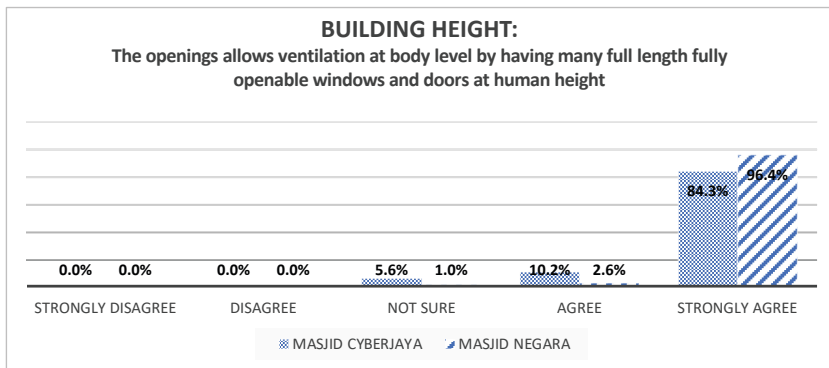
Graph. 3. User's perception on the façade shading at National Masjid and Raja Haji Fisabilillah Masjid (Q1)



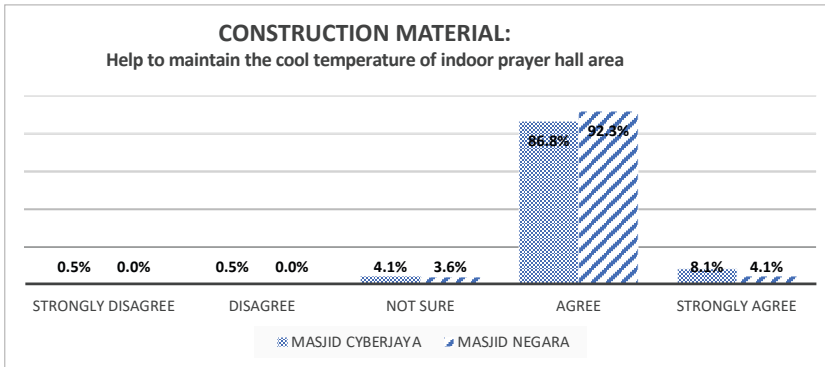
Graph. 4. Users' perceptions on the façade shading at National Masjid and Raja Haji Fisabilillah Masjid (Q2)



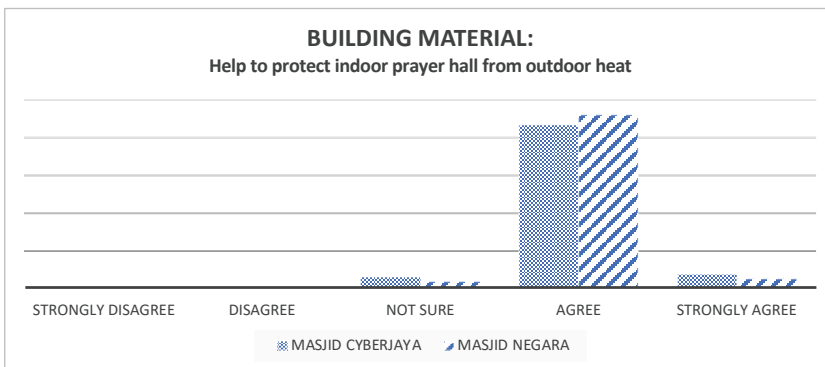
Graph. 5. Users' perceptions on the building height at National Masjid and Raja Haji Fisabilillah Masjid (Q1)



Graph. 6. Users' perceptions on the building height at National Masjid and Raja Haji Fisabilillah Masjid (Q2)



Graph. 7. Users’ perceptions on the construction materials used at National Masjid and Raja Haji Fisabilillah Masjid (Q1)



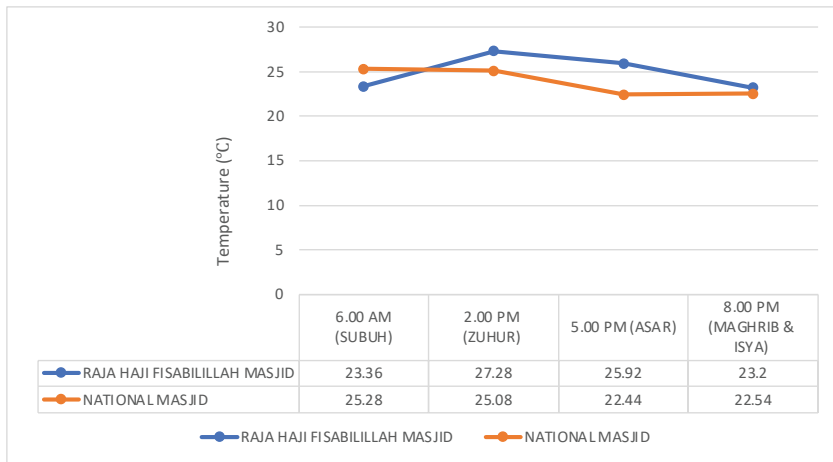
Graph. 8. Users’ perceptions on the construction materials used at National Masjid and Raja Haji Fisabilillah Masjid (Q2)

By using a 5-point Likert scale, the questionnaire also obtained respondents perceptions on indoor thermal environment. This survey found users in both masjids mostly perceived façade shading as a semi-open space being the main contributor that efficiently allows natural lighting and ventilation into the indoor prayer hall. This space reduces solar penetration and respondents felt the indoor temperature decrease at the main prayer hall. In both masjids, the applied vernacular strategies at external shading devices include *serambi*, overhangs, mashrabiya and partitions to improve thermal performance for masjid users. Based on the survey data, the level of comfort score was recorded within the score of 3-5 (not sure-strongly agree). According to ASHRAE 55-2010 and Malaysian Standard 1525, heat sensation readings from 3-5 are considered to represent comfort when assessing the indoor thermal environment through a questionnaire survey method. Thermal environmental conditions are defined as acceptable when at least 80% of the occupants are comfortable in the space concerned. As a result, this survey has shown the users of the Malaysia National Masjid and Raja Haji Fisabilillah Masjid are both satisfied with the internal thermal conditions.

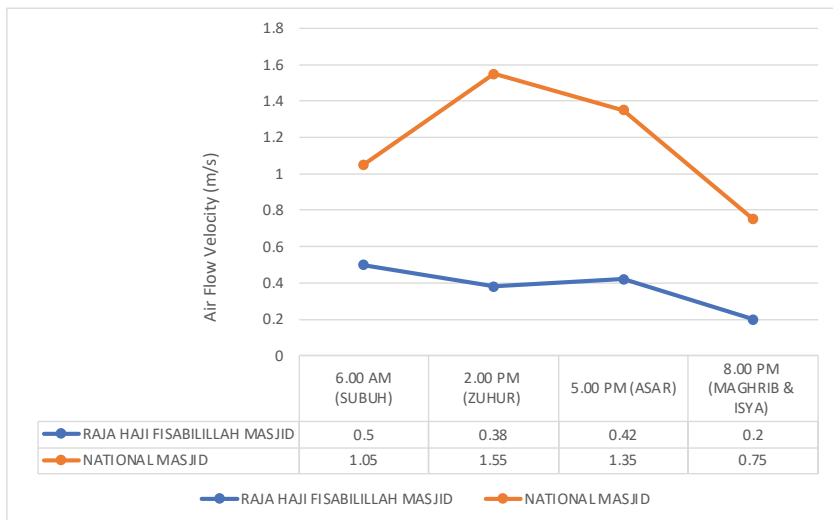
b. Field measurement

Data were collected at several identified points to calculate the mean measurement for each zone. Graphs 9, 10, and 11 present the data of indoor field measurement at Malaysia National Masjid and Raja Haji Fisabilillah Masjid. Indoor temperature values ranged between 23-27°C at Raja Haji

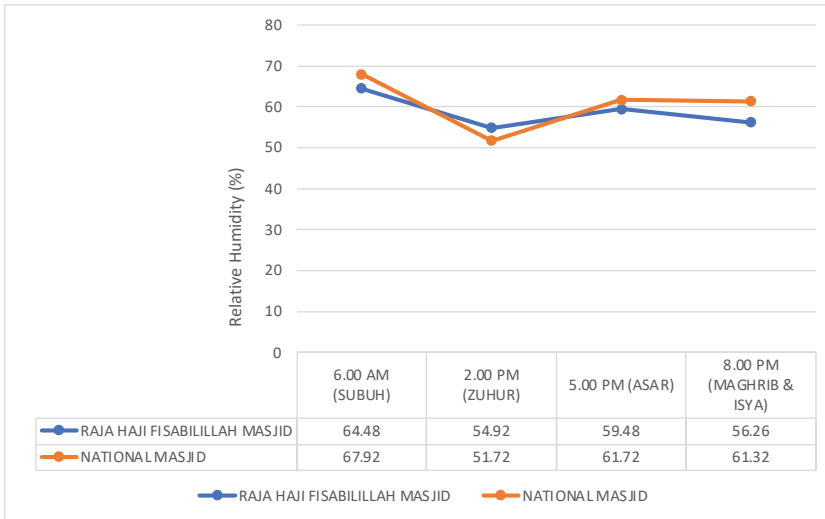
Fisabilillah Masjid while the measurement at Malaysia National Masjid range between 22-25°C. The lower indoor temperature at Malaysia National Masjid might be from higher wind velocity at the building that show wind velocity ranging from 0.75-1.55m/s while air velocity at Raja Haji Fisabilillah Masjid is 0.2-0.5m/s. Field measurements found that relative humidity at both masjids are highest during Subuh prayer time with recorded reading of 64.48% at Raja Haji Fisabilillah Masjid and 67.92% at Malaysia National Masjid. According to the recommendation of the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), thermal comfort can be attained when a minimum air velocity of 0.15m/s blows into a room, indoor air temperature is within 23-26°C and relative humidity is less than 70%. As Malaysia is in a tropical climate, which is hot and humid throughout the year, the Department of Standards Malaysia (DOSM) recommends that the indoor design temperature and relative humidity are 23-26°C and 60-70%, respectively. This justifies the user's response in the questionnaire survey that found the air temperature as slightly lower than the comfort level after sunset.



Graph. 9. Mean result of air temperature (Ta) at National Masjid and Raja Haji Fisabilillah Masjid



Graph. 10. Mean result of air velocity (Va) at National Masjid and Raja Haji Fisabilillah Masjid



Graph. 11. Mean result of relative humidity (RH) at National Masjid and Raja Haji Fisabilillah Masjid

5. CONCLUSION

Application of a vernacular approach to modern façade design demonstrates the originality and authenticity of Malaysian identity for indigenous masjid architecture. The perception and satisfaction of users with indoor thermal comfort was in response to the elements of vernacular architecture found in the façade of the modern vernacular masjids. The questionnaires gauged the existing indoor thermal condition, ventilation, and indoor air quality, while also assessing the architectural elements/components of each building's façade that contributes to thermal performance in that masjid. The field measurement relates the results from questionnaires with the on-site data collection. This study found respondents to mostly perceive the semi-open space as being the main contributor for indoor thermal comfort. It reduces solar penetration and respondents felt the indoor temperature decreased at the entrance to the main prayer hall.

There are a number of knowledge gaps not addressed by this study that would benefit from further research. This includes extending and further testing the potential of façade shading adapted from vernacular design approaches into modern masjids.

In-depth exploration of the potential adaptation of vernacular strategies for the façade of modern masjids is highly recommended. Further research might also compare, for example, the impact of *serambi*, *mashrabiya*, partitions, and other building openings which significantly impact indoor thermal performance. Future research can focus on finding a suitable opening ratio at the semi-open space that allows for natural lighting and ventilation in support of optimal indoor thermal performance.

The goals of this conclusion and recommendation are to improve the wellbeing of people and value the natural environment. Hopefully the findings from this research can be expanded beyond the scope of masjid architecture and create a space for future research such as in other communal organizations and residential development issues related to this area.



VERTICAL GARDENS AS A MODERATOR IN MASJID ARCHITECTURE TOWARDS ENHANCING LIFE SATISFACTION.

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Abstract

Previous literature highlighted the attention towards introducing new visions of masjid architecture to cope with the societal developments and various transformations of masjid architectural designs. Moreover, growing literature evokes the healing significance of vertical gardens and its various environmental, economic, and psychosocial benefits towards a better environment and used spaces.

This paper is proposing vertical gardens as a design tool with restoration effect in masjid architectural design. The main aim of our study is investigating the contribution of vertical gardens to enhance life satisfaction in masjid design through its restorative attributes. using a questionnaire method; fifty architects answered analytical questions investigating 1- the perceptions towards vertical gardens' significance in masjid architecture, 2- towards the factors affecting the application, 3- towards the visual comfort and 4- towards the health effect that could be added to the masjid environment through the application of vertical gardens. In addition to rating masjid design simulations with vertical gardens according to its restorative effect and quality of life attributes. Results were analyzed through SPSS program and presented as a correlational analysis. Findings showed that architects acknowledge vertical gardens significance in masjid architecture in addition to its contribution to the visual comfort and health enhancements, also there were high significant correlations between the restorative effect of vertical gardens and the quality of life in masjid design. Accordingly, it was proven that vertical gardens could enhance the spatial experience of masjid design through its restorative effect. However, there were high agreement about the maintenance and economic aspect as the main factor affecting the vertical gardens' application.

Keywords: Vertical Gardens, Healing Space, Restorative Environment, Masjid Design Architecture.

1. Introduction

Life satisfaction refers to the quality of life enhancement of people's life as good food and quality of air, the sense of enjoyment of unconstrained open spaces and water features, in addition to the presence of wildlife and natural resources, sense of security from crime, radiation and toxic free environment (Serag El Din , Shalaby , & Elsaye, 2013). It is also referring to the individual's sense of satisfaction and well-being, as a good state of mind, body and spirit, not merely the absence of disease (El Ariane, 2012), studies referred that certain places and spaces could impact the wellbeing of people, to make them feel more comfortable, less stressed and calmer (Butterfield, 2014). The masjid design since the prophet's era was not designed only for worships, it was for different cultural social obligations to fulfill and functional activities (Rasdi & Utaberta, 2010; Allahham, 2016).

According to Alexander, the building is an activity that allows creating physical order in everyday life (Alexander, 2002), buildings are designed for human value, and friendly to people, to human spirit in traditional society. In the 20th. century, architects and designers became "mechanistic rationalist"¹, and buildings became with low aesthetic values aiming to gain profit and image making industry. People enjoyed and appreciated the landscaping (Bicer, 2008).

In the 21st Century, there was a recognized shift from aesthetics to perceptions towards biophilia (Skywards, 2017). to create a biophilic city, an active city that is restored and repaired from nature as humans rely on nature to survive (Wilson & Kellert, 1980) in which users spend time enjoying the biological urban spaces

1 A mechanical perspective in nature that architects or builders have in their minds (Bicer, 2008).

and its natural environment (Beatley, 2011). The nature in dense, compact cities may be found in smaller doses and in more discontinuous ways than in nonurban locations. Even small greenery implemented into cities will provide a positive effect (Butterfield, 2014). The impacts of urban developments on the natural environments was astonished which increased the awareness towards urban greenery and urban green areas (Skywards, 2017). In the light of this theory, vertical gardens' technology as a building morphology started to play important roles (Gallon & Francisco, 2017).

Building contribute to the life satisfaction of individual and it is believed that this should be put into consideration during the process of masjid design. Vertical gardens as an architectural integration with landscape, is also another ambivalence of landscape architecture (Jusuck, 2008). Previous literature discussed the healing and restorative effect of vertical gardens on users in public spaces from different aspects concerning quality of life attributes (Lotfi (a), 2020; Lotfi (b) , 2020). This paper is studying the effect of vertical gardens on masjid design procedures to improve the user's quality of life standards and indication to life satisfaction.

2. Theory of Verticality Through History

The roots of verticality could be found in the principles of life itself. All gardens are influenced by the verticality of vegetation (figure 1), the vertical trees flowers, and waterfalls ext... Considering the symbolic verticality of human intervention without neglecting the fact that in the context of nature, man sees himself as a vertical element; the mature adulthood of the human being is expressed by his verticality. Despite this, perceptions of the objects that are part of space in our world is rarely vertical (Lambertini, 2007). According to such assumption, gardens are seen horizontal as it is vertical. Vertical gardens has far reaching roots; it appeared since ancient Egypt (3,050 BC to 900 BC) as climbers on walls (figure 2) (Hüfing, Jäger-Katzmann, Pendl, & Tributsch, 2009), and also appeared during the Greeks and Romans (850 BC to 476 AD): The Hanging Gardens of Babylon (figure 3) were one of the greatest achievements of vertical gardening in the ancient times (Lambertini, 2007). And since the 19th century, the development of metal architecture was introduced led to the possibility of designing structures that were both lightweight and transparent which began new techniques and systems of vertical gardens as a building morphology (Gallon & Francisco, 2017).



Figure 1: gardens are influenced in the verticality of vegetation. Luxembourg garden. Paris, France. Photos taken by author on 15-07-2017



Figure 2: illustration of a grape arbor, Thebes, 17 Century BC (Hüfing, Jäger-Katzmann, Pendl, & Tributsch, 2009)



Figure 3: the famous Hanging Gardens of Babylon.URL: <http://www.livingwallart.com/the-history-of-living-walls/>

3. Vertical Gardens' Effect on Life Satisfaction Through Masjid's Design

According to the WHO, increasing green areas could come with great benefits to enhance life satisfaction and urban quality of life (Psatha, Deffner, & Psycharis , 2011). The standards for quality of life consists of three key areas of studies (table 1): urban masjid, façade design and thermal comfort. These standards are responsible for improving the life satisfaction in urban masjids (Abdullah & Abdul Majid, 2016). And since vertical gardens could contribute to urban quality of life as stated by previous studies (Lotfi (a), 2020). this could also contribute to life satisfaction in masjid design as below:

Table 1: life satisfaction indicators and vertical gardens' contribution after (Lotfi (a), 2020; Abdullah & Abdul Majid, 2016)

		Indicator/ Life Satisfaction	Proposed Solutions to enhance masjid's life satisfaction through Vertical gardens after (Lotfi (a), 2020)
Physical	Urban masjid, UM (Condition in urban masjid environment)	1.Physical condition: Good/Bad	Enhance Architectural character through imitating scenes of nature
		2.Functional spaces: Function/ Not function	Provide different functions as Urban gardening, recreational activities, and buffer zoning
Social and Spiritual	Façade Design, FD (Design parameters)	3.Spiritual condition: Religious value & concentration level	Enhance psychological, physiological, and behavioral state of user
		4.Social relationship: Unite/ Disunite	Improve socialization
		1.Visual Comfort	Provide aesthetic value to the space
		2.Aural Comfort	Help Reduce noise pollution
Environmental	Thermal Comfort, TC	3.Air Quality	Improve air qualities and decrease air pollution
		4.Thermal Comfort	Enhance indoor temperature and provide shading opportunities
Economic		Health condition	Provide restorative and healing effect to user
		Economical value-decrease energy consumption	Decrease energy consumption through enhancing indoor temperature.
		Productivity Level	Increase productivity and absenteeism level through increasing greenery.
Absenteeism: Less or more occupancy			

3.1 Vertical Gardens Enhancement to Physical Attributes of Life Satisfaction:

vertical gardens could contribute to physical condition of masjid design; it could enhance façade visibility and give an aesthetic identity and enhance the physical surrounding of the masjid, vertical gardens could imitate the effect of natural cliff (Lotfi (a), 2020) as imitating scenes of nature (figure 4). It could

help attracts birds in the space which is one of the healing landscape design guidelines for imitation of nature and helps add bio diversity (El Barmelgy, 2013; Abd El Latif, 2016; Stark, 2010).



Figure 4: imitating cliffs through vertical gardens (Lotfi (a), 2020).



Figure 5: vertical screening in garden of Paris. Photo taken by author on 14-07-2017.



Figure 6: vertical garden providing shade. URL: <https://www.lifewall.in/single-post/Different-kinds-of-Vertical-Gardens-and-Products>. accessed on 28-01-2018

3.2 Vertical Gardens Contribution to Social and Spiritual Attributes of Life Satisfaction

Contemporary masjids in the present days experience regression in its role as it became only for praying and worshipping and it abandoned the social qualities it could add to the community (Allahham, 2016). However, the masjid is a catalyst for the Muslim community (Baharudin & Ismail, 2014). Research has linked increased contact with vegetation to better social relationships between neighbors, increased residential satisfaction, stronger levels of community attachment, and higher levels of sense of community (Kazmierczak & James, 2007; Moustafa, 2009). A masjid design with these qualities could be a good addition in the urban neighborhood.

Different facilities could be implemented to vertical gardens (Lotfi (a), 2020) to revive the social role in masjid design; as 1- applying urban gardening facility using local materials which could also be with a social benefits (Al Boghdady, 2017), it could act as a charity process, this could also encourage sense of belonging towards users and create multiple volunteers and revive the masjids activities. 2- providing buffering opportunities and shading devices (figure 5 and 6); as Shrubs, fences, or walls may be used to provide varying degrees of screening of gardens (Ghazala, 2013). Vertical gardens could provide a privacy barrier to any space to unify the visual scenes of place (Al Boghdady, 2017). And 3- adding recreational activities for children to interact with the environment.

The feeling of comfort and relaxation are very important for users and must be put into consideration in masjid design (Ibrahim , Baharun , Nawi , & Junaidi , 2014; Allahham, 2016). Recent literature stated the importance of vertical gardens towards the psychological, physiological and behavioral state of users (Lotfi (a), 2020; Lotfi (b) , 2020).

Greenery in vertical gardens could enhance the general health of users as well as the aesthetic value of the space through the contact with nature and vegetation as it is important to general psychological health (Ulrich, 1979; Kaplan & Kaplan , 1989; Kellert, 2005; Van den Berg, Hartig, & Staats, 2007;

Anderson, 2008). Moreover, it could reduce stress levels, and have a positive effect on behavior and functioning (Ulrich, 1979).

3.3 Vertical Gardens Environmental Enhancement of Life Satisfaction

According to The WHO identification to health, it is “a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity” (WHO, 1946). However, it was clarified that this definition could be idealistic, and health could be rather defined as a condition or state of human beings resulting from the interrelations between humans and their biological, chemical, physical, and social environment. In the medieval period, gardens had health effects stimulating different senses (Butterfield, 2014), that are important factors in the healing landscape design literature (Shahrad, 2012; Butterfield, 2014). Stimulation of sense are clearly recognized through cognitive brain (Marcus & Barnes, 1999); calm the mind, and reduce stress (Nedučín, Krklješ, & Kurtović-Fo, 2010), Vertical gardens could contribute to enhancing spiritual state through its aesthetic and visual implications. In addition, vertical gardens could create biophilic essence and add sense of aesthetics to nature as well as environmental qualities. Such as enhancing the air quality and noise pollution (Lotfi Y. A., 2014).

3.4 Vertical Gardens Economic Contribution to Life Satisfaction

Increasing energy efficiency is crucial in masjid design (Abdullah & Abdul Majid, 2016; Numan & Almaziad, 2016; Othman , Shaawat, & Ashra, 2016). Previous literature indicated that air conditioning systems play the most important role for increasing the electricity usage in masjids (More than 80% of annual electricity) (Numan & Almaziad, 2016). Previous literature proved that vertical gardens could increase energy efficiency facilities (Lotfi Y. A., 2014). With implementing vertical gardens as a shading tool in masjid design, this could provide with simple low-cost elements. thermal comfort is important for the general satisfaction of users in the worshipping space (Hussin, Salleh, Chan , & Mat, 2014) Vertical gardens can lead to reduce indoor temperatures, the strategy can contribute to significantly lower building cooling energy consumption (Perez, Rincon, Vila, Gonzalez, & Cabeza, 2011(b); Stav & Lawson, 2012). In addition to the environmental and ecological importance of reduced energy consumption, this can greatly lower building operation costs (Lotfi (a), 2020) and contribute in creating a sustainable masjid design.

In addition to the general enhancement of the perceived quality of the environments, contact with nature has also been associated with increased productivity and lower rates of absenteeism in work environments (Hum, 2007). vertical gardens can have the same effect (Lotfi Y. A., 2014)

4. Method

A “questionnaire” method was applied to collect perception and preferences data. The questionnaires were administrated to architects. The selection of architects relied on a convenience and snowballing sampling approach. The respondents included 52 architects, and all the architects lived and practiced in Egypt, they varied however in terms of number of years of professional experience; some were less than 10 years (= 30) and some had experience from 11 to 24 years (= 22).

The questionnaire consisted of 1- an analytical survey that contained set of questions that assessed the perceptions towards vertical gardens’ significance, factors affecting vertical gardens’ in masjid design, and perceptions towards

visual comfort and health effect of vertical gardens. These was to investigate the perception of experts in the field towards the application of vertical gardens and the significance of such application in the masjid architecture. In addition to a 2- visual survey that defines the relationship between the restoration effect of vertical gardens and its effect on life satisfaction towards a better understanding of the possibility of using vertical gardens as a restorative tool towards enhancing the life satisfaction in masjid environment.

5. Results

All architects answered the questionnaire individually. The questionnaire assured the respondents of confidentiality. The results are shown as below:

5.1 Perceptions Towards Vertical Gardens Significance

This question was designed to show the awareness towards the benefits and significance of vertical gardens in masjid design. These answers would be important when analyzing costs putting benefits into considerations during masjid design.

Results in Table 2 suggests that architects tended to understand and agree with benefits of vertical gardens. Indeed, they indicated a relatively strong level of agreement with the statements "vertical gardens could add beauty to the masjid architecture" and "vertical gardens could help improve health conditions in the space" with highest mean rates. There was also a more moderate level of agreement "vertical gardens could help for a more sustainable masjid design" and "vertical gardens could help address the lack of green areas in the neighborhood as well help with adding biophilic spaces in the masjid design".

5.2 Perceptions Towards Factors Affecting Vertical Gardens

Vertical gardens significance	Mean
Perceptions towards vertical gardens' aesthetic quality	4.268
Awareness of vertical gardens' healing effect	4.175
Perceptions towards vertical gardens' contribution to sustainability	4.016
Awareness of vertical gardens' potential to increase green areas	3.960

Table 2: perceptions towards vertical gardens significance- Frequency Distribution

Factors affecting vertical gardens in masjid design	Mean
Maintenance and care	3.130
Economic cost	2.761
Aesthetic quality	2.242
Healing effect	1.655

Table 3: perceptions towards factors affecting VG in Masjid Design- Frequency Distribution

Vertical garden's functional facilities effect on spiritual environment of masjid architecture	Mean
Sense of pleasure	5.598
Sense of Stress Relief	3.48
Connection to Space	3.346

Table 4: preferences towards aspects of spiritual environment in masjid architecture - Mean Rate

This question was created to identify architects' opinions towards the most affecting factors of vertical gardens application in masjid architecture. Architects were asked to arrange three factors: 1) Economic cost, 2) aesthetic qualities and 3) maintenance and care 4) Healing effect (where 1 is the most affecting factor and 4 is the least). the survey results showed that "maintenance and care" was the most important factor, second was "the economic cost", third was "the aesthetic quality" and least was the healing effect (table 3). Similar to other research (Lotfi, 2014), This result reflects architects' concerns towards the aspects of maintenance and care and economic costs, despite their awareness of vertical gardens' significance towards improving general health and aesthetic quality from the previous question.

5.3 Preferences Towards Vertical Garden’s Functional Facilities

The purpose of this question was to determine primary information about how architects perceive the spiritual contribution of vertical gardens in relation to its functional facilities as a tool in masjid architecture. architects were asked to answer, 5-points rating Likert scale, this was used to answer each of the 5 questions. The rating scale ranged from 1 “the lowest to ratings” to 5 “the highest ratings” (Stamps III, 2004; Dawes, 2002; Likert , 1932). Results in table 4 showed that highest preference with highest mean ratings was “the sense of pleasure”, followed by “Sense of Stress relief”, “connection to space”, and “sense of comfort”.

When determining the relation between architects who stated the elements preferred in masjid architecture as functional services (recreational activities, urban gardening, increasing green areas, shading and buffer opportunities) and the perceived spiritual contribution (figure 7), results showed that according to experts’ perception: shading opportunities plays the highest role concerning sense of pleasure, increasing green areas is important for stress relief, recreational activities and shading and buffer opportunities can increase the connection to space and sense of comfort.

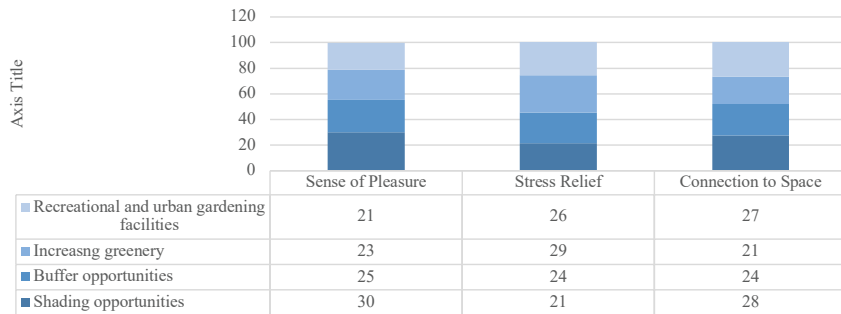


Figure 7: Perception towards the significance of functional activities towards visual measures of vertical gardens percentage.

5.4 Correlation Analysis

This section aimed to test the relationship between the restorative effect the vertical gardens could provide and its contribution to life satisfaction in the masjid environment. Three colored photographs of 10 cm x 10 cm size showing vertical gardens integrated in masjid design were in the visual survey used. Vertical gardens were stimulated and added in photographs through adobe photoshop. (figure 8). Architects were asked to rate the photographs (on a scale of 0 to 6 were 6 was the highest rating and 0 was the lowest) according to different set of criteria, the aspects of restoration (extent, being away, computability, fascination) and the quality of life attributes (the physical, social and spiritual and the health state in the environmental attributes).

Architects were asked to give their honest ratings and opinions, and indicated that there was no right or wrong answers and were reminded to evaluate the quality of the designed environment, but not the picture quality Also, to encompass quantitative data by different strategies applied, to determine relationships among restoration and quality of life attributes as different variables, statistics and analysis were conducted through using SPSS. “correlation analysis helped to determine the degree of association between

variables". Pearson correlations were administered to the total participant sample, to test the relation between variables: vertical gardens' restoration effect and attributes of quality of life results are shown in table 5.



Figure 8: colored photographs of vertical gardens' integration with masjid design

Table 5: correlation between quality of life attributes and restorative aspects to investigate life satisfaction of vertical gardens on masjid design.

Attributes of Masjid Design		VG Restoration Effect			
		Extent	Compatibility	Being Away	Fascination
Physical	Physical condition: imitating scenes of nature	.602**	.926**	.919**	.784**
Social, And spiritual	Functional spaces: (buffer, shading, recreational and urban gardening activities)	.638**	.844**	.775**	.680**
	Spiritual condition: Religious value & concentration level	.486**	.729**	.866**	.596**
	Sense of pleasure	0.339	.700**	.875**	.549**
	Stress relief	.488**	.726**	.689**	.511**
	Connection to the space	.487**	.406*	0.335	.504**
	Socialization	.468**	.731**	.681**	.735**
	Visual Comfort	.488**	.726**	.689**	.511**
Environmental	Health condition	.520**	.696**	.659**	.437*

** . Correlation is significant at the 0.01 level (2-tailed).
* . Correlation is significant at the 0.05 level (2-tailed).

The results show high significant correlation between both variables. physical, environmental, and social and spiritual attributes were highly correlated with attributes of restoration objectives with average correlation coefficient from 0.460 to 0.902.

"Physical attributes" were highly correlated with sense of "Extent", "Compatibility", "being away", and "fascination".

The social and spiritual attributes were also positively highly correlated with all restoration aspects.

- Functional spaces (buffer, shading, recreational and urban activities were most highly correlated with computability).
- Spiritual conditions were moderately correlated with extent. but was also highly correlated with "compatibility", "being away" and "fascination". Sense of pleasure and sense of relief were highly correlation with "compatibility", "being away" and "fascination". However, connection to the space was highly correlated with fascination and moderately correlated with "compatibility", and "being away".
- In addition to the highly correlation of socialization created by greenery of vertical gardens with "compatibility", "being away" and "fascination".

As for the contribution to health as an environmental attribute, architects' perception was highly correlated with "Extent", "Being away", and "Compatibility", and was moderately correlated with "fascination".

5. Discussion and Conclusion

Architects acknowledge vertical gardens significance towards enhancing the aesthetic quality of the environment and add health effect to users, in addition to its role in masjid sustainability more than just add greenery to the space or only with aesthetic function. However, there are concerns towards the maintenance of vertical gardens and its system sustainability. As well as its economic feasibility for application. According to the spiritual environment vertical gardens could add: Architects prefer sense of pleasure the most for creating the best spiritual condition in the masjid environment, they also perceived shading opportunities and creating buffer for privacy by vertical gardens are the most suitable functional facilities for creating sense of pleasure. As well as Increasing greenery and recreational facilities that could contribute more to create sense of relief and connection to the space, respectively. finding of architects' perception also showed that vertical gardens could play a role to connect the user with the space and enhancing social attributes in the environments.

Findings of the correlational analysis showed that architects acknowledged the restoration effect towards the physical contribution of vertical gardens in masjid architecture. As well as the social attribute, which shows the understanding of the effect of functional facilities to this specific aspect of restoration, and how it could add restoration to users in the masjid environment. Architects also perceived the contribution of vertical gardens to the restoration and spiritual condition as a life satisfaction in masjid architecture. They also perceived the aesthetic value of greenery and vertical gardens and their "fascination" effect and role in restoration. There was no high correlation with "Extent" as an aspect of restoration, this reflects experts' perception towards "Extent" as not a highly common for masjid design.

It is recommended to use vertical gardens as a restorative moderator in masjid architecture for its contribution to the physical, social, and spiritual, environmental, and economic attribute for life satisfaction in masjid design. and to create balance between natural and built forms with restorative qualities. Moreover, Provide the awareness towards vertical gardens to communities especially to children, And Highlight the role of users of urban communities in participating different activities in masjid environment, it is for socialization and not just for praying. provide educational facilities to provide ways and techniques to create simple vertical gardens with low costs. Increase the government's awareness towards the restorative landscape and its importance in masjid design. which could also add biophilic qualities and add to the urban life satisfaction.

Finally, as the maintenance of vertical gardens is crucial for the survival of the garden, it is recommended encouraging the awareness of continuous maintenance strategies and repair policies for the system sustainability.

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MOSQUES OF RAWALPINDI (PAKISTAN): HISTORY AND ARCHITECTURE, 1857-2017

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Abstract

Rawalpindi is an important and historical city in South Asia. It has its links with the Gandhara Civilization and has been a cultural nexus and invasion route for centuries. It has been invaded by Greeks to the Afghans. Rawalpindi was a main center and trade route during the 18th century. Nowadays, it is part of the twin city of Islamabad, the capital of Pakistan.

Rawalpindi has its own distinctive culture and architecture. It was the city of the Gakkhar tribe, which traces its traditional origin from the Kiyanis of Persia. It was during the Gakkhar period that, Rawalpindi gained its lost position. After the fall of Gakkhars in 1765, the Sikhs, and after March 1849, the British were the custodians of the city. Since 1947, it is an important religio-political, social and military center of Pakistan.

Rawalpindi has several remains of the rich architecture of the Muslim, Hindu, Sikh, and British origins. Muslim architecture mostly consisted of mosques, tombs, and forts. The region has some ancient mosques and *madāris* (educational institution). The oldest mosque of the region is located in a small village, Bagh Joghian, near Pharwala Fort, which was built in the early 16th century by Mai Qamro. A *masjid* built in 1601/02, is still present with the name of Golīyāñwālī Masjid.

In this paper, an attempt has been made to explore the archeological and architectural history of mosques in Rawalpindi, taking Markazī Jāmia' Masjid as a case study. The formal foundation stone of the Markazī Jāmia' Masjid was laid down in 1903 and its construction was completed in 1905. It is one of the few mosques in the region which replicates traditional Mughal architecture.

Keywords: Rawalpindi, History, architecture, mosques

Rawalpindi city¹ is the fourth largest city in Pakistan. Rawalpindi has a centuries-old history, tracing its beginning from the pre-historic period. The remains of the Bronze Age were also found in this area. It was also a center of Soan Valley and Gandhara cultures.² According to Dr. Ahmad Hasan Dani (1920-2009), this region has once been the home of the earliest human, *Australopithecus*.³ The 'modern' period commenced from 500 A.D. This region, due to its strategic position, played a considerable role in (re)shaping the course of history.

Historical Background

In 995, the region came into the possession of the Gakkhars and remained under their control for almost eight centuries. It was only when Jhanda Khan, a Gakkhar chief, restored its lost position, founded a new town nearby, at the site of an old town known as Fatehpur Baori / Baoli, and named it Rawalpindi.⁴ It is during this period that Rawalpindi came into prominence. During the time of the third Mughal Emperor Jalaluddin Muhammad Akbar (1542-1605), the Gakkhar region was divided due to a state of anarchy, and Rawalpindi fell to the lot of Said Khan, the third son of Sultan Sarang Khan (d.1546).⁵

When Alexander the Great of Macedonia (356-323 B.C.) in 326 B.C., invaded the area now comprising Rawalpindi district, it was known by the name of *Amanda* and governed by Raja Ambhi. *Ghaziabad / Ghazipur* and *Pind wal* are also its ancient names.⁶ The region during the Mughal period (1526-1858) was known as *Sindh-Sagar*. The ruins of an ancient city founded by Raja Gaj, *Gajipur* or *Gajnipur*, were also found. Here troops of Mahmud of Ghazna (971-1030) were stationed in 1005.⁷

After the death of the sixth Mughal Emperor Muhammad Aurangzeb Alamgir (1618-1707), the Gakkhar chief Jhanda Khan ruled over this area.⁸ However, it gained importance in 1765 when a Sikh Chief Sardār Gujjar Singh Bhangi (d.1788) marched from Lahore and defeated Muqarrab Khan, the last Gakkhar ruler in a bloody battle outside the walls of Gujrat. Sardār Gujjar Singh seized everything of the Gakkhars, except for their stronghold, Pharwala.⁹ Another Sikh Sardār, Milkha Singh Thehpuria (d.1804), took control of Rawalpindi and established his headquarters here and he was the first to fortify the town and built some new houses. It was after the occupation of Sardār Milkha Singh that

1 Its Grid Code is G8, Latitude, and Longitude is 33 36N 73 04 E.

2 For details see, Hasan, Shaikh Khurshid. (2008). *Religious Architecture of Gandhara-Pakistan: Buddhist Stupas and Monasteries*. Islamabad: National Institute of Historical and Cultural Research and Salim, Mohammad. (1986). *The Middle Stone Age Cultures of Northern Pakistan*. Islamabad: Centre for the Study of the Civilizations of Central Asia.

3 Dani, Ahmad Hasan. (1999). "Islamabad And The Soan-The Golden River (Story of the Oldest Living Place in the World)," in *Lahore Museum Bulletin*, Vol. XII, No. 2, 102. A 45,000-year-old open-air Paleolithic site has been found near Rawat in 1980. For details see, Dennell, Robin W. et al. (1992). "A 45,000-Year-Old Open-Air Paleolithic Site at Riwayat, Northern Pakistan," *Journal of Field Archaeology*, Vol. 19, No. 1, 17-33.

4 Abbasi, Shamim. (1975-76). "Growth of Rawalpindi City," *The Kohsar*, Vol. XXIII, No. 1, 49.

5 Dani, "Islamabad And The Soan," 100.

6 Husain, Karāmat. (2007). *Kallar Sayyidān ki kahānī tārikh ki zubānī*. Lahore: Dastāwaiz, 27.

7 Hāyderī, Karam. (1980). *Sarzamīn-i-Puṭṭuhār*. Rawalpindi: Maktabah al-Maḥmūd, 15.

8 Malik, 'Aziz. (1970). *Rāwal Dāis*. Rawalpindi: Book Center, 43-44.

9 *Gazetteer of The Rawalpindi District*. (1895). Revised Edition, 1893-94. Lahore: Civil and Military Gazette Press, 51.

Rawalpindi also emerged as a financial district during the Sikh rule (1809-49).¹⁰ After the death of Jiun Singh in 1814, the area came under the direct control of Ranjit Singh (1780-1839), the Sikh ruler of the Punjab.¹¹

The Gakkhars attempted to regain their lost sovereignty in the region even during the lifetime of Milkha Singh but in vain. They again fought for the restoration of their suzerainty under the leadership of Raja Nadir Khan, a Gakkhar notable against Brigadier-General John Nicholson (1822-57). The district authorities captured Nadir Khan, tried him for rebellion, and found him 'convicted' and hanged him in 1853 in the Mandla Gakkhar Fort.¹²

The British Period

After the Second Sikh War (1848-49), the Sikh army under Chattar Singh (d.1855) and Raja Sher Singh (d.1858) surrendered against the British on 14 March 1849 and after that, Rawalpindi came under British Imperial Rule (1858-1947).¹³

Under the British, probably no district in the British Punjab (1849-1947) underwent greater development than that of Rawalpindi. Besides their imperial motives, the British tried to develop Rawalpindi as a modern civic center of Northern India.

Architectural History: Mosques

Architecture is regarded as a reflection of one's culture and way of life. The mosques in Islam are the most emblematic buildings which are the most prominent physical signs of Islam. The mosques' architecture is also a manifestation of the region and the people.¹⁴ Thus, Muslim architecture mostly consisted of mosques besides, tombs, inns and forts. There are numerous remains of the Sikh, Hindu, British, and Muslim architecture in Rawalpindi and around, each of which have unique architectural features and importance.

The oldest mosque of the region is located in a small village, Bagh Joghian, near Pharwala Fort, which was built in the early 16th century by Mai Qamro, wife of Hathi Khan Gakkhar (d.1520). The mosque, built in a rectangular plan and crowned with three squat domes, is a great specimen of Gakkhar architecture, resembling the Lodhi period (1451-1526) mosques in Delhi, India.¹⁵

Sultan Kaigohar, alias Ghakkar Shah, in his new headquarters of Pharwala, built a fort on the left bank of the river Soan in 1000. The elegant small stone Rawat fort-cum-caravan serai is square in plan and *inter alia*, has a three-domed

10 Irtāsib, Muḥammad. ed. (2005). Tadhkirah Puṭṭuhār wajah tasmiah-i-dihāt-i-Panjāb. Gujar Khan: Sak Publishers, 409, and quarterly Awāz (Lahore), April-June 2000, 273-274.

11 Chughtā'ī, Muḥammad Iqbāl. (2001). Rāwalpīndī: Shahr-i-baē mithāl. Lahore: Chughtā'ī adābī idārah, 8-9.

12 Gazetteer of The Rawalpindi District, 53.

13 Ibid., 56, 59.

14 Khan, Hasan-Uddin. (2008). "Contemporary Mosque Architecture," in ISIM Review, No. 21, 52-53.

15 Kalhor, Zulfiqar Ali. (2016). "Gakhar Architecture in Potohar, Punjab (Pakistan)," in Arnava, Vol. V, No.1, 40 and Khan, Muhammad Ashraf, et al. (2010). "Archaeological Remains and Monuments of Islamabad Capital Territory and District Rawalpindi," Journal of Asian Civilizations, Vol. 33, No. 2, 57-58.

mosque in the middle of the western wing.¹⁶

A *masjid* built in 1601/02, is still present in the interior of the city with the name of *Goliyānwālī Masjid*.¹⁷ A 100-year-old mosque is also under the process of renovation by the Capital Development Authority, near Kanwal Lake, Shakarparian, Islamabad.

Markazī Jāmiā' Masjid Ḥanfiah

Although there was already a *jāmiā' masjid* in the interior of the city, however, it was never considered as a central *jāmiā' masjid*. The place selected for a *markazī jāmiā' masjid* was an 18-Kanal (2.25 acres, or approx. 9,105 m²) pond surrounded by a Hindu temple and Sikhs' private properties, including a Gurdwara (*Sikh place of worship*). Although the construction of the *masjid* was started in 1896, the formal foundation stone of the *Markazī Jāmiā' Masjid Ḥanfiah* wasn't laid down until 1903 by Muhammad Ayub Khan (1857-1914), former Amir of Afghanistan, and its construction was completed in 1905.¹⁸ Among other men and women, Munshi Ghulām Nabī Kāmil (d.1955) vehemently worked in the construction of the mosque.¹⁹ The mosque, built mainly by donations, is embellished with intricate tile work and detailed frescos in vibrant colors. The rich and beautiful artwork consists of a bold and graceful mosaic. The walls of the mosque are decorated with Quranic verses. It is one of the few mosques in the region which replicates traditional Mughal architecture.²⁰

The Front

The front of any building not only gives the first depiction of its history and nature but also reflects the socio-religious and cultural background of its builders. The front of the *jāmiā' masjid* was very wide-ranging, but over time, and most probably for economic reasons, it has become camouflaged by small shops, built for rental purposes. At the main entrance, there are two minarets, land marking for better vision and sound travel. The main entrance is beautified with different color schemes and some glasswork. Some sacred Islamic icons are also visible. The mosque was designed to be viewed from the front only as there is no ornamentation on either side.

On both sides of the main gate, small minarets are joined at their tops with glass mosaic having Thuluth style calligraphy. At the bottom of these minarets, there is an ornamentation of crescents and stars. However, there are also some non-Islamic floral motifs, most probably reflecting the local Hindu-Sikh cultural sway.

Main Entrance

The long narrow entrance opens up into a vast rectangular courtyard and the main building of the mosque. It is at an angle to the main road and in line with the *qiblah* direction. So, when one enters the mosque, he faces the *qiblah*. It is also well decorated with colorful mosaic. There are floral patterns on the walls and ceiling of the entrance with an overlapping of layers.

16 Hasan, Shaikh Khurshid. (2005). Historical Forts In Pakistan. Islamabad: National Institute of Historical & Cultural Research, 61-63.

17 Afkār Rāwalpingī *ḡā'irakūrī*. (1962). Rawalpindi: Sayyid Ghulām Muṣṭafah Khālīd Gilānī, 309.

18 Malik, Rāwal Dāis, 39-42.

19 Ḥāiyderī, Karam. (1980). Sarzamīn-i-Puṣṭuhār. Rawalpindi: Maktabah al-Maḥmūd, 108-109.

20 Khān, Ḥusāin Aḥmad. (2017). Rāwalpingī kī yādīān. Rawalpindi: Hamāliyah Publishers, 83-84.

Rear Side of Main Entrance

The top of the rear side of the main entrance, most probably extended, thus, hiding the front door minarets' view from the courtyard. The original structure has a blended arch of Victorian and Islamic styles.

Quranic Calligraphy

The walls of the mosque are decorated with selected Quranic verses, *Kālimah-i-Ṭaiyyabah*, the first Muslim article of faith, a salutation for the Prophet Muḥammad (SAW), and with some Arabic couplets in poetry in Square and Fatimid Kufic and Naskh calligraphic styles.

In one of the calligraphic writings, the worthlessness of worldly life is mentioned and it is emphasized to do good deeds for peace and happiness in eternal life. Likewise, in other writing, the importance and listing of good manners are written. Among all, religion was placed first, followed by wisdom, knowledge, and self-control. Generosity, righteousness, patience, thankfulness, etc. are also mentioned.

Pond

Just near the main gate, there is a pond that is supposed to be used for ablution with a fountain in its center, which may be a replica of paradise gardens. There is asymmetry of the *qiblah* and the fountain shows the non-typical mosque design.

The main pulpit of the mosque and meḥrāb

The main pulpit is made of white marble whereas the *meḥrāb* is beautifully decorated with *Multānī* glasswork, the most precious and costly in the region. A wooden pulpit is also placed at the corridor of the mosque.

Minarets and domes

The minarets and domes are integral portions of a mosque. There are many ornamental minarets in front and structural minarets at the back of the mosque. However, their thickness and height varies. There are five different shapes and sizes of the minarets and domes. They are all in symmetry from the center. The rooms around veranda are being used for offices and a store. In the courtyard floor, typical Islamic geometric patterned mosaic is used. The different styles of frescos on the ceiling and walls of the main prayer hall are also attractive and unique in their designs.

Conclusion

The mosque, built at the dawn of 20th century, has perfect vertical symmetry. Although the three main domes, the calligraphy, and the large arches follow Islamic traditions, the various types of minarets, the design of the domes, the floral patterns on walls and columns, and the color scheme are following non-Islamic aesthetics.

This mosque is a masterpiece of Muslim architecture blended with local Hindu and Sikh architectural touches. For the construction of this building, a Victorian style of architecture with round top arches was also used.

As the mosque is almost 120 years old, the condition of its building , mosaic and glasswork were/are under severe threat due to bad climatic conditions and lack of proper maintenance. Although the Awqāf Department is taking care of the mosque, there is still need of paying proper attention to the preservation of this historic and Islamic heritage.



الأسس والمعايير التخطيطية والتصميمية المستقبلية للمساجد لتوفير بيئة صحية للسكان

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ملخص البحث

يرتبط تحقيق الصحة العامة بالحفاظ على طاقة وقدرات السكان الجسدية والعقلية، وتجعلهم قادرين على الأتاج والتميز، وقد زاد الاهتمام بالصحة والرياضة بعد جائحة كورونا كأحد سبل الوقاية من المرض حيث أن الرياضة وخصوصاً المشي لها تأثير إيجابي على صحة الأنسان، وهو ما يجعل الالتزام بالصلاة في المسجد أحد اهم العوامل التي تجعل المسلمون يمارسون رياضة المشي للمسجد يومياً، وهو ما يحسن الصحة ويدعم مناعة المصلين ويعمل على درء المرض، مما يعيد النظر في المعايير التخطيطية للمساجد ونطاق خدمتها وتأثيرها. ومع ذروة جائحة كورونا اصبح اعتماد كثير من السكان في العمل والشراء والتجارة والخدمات على الأترنت مما قلص معه التقارب الاجتماعي الفعلي بين السكان، وهو ما قد يدفع مصممي المساجد والمناطق المحيطة بها للتعويض هذا الجانب من خلال التقاء المصلين بالمسجد، وهو ما يدعم أيضاً تطوير المعدلات التخطيطية والتصميمية لتلبي احتياجات السكان وفقاً للتغيرات المستقبلية، وبما لا يتعارض مع القيم والمبادئ الإسلامية التي يتم على أساسها وضع هذه الأسس والمعدلات، لمراعاة البعد الاجتماعي بين المصلين في الأيام العادية واثاء فترة أنتشار المرض.

وترتكز إشكالية البحث بأن جميع التعلّم الإسلامية ترتبط بتحسين الصحة العامة والنظافة والوضوء واللياقة البدنية وغيرها، مما يستلزم أنعكاس ذلك على المعايير التصميمية للمساجد خصوصاً مع أنتشاء الأوبئة. ومن أهم النتائج التي يستهدفها البحث: - تحديد مسافة المشي الصحية بين المنازل والمساجد، وكيفية الفصل بين دورات المياه وأماكن الصلاة، وتحديد استيعاب المسجد في الاوقات العادية ووقت الأزمات وأنتشار الأوبئة، وكيفية الاهتمام بالأبعاد غير العادية في تحسين الصحة النفسية غيرها.

مقدمة

المسجد الحرام هو قبلة المسلمين وهو وجهتهم والمسجد أهمية كبيرة في الإسلام، وللمسلمين، وقد نوّه القرآن الكريم بالمسجد ومكانته "أَنَّا نَعْمُرُ مَسَاجِدَ اللَّهِ مِنْ أَمْنٍ بِاللَّهِ وَالْيَوْمِ الْآخِرِ" ويعود تاريخ المساجد إلى بدايات الإسلام حيث تم بناء أول مسجد (قباء) عام 622 م في المدينة المنورة.

أثرت جائحة كورونا COVID-19 في العالم وأصابت الملايين من البشر مما أدى إلى وفاة مئات الآلاف منهم، كما أدت إلى إغلاق عدد من المباني العامة والرئيسة على مستوى العالم ومنها المساجد، وفرضت قيود على الحركة والتنقل والتجارة والصلاة في المساجد وغيرها، واعتمد كثير من جهات العمل ومقدمي الخدمات والتجار على إدارة أعمالهم اعتماداً على الأترنت. ولكن قلوب المسلمين ظلت معلقة بالمساجد، فللمسجد دور اجتماعي وثقافي وسياسي، بالإضافة لدوره الديني. فلا تستطيع وسائل التواصل الاجتماعي أن تؤثر في ارتباط المصلين بالمسجد، لذا أصبح من المهم والضروري إيجاد حل يجعل المسلمين يستمرون في الذهاب للمسجد للصلاة حتى وقت الأوبئة والأزمات دون أن يصيبهم أذى أو ضرر.

قد أكدت عدد من الدراسات مثل (Sports Medicine) أهمية الصحة في تقليل الإصابة بفيروس كورونا بنسبة تقارب من 30٪. ووفقاً لمعهد برشلونة للصحة العامة (أنه ما يقرب من 25٪ من صحتنا تحددها البيئة المبنية، من منازل ومباني عامة ومساجد وغيرها)، وهذا قد يعني أن التصميم الجيد للمساجد وغيره من المباني قد يسهم في تقليل من مخاطر الإصابة بالأوبئة بحوالي 8٪.

وبناء عليه يهدف البحث الى العمل على قيام المساجد بأداء دوره في جميع الظروف وذلك من خلال دراسة عناصر وأبعاد الصحة العامة (البدنية والنفسية) وكيف يمكن من خلال الأسس والمعايير التخطيطية تحسين الصحة العامة للمصلين ودوره المخاطر والأوبئة عنهم. وذلك على محورين الأول تحسين الصحة العامة، والثاني العمل على الحد من أنتشار

الفيروسات، ويتم ذلك اعتماداً على تحديد الأسس التصميمية والتخطيطية للمساجد، التي تلبي هذه الأهداف، وذلك من خلال ثلاث مراحل (تحديد العناصر التي ترتبط بكل من الصحة العامة، وأسس تصميم المساجد، وتحديد أكثر عناصر التصميم ارتباطاً وتأثيراً في الصحة العامة وانتشار الفيروس، وتحديد الأسس والمعادلات التي يجب الالتزام بها لتحسين الصحة العامة والحد من انتشار الفيروس).

منهجية الدراسة

تركز منهجية البحث على محورين رئيسين: الأول هو وضع أسس تصميمية تدعم الصحة العامة من خلال دراسة المتغيرات المتعلقة بها والمؤثرة في تصميم المساجد، ومن ثم يمكنها أن تحد من خطر الأوبئة المختلفة، والثاني وضع الاشتراطات والمعايير بشكل مباشر- التي تكفل الحد من انتشار هذه الأوبئة والحماية منها، وذلك على ثلاث مراحل (شكل1): -

المرحلة الأولى: - مراجعة عناصر الصحة العامة وتحديد العناصر التي تربطها بكل من عناصر تصميم المساجد وتخطيط المناطق المحيطة بها، وأيضاً ما يرتبط بالصحة العامة وشروط وواجبات إقامة الصلاة في المسجد، وذلك من خلال مراجعة (معايير الصحة العامة والأنشطة المتعلقة بالصلاة، وأسس تصميم المساجد).

المرحلة الثانية: - تحديد أهم العناصر ارتباطاً بالصحة العامة من هذه الأسس والمعايير من خلال الاعتماد على الدراسات البحثية المثبتة والمؤكدة، وتحديد مدى تأثير تغير هذا المعدلات إيجابياً أو سلباً في الصحة العامة مع بعض الأمثلة من المساجد المصرية.

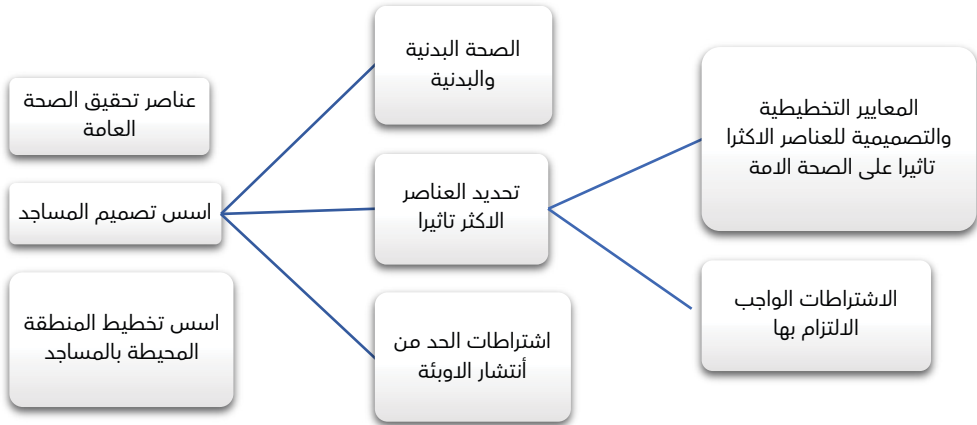
المرحلة الثالثة تحديد الأسس والاشتراطات التخطيطية والتصميمية للمساجد التي تحقق الصحة العامة بالاعتماد على ما يلي: -

• أولاً تحديد الأسس والمعايير التخطيطية والتصميمية للمساجد لتحسين الصحة العامة وتصنيفها من حيث صحة الأسان إلى: -

عوامل تؤثر في الصحة البدنية

عوامل تؤثر في الصحة النفسية.

• ثانياً تحديد الأسس والمعايير التخطيطية والتصميمية للمساجد التي تحد من انتشار الفيروسات وقت الأزمات وانتشار الأوبئة التي ترتبط بالتباعد الاجتماعي والتعقيم والفصل بين الاستخدامات المختلفة، وتحديد المعايير المتوافقة مع البيئة المصرية.



شكل (1)

يوضح منهجية البحث لتحديد الأسس الصحية لتصميم المساجد

أولاً: -الدراسات السابقة التي تناولت عناصر المساجد المرتبطة بتحقيق الصحة العامة

ارتبطت كثير من العناصر التصميمية للمساجد بتحقيق الصحة العامة فالتباعد عامل مهم للحد من انتشار الفيروسات (كسور اسيا، 2020)، كما أن شكل التصميم يؤثر في الصحة العامة فالشكل النصف كروي توجد به طاقة إيجابية تنعكس على صحة السكان. (خليل مسيحة، 1985). كما أن المشي من المنزل المسجد لمدة تتراوح بين 5 و10 دقيقة في الخمس صلوات يوميا يقلل من هرمون الإجهاد بنسبة 10٪، (Tania، 2019). كذلك فالألوان التي نراها تنعكس على ردود أفعالنا واحاسيسنا اتجاه ما نراه. (دعاء محمد الغمري،2020). ومن الأهمية عدم استخدام الزخارف المفرطة أو الألوان الزاهية على حائط القبلة الداخلي حتى ارتفاع 1.8 متر (لجنة تطوير المساجد،2021)، وكذلك الأنظمة الإيقاعية تعطي استمرارية والأنسجام وهذا يؤثر إيجابيا على الصحة العامة. (دعاء محمد الغمري،2020). وبعد مراجعة كثير من الأدبيات المتعلقة بتصميم وتطوير المساجد يمكن عرض هذه الأسس والتصميمات في منهجية بحيث يمكن الاستفادة منها في مساجد أكثر تحفيقا لظروف الصحة العامة للمصلين.

ثانياً تحديد المفاهيم المرتبطة بالصحة العامة وأسس تصميم المساجد

سنتناول فيما يلي بعض المفاهيم المتعلقة بالصحة العامة وأسس التصميم وأهمية الربط بينهم .

1-تعريف الصحة العامة (Public Health)

يهدف مصطلح الصحة العامة إلى حماية السكان في المدن من الإصابة بالأمراض المختلفة، والمحافظة عليهم بصحة جيدة، من خلال توفير بيئة آمنة، وتقديم الخدمات الصحية، للحد من انتشار الأمراض، وتقديم العلاج لهم، وكذلك لتحسين السلوكيات الصحية والظروف البيئية، التي تشمل الجوانب العقلية أو الجسدية، بالإضافة إلى الجانب الاجتماعي لتمكين السكان من أداء جميع أعمالهم. كما أن تحسين مستوى الصحة العامة يقلل من فرص احتمال الإصابة بالفيروس بنسبة 31 % كما ذكرت مجلة «Sports Medicine» . كذلك فإن الصحة الجيدة تمكن السكان من التفكير العقلاني وبناء علاقات اجتماعية صحية. تُعرّف منظمة الصحة العالمية الصحة العامة بأنها «فن وعلم الوقاية من الأمراض وإطالة العمر وتعزيز الصحة من خلال الجهود المنظمة للمجتمع» (WHO/1988).

2-أهمية الصحة العامة ودورها في الحد من الأوبئة

تعمل الصحة العامة على وقاية الأشخاص في المجتمع من الإصابة بالأمراض المختلفة، والعمل على الحفاظ عليهم بصحة جيد، وتحسين حياتهم وقدرتهم على الأنتاج والتفكير والإبداع، وذلك من خلال توفير البيئة الصحية آمنة، وتقديم مجموعة الخدمات الصحية والتوعوية اللازمة، وذلك للحد من انتشار الأمراض، وتقديم العلاجات اللازمة، (WHO/1988)بالإضافة للاهتمام بالسلوكيات الصحية، وتحسين الظروف البيئية المحيطة وهي تشمل جوانب عقلية، أو نفسية، أو جسدية، بجانب الأبعاد الاجتماعية. لتمكن السكان من أداء جميع أعمالهم، وبناء العلاقات اجتماعية سليمة.

تعرف الصحة العقلية بأنها الحالة التي يكون عقل الإنسان سليماً وصالحاً يمكنه من إدراك كل ما يدور حوله ومعرفة إمكاناته وكيفية توظيفها، كما يمكنه من التأقلم مع ضغوط الحياة العادية، وكذلك أن يعمل بشكل منتج ومثمر وأن يكون قادراً على الإسمهم في المجتمع. (WHO,1988)

3-أهمية الصلاة وعلاقتها بالصحة العامة

الصلاة عماد الدين، ورياضة رب العالمين وهي الصلة بين العبد والرب جلّ وعلا، وهي الركن الثاني من أركان الإسلام، فمن الكشوفات الحديثة عن أسرار الصلاة أنها وقاية من

مرض الدوال بسبب الحركات التي يؤديها المؤمن في صلاته من ركوع وسجود، وتجدد نشاط الدورة الدموية في كافة أجزاء الجسم، كما أن توقفت الصلوات الخمسة من بزوغ الفجر وشروق الشمس وزوالها وغيابها وغياب الشفق تتوافق مع العمليات الحيوية للجسم، الأمر الذي يجعلها كالمنظم لحياة الأنسان وعملياته الفيزيولوجية. (الكحيل، 2019). كما أن السجود على الأرض يسحب الطاقة السلبية من جسم الأنسان (الغضبان، 2021). وكثير من الدراسات الحديثة أكدت أنها وقاية من مرض الأمر المفاصل وتجدد نشاط الدورة الدموية وتعيد تنظيم ضغط الدم (في الكحيل، 2019). وهناك كثير من الدراسات التي تثبت بشكل واضح أهمية الصلاة لصحة الأنسان خصوصاً عندما يؤديها المسلمون خمس مرات يومياً بما يقيهم من كثير من الأمراض ويحسن صحتهم بشكل عام.

4-أهمية تحقيق الأسس الصحية في التصميم.

أخذت كثير من الدول على عاتقها في الآونة الأخيرة عقب أنتشار جائحة كورونا المستجدة تحقيق مفهوم البيئة الصحية، وهي البيئة التي تتوافر بها أسس واشتراطات تحقيق حياة صحية لسكانها ويعد توفير الأسس الصحية في تصميم جميع المباني وعلى رأسها المباني العامة وخصوصاً المساجد التي تعد عاملاً مهماً للحد من أنتشار هذه الأوبئة، وكذلك فإن البيئة الصحية تكون مستعدة لمواجهة الأوبئة المختلفة، التي يكون تصميمها وتخطيطها مؤهلاً لمواجهة هذه الأوبئة، وأن يتوفر بجميع المساجد الأدوات والتقنيات اللازمة للحد من أنتشار هذه الأوبئة، حيث أن المساجد في مخططاتها وتصميماتها المعتادة ليست مصممة لمواجهة مثل هذه الأوبئة والجائحات.

ثأبنا: -تحقيق الصحة العامة من خلال الأسس التصميمية والتخطيطية للمساجد على المستويات المختلفة

يمكن تحقيق المساجد الصحية من خلال مجموعة من العوامل على مستويين، الأول: هو مستوى المنطقة المحيطة بالمسجد من طرق ومداخل ولأند سكب وخدمات وإستعمالات محيطة ومناطق الامتداد ومناطق الخضراء وغيرها، والمستوى الثأبي: على التصميم المعماري للمسجد وهذا التصنيف يساعد على توضيح الفكرة وسهولة تطبيقها مع إمكانية تقييم كل عامل وكل مستوى على حدة. وهو ما سنوضحه فيما يلي: -

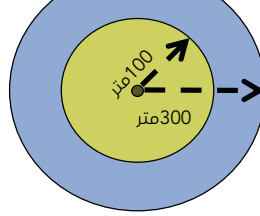
1-الأسس التخطيطية على مستوى المنطقة المحيطة بالمسجد

تُعَدّ صلاة الجماعة في المسجد من أفضل الطاعات التي يتقرب بها العبد إلى الله؛ لما فيها من إظهار لشعائر الإسلام، وإظهار لوحدة الأمة، فضلاً عما تُبجّه صلاة الجماعة من اجتماع المسلمين وتواصلهم بالخبر، عن أبي سعيد الخدري- رضي الله عنه- وفيما يلي سوف نستعرض الأسس التخطيطية الصحية للمنطقة المحيطة بالمسجد.

أ- تحديد البعد الملائم بين المسجد والمنزل

عن النبي- صلى الله عليه وسلم- قال: عن عبد الله بن عمر -رضي الله عنهما- أن رسول الله صلى الله عليه وسلم- قال: ((صلاة الجماعة أفضل من صلاة الفرد بسبع وعشرين درجة)). كثير من المعايير التخطيطية تحدد عدد المساجد اللازمة لتلبية عدد معين من احتياجات السكان داخل الحي او المجاورة السكنية، كذلك التباعد بين المسجد والمنازل. ونقترح اضافة متغير جديد يمكن أن يأخذ به ضمن هذه المعايير وهي المسافة الصحية المناسبة بين المسجد والمنازل حيث أن الميئ يعد من أهم الرياضات التي تناسب جميع الأعمار. وأن المشي لمدة تتراوح بين 20 و30 دقيقة يومياً وسط الطبيعة يقلل من هرمون الإجهاد «الكورتيزول» بنسبة 10%، بحسب صحيفة «ساينس ديلي» البريطانية (Tania ، 2019)، كما أن المشي يدعو الناس إلى التأمل والاستمتاع بالطبيعة، فضلاً عن ارتباطه بمعايير السعادة وجودة الحياة. وتحسين الحالة المزاجية للأنسان. وينصح بالمشي يوماً من 15-30 دقيقة أي (4-2) كم وهو أمر مهم لصحة الأنسان حيث أنه يحرق (150-200) سعر حراري. كما يؤثر

المشي في (تنشيط الدورة الدموية والرئتين وتقوية الجهاز التنفسي والقلب. لذا فإنه يقترح أن لا تقل مسافة السير بين المسجد والمنزل عن 5 دقائق ولا تزيد عن 20 دقيقة مشياً على الأقدام. (شكل2).



شكل (2)

يوضح نطاق تأثير المساجد من اعداد الباحث
اعتماد على معدلات الخدمات الهيئة العامة للتخطيط العمراني مصر
2016

ب-استعمالات الأراضي وتأثيرها على الصحة العامة

العوامل التي تؤثر في تحديد نوعية استعمالات الأراضي التي تحيط بالمسجد يمكن مناقشتها

فيما يلي :-

ج-تنوع الاستعمالات المحيطة

تنوع الاستعمالات خصوصاً بالقرب من المسجد يعمل علي زيادة الحركة والنشاط في المنطقة المحيطة بالمسجد مثل وجود أنشطة تجارية يمكن أن تجذب السكان بعد الصلاة ((فإِذَا قُضِيَتِ الصَّلَاةُ فَانْتَشِرُوا فِي الْأَرْضِ وَابْتَغُوا مِن فَضْلِ اللَّهِ وَاذْكُرُوا اللَّهَ كَنِيَئًا لَّعَلَّكُمْ تُفْلِحُونَ)) (سورة الجمعة الآية 10) وهذا له انعكاس إيجابي على صحة المصلين وسكان المنطقة لأنها تعمل على زيادة الحيوية من بواعث حركة ونشاط بالمجاورة والحي الذي يقع به المسجد، مما يعطي الأتسأن الأمل والتفاؤل والنشاط.

د-الضوضاء

الضوضاء لها تأثير سلبي على الصحة العامة، وتعتبر الضوضاء ثاني أبرز العوامل حضرية تؤثر على صحة السكان في أوروبا ((WHO/2018). أظهرت الدراسات الحديثة التي نشرتها الوكالة الأوروبية للطاقة (2020) أن واحدًا على الأقل من كل خمسة أشخاص أوروبيين يتعرض لمستويات تعتبر ضارة بالصحة، وتبعتها منظمة الصحة العالمية ((WHO/2018) إلى أن التعرض طويل المدى للضوضاء يمكن أن يسبب أمراض القلب والأوعية الدموية، والضعف الإدراكي، واضطراب النوم. ارتفاع ضغط الدم والأنزعاج، وتمثل الضوضاء في الشوارع في الاستخدامات مزعجة، مثل ورش العمل والمقاهي في المناطق السكنية وسيارات الأجرة والسيارات بنوعها المختلفة والدراجات النارية والازدحام والعقدة المرور. ويمكن أن يؤدي متوسط التعرض طويل المدى لمستويات أعلى من 55 ديسيبل (للمنطقة السكنية) لكثير من المشاكل الصحية، كما أن الضوضاء الصادرة عن شارع مزدحم إلى ارتفاع ضغط الدم والنبوت القلبية، وسيؤدي التعرض المستمر للضوضاء فوق 70 ديسيبل بمرور الوقت إلى فقدان السمع. وفقًا لإرشادات منظمة الصحة العالمية (WHO). ويقترح البحث منع جميع الأنشطة المزعجة من وجودها في المنطقة المحيطة بالمسجد مثل (الورش، صالات الافراح وغيرها) بالإضافة للبعد الصحي فإن الضوضاء تؤثر في الخضوع وقدسسية المكان. ويجب تصميم المسجد بحيث يضمن عدم وصول الضوضاء أو الاهتزازات الناجمة عن الأنظمة الميكانيكية إلى المصلين في أثناء أداء الصلاة.

هـ- الأجهزة والمرافق التي لها مجال مغناطيسي مؤثر في صحة المصلين كلما ابتعد السكان عن الأجهزة التي تسبب إشعاع أو مجال كهرومغناطيسي أنعكس ذلك بشكل إيجابي على صحة السكان، فلابد أن يبعد المسجد عن أبراج المحمول مسافة لا تقل عن 50 متراً كذلك عن خطوط الضغط العالي، وأهمية قفل أجهزة المحمول عند الدخول للمسجد، كل هذه الإجراءات تحد من خطر التأثير السلبي على صحة المصلين فقد اشارت بعض الدراسات إلى احتمال أن تزيد هذه الأبراج من الإصابة بمرض السرطان. (يوسف أحمد، 2021)

و-الخدمات المحيطة بالمسجد

تقع اغلب المساجد في مركز المجاورة او الحي السكاني، كما تقع الجوامع الكبرى في مراكز المدينة وهذه المراكز تتوفر بها الخدمات الرئيسة بالإضافة الى أنشطة تجارية وبالطبع وجود خدمات طبية (مستشفيات وعيادات ووحدات طوارئ) امر مهم بالنسبة للمسجد خصوصاً مع عدد المصلين الكبير في الجمعة والأعياد، بالإضافة إلى أن وجود الخدمات التعليمية بالقرب من المساجد خصوصاً المعاهد الأزهرية امر مستحب. هذا بالإضافة الى أن بعض الأنشطة التجاري تعطي حركة وجوية للمنطقة كما ذكرنا سابقاً. كما أن وجود الخدمات والأنشطة التجارية بجوار المسجد يساعد على تحقيق فكرة مدينة الـ 20 دقيقة، وهي فكرة توفير الخدمات على بعد لا يتجاوز 20 دقيقة من المنازل مما يشجع السكان على المشي والحركة وهو ما يدعم الصحة العامة للسكان.

ز-الساحة المحيطة بالمسجد

في حال وجود منطقة فضاء أو خضراء داخل المسجد يفضل أن توجد خلف مدخل المسجد الرئيسوعكس اتجاه القبلة بحيث تستوعب اعداد المصلين عند اكتمال استيعاب المسجد في أيام الجمعة او المناسبات المختلفة، او أوقات انتشار الأوبئة بحيث تدعم المسافات الآمنة بين المصلين، ولا مانع أن تكون منطقة خضراء مجهزة يمكن استخدامها للمصلين وقت الاحتياج والأزمات. كما في مسجد الأمير أحمد (شكل3)



شكل (3)

الساحة الأمامية بمسجد الأمير احمد بمكة المكرمة

ج- شبكة الطرق والمداخل المحيطة بالمسجد

تقع كثير من المساجد على الطرق الرئيسية وهو ما يستلزم توفير عبور آمن لسكان المنطقة لهذه الطرق عند ذهابهم للمسجد وقد شهد عام 2019 وحده حوالي 9900 حادث في مصر، ومات 9 أشخاص من كل 100,000 شخص بسبب حوادث الطرق، كذلك لابد من فصل حركة المشاة عن حركة السيارات بقدر الإمكان حتى يتم تأمين وصول المصلين للمساجد دون حدوث مشاكل لهم. وهناك عدد من الإجراءات الاحترازية التي تمنع حوادث الطرق وتقلل من مخاطرها ومنها توفير معايير أمانة للمشاة ونظام حديث لإشارات المرور مع إمكانية إيقافها يدوياً في حالات الطوارئ وإقامة الجسور وأنفاق المشاة وتأمين ممرات الدراجات، التطبيق الصارم لقواعد وتعليمات المرور، والحد من مخاطر الاصطدام الذي يلتزم بتطبيق معايير وإرشادات تصميم الطريق (AASHTO).

ط-الارتفاعات المحيطة بالمسجد

ارتفاعات المباني - المبالغ في علوها - حول المسجد التي تحجب رؤية السماء والشمس والهواء الطبيعي الاندماج مع الطبيعة عن المصلين بالمسجد، كما أن المباني العالية في المحيط المباشر بالمسجد لا تتفق مع هبة واحترام المسجد ونجد كثيراً من الكنائس لا يسمح بالارتفاعات والمباني العالية في محيطها مثل الفاتيكان على سبيل المثال، لذا يجب ألا تكون المساحة المحيطة بالمسجد بها ارتفاعات عالية وأن الارتفاعات المحيطة لا تتجاوز 1.2م من عرض الشوارع المقامة عليها.

ك-أهمية توافر مناطق انتظار الدرجات خارج المسجد

أهمية تخصيص أماكن لمواقف الدراجات الهوائية ضمن مسافة لا تزيد عن 30 متراً من مدخل المصل الرئيسي (لجنة تطوير المساجد، 2021).

ل-المناطق الخضراء والمفتوحة

النظر إلى الطبيعة بشكل يومي سواء كانت مناطق خضراء أو جبال أو شلالات أو وديان أو السماء الصافية، فكلها تؤثر بشكل إيجابي على صحة الإنسان، ولذلك أشارت بعض الدراسات إلى أهمية أن يقضي السكان من 20 إلى 30 دقيقة من وقتهم في رؤية الطبيعة وهي تقرب من الفترة التي يقضيها السكان للذهاب للمسجد للصلاة لذلك فالاستفادة من الأماكن الطبيعية حول المسجد تتيح لأكثر عدد من السكان لرؤية هذه الأماكن الخضراء والطبيعية مما يعكس إيجاباً على صحتهم.

ثالثاً-على مستوى تصميم المساجد

يستعرض البحث فيما يلي أسس التصميم على مستوى المسجد الملائمة لتوفير بيئة صحية للمصلين وسكان المنطقة المحيطة بالمسجد.

أ-مساحة المسجد وعدد المصلين

تشير المعايير التصميمية للمساجد في الدول العربية (مصر - السعودية- الامارات) إلى أن المصلي يحتاج إلى مساحة صافية 1 م² حيث يحتاج لمساحة 1.2*0.8 م² وللإحتراز من الأوبئة وإتباع الإجراءات احترازية يجب ترك مسافة مصلي بين كل مصلي واخر أي تضاعف المساحة المطلوبة

للمصلي من 2م¹ الى 2 متر مربع، او يقل استيعاب المسجد إلى النصف في الظروف الاستثنائية، شكل (4) بالإضافة إلى مساحة الخدمات التي تتراوح بين -1.2: 1.4 م² حسب نوع المسجد ودوره

والمساحة التي يقوم بتلبية احتياجاتها وهل هو مسجد جامع أم لا، وهناك من الوسائل الحديثة لتحديد عدد المصلين (آلات استشعار والتي يتم استخدامها لتحديد عدد المصلين في المسجد بحيث ألا تزيد عن قدرة

الاستيعاب المطلوبة) وقد طبقت هذه الأنظمة بالفعل في عدد من الدول العربية ومنها الإمارات العربية المتحدة. وتحسب مساحة المسجد على أساس 35% من عدد السكان بالمنطقة ومساحة مصلى النساء تكون 5% من مساحة مصلى الرجال، يجب أن تكون المسافة بين الصفوف 1.2 متر كحدٍّ أدنى لتمكين المصلين من أداء الصلاة بشكل مريح والحد من انتشار الأوبئة.



شكل (4)

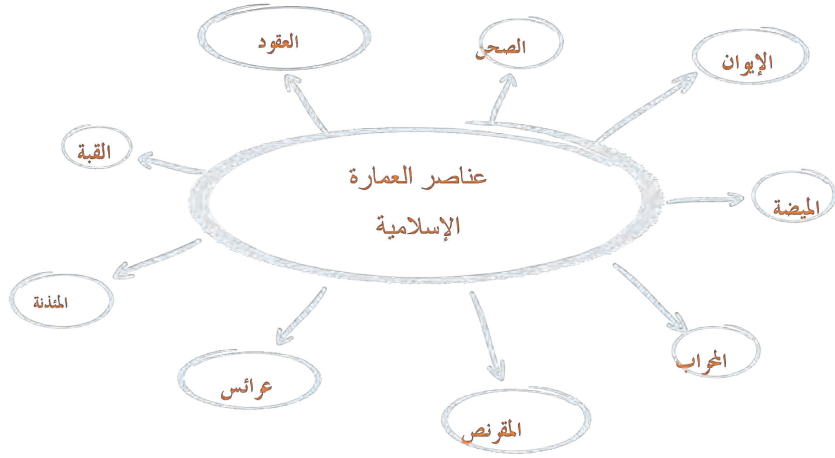
شكل يوضح التباعد بين المصلين وتأثيره على استيعاب المسجد داخل المسجد النبوي

ب-العناصر المعمارية للمساجد وعلاقتها بتحقيق الصحة العامة
المسجد بالأساس هو الأرض التي تخصص للعبادة والصلاة ولا يشترط أن تكون مبنية، وقد كانت المساجد تركز على القيمة النفعية في بداية انتشار الإسلام حتى استقرار وازدهارها في بداية الدولة الأموية حيث تطورت المساجد بشكل كبير بإضافة بعض العناصر مثل المآذن والمحراب ولقباب

والفناء الداخلي والأروقة وغيرها، (شكل 5) ويختلف تصميم المباني الدينية من دولة لأخرى بحيث يكون لكل دولة طابع مميز، وهذا التميز يكون في اختلاف العناصر المعمارية للمساجد. وفيما يلي مناقشة العناصر المعمارية للمساجد وابعدها التي يمكن أن ترتبط بالصحة العامة.

ج-المآذن

تعد المآذن المعالم البارزة والمميزة لعمارة المساجد الإسلامية، وقد تطورت على مر الزمان منذ الأذان الأول في الإسلام الذي رده بلال بن رباح وحتى الأشكال الحديثة في مختلف دول العالم والمهذنة علامة دالة على مكان العبادة (المسجد)، ولظهورها وسهولة تمييزها، استخدمت كنقطة مرجعية للاستدلال طرق المدينة وأحيائها لذلك فلها دور مهم للاستدلال على الاستعمالات المختلفة بخلاف المسجد مما يرسخ الإحساس بالطمأنينة والاستقرار وينعكس إيجابية على صحة السكان. ولقد أصبحت جزءاً أساسياً من خط السماء (Skyline) للمدينة الإسلامية، لتصبح بذلك مكوناً أساسياً لهويتها وطابعها العام، واشتهرت مدن عديدة بكثرة مآذنها كمدينة القاهرة، التي عُرفت بأنها «مدينة الألف مهذنة»، ومدينة إسطنبول، التي لا تغيب المآذن المدينة عن خط السماء فيها.

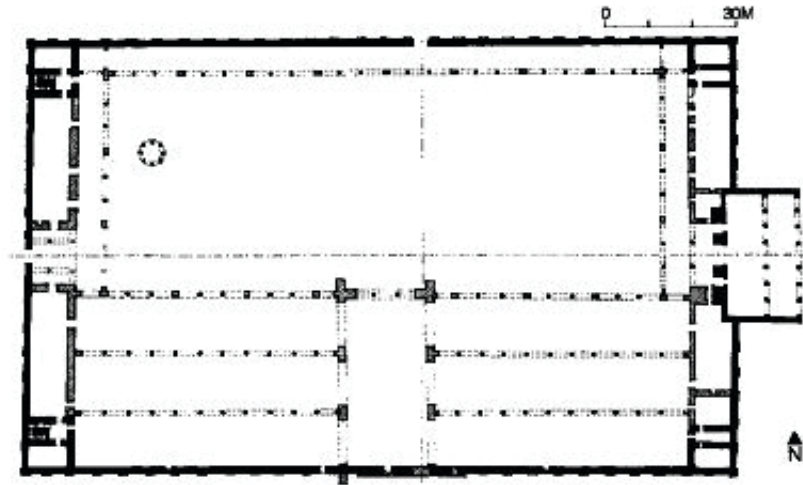


شكل (5)
يوضح عناصر المعمارية بالمسجد

د-القباب

تعتبر القبة من أهم وأقوى العناصر المعمارية والإنشائية على مر العصور وأكثرها ثباتاً وأحد أهم مفردات العمارة الإسلامية. تطور شكل القباب ووظيفتها وهيكلها وحجمها ومواد البناء المستخدمة لها على مر العصور إلى أن وصلت إلى الحضارة الإسلامية فقد ظهرت في الحضارات السابقة إلا أن في العصور الإسلامية أخذت القبة طابعاً خاصاً مميزاً.

القبة هي نوع من أنواع التسقيف، وتعرف بتعدد أشكالها وأنواعها وطرق تشييدها فأبسطها نصف دائرة كُروية مجوفة، تعد من أهم وأقوى العناصر المعمارية والإنشائية على مر العصور.



شكل (6)
مسقط أفقي للمسجد الاموي موضح الفناء الداخلي

يمتلك الشكل النصف كروي جزء من خصائص الكرة والتي تكمن أهميتها في علوم الطاقة فينبعث من مركزها إلى نقطة في قمة الشكل النصف كروي حيث توجد بها طاقة إيجابية تنعكس على صحة السكان. (خليل مسيحة، 1985).

ه-الفناء الداخلي

وهو المساحة المكشوفة في البناء داخله أو الممتدة خارجه ولفناء المسجد كثير من المميزات فهو يدعم وصول أشعة الشمس والتهوية والشعور بالخصوصية والاحتواء ويساعد على الأندماج بين المصلين والطبيعة متمثلة في السماء، وهذه العناصر تقلل من الإصابة بالتبوء وبالطبع فإن استخدام الفناء الداخلي يرتبط بالبيئة والمناخ المحيط بموقع المسجد فمناخ البحر المتوسط مختلفة عن مناخ المناطق الحار الجاف. وقد كثر استخدامه في مناطق مثل القاهرة ودمشق والقيروان والدار البيضاء. ولوجود الفناء الداخلي في عمارة المسجد فوائده على صحة المصلين وجودة العمران وسلامة البيئة. (عباس الزعفران، 2021). (شكل 6)

و-تصميم المسقط الأفقي للمساجد

أهمية توفير ممرات مخصصة حول كافة ساحات الصلاة بحيث تتيح سهولة الحركة للمصلين على أن يكون الحد الأدنى لعرض هذه الممرات كما يلي: 0.75 متر لساحة الصلاة التي لا تزيد سعتها عن 1000 مصل، 1.5 متر لساحات الصلاة التي لا تزيد سعتها عن 2000 مصل، 2.5 متر لساحات الصلاة التي تزيد سعتها عن 2000 مصل. (لجنة تطوير المساجد، 2021).

ز-التكرار والإيقاع في تصميم المساجد والأبعاد الصحية

اعتماد التصميم على الإيقاع والتكرار: - فيعد الإيقاع حركة موحدة وتوصف بأنها تكرر وتتابع منسق لعناصر شكلية في تناوب منتظم او غير منتظم داخل تكوين معين، ويمكن ملاحظتها بصريا في تعاقب تلك العناصر عند التقدم والحركة خلال فراغات متسلسلة. (محمد عزت سعيد، 2002). ويرتبط التكرار والإيقاع بالطبيعة فهو يماثل الليل والنهار وفصول السنة وعملية التنفس ودقات القلب وغيرها، والأنظمة الإيقاعية تعطي استمرارية والانسجام. (دعاء محمد الغمري، 2020). والتكرار في المساجد يظهر في تكرار العقود والأروقة والبوابي والنوافذ وغيرها، كما يظهر في الألوان والملبس والحجوم، حيث أن انتظام تكرار العنصر يساعد على تنظيم حركة الطاقة وسرعة سريانها مما يحقق التوازن والانسجام ويؤثر إيجابيا على صحة المصلين والسكان المقيمين حول المسجد. (Gilbert، 2002)

ح-الزخارف داخل المساجد

نظرا لطبيعة المساجد وأسس العقيدة الإسلامية فإن الزخارف التي تزين المساجد يجب أن تتفق والعقيدة الإسلامية والتي تحرم تصوير ورسوم الكائنات الحية خصوصاً في الأماكن الدينية، ولكنها تعتمد على الزخارف الهندسية المختلفة والخط العربي وبرعت فيهما وتحولت إلى فنون قائمة بذاتها تستخدم في المساجد وخارجها، هذه الفنون التي تجذب أنظار السكان من جميع الجنسيات، ويجب ألا تكون هذه الزخارف مبالغ فيها بحيث تبعد المصلين عن الخشوع. وأن استخدام الآيات القرآنية وأسماء الله الحسنى داخل المسجد تبعث على الطمأنينة والسكينة كما أن الدعاء بها يشفي من الأمراض ويحسن الصحة العامة. ويجب عدم استخدام الزخارف المفرطة أو الألوان الزاهية على حائط القبلة الداخلي حتى ارتفاع 1.8 متر. (لجنة تطوير المساجد، 2021). (شكل 7) يوضح الزخارف بمسجد الشيخ خليفة.



شكل (7)

الزخارف الإسلامية بمسجد الشيخ خليفة بمدينة العين

ط-استخدام الألوان في تصميم المساجد واللاند سكيب المحيط بالمسجد

الألوان عبارة عن ضوء مرئي حيث يشتق منه جميع ألوان الطيف، فضاء الشمس يحتوي على جميع أطوال الموجات التي تكون الطيف الكهرومغناطيسي الذي نعتمد عليه لنحيا على الأرض. والألوان لها القدرة على مساعدة جسم الإنسان في إحداث تغييرات بالخلايا والهرمونات بحيث تؤدي إلى اتزانها أو حدوث خلل بها. فاللون له تأثير على مستوى الطاقة الغير مرئية المكونة للإنسان، أي أن اللون يمتد تأثيره بعمق إلى مستويات غير ملموسة لدينا، فالألوان التي نراها من الأهمية بحيث تعكس كل ذلك على ردود أفعالنا واحاسيسنا اتجاه ما نراه. (دعاء محمد الغمري، 2020)

وتؤثر الألوان في الحالة المزاجية والسلوكية للإنسان بل حتى على نظامه الغذائي ونظام النوم والساعة البيولوجية والألوان المختلفة، الألوان لها تأثيرات فسيولوجية وسيكولوجية على الإنسان فهي تغير من حالته الصحية أو سلوكه داخل الفراغ المتواجد فيه فقد تجعله ايجابي أو سلبي في ردود أفعاله المختلف. (Rossbach, 1994) ويمكن الاستفادة من طاقة الألوان خصوصاً في الشكل الخارجي للمسجد او التصميم الداخلي وعناصر اللاند سكيب، من خلال استخدام اللون المخصص في المكان المناسب، كذلك في استخدام توليفة الألوان المنسجمة والتي تحقق الاستفادة من طاقات الألوان المختلفة، بما يتوافق مع معايير ومحددات الصحة العامة. فقد اشارت بعض الدراسات إلى أن الألوان قد تؤثر على معدل ضربات القلب ودرجة الحرارة وضغط الدم وغيرها من المؤشرات الصحية اما بالنسبة للتأثيرات الإيجابية فقد أشار بعض الدراسات إلى أن اللون الأخضر يدفع السكان للتفكير الإيجابية والامل مما يشعر السكان بالسعادة والتفاؤل، وهو يرتبط بالمستقبل والتعاطف والرعاية ويقلل من التعب والأرق والاكتئاب، كما أن اللون الأزرق للتهنئة يرمز للسماء، والماء، ويحفز المواد الكيميائية المهدئة في الجسم كمن أن له علاقة بالثقة والولاء. كما أن اللون الأزرق في علوم الميتافيزيقي يمنع الطاقات السلبية التي تواجه الإنسان ولقد استخدم لهذا الغرض في معظم دول العالم تحت مسميات مختلفة، اللون الأبيض يستخدم للتعبير عن النقاء ولفضاء والراحة النفسية كما تستخدم درجات الألوان الغامقة لإطفاء الإحساس بالخشوع والهيبة بالمسجد.

ي-الاحتياطات الوقائية في تصميم المساجد لمنع انتشار الأوبئة

حتى تستطيع الحكومات مواجهة الأوبئة والجوائح المختلفة، لابد من اتخاذ بعض التدابير والاحتياطات التي من شأنها الحد من انتشاره، ويعد المسجد أحد هذه المحاور الذي يمكن تطبيق هذه الاحتياطات عليه، حيث يتجمع عدد كبير من المصلين خمسة مرات يومياً، الأمر الذي يستلزم الاستعداد والتزوّد بأحدث التدابير الوقائية الواجب اتخاذها و العمل على وضع خطط لحماية المصلين من العدوى، حيث لا يمكن أن تنتشر العدوى بسهولة بين المصلين في المساجد، ويمكن أن تؤدي التجمعات العامة إلى ارتفاع نسبة الإصابة بالعدوى بمعدل 10% لذلك فلا بد من الاهتمام بما يلي:

ك-النظافة

والمسجد مكان طاهر يلتقي فيه العبد بالخالق، فهو مساحة نظيفة مستوية مطهرة يحيط بها سور وظيفته تعيين حدود ذلك المكان المطهر المخصص للصلاة، لذلك فلا بد المحافظة على نظافة وطهارة المسجد والخدمات الملحقة به، كذلك تعقيم مناطق الوضوء والحمامات وأماكن حفظ الأحذية وحجرات القائمين على المسجد بشكل دائم لمنع البكتريا والميكروبات.

ل-فصل أماكن الوضوء عن الحمامات

أهمية فصل دورات المياه عن المسجد وأماكن الوضوء، حيث تعد دورات المياه أماكن غير طاهرة لابد من فصلها عن المساجد وأماكن الصلاة، اما أماكن الوضوء فهي أماكن طاهرة يمكن وضعها داخل المسجد وأماكن الصلاة دون فصل، بل أن وضع أماكن الوضوء داخل المسجد وفصلها عن دورات المياه، سوف يتيح عدم استخدام احذية الوضوء الخفيفة التي تنقل كثيراً من الأمراض، وسوف يسهل عملة تعقيم دورات المياه، و يجب أن يراعى وضع دورات المياه عكس اتجاه الرياح بالنسبة للمسجد.

م-مداخل ومخارج المصلين

لابد من وجود أبواب جانبية للخروج فقط بالإضافة للأبواب الأمامية الخاصة بدخول المصلين، وعدم التزاحم في المخارج والمداخل بحيث يكون في كل جهة مسار للدخول ومسار للخروج.

ن-التهوية

يوصى بالتهوية الجيدة في المسجد والتهوية هي عملية إدخال الهواء الخارجي النظيف إلى الأماكن المغلقة والسماح لهواء الأماكن المغلقة بالخروج من أجل الحفاظ على نوعية الهواء أو تحسينها. تزداد مخاطر الإصابة بعدوى كوفيد-19 في الأماكن المزدحمة والسيتة التهوية. وذلك لأن الفيروس ينتقل بين الناس عن طريق الجسيمات التنفسية الملونة في شكل قطرات ورذاذ. وفي الأماكن السيتة التهوية، يمكن للرذاذ الملوث أن يبقى في الجو وأن ينتقل لمسافة تزيد على متر واحد. وتحد التهوية في الأماكن المغلقة من مخاطر انتشار الفيروس بداخلها. (WHO, 2022) فيجب توجيه المنافذ وفي اتجاه الرياح المحبة وفتحة مدة لا تقل عن ربع ساعة مع كل صلاة، كما أن النوافذ الكبيرة والعالية تزيد من سرعة الهواء الداخل خصوصاً عندما تكون الفتحات التي يدخل منها الهواء تساوى نفس الفتحات التي يخرج منها الهواء. وعندما تكون فتحات المسجد غير متساوية والفتحات التي يخرج منها الهواء أكبر وأكثر ارتفاعاً وتكون السرعة أعلى، ويجب أن نأخذ في عين الاعتبار عدم اعتراض مرور الهواء بالتصميم الخاطئ للفواصل الداخلية. (جمال اللافي، 2021).

ثالثاً: -إرشادات عامة للحد من انتشار الأوبئة داخل المساجد

• توفير سلال مهملات ونفايات تعمل دون الحاجة للمس ويجب التخلص من النفايات

بشكل مستمر.

• وضع المصاحف في مكان ذاتي التعقيم.

• يجب تغطية المناطق الفاصلة بين مكان الوضوء وصالة الصلاة بمواد مضادة للفطريات والجراثيم.

• تزويد دورات المياه بالصابون السائل، والحفاظ عليها نظيفة بشكل دائم.

• استخدام عوازل لسجادة الصلاة تستخدم لمرة واحدة في حال انتشار الفيروس.

• تنظيف وتعقيم الأسطح والسجاد والممرات وأماكن تواجد أحذية المصلين بصفة دورية ويعد كل صلاة.

• الحرص على أن تكون نصف النوافذ والأبواب على الأقل مفتوحة لتجديد التهوية داخل المسجد خلال أوقات الصلاة وإغلاقها بعد الانتهاء منها وخروج جميع المصلين.

• وجود حنفية مياه بالقرب من مداخل المسجد للحفاظ على النظافة والتعقيم).

الخاتمة

يمكن دره كثير من الأوبئة والأمراض والحد من انتشارها عن طريق إعادة تحديد بعض المعدلات والأسس التصميمية والتخطيطية للمساجد، فقد اشارت الدراسات السابقة إلى أهمية اتباع تعليمات الصحة العامة وتحقيق الأنشطة الداعم لها مثل الرياضة في الحفاظ على صحة السكان والحد من انتشار الأوبئة، مما يجعل السكان أكثر مقاومة للأوبئة المختلفة، كما أن الالتزام بالأسس التصميمية والتخطيطية من شأنها الحد من انتشار الأوبئة وتحسين الصحة العامة، قد اثبت علميا أن المثني يعمل على تحسين الصحة العامة، لذلك فأن الاستفادة من ذلك في تحديد البعد المناسب بين المسجد والمنزل عنصر مهم في دعم الصحة العامة للسكان، كما أن التباعد عامل مهم في الحد من انتشار الأوبئة فأن تحديد العدد المناسب للمصلين في المسجد فترة الأوبئة عام مهم أيضا في دعم الصحة العامة، كما أن التأثير الإيجابي للمناطق الخضراء حول المساجد والنوعية الزخارف والألوان وتوفر الأبنية داخل المسجد كذلك عامل مهم في تحسين الصحة العامة لهم. ويمكن تلخيص هذه الأسس و المعايير التخطيطية والتصميمية التي تدعم الصحة العامة كما هو واضح في النتائج والتوصيات كما يلي:

النتائج والتوصيات

يمكن تصنيف العوامل التي تؤثر على الصحة العامة عند تخطيط وتصميم المساجد إلى قسمين :

أولاً: عوامل تتعلق بالصحة العامة عند تخطيط المنطقة المحيطة بالمسجد وكأن من أهمها الاشتراطات خصوصاً بها: -

1- ألا تقل مسافة السير بين المسجد والمنزل عن 5 دقائق ولا تزيد عن 20 دقيقة.

2- تنوع الاستعمالات بالقرب من المسجد لزيادة الحركة والنشاط في المنطقة المحيطة به.

3- منع جميع الأنشطة المزعجة من التواجد في المنطقة المحيطة بالمسجد.

4- تصميم المسجد بحيث يضمن عدم وصول الضوضاء أو الاهتزازات الناجمة الخارجية.

5- وجود الخدمات والأنشطة التجارية بجوار المسجد يساعد على تحقيق فكرة مدينة ال
20 دقيقة.

6-الارتفاعات المحيطة لا تتجاوز 1.2 من عروض الشوارع المقامة عليها.

ثانياً: عوامل تتعلق بالصحة العامة عند تصميم المسجد: -

1-يجب أن يقل استيعاب من المصلين المسجد إلى النصف في الظروف الاستثنائية (انتشار الأوبئة).

2-وجود الفناء الداخلي في المسجد له فوائده على صحة المصلين.

3-تكرار عناصر معمارية محددة يحقق التوازن والانسجام في التصميم ويؤثر إيجابياً على صحة المصلين.

4-تعتبر دورات المياه أماكن غير طاهرة لابد من فصلها عن المساجد وأماكن الصلاة.

5- توفير أبواب جانبية للخروج من المسجد بالإضافة للأبواب الأمامية خصوصاً بدخول المصلين .

6- وجود حنفية مياه بالقرب من مداخل المسجد للحفاظ على (النظافة والتعقيم).

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مصليات النساء: رؤية سلوكية
معمارية
دراسة حالة مساجد الأحياء في
مدينة الرياض

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ملخص

تزايد الاهتمام بالمساجد وعمارتها في كثير من أنحاء العالم الإسلامي، ولاسيما مع التغيرات الاجتماعية والثقافية والاقتصادية. ومن العناصر الحيوية التي اكتسبت أهمية متزايدة في السنوات الأخيرة مصليات النساء في المساجد؛ نتيجة لتزايد عدد النساء اللواتي يؤديان الصلاة خارج المنزل، بالإضافة إلى الصلوات الموسمية كالتراويح والعيدين والجنائز. ومن المصليات التي تحتاج عناية ودراسة مصليات النساء، ولاسيما في مساجد الأحياء التي يقل الاهتمام بها حتى يقترب شهر رمضان وتستعد تلك المساجد لاستقبال النساء في مصلياتهن. ولذلك، فإن هذه الدراسة تهدف إلى تقديم وصف تحليلي لمصليات النساء بشكل عام وإيجابياتها وسلبياتها، والتعرف على تقييم النساء للوضع الراهن للمصليات النسائية، وعناصرها الأساسية، واستقصاء لأهم المطالبات والمقترحات التي ترى النساء أهمية وجودها في المصليات، بناء على معاشتهن الواقعية لتلك الفراغات، للوصول إلى توصيات ومعايير تصميمية لمصليات النساء.

بدأت الدراسة باستعراض الأحكام الشرعية لمصليات النساء والاعتبارات المعمارية لمصليات النساء. وبعد زيارات ميدانية، ومقابلات شخصية استكشافية، ومراجعة للأدبيات وما كتب في الصحافة ووسائل التواصل الاجتماعي حول مصليات النساء، صممت استبانة إلكترونية لجمع آراء المصليات، بلغ عدد المشاركات فيها (1085) إجابة. وقد شملت الاستبانة تقييم العناصر الأساسية التالية لمصلى النساء: الطريق إلى المدخل، بهو المدخل، أماكن الضوء، دورات المياه، الدرج والمصاعد، قاعة الصلاة، موقع المصلى. واتبعت هذه الدراسة منهجية «تقييم المباني بعد الإشغال».

وجدت الدراسة أن مستويات الرضا بشأن تلك العناصر متنوعة، إلا أن كثيرا من الإشكالات ترتبط بكيبرات السن، والمعاقات، وبسهولة الحركة والشعور بالأمان. وختمت الدراسة بعدد من التوصيات التي تم استنباطها من الإجابات في الاستبانة، ومن المقترحات التي قدمتها المشاركات بناء على تجربتهن ومعاشتهن للمصليات. وختمت بقاتمة مقترحة تشمل 40 معيارا تصميميا ترى الدراسة أهمية تطويرها لتصبح معايير تصميمية شاملة لمصليات النساء.

مقدمة

حظيت المساجد باهتمام ملحوظ، ولاسيما في العقود الأخيرة، سواء في عمارتها والعناية بها، أم بحجم الدراسات التي أجريت حولها، حيث أقيمت مسابقات عالمية للاهتمام بعمارة المساجد، مثل جائزة ألغا خان (الآغا خان، 2020) في دوراتها المختلفة (Dogan, 1999)، وجائزة الملك فهد للتصميم والبحث العلمي في العمارة الإسلامية (الجوهري، 1424) وجائزة عبد اللطيف الفوزان (الفوزان، 2022)، إضافة إلى الجوائز الأخرى التي تقيمها بعض الهيئات المعمارية وتكون المساجد ضمن المدخلات التنافسية فيها.

ومع التغيرات المتابعة في السياق الاجتماعي والثقافي والاقتصادي، تبقى الاعتبارات الوظيفية والسلوكية ودورها في التصميم المعماري من أهم العوامل المؤثرة والحاسمة في تحقيق المبني لاحتياجات المستخدمين، ومستوى رضاهم وارتياحهم أثناء استخدامه (Altman and Chemers, 1980).

ومع أهمية مصليات النساء كعنصر رئيس في كثير من المساجد، إلا أنها من الأجزاء التي تتراوح مدة وكثافة استخدامها من النادر إلى المتوسط. ولاسيما تلك المصليات التي توجد في وسط الأحياء، بعيدا عن شرايين الحركة المرورية الكثيفة. مما يجعلها بعيدا عن الأعين، وربما يقل الاهتمام بها حتى يقترب شهر رمضان وتستعد تلك المساجد لاستقبال النساء في مصلياتهن. لذلك تزداد الحاجة إلى دراستها، والتعرف على أوضاعها، وتحليل الاحتياجات، وتقديم رؤية أكثر ارتباطا بتلك الاحتياجات ليؤخذ بها في تصميم تلك المصليات.

مشكلة البحث

تعد مصليات النساء في المساجد من الأجزاء المهمة في التكوين الفراغي للمساجد عموماً، حيث تشتمل معظم المساجد (سواء الجوامع أو مساجد الأحياء أو مساجد الطرق أو الأسواق) على جزء مخصص لصلاة النساء. ولكن الملحوظ وجود حالة من عدم الرضا عن وضع كثير من تلك المصليات تعبر عنها شكاوى كثير من النساء عن انزعاجهن كثيراً من حال تلك المصليات النسائية، وخاصة تدني مستوى تصميم تلك المصليات وتجهيزها، وانخفاض جودة الفراغات الداخلية ومناسبة الخدمات المقدمة للنساء فيها، وسهولة الوصول إليها واستخدامها، والشعور بالأمان أثناء استخدامها، إضافة إلى قلة الصيانة والعناية بها.

ومن يطلع على التحقيقات الصحفية أو مواقع التواصل الاجتماعي على الإنترنت، إضافة إلى التجارب الشخصية للنساء، يجد تأكيداً لتلك الشكاوى بدرجات مختلفة، اعتماداً على مستوى المسجد وحجمه وموقعه ومستوى الاهتمام والعناية به.

لذلك، تناول هذه الدراسة أوضاع مصليات النساء التي تقام فيها صلاة التراويح في مدينة الرياض، حيث تشكل في رمضان نسبة الإشغال الأعلى لتلك المصليات مقارنة ببقية شهور السنة. وكما هو ملحوظ، فإن المساجد كلها تقريباً تفتح مصليات النساء في رمضان لصلاة التراويح، إذ تتراوح مصليات النساء في المساجد في غير شهر رمضان بين ثلاث حالات:

1. الإغلاق التام كما في مساجد الأحياء الصغيرة التي لا ترتادها النساء للصلاة اليومية، ولا تحتاجها باعتبار موقعها البعيد عن احتياج النساء
2. الإغلاق الجزئي كما في حالة المساجد التي تكون قريبة من الشوارع والطرق الرئيسية أو الموجودة في الأسواق الشعبية أو بجوارها، فلا تفتح إلا في وقتي صلاة المغرب والعشاء، حيث تكثر حرمة تنقل الناس، ويحتاجون التوقف لأداء الصلاة
3. الفتح الكامل أو شبه الكامل، كما في المساجد الكبرى، وخاصة التي تتضمن إما صلاة الجنائز أو تقدم فيها نشاطات دينية أو علمية أو توعوية، حيث تكون متاحة لصلاة النساء فيها جميع الأوقات، باستثناء صلاة الفجر.

وبالتالي، فإن دراسة تلك المصليات في شهر رمضان أتاحت فرصة أكبر للتعرف على وضعها، ومشاركة أعداد أكبر من المستخدمات في الدراسة، وبشكل أكثر عمقا وارتباطاً، والتي قد لا تتاح في بقية الشهور لنسبة معتبرة من المصليات.

أهمية البحث

عبر بحث تباعي لما كتب عن مصليات النساء، لم يتيسر الحصول على أي دراسات أو بحوث تناول مصليات النساء، لكن تتم الإشارة إليها سريعاً في ثنايا الحديث عن المساجد بشكل عام. لكن في المقابل هناك عدد من التحقيقات والمقالات الصحفية¹ التي تلقي الضوء على أوضاع مصليات النساء وشكاوى النساء من تردّي أوضاع بعضها. ومن خلال النظر في تلك المصادر، وإن كانت تسم بقلّة الموضوعية من وجهة النظر البحثية، إلا أنها تشير إلى وجود مشكلات في تلك المصليات، وأن هناك تدني في مستوى الرضا يصل أحياناً إلى التذمر من وضع تلك المصليات، سواء ما يتعلق بضعف مستوى الاهتمام بتصميمها أو ما يتعلق بتشغيلها والعناية بها.

يعد هذا الموضوع من الموضوعات المهمة والحيوية في تصميم المساجد المعاصرة، ويلعب دوراً مهماً في تشييط الارتباط الديني لسكان الحي السكني بمجتمعهم المحيط، ويزيد

1 <https://www.alriyadh.com/852880>

التعارف بين الجيران، ولا سيما أن كثيراً من النساء يشكن من قلة الأماكن الاجتماعية العامة التي تتيح فرصاً للقاءات العفوية العابرة مع الجارات. وبالتالي، فقد كان من المتوقع أن يواجه الباحث صعوبة الحصول على المعلومات بشأن طبيعة تلك المصليات، وتقييم تجربة المستخدمين لها، وهل هناك معايير معتمدة لتصميم مصليات النساء.

إضافة إلى ما سبق، فإن المعايير المتعلقة بتصميم المساجد عموماً، والمصليات النسائية خصوصاً تعد قديمة نسبياً. يؤكد ذلك ما يلي:

«أما الجهة أو الجهات الحكومية المنظمة فمن الملاحظ تركيزها على الاشتراطات العامة مثل الارتدادات (ومع ذلك غالباً لا تتضمن العدد الكافي من المواقف)، ويغلب تجاهلها لدراسة وتحديد مساحات واستيعاب ومواصفات كافة العناصر والمكونات الجزئية للمسجد بالشكل الذي يمكن المسجد من تحقيق أهدافه وخدمة المستفيدين منه بشكل تكاملي لا يكون فيه تضاد بين الوظائف الجزئية لعناصر المسجد ولا إزعاج للجيران والمنطقة المحيطة. وربما تتدخل الجهات الحكومية بعد تشغيل المسجد لمحاولة حل بعض الإشكالات التي تسبب بع التصميم والبناء غير الأمثل للمسجد، مثل شكاوى الجيران من ازدحام وانسداد الطرق وتوقف المصلين أمام مداخل البيوت فتأتي بحلول ترقيعية تعالج مشكلة وتوجد أخرى» (الموسى، د. ت، ص 11).

أهداف البحث

تسعى هذه الدراسة إلى تحقيق الأهداف التالية:

1. وصف عام لوضع مصليات النساء في مساجد الأحياء في مدينة الرياض بشكل عام وإيجابياتها وسلبياتها.
2. التعرف على تقييم النساء للوضع الراهن للمصليات النسائية، وعناصرها الأساسية مثل المداخل ومرافق الضوء ودروات المياه وعناصر الحركة والأثاث والأجهزة إضافة إلى جوانب الأمن والسلامة ومعرفة الطريق ووضوح العناصر وسهولة استخدامها خاصة من قبل كبريات السن وذوات الإعاقة،
3. استقصاء لأهم المطالبات والمقترحات التي ترى النساء أهمية وجودها في المصليات، بناء على معاشتهن الواقعية لتلك الفراغات، للوصول إلى توصيات تصميمية أولية تناسب المصليات الحالية أو المصليات التي تنشأ مستقبلاً،
4. وضع قائمة أولية بالمعايير التصميمية لمصليات النساء، انطلاقاً من رأي المشاركات في الدراسة، كونهن المستفيد الأكبر والأول من تلك المصليات، واسترشاداً بكتب وأدلة المعايير التصميمية والمراجع التي تمت مناقشتها.

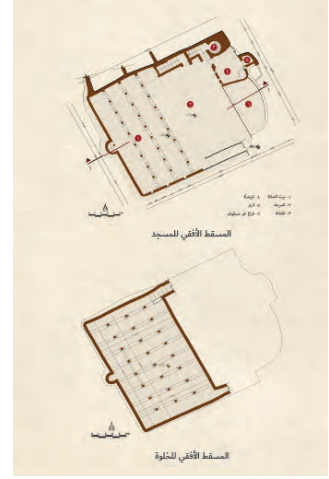
مصليات النساء تاريخياً

وجدت مصليات النساء في عديد من المساجد المعروفة في العالم الإسلامي، ولاسيما تلك المساجد الكبيرة التي تحضر إليها النساء بأعداد كبيرة، ومن أمثلتها مسجد الأمير عبد القادر بالجزائر (عادل والظاهر، 2018)، ومسجد الغالي في المكلا باليمن (الريمي وآخرون، 2020)، وغيرها.

في الفترة التي تمتد إلى نصف قرن وما قبلها في مدينة الرياض، كان الوضع في المساجد الطينية القديمة (الشكل 1)، عند حضور النساء لصلاة التراويح، يعتمد على عدد من الاحتمالات، بحسب مساحة المسجد، وتوافر الفراغات المناسبة لهن فيه، ومنها ما يلي:

1. تخصيص السطح للنساء في الليالي التي يكون فيها الجو معتدلاً، بينما يصلي الرجال في قاعة الصلاة المعتادة في الدور الأرضي (الشكل 2)،
2. تصلي النساء في خلوة (قبو) المسجد في الليالي التي يكون فيها الجو بارداً، بينما يصلي الرجال في قاعة الصلاة،

3. صلاة النساء في آخر السجدة (الفناء) بينما يكون الرجال في المقدمة، خاصة في ليالي الصيف ،
4. وضع رواق من القماش في آخر المسجد يكون مخصصا للنساء، ينصب مع بداية رمضان ويرفع بعد انقضاء الشهر.



الشكل (2)
ساحة المسجد الخارجية، والدرج المؤدي إلى السطح (الهيئة العامة للسياحة والتراث الوطني، 1440)

الشكل (1)
المسجد القبلي بحي منفوحة بالرياض (الهيئة العامة للسياحة والتراث الوطني، 1440)

وقد استمر أسلوب وضع رواق القماش (والذي يكون عادة ثقيلًا، مثل أقمشة الخيام) في المساجد التي تلت مساجد الطين، والتي واكبت بدايات استخدام مواد البناء الحديثة، التي تبنى غالبًا من الطوب وتسقف بمرايبع الخشب، بل وحتى بدايات المساجد الخرسانية. تحول لاحقًا إلى حاجز زجاجي عاكس بإطارات ألومنيوم مثبتة، ولا يمكن تحريكها.

ولكن مع تزايد أعداد النساء وحاجتهن لفراغات خاصة بهن، ولاسيما تخصيص مدخل خاص لهن بعيدا عن مزاحمة الرجال، ودورة مياه، ومكان وضوء. لذلك، نشأت فكرة فصل النساء عن الرجال في مصليات خاصة، ولاسيما وقت صلاة التراويح، لكونها تستغرق وقتًا أطول من الصلوات الخمس اليومية، خاصة بعد تحقق الوفرة المالية والقدرة على بناء المساجد بشكل يسهم في تحقيق الراحة للجنسين. وكان نصيب الجوامع الكبرى أعلى من المساجد الصغيرة. وهذا ما يشاهد في عديد من المساجد التاريخية التي قامت الجهات الرسمية بترميمها أو إعادة بنائها (الهيئة العامة للسياحة والتراث الوطني، 1440؛ الهيئة العليا لتطوير مدينة الرياض، د. ت).

والملاحظ في المساجد عالميا، وإن كان بصور متنوعة، وجود جزء من فراغ المسجد مخصص لصلاة النساء (الشكل 3)، ومع وجود الجدول الدائر حول مشروعية عزل النساء تماما عن الرجال في فراغ مستقل، يبقى القول الراجح لكثير من العلماء المعاصرين بجواز هذا الأمر، وأنه يراعي الاعتبارات الوظيفية والاجتماعية والنفسية بشكل أكثر توافقًا مع المتغيرات الحديثة.



الشكل (3)

مصلى النساء في الدور العلوي من الجزء الخلفي من المسجد، متصل بنوافذ معتمة صغيرة بقسم الرجال

مراجعة الأدبيات

تعرف مصليات النساء بأنها: "تلك الأماكن المتخذة لهن في المساجد والمختزلة من آخر المسجد والمعزولة بعازل من قماش أو خشب أو حديد سواء كانت في آخر المسجد أو في الدور الثاني أو خارج المسجد والمحاطة بسور المسجد / والتي تصلي فيها المرأة بعض الأوقات والأحيان والمناسبات كصلاة التراويح التي تقام في المصليات الداخلية، أو صلاة العيدين والاستسقاء والكسوف والتي تقام في المصليات الخارجية" (الشريف، 2018، 383).

تنقسم الكتابات عن موضوع مصليات النساء بشكل رئيس إلى فئتين، الأولى: الدراسات الفقهية التي تناولت الأحكام الشرعية المتعلقة بصلاة النساء عموماً، وأحكام مصليات النساء بشكل أخص. والثانية: دراسات معمارية تناولت تصميم المساجد وعناصرها الفراغية، وتطرقت إلى مصليات النساء ضمن الحديث عن تلك العناصر.

الأحكام الشرعية لمصليات النساء

هناك عدد من القواعد الفقهية التي تنظم حضور النساء للصلاة في المساجد، وكما هو حال كثير من الأحكام في الشريعة الإسلامية، يعطينا الشارع الحكيم القواعد الأساسية، ويترك المجالات مفتوحة للتطبيق بما يتوافق مع تلك القواعد، مستصحبا الضوابط الفقهية الكبرى المتعلقة بجلب المصالح ودفْع المفساد في الشريعة، والتي نصت عليه الأحاديث النبوية الشريفة التالية:

1. مشروعية صلاة النساء في المساجد: قال صلى الله عليه وسلم في الحديث الذي رواه أبو هريرة رضي الله عنه: (لا تمنعوا إماء الله مساجد الله)،
2. أفضلية صلاة المرأة في بيتها: في الحديث الذي رواه أم سلمة رضي الله عنها، قال الرسول صلى الله عليه وسلم: (صلاة المرأة في بيتها أفضل من صلاتها في حجرتها وصلاتها في مخدعها أفضل من صلاتها في بيتها)،
3. التأخر عن الرجال: خير صفوف النساء آخرها وشرها أولها: وعن أبي هريرة، قال: قال رسول الله صلى الله عليه وسلم: (خير صفوف الرجال أولها، وشرها آخرها، وخير صفوف النساء

آخرها، وشربها أولها) رواه مسلم،

4. تأخر الرجال في الخروج حتى تصرف النساء: عن أم سلمة رضي الله عنها، قالت: (كان رسول الله صلى الله عليه وسلم إذا سلم قام النساء حين يقضي تسليمه، ومكث يسيرا قبل أن يقوم)، قال ابن شهاب: "فأرى والله أعلم أن مكثه لكي ينفذ النساء قبل أن يدركهن من انصرف من القوم" رواه البخاري،
5. جعل للنساء بابا في المسجد: وعن ابن عمر، قال: قال رسول الله صلى الله عليه وسلم: (لو تركنا هذا الباب للنساء)، قال نافع: "فلم يدخل منه ابن عمر، حتى مات" رواه أبو داود،
6. خلاصة أقوال العلماء في صلاة النساء في المصلى الخاص بهن صحيحة، سواء رأين الإمام أو لم يرهن، وسواء رأين المأمومين أو لم يرينهم، لأن المسجد مكان واحد يشمل هذه الأجزاء كلها (الشريف، 2018).

وقد ذكر استانبولي والحفناوي (2016) أن بعض المساجد التاريخية احتوت مقاصير لصلاة النساء، وأن مصلى النساء يعد من العناصر الأساسية في تصميم المساجد بتوفير باب خاص لهن وحاجز يفصل بينهن وبين الرجال. وقد انتقد تارم (1999) استحداث عزل مصليات النساء، مستندا إلى كونها غير موجودة في الأزمنة الأولى من التاريخ الإسلامي، ومعتمدا على قول وحيد للفيقهي ابن قدامة الذي اشترط رؤية النساء لصفوف الرجال، خشية الاختلاف. وهذا القول مرجوح بقول عديد من العلماء المعاصرين بجواز تخصيص مكان للنساء وعزله بصورة مناسبة تحقق الخصوصية مع القدرة على متابعة الإمام، كما يوضح كل من الخضير (1999) والسدلان (1999) وإبداح والعساف (2014) الذين قاموا باستعراض الضوابط الشرعية لمصليات النساء بتفصيل أكثر، من وجهة نظر فقهية، رجحوا فيها جواز عزل مصليات النساء عن الرجال، سواء جزئيا أو كليا.

يستنبط مما ورد من الأحاديث النبوية الشريفة، وأقوال العلماء في المسألة، أهمية التركيز على الجوانب الوظيفية والسلوكية التالية:

1. التباعد بين الرجال والنساء بالقدر الكافي، مترجما في تحقيق فراغ شخصي كاف لهن أثناء الدخول والخروج،
2. حماية الفراغ الشخصي لمجموعة النساء الحاضرات للصلاة بشكل عام، ولكل امرأة بشكل خاص، وتوفير حيز فراغي خاص بهن لا يخرقه الرجال،
3. تحقيق الخصوصية البصرية بشكل رئيس، ثم الخصوصية السمعية بمستوى مناسب،
4. مراعاة الحاجة بحسب الزمان والمكان (مساجد الأحياء تختلف عن الجوامع الكبرى، الصلوات الخمس تختلف عن التراويح والعيدين والجنائز)،
5. التركيز على هدف الخشوع وما يسهم في تحقيقه للنساء أثناء أداء صلاتهن، وأيضا للرجال.

الاعتبارات المعمارية لمصليات النساء

قام الجديد (1999) بمراجعة ضوابط عمارة المساجد، مستشهدا فيها بالأدلة الشرعية والإراء الفقهية وفقا لأقوال كبار العلماء المعاصرين. ولاحظ المقرن (1999) أن قرابة 41% من عينة من المساجد في مدينة الرياض احتوت مصلى دائما للنساء، بينما وُجد مصلى للنساء في رمضان في 91% من المساجد. مما يوحي بأن الاهتمام بمصليات النساء في رمضان بشكل خاص كان أمرا متبعاً منذ سنوات عديدة. كما وجد المقرن أن المصلين احتاجوا لعدد من المعالجات السلوكية التي رأوا أهمية وجودها في المساجد، ولعل تحليل إجابات المصليات تدلنا على الاحتياجات السلوكية للنساء في مصلياتهن، والتي من أبرزها ضرورة توفير الخشوع، والحاجة إلى مساند للظهر للجلوس إليها، وتهيئة مكان مناسب للأذنية.

ترى بعض الدراسات على المساجد والمراكز الإسلامية في أوروبا وأمريكا أنه لا يوجد رأي

موحد للمسلمين في تلك البلاد بشأن تخصيص مكان لصلاة النساء، فهناك من يرون الفصل في جزء مستقل، وهناك من يرون صلاة النساء في قاعة الرجال نفسها في الصفوف الخلفية، وهناك من توسطوا وجعلوا حاجزا قصيرا يحدد مكان صلاة النساء. ولم يخل النظر لمكان صلاة النساء في الدول الغربية من تأثر ببعض الآراء النسوية التي ترى أحقية النساء التامة في المساواة مع الرجال، حتى في أحكام الصلاة (Kahera et al, 2009). وربما تكون بعض الرؤى متأثرة بتنوع الخلفية الثقافية للمصلين، إضافة إلى وجود قدر من الاعتقاد للاختلاط بين الرجال والنساء بشكل شبه كامل في الحياة العامة خارج المساجد. وانطلاقا من المبدأ نفسه، تعد مصليات النساء نموذجا لمرونة تصميم المساجد في الاستجابة لتطلعات ورغبات المستخدمين، سواء الضروريات أو الاحتياجات أو التحسينات (الشاطي، 1997).

وفي مسابقة معمارية لتصميم مسجد، قام المتسابقون بتقديم ثلاثة حلول لتصميم مصلى النساء، كلها توفر الخصوصية لهن: فصله عن مصلى الرجال، تداخله فراغيا، تلاصقه مع جدار مصلى الرجال. وقد لاحظ الباحث (الغامدي، 2016) أن التداخل الفراغي بين مصلى النساء ومصلى الرجال يتيح فرصة أكبر للاستفادة من مصلى النساء لاستيعاب المصلين الرجال وقت الحاجة، كما في صلاة الجمعة مثلا.

وقد قام وقف سعد وعبد العزيز الموسى بإعداد كتيب يتضمن معايير تصميم المساجد، جاءت فيه توصيات تتعلق بجزء النساء في المساجد، ومنها التشجيع على وضع مصلى النساء في الدور الأرضي خلف مصلى الرجال بحاجز ارتفاعه (2) متر، تسهيلا لوصول النساء، إضافة إلى كونه أكثر أمانا من الدور العلوي، وأقل في متطلبات الصيانة نتيجة لقربه من إشراف الإمام وانعدام الحاجة لمصعد وما يتعلق به من متطلبات الصيانة وزيادة المساحة. كما أوصى التقرير بأن يكون المدخل ساترا ولا يكشف قسم النساء، وأن يكون زجاج النوافذ غير شفاف (الموسى، د. ت.).

وقد وجد الدبل (1999) أن قيام المسجد بدوره في المجتمع يتأثر وبشكل قوي بمستوى التجهيزات والصيانة والإدارة، بما في ذلك مصليات النساء، حيث إنها تعد جزءا مكتملا للتصميم المعماري يسهل قيام المسجد أو المصلى بالوظائف والنشاطات الأخرى المتوقع قيامها فيه، مثل تحفيظ القرآن الكريم والدروس العلمية والمحاضرات.

منهجية البحث

نظرا لقلّة الدراسات المهمة بمصليات النساء في المساجد المعاصرة، فقد رأى الباحث أن تناول موضوع مهم مثل هذا يحتاج إلى الدراسة على عدة مراحل، حيث يتطلب أولا التوسع الأفقي لاستطلاع الآراء وجمع الخبرات والتجارب، واستقصاء الاحتياجات والتطلعات التي تود النساء توافرها في مصلياتهن. وبعد ذلك، يمكن التركيز بعمق على عديد من القضايا المتعلقة بالمصليات، باستخدام أدوات أكثر دقة وعمقا للتوصل إلى تشخيص أدق للمشكلات المعمارية في تلك الأقسام من المساجد والفراغات المتعلقة بها، وفقا لحجم المسجد وطبيعة النشاطات التي تقام فيه وأعداد المشاركات في تلك النشاطات.

بدأت الدراسة بزيارات استكشافية لبعض مصليات النساء التي كان من المتاح الدخول إليها في غير وقت استخدامها، وتدوين الملحوظات الأولية حولها. ومن ثم أجرى الباحث مقابلات شخصية غير مقتنة مع القريبات من النساء لسؤالهن عن أوضاع مصليات النساء التي قمن بالصلاة فيها. وبالتوازي مع هاتين الخطوتين، قام الباحث بمراجعة ما كتب حول مصليات النساء في وسائل التواصل الاجتماعي، وتدوين أبرز الملحوظات عليها. واستنادا إلى هذه الخطوات، مع مراجعة الأدبيات البحثية حول مصليات النساء -رغم قلتها- ساعد في بناء تصور عن كيفية بناء الاستبانة التي تم توزيعها إلكترونيا للوصول إلى أكبر عدد ممكن من المشاركات.

أدوات الدراسة

تعد هذه الدراسة مسحية استكشافية، تتبع المنهج الوصفي لتحقيق أهداف البحث عبر تقديم وصف محدد وشامل للواقع وتعريف المشكلات التي تواجهها المبحوثات (العساف، 1995)، وتستهدف توصيف الوضع الراهن لمصليات النساء، واستطلاع آراء المستخدمين لها عبر أدوات التقرير الذاتي (أندرو، 1998)، وتسليط الضوء على الجوانب المهمة في تصميم وتشغيل المصليات النسائية عبر استبانة صممت لهذا الغرض (Marans, 1987)، وذلك تمهيدا لدراسات أشمل وأعمق، تتضمن تحليلات فراغية وبيئية وسلوكية. وتركز الاستبانة على المحاور التالية:

1. الطريق إلى المدخل
2. بهو المدخل
3. أماكن الوضوء
4. دورات المياه
5. الدرج والمصاعد
6. قاعة الصلاة
7. موقع المصلى

وقد قام الباحث بنشر الاستبانة عبر وسائل التواصل الاجتماعي، في تويتر، وفي عدد من المجموعات البحثية في التلغرام، وعبر مجموعات الواتساب (النسائية خصوصا)، وعبر التواصل الشخصي مع الأقارب والأصدقاء والزلاء لإيصال الاستبانة إلى أكبر عدد ممكن من النساء اللواتي يحضرن لأداء صلاة التراويح في مساجد مدينة الرياض (Zeisel, 1981). بدأ التوزيع بعد انقضاء الثلث الأول من شهر رمضان 1443هـ وحتى نهايته. وقد بلغ عدد الاستبانات المكتملة التي قامت المبحوثات بتعبئتها وإرسالها (1085) نموذجا.

وكان اختيار هذا التوقيت لأجل إعطاء النساء فرصة كافية لاعتماد المصليات، ومعايشة إيجابياتها وسلبياتها، وتكوين قدر معقول من المعرفة بواقعها. لاسيما بعد أن عادت الصلاة إلى وضعها الطبيعي تقريبا بعد زوال الجزء الأكبر من جائحة كورونا، وتراجع حالات الإصابة.

من الأساليب التي أثبتت فعاليتها في تقييم المباني ما يعرف بـ "تقييم المباني بعد الإشغال" أو (post-occupancy evaluation)، وهو منهجية تساعد الباحث في الوصول إلى تقييم واقعي للمبنى وعناصره المعمارية وأدائه الوظيفي والبيئي بعد استخدامه من خلال المستخدمين أنفسهم، مما يقلل التحيزات التي قد يقع فيها بعض الباحثين حينما يقومون بتقييم المباني بالاعتماد على خبراتهم ومعارفهم المجردة بعيدا عن المستخدمين. (Preiser, 2001).

وانطلاقا من المستوى الأول لتقييم ما بعد الإشغال (indicative) بالاعتماد على رأي المستخدمين لتقييم انطباعاتهم عن أوضاع الفراغات المعمارية، وتحديد النقاط التي تستدعي عناية المصممين واهتمامهم لرفع مستوى الراحة والرضا أثناء استخدام تلك الفراغات (Preiser et al, 1988)، جاءت هذه الدراسة ممثلة لمرحلة أولى من دراسات التقييم لأوضاع مصليات النساء، بالتركيز الجغرافي على مدينة الرياض، بحيث تلتوها دراسات أشمل وأعمق للمصليات.

حدود الدراسة

الحدود الموضوعية: الوضع الراهن لمصليات النساء في أحياء مدينة الرياض.

الحدود المكانية: مدينة الرياض.

الحدود الزمانية: شهر رمضان عام 1443 هـ.

الحدود البشرية: النساء اللواتي يحضرن للصلاة في مصليات النساء.

تقييم المصليات من وجهة نظر المستخدمين

سيتم في هذا الجزء استعراض تقييم المستخدمين لفرغات المصليات

الجزء الأول: الطريق إلى المدخل

العدد	النسبة المئوية	واضح بشكل متوسط	واضح جدا	غير واضح
512	47.2	512	473	100
539	49.7	539	43.6	9.2
652	60.1	652	360	186
696	64.1	696	33.2	17.1
476	43.9	476	بمقدار متوسط	لا
557	51.3	557	مضاء بشكل ضعيف	لا غير مضاء
577	53.3	577	مريح ومهيأ بدرجة متوسطة	لا غير مريح وغير مهياً
557	51.3	557	مريض موجود ومناسب	موجود ولكنه غير مناسب
51.3	47.2	51.3	مريض موجود ومناسب	موجود ولكنه غير مناسب

تعد معرفة كيفية الدخول إلى أي مبنى هو التساؤل الأول الذي يرد في ذهن الزائر للمبنى للمرة الأولى (ديسي ولاسويل، 1990)، حيث إنه النقطة الأولى للتفاعل البصري بين المستخدم قبل الوصول إلى المدخل، ثم الدخول. أظهرت الإجابات أن طريق الوصول إلى مصلى النساء متوسط المستوى بالعموم. إلا أن هناك قصورا نسبيا في وضع لوحات كافية تدل على المدخل، وتوفير إضاءة كافية، وتوفير منحدرات لكراسي المعاقين وكبيرات السن.

وهذا يستدعي زيادة العناية بالمدخل، لأنها النقطة الأولى للتفاعل بين المستخدم والمبنى، ولابد من تسهيل الدخول، دون عوائق أو أخطار محتملة.

الجزء الثاني: بهو المدخل

هل الباب سهل الفتح؟	نعم سهل الفتح	متوسط السهولة	صعب الفتح
العدد	725	314	46
النسبة المئوية	66.8	28.9	4.2
هل إضاءة بهو المدخل كافية؟	نعم كافية	متوسطة	غير كافية
العدد	768	278	39
النسبة المئوية	70.8	25.6	3.6
هل بهو المدخل نظيف؟	نعم	متوسطة النظافة	لا
العدد	700	313	72
النسبة المئوية	64.5	28.8	6.6
هل بهو المدخل مرتب وخالي من الأغراض التي لا تتعلق بمصلي النساء؟	نعم مرتبة وخالية من الأغراض	يوجد بها كرائن مياه الشرب فقط	غير مرتبة ويوجد بها أغراض تخزين لا تتعلق بمصلي النساء
العدد	635	233	217
النسبة المئوية	58.5	21.5	20
هل يوجد مكان مناسب لوضع الأحذية؟	نعم	لا	يوجد ولكنه غير مناسب
العدد	637	283	165
النسبة المئوية	58.7	26.1	15.2
هل توجد مقاعد تساعد كبيرات السن على خلع الأحذية وارتدائها؟	لا	نعم	توجد ولكنها قليلة أو غير مناسبة
العدد	641	269	175
النسبة المئوية	59.1	24.8	16.1

يعد بهو المدخل المكان الأول الذي يلتقي فيه المستخدم بمرافق المبنى، وفيه يكون الاستقبال (حتى لو لم يكن عبر وسائل الاستقبال التقليدية، مثل طاولة وموظف استقبال)، ويشعر فيها الزائر بالترحيب أو بعدمه. كانت معظم المصليات جيدة في صنع انطباع أولي للمصليات، إلا أن بعضها كان يستخدم لتخزين المياه أو لأغراض أخرى لا تتعلق بالمصلي نفسه، إضافة إلى أن بعض المصليات اشتمت من عدم توافر مكان مناسب لوضع الأحذية، ولا للجلوس أثناء خلعها وارتدائها، خاصة لكبيرات السن.

من المهم تأكيد ضرورة العناية بصالات المداخل، نظراً لأهميتها في تهيئة مستخدم المبنى بالانتقال من الخارج إلى الداخل، وبداية ممارسة نشاطاته الفعلية داخل المبنى.

الجزء الثالث: أماكن الوضوء

لا أدري		لا	نعم	هل توجد أماكن مخصصة للوضوء، غير مغاسل الأيدي؟
253		347	485	العدد
23.3		32	44.7	النسبة المئوية
لا أدري		داخل دورات المياه	خارج دورات المياه	(2) أين توجد أماكن الوضوء؟
312		375	398	العدد
28.8		34.6	36.7	النسبة المئوية
لا	لا أدري	نعم	إلى حد ما	(3) هل استخدام أماكن الوضوء سهل بشكل عام؟
89	237	371	388	العدد
8.2	21.8	34.2	35.8	النسبة المئوية
نعم	إلى حد ما	لا	لا أدري	(4) هل استخدام أماكن الوضوء سهل لكثيرات السن تحديداً؟
174	270	298	343	العدد
16	24.9	27.5	31.6	النسبة المئوية
لا	نعم	لا أدري	إلى حد ما	(5) هل استخدام أماكن الوضوء بشكل عام آمن، دون مخاطر سقوط أو انزلاق؟
170	271	302	342	العدد
15.7	25	27.8	31.5	النسبة المئوية
إلى حد ما	نعم	لا أدري	لا	(6) هل يوجد مكان مناسب ومرح لغسل الأقدام دون الحاجة إلى رفعها بشكل قد يؤدي إلى السقوط؟
200	202	272	411	العدد
18.4	18.6	25.1	37.9	النسبة المئوية

تراعي كثيرا من المصليات أماكن الوضوء، بالضرورة. مع أن بعض النساء تتجنب الوضوء في مواضع المصليات، نظرا لكونها غير مريحة للاستخدام أو غير نظيفة، حيث يوجد جزء منها داخل دورات المياه. كما يوجد بعضها على شكل مغاسل أيدي. ولكن الملحوظ أن غالبية المصليات غير مريح لكثيرات السن، وربما لا يوفر اعتبارات السلامة من السقوط أثناء غسل الأقدام، حيث لا يوجد مكان مناسب لغسلها.

من الضروري أن يزداد الاهتمام بأماكن الوضوء، ولاسيما في المصليات التي تصل فيها التراويح أو التي توجد على شرايين حركة مرورية رئيسة، مما يستدعي الوقوف وأداء الصلاة في مصليات تلك المساجد.

الجزء الرابع: دورات المياه

لا أدري	لا	نعم	إلى حد ما	1 هل دورات المياه مجهزة بشكل مناسب يكفي احتياجات النساء؟
176	249	313	347	العدد
16.2	22.9	28.8	32	النسبة المئوية
لا	لا أدري	نعم	إلى حد ما	2 هل دورات المياه نظيفة ومرتبّة؟
166	178	341	400	العدد
15.3	16.4	31.4	36.9	النسبة المئوية
لا	لا أدري	إلى حد ما	نعم	3 هل تعمل دورات المياه بشكل جيد؟
90	205	353	437	العدد
8.3	18.9	32.5	40.3	النسبة المئوية
لا	نعم	لا أدري	إلى حد ما	4 هل تستطيع النساء كبيرات السن استخدام دورات المياه بسهولة؟
154	273	297	361	العدد
14.2	25.2	27.4	33.3	النسبة المئوية
لا	لا أدري	إلى حد ما	نعم	5 هل دورات المياه قريبة من غرفة الصلاة، بحيث يمكن لكبيرات السن الذهاب إليها بسهولة دون مساعدة؟
108	110	259	608	العدد
10	10.1	23.9	56	النسبة المئوية
نعم	إلى حد ما	لا أدري	لا	6 هل توجد دورة مياه مناسبة لاستخدام ذوات الإعاقة الحركية، خاصة من يستخدمن الكراسي المتحركة؟
118	135	376	456	العدد
10.9	12.4	34.7	42	النسبة المئوية

تعد دورات المياه في مصليات النساء عنصرا مهما لأداء الصلاة بشكل مريح وميسر، حيث تستعد النساء قبل أداء الصلاة بالوضوء، أو تجديد الوضوء في صلاة التراويح، ولاسيما النساء كبيرات السن أو من ذوات الإعاقة. كانت معظم المصليات أقل من المستوى المتوسط في درجة رضا المستخدمات، حيث تعد صيانة دورات المياه والمحافظة عليها تحديا ضخما أمام الجهات المسؤولة عن ذلك. كما أن مستوى توافر دورة مياه لاستخدام ذوات الإعاقات الحركية ممن يستخدمن الكراسي المتحركة منخفض جدا.

من المهم العناية بدروات المياه، ونظافتها، وصيانتها، لكونها عنصرا مهما جدا لتمكين النساء من أداء الصلاة سواء في مصليات الأوقات على شرايين الحركة المرورية الرئيسة، أو المصليات التي تؤدي فيها صلاة التراويح.

الجزء الخامس: الدرج والمصاعد

1) أين يوجد مصلى النساء؟	جزء في الدور الأرضي وجزء في الدور العلوي	في الدور الأرضي	في الدور العلوي ويوجد مصعد	في الدور العلوي ولا يوجد مصعد
العدد	513	403	96	73
النسبة المئوية	47.3	37.1	8.8	6.7
2) هل حجم المصعد يتسع للكربي المتحرك مع امرأة أخرى تدفع الكربي؟	لا يوجد مصعد	نعم يكفي	يكفي ولكن بصعوبة	لا يكفي
العدد	623	293	117	52
النسبة المئوية	57.4	27	10.8	4.8
3) هل الدرج مريح للصعود؟	نعم	إلى حد ما	المصلى في الدور الأرضي	لا
العدد	381	370	243	91
النسبة المئوية	35.1	34.1	22.4	8.4
4) هل يوجد به مقابض أو درابزين للاستناد عليه أثناء الصعود؟	نعم	المصلى في الدور الأرضي	لا	لا أدري
العدد	662	240	101	82
النسبة المئوية	61	22.1	9.3	7.6

تعد عناصر الحركة الرأسية (الدرج والمصاعد) من أهم الإشكاليات التي توجه المصليات في الأدوار فوق الأرضي، وذلك لوجود عدد من الاعتبارات الإنسانية التي ترتبط بسهولة الوصول إلى الدور العلوي. ومع أن درجة الموافقة على توافر العناصر الرئيسة تعد أعلى من المتوسط غالباً، إلا أن بعض المصليات ما زالت تعاني من نقص أو انعدام الاحتياجات الرئيسة للحركة الرأسية، أو ما يساندها مثل توافر المصاعد في حال كون المصلى في الدور العلوي بأكمله، وتصميم الدرج غير المريح، وافتراده عناصر الأمان.

وفي هذه النقطة تبرز أهمية العناية بتوفير المصاعد الكافية والمريحة، وأيضاً الدرج الذي يراعي سهولة الصعود (ارتفاع القائمة لا يتجاوز 15 سم) حتى تكون مريحة لكبيرات السن أو النساء اللواتي يعانين صعوبة في صعود الدرج، مع توفير مقابض للأيدي تساعد في الاستناد عليها وتقلل احتمالات السقوط.

الجزء السادس: قاعة الصلاة

1) هل المساحة كافية للنساء وقت أداء الصلاة؟	نعم	إلى حد ما	لا
العدد	830	202	53
النسبة المئوية	76.5	18.6	4.9
2) هل تشعرين بالأمان وأنت تصلين هناك؟	نعم	إلى حد ما	لا
العدد	898	145	42
النسبة المئوية	82.8	13.4	3.9
3) هل الإضاءة مناسبة لاحتياجات غرفة الصلاة؟	نعم	أحياناً	لا
العدد	926	121	38
النسبة المئوية	85.3	11.2	3.5
4) هل التكيف جيد وكافي للحصول على درجة حرارة مناسبة؟	نعم	أحياناً	لا

العدد	780	237	68
النسبة المئوية	71.9	21.8	6.3
(5) هل التهوية جيدة وكافية للشعور بنقاء الهواء داخل مكان الصلاة؟	نعم	أحيانا	لا
العدد	675	257	153
النسبة المئوية	62.2	23.7	14.1
(6) هل فرش الأرضية في مكان الصلاة نظيف؟	نعم	متوسط	لا
العدد	740	282	63
النسبة المئوية	68.2	26	5.8
(7) هل فرش الأرضية في مكان الصلاة مريح؟	نعم	متوسط	لا
العدد	800	238	47
النسبة المئوية	73.7	21.9	4.3
(8) هل تتوفر كرسي كافية ومريحة لمن تحتاج الجلوس أثناء الصلاة؟	نعم	أحيانا	لا
العدد	745	272	68
النسبة المئوية	68.7	25.1	6.3
(9) هل يوجد مكان مناسب للأمهات اللواتي يحضرن للصلاة مع أطفالهن؟	لا	نعم	مناسب بدرجة متوسطة
العدد	595	290	200
النسبة المئوية	54.8	26.7	18.4
(10) هل يشكل وجود الأطفال مصدر إزعاج وتشويش يقلل خشوع المصليات؟	نعم	إلى حد ما	لا
العدد	653	316	116
النسبة المئوية	60.2	29.1	10.7
(11) هل تستطيع النساء رؤية قسم الرجال للمتابعة أثناء الصلاة (عند سجود التلاوة مثلا)؟	لا	إلى حد ما	نعم
العدد	889	103	93
النسبة المئوية	81.9	9.5	8.6
(12) هل يمكنكم سماع صوت الإمام بوضوح، دون أي مشكلات؟	نعم	أحيانا توجد بعض المشكلات الصوتية	لا
العدد	891	170	24
النسبة المئوية	82.1	15.7	2.2

أغلب المصليات التي أجابت عنها المبحوثات تتمتع بقاعة صلاة بمواصفات جيدة، من حيث المساحة والنظافة والتكييف والتهوية والإضاءة. لكن مستوى الرضا في حال وجود الأطفال ينخفض بشكل ملحوظ، ولاسيما أن نسبة قليلة من المصليات توفر غرفة مستقلة للأمهات اللواتي يصطحبن أطفالهن. كما أن غالبية المساجد لا تتيح تواعلا بصريا بين مصل النساء والمصلين الرجال، إلا أن النقل الصوتي يعد في معظم الأحوال جيدا جدا.

الجزء السابع: موقع المصلى

مكان آخر	في الساحة الخارجية، مع حواجز ساترة	في الدور العلوي	في الجزء الخلفي من مصلى الرجال، مع حاجز عازل	(1) بشكل عام، لو لم يوجد مكان للمصلى في الدور الأرضي، فهل من الأفضل برأيك أن يكون موقع المصلى؟
72	124	378	511	العدد
6.6	11.4	34.8	47.1	النسبة المئوية

كان المكان الأفضل لموقع المصلى برأي المبحوثات، لو لم يكن فراغا منفصلا في الدور الأرضي، هو مكان خاص بالنساء خلف الرجال، مع حاجز عازل، يليه وضع المصلى في الدور العلوي، وبعد ذلك وضعه في الساحة مع حواجز ساترة. وهذا مؤشر على أن الدور العلوي ليس المكان المفضل لجميع النساء، وبالتالي قد يكون من المناسب تفكير المصمم في حلول مبتكرة لراحة المصليات وتسهيل وصولهن إلى المصلى، دون الحاجة إلى صعود الدرج أو استخدام المصاعد.

التحليل والمناقشة

بعد تحديد العناصر الرئيسية، ذات التأثير الجوهري على استخدام المصليات، من مراجعة الأدبيات ومناقشة الموضوع مع ذوات الاهتمام ومتابعة الإعلام بشقيه الصحفي والاجتماعي، جرى استعراض رأي المشاركات من النساء اللواتي يستخدمن المصليات النسائية. بعد ذلك، أمكن تقييم العناصر الواردة في الاستبانة، ثم تويب المقترحات والتطلعات اللواتي تأمل النساء توافرها في المصليات، يستعرض هذا الجزء الجوانب التي يرى الباحث ضرورة الاهتمام بها.

كانت مستويات الرضا في الغالب أعلى من المتوسط كما أوضحت الاستبانة، عن المصليات التي ترتهاها النساء لصلاة التراويح في شهر رمضان الماضي²، سواء كانت قريبة من المنزل أو من المصليات في المساجد الكبرى التي تميزت بحسن تلاوة الإمام وجودة تجهيزات المكان مما يزيد الراحة أو الخشوع. لكن في المقابل، كانت التوصيات والمقترحات كثيرة جدا، وفي الغالب نتجت من معايشة مصليات نساء متعددة في أماكن مختلفة.

والمناقشة التالية ستكون لعديد من المحاور، أولها توصيات عامة تتعلق بالمصليات عموما. ثم تلت ذلك التوصيات المتعلقة بالمحاور التالية، للارتقاء بوضع المصليات النسائية، انطلاقا من المعلومات التي وردت في الاستبانة، وفقا للتسلسل الوظيفي لاستخدام المصليات، سواء في صلاة التراويح أو في غيرها.

توصيات عامة

1. الاهتمام بالنظافة بشكل عام، وخاصة في دورات المياه، وقاعة الصلاة، والمدخل، وممرات الحركة الخارجية والداخلية، وفق جدول يراعي المحافظة على النظافة، وعدم تراكم الأوساخ أو الأتربة، والعناية بالأثاث والمفروشات (كان هذا المتطلب من أعلى المقترحات تكرارا)،
2. توفير إضاءة كافية، قبل المدخل، وفي بهو المدخل وقاعة الصلاة ودورات المياه وأماكن الوضوء ومتابعة صيانتها بشكل دوري، تكون متوسطة الشدة وغير مجهرة للعين،
3. توفير مستودع يكفي لتخزين المستلزمات والأثاث الزائد والأغراض التي يستغنى عنها مؤقتا وكراتين مياه الشرب، مما يسهل إزالة الأغراض التي لا علاقة لها بالمصلى من المدخل أو قاعة الصلاة،
4. إعادة تقييم تأهيل المساجد، بما فيها مصليات النساء لتحقيق متطلبات الوصول

2 من المحتمل أن تكون الاستعدادات لشهر رمضان قد أسهمت في عناية معظم المساجد بصيانة شاملة للمصليات، كما يحدث عادة في الإضاءة ونظافة الأرضيات وربما السجاد في قسم النساء.

الشامل، ولاسيما في المساجد التي تؤدي فيها صلاة التراويح، حيث يزداد حضور النساء كبيرات السن أو ذوات الإعاقة،
5. الاهتمام بالصيانة وجدولتها بشكل دوري، للإضاءة والتكييف وتمديدات المياه والصرف الصحي، حيث إن ارتباط أعمال الصيانة بالرجال (سواء الإمام والمؤذن أو مشرفي الصيانة من الوزارة) ربما يجعلهم لا ينتبهون لاحتياجات النساء، خاصة في المصلبات التي تستخدم بشكل عابر أو متقطع. إضافة إلى أن معظم أعمال الصيانة تتم في النهار، مما لا يجعل الحكم على مستوى الإضاءة، على سبيل المثال، دقيقا.

المدخل:

1. توضيح المدخل، وتمييزه وإبعاده عن مدخل الرجال
2. وضع المدخل في منطقة متوسطة ليناسب حركة النساء القادمات من جهات مختلفة، وخاصة من جهة مواقف السيارات، حيث إنهن الفئة الأقل معرفة بالمصلى وموقع مدخله
3. وضع اللوحات الإرشادية الدالة على وجود مصلى للنساء (الشكل 4)
4. خلو الطريق إلى مدخل مصلى النساء من أية عوائق بصرية تشعر المصلبات بقلّة الأمان أثناء توجههن لدخول المصلى، مثل الأشجار الكثيفة
5. استخدام درج مريح يؤدي إلى مدخل المصلى
6. توافر منحدر مريح وواسع للكراسي المتحركة بميول مريح (الشكل 5)



الشكل (4)

صورة توضح وجود لوحة إرشادية لمدخل النساء فوق المدخل، لكنها بلون مقارب للخلفية فليست واضحة عن بعد، إضافة إلى كونها اللوحة الوحيدة لإرشاد المصلبات للمدخل.



الشكل (5)

درج أمام مدخل النساء ومنحدر للكراسي المتحركة بجانب المدخل

بهو المدخل

1. تجنب الأبواب الكبيرة الضخمة، والحرص على استخدام الأبواب خفيفة الوزن، صغيرة الحجم، سهلة الفتح (الشكل 6)
2. توفير بهو واسع للمدخل مع ممر عريض
3. توفير أرفف مناسبة وكافية لحفظ الأحذية، تجنبها لوضعها على الأرض
4. توفير كراسي مريحة لكبيرات السن لارتداء وخلع الأحذية، قريبة من أرفف حفظ الأحذية



الشكل (6)

يوضح ضخامة بعض الأبواب، وثقل وزنها، بما يتطلب قوة جسدية لدفعها حتى يمكن فتحها

أماكن الوضوء

1. أماكن خاصة بالوضوء خارج دورات المياه
2. استخدام أرضيات متوسطة الخشونة حتى تقلل الانزلاق
3. توفير مغاسل أقدام أرضية تقلل الحاجة لرفعها بشكل قد يؤدي إلى السقوط (الشكل 7)
4. الحرص على توفير مكان وضوء آمن للنساء الكبيرات عموماً، وللمعاقات بشكل خاص (الشكل 8)
5. توفير العناصر الضرورية، مثل مناديل، صابون، شباشب، مرايا
6. توفير معلق للعباءات قريباً من أماكن الوضوء
7. تهوية وتعطير منطقة الوضوء



الشكل (8)

كرسي وضوء، يمكن استخدامه والشخص جالس، يمكنه من غسل أعضاء الوضوء بما فيها القدمين دون الحاجة للوقوف، مع مقابض تساعد على الوضوء والجلوس والقيام بسهولة وأمان¹



الشكل (7)

أماكن الوضوء المعتادة في المساجد والمصلبات

1 <https://www.architonic.com/en/product/wudumate-wudumate-commercial/1084175>

دورات المياه

1. وضع دورات المياه قريبة من قاعة الصلاة في كل دور وسهل الوصول إليها
2. توفير عدد كاف من دورات المياه كافية متناسب مع عدد المستخدمات وحجم المصل ومناسبة لكبيرات السن والمعاقات
3. استخدام أرضيات مقاومة للانزلاق والسقوط على الأرض أثناء المشي
4. مكان لتغيير للأطفال ونظافتهم حتى لا تستخدم قاعة الصلاة لذلك
5. توفير مغاسل أيدي خاصة بمنطقة دورات المياه، غير أماكن الوضوء
6. استخدام نظام تفريغ مياه المراحيض (السيفون) آلياً
7. توفير العناصر الضرورية، مثل مناديل، صابون، شباشب، مرايا
8. توفير معلق للعباءات قريباً من دورات المياه
9. تهوية منطقة دورات المياه

الدرج والمصاعد

1. وضع المصلى في الدور الأرضي قدر الإمكان، وعدم اللجوء للدور العلوي إلا للضرورة
2. توفير مصعد في المساجد التي يوجد مصلى النساء في الدور العلوي
3. يكون حجم المصعد واسعة كافيًا لاستيعاب الكرسي المتحرك مع مرافقة
4. توفير مقابض أيدي للدرج (درايزين) لمساعدة النساء على صعود الدرج والمحافظة على الاتزان

قاعة الصلاة

1. تقسيم قاعة الصلاة إلى جزء خاص بالنساء بدون أطفال، لتحقيق الخشوع والطمأنينة وقلّة التشتت، ومكان آخر للأمهات مع أطفالهن مع العزل الصوتي الجيد بينهما
2. مكان خاص ومنعزل للأطفال، يتولى رعايتهم ومتابعتهم مع مشرفة/ مشرفات ويفضل تقديم ألعاب وتلوين وقصص لشغل الأطفال أثناء صلاة الأمهات
3. حضانة للأطفال الصغار تُشرف عليها مربيّات مؤهلات خاصة في المساجد الكبيرة
4. زيادة مساحة مصلى النساء ليستوعب عدد المصليات المتوقع حضورهن لأداء الصلاة أو النشاطات الأخرى
5. زيادة المسافة بين الصفوف بما يتيح الصلاة دون سجود امرأة على عباءة الأخرى
6. حواجز لمنع قطع الصلاة وللعربات مسار خاص
7. إزالة الحواجز غير الضرورية، والاقتصر على وضعها في مكان مناسب يحقق الهدف منها دون إعاقة للحركة، خاصة بالنسبة لكبيرات السن أو مستخدمات الكراسي المتحركة
8. الاهتمام برفع الشبائيك عن مستوى النظر من الخارج، حفظًا للخصوصية البصرية للنساء داخل المصلى
9. توفير سجاد مريح، وتنظيفه دوريًا بالبخار لإزالة الروائح العالقة، وإبعاد الغبار، وتغييره عند الحاجة إذا صار قديمًا ربما يفكر في استخدام سجادات قابلة للطّي تستأجر فترة صلاة التراويح لضمان نظافتها وجودتها (تجزئة الفرش، سجادات توضع واحدة إلى جانب أخرى، استئجارها قبل رمضان مثلًا)
10. وضع بابين أو أكثر للمصليات التي تزدحم فيها النساء، لاسيما المصليات الكبيرة، مع توفير مخارج للطوارئ، ومساحة كافية للتحرك خاصة عند الحاجة للإخلاء دون تزاخم أو تدافع

الترتيب الداخلي لقاعة الصلاة

1. كراسي مناسبة لمن يحتجها من المصليات، وتكون بعدد كافٍ بحسب المتوقع حضورهن
2. مساند للظهر للمصليات، خاصة للراحة أثناء قراءة القرآن الكريم، وأثناء انتظار الصلاة
3. تحديد مكان الكراسي في الصفوف (الشكل 9)
4. علامات توضح أماكن الصفوف
5. ساعة حائط، توضح أوقات الصلوات
6. أرصفة للمصاحف تكون بارتفاع مناسب قريبًا من المصليات وبعيدًا عن عبث الأطفال مع مصاحف كبيرة الحروف وحوامل مرنة



الشكل (9)

جلسة كرسي بمسند ظهر لكبيرات السن أو ذوات الإعاقة دون الحاجة للكراسي المتحركة، ملاصقة لمساند ظهر أرضية، يمكن استخدامها لجلوس بعض المصليات وقت الحاجة لكنها بدون مسند للظهر.

موقع المصلي

1. إبعاد مكان الرجال عن مصلى النساء لتحقيق الخصوصية، خاصة السمعية، في المساجد الكبيرة ذات الحضور النسائي الكثيف بحيث تشعر النساء بالأمان، ويمكن تخصيص دور خاص للنساء بأكمله
2. جعل مصلى النساء خلف مصلى الرجال، مفصول بحواجز زجاجية أو مشربيات خاصة في المساجد الصغيرة أو التي يكون حضور النساء فيها قليل

معالجات وتجهيزات

1. توفير المستلزمات الصحية، مثل المناديل في دروات المياه وأماكن الوضوء والمغاسل، والصابون عند المغاسل، وتوزيع حاويات النفايات بالقرب من الأماكن المذكورة، إضافة إلى بهو المدخل وقاعة الصلاة
2. ماء للشرب يكون في مكان غير معيق للحركة، ولا يسبب ازدحامات تعيق الصلاة، خاصة البرادات أو التلاجات، وتتوفر مبردة وعادية
3. مكبرات صوت واضحة لنقل صوت الإمام دون ارتفاع أو انخفاض
4. تكييف مناسب يكون بدرجة حرارة مناسبة ومتوسطة بين رغبات الجميع، والتحكم فيها لدى المسؤول. وربما التفكير في تخصيص منطقة باردة وأخرى أقل برودة لمراعاة اختلاف الرغبات وتوفير الراحة لأغلب المصليات
5. تبخير وتعطير المصلى والمنطقة المحيطة به، مثل أماكن الوضوء ودورات المياه، بروائح هادئة غير قوية ولا مزعجة، ولا تلتصق بالعباءات أو الملابس (نظرا لخروج بعض المصليات مع السائقين)
6. توفير قدر كاف من التهوية، سواء الطبيعية عبر النوافذ أو عبر أجهزة التهوية، مع مراعاة إمكانية الاختيار بحسب الجو الخارجي (معتدل، غبار، حار)
7. شاشة لمتابعة الإمام، تتيح للمصليات معرفة الفرق بين الركوع وسجود التلاوة
8. كاميرات مراقبة
9. ركن طوارئ واسعافات أولية
10. جرس طوارئ، يمكن استخدامه لتنبيه الرجال إلى وقوع ما يستدعي النجدة والتدخل للمساعدة
11. شراشف وسجادات معقمة ومغلقة

12. تشجيع النشاطات الأخرى للاستفادة من المصل

13. إقامة محاضرات ودروس علمية

14. وضع لوحات إرشادية وتعليمية

15. حلقات قرآنية وتحفيظ

جوانب إدارية وبشرية

1. مشرفات لتنظيم الصفوف ومتابعة النظام ومنع العبث بمحتويات المصل مع الإشراف والمتابعة

2. عاملات نظافة للعناية المستمرة بالمصل وخاصة دورات المياه، مع الإشراف والمتابعة

3. حارس أو حارسة أمن، يكون الحارس عند الباب ويضبط حركة الدخول والخروج لاسيما وقت الطوارئ (اشتباه في سرقة أو دخول رجل) ووجود حارسة أمن تراقب المصل (خاصة المصليات الكبيرة) لمنع السرقات خاصة والمشكلات الأخرى

4. منطوقات للتنظيم وخاصة لمساعدة كبريات السن

5. عدم اصطحاب الأطفال، تجنباً لإزعاج المصليات والتأثير على مستوى الخشوع

6. عدم استخدام مصلى النساء لتناول الإفطار والسحور للمعتكفين، ولا يكون إفطار الصائمين في جزء النساء، حفظاً للمصلى من بقايا الطعام وإبقائه برائحة جيدة (الشكل 10)

7. الاهتمام بتوفير الطاقة، فلا حاجة لتشغيل الإضاءة والتكييف إذا لم يكن هناك نساء في المصل أو عددهن قليل لا يستلزم تشغيل الأجهزة كلها

8. غرف للمعتكفات وأثاث مناسب لهن: طاولات ودوايب وجلسات أرضية، مع مكان لتناول السحور والإفطار، وشرب الشاي أو القهوة



الشكل (10)

موائد تقطير الصائمين في المساجد، أحياناً تكون في مصلى النساء، نظراً لانشغال مسجد الرجال بصلاة المغرب³

استخلاص المعايير التصميمية لمصليات النساء

بعد مراجعة التوصيات التي تم التوصل إليها عبر الاستبانة، نقدم في الجدول التالي قائمة أولية بمعايير التصميم لمصليات النساء، بحيث يمكن العمل على مراجعتها من قبل فريق متخصص في تصميم وإنشاء وتشغيل وصيانة المساجد من وزارة الشؤون الإسلامية ومن غيرها من المهتمين.

3 <https://www.alyaum.com/>

رقم	المعيار	الهدف من المعيار
توصيات عامة للمصلى		
1	استخدام أرضيات خشنة أو متوسطة الخشونة	تجنباً للسقوط أو الانزلاق، خاصة في المناطق التي تتعرض للمياه، مثل المدخل عند نزول الأمطار، وأماكن الوضوء، وفراغ دورات المياه
2	وضع تغطيات أرضية مطاطية للأماكن المبتلة للوقاية من السقوط على الأرض أثناء الوضوء أو المشي	حماية النساء أثناء التنقل من السقوط في الأماكن التي قد يتسرب إليها البلل في الأرضيات، فتمنع الأرضية المطاطية المرتفعة الانزلاق بينما تتيح حركة الماء نحو فتحات التصريف
3	تكون قاعة الصلاة وأماكن الوضوء ودورات المياه بنفس المستوى مع الفراغات المحيطة بها	سهولة وصول مستخدمات الكراسي المتحركة، وتجنب تعثر كيريات السن
3	توفير إضاءة كافية خارجية وداخلية	جعل المكان مرئياً بوضوح قبل الدخول، وأيضاً أثناء الدخول، وفي الفراغات الداخلية
المدخل		
4	وضع لوحات واضحة ويحجم مناسب تشير إلى مدخل مصلى النساء مرئية من جميع جهات المسجد الخارجية، وجهة مواقف السيارات	تسهيل التعرف على المدخل من جميع الجهات
5	إبراز المدخل بتكوين معماري مميز بصريا وواضح، لونيًا و تكو بنيا	لتمييزه عن بقية التشكيلات المعمارية في المسجد، خاصة مدخل الرجال
6	إزالة أي عوائق بصرية أمام المدخل، وتجنب ما قد يتحول مستقبلاً لعوائق بصرية مثل مواقع أحواض الشجر قريباً من المدخل أو على الطريق المؤدية إليه	تفادياً لوجود أماكن يمكن أن يختبئ خلفها أشخاص ذوي أهداف مشبوهة، كالاغتداء أو السرقة
7	استخدام درج مريح يؤدي إلى مدخل المصل، يراعي الأبعاد المناسبة ل كبار السن (15 سم قائمة و30 سم للأفقية)	سهولة صعود المصليات للدرج عند دخول المصل
8	تزويد درج المدخل بمقبض للأيدي (درازين)	الاستناد على المقبض، والحماية من السقوط
9	توافر منحدر مريح وواسع للكراسي المتحركة بميول مريح (1:12) على الأقل	سهولة استخدام الكراسي المتحركة عند دخول المصل
10	تزويد منحدر الكراسي المتحركة بحاجز (درازين)	منع السقوط أو انزلاق الكراسي مع جهة الجوانب
11	استخدام أبواب ذات وزن يناسب القدرة البدنية لمتوسط المستخدمين	لتنسيط المصليات فتح الباب بسهولة، دون إضرار بهن أو عجزهن عن فتح الباب كما في بعض الأبواب الحديدية الثقيلة
12	في حال استخدام أبواب خارجية ثقيلة الوزن، يجب استخدام أبواب بحساسات كهربائية ذاتية الفتح، مع فتح الأبواب الثقيلة طوال ساعات استخدام المصل	لتسهيل الدخول، دون الحاجة لفتح الباب الثقيل كل مرة تريد إحدى النساء الدخول
13	توفير بهو مدخل لا يقل عرض ممراته عن مترين، ولا تقل مساحته عن (10 متر مربع) للمصليات الصغيرة، و(20 متر مربع) للمصليات المتوسطة، و(30 متر مربع) للمصليات الكبيرة	يكون فراغاً انتقالياً بين الخارج وقاعة الصلاة، كافياً لحركة المصليات والكراسي المتحركة، وتفتح عليه الخدمات الأخرى، مثل دورات المياه وأماكن الوضوء
14	توفير مكان لحفظ الأحذية، على شكل أرفف بارتراف لا يزيد عن (1.80 متر) تكفي لعدد يساوي عدد النساء المصليات	تجنباً لخلع الأحذية بشكل عشوائي مما يعيق حركة الكراسي المتحركة، وقد يسبب تعثر بعض المصليات خاصة كيريات السن أو من يستخدمن العكازات فيها
15	توفير كراسي جلوس بالقرب من رفوف الأحذية	لاستخدام كيريات السن أثناء خلع وإرتداء الأحذية

أماكن الوضوء

16	تكون أماكن الوضوء في فراغ خاص ومنعزل عن فراغ دورات المياه، ولكن قريبة منها	فصلا للوظائف ذات الطبيعة المختلفة، وتجنباً لأي رطوبة محتملة قد تكون نجسة
17	توفير مغاسل أقدام أرضية لا تتطلب رفع الأرجل للوضوء أكثر من (40 سم) عن الأرضية	تجنباً للسقوط نتيجة لرفع الأرجل بشكل يخل بالتوازن
18	عدد أماكن الوضوء لا يقل عن اثنين، إذا كان العدد المتوقع في حدود 25 مصلية، يضاف بعدها مكان وضوء لكل 20 مصلية إضافية	حتى تكون كافية لاحتياج المستخدمين، وتحسباً لاحتمال تعطل أحدها فتكون الأخرى تعمل بشكل مقبول
19	توفير مكان وضوء واحد على الأقل بقياسات مناسبة يشتمل على مقابض أيدي وجلسة مريحة للمعاقات أو كبار السن	لتحقيق السلامة الجسدية بتجنب السقوط، خاصة بالنسبة للمعاقات أو كبار السن أو الحوامل
20	توفير معاليق للعباءات قريباً من مكان الوضوء	حماية لها من البلل أو النجاسة أو الأوساخ

دورات المياه

21	توفير أحواض مغاسل خاصة لتنظيف اليدين في نفس فراغ دورات المياه وقريباً منها	لضمان النظافة قبل دخول قاعة الصلاة، وعدم استخدامها للوضوء
22	تكون المغاسل في فراغ دورات المياه مستقلة عن مكان الوضوء	مراعاة لمتطلبات النظافة والتعقيم، إضافة إلى تجنب خطر السقوط عند استخدامها لغسل الأقدام
23	وضع دورات المياه قريباً من قاعة الصلاة، ولكنها منعزلة عنها	حماية لقاعة الصلاة من الروائح وأصوات المياه وأصوات المستخدمين لها
24	عدد دورات المياه لا تقل عن اثنين، إذا كان العدد المتوقع في حدود 25 مصلية، يضاف بعدها دورة مياه لكل 20 مصلية إضافية	حتى تكون كافية لاحتياج المستخدمين، وتحسباً لاحتمال تعطل أحدها فتكون الأخرى تعمل بشكل مقبول
25	تجهيز دورة مياه واحدة على الأقل مجهزة بشكل كامل للمعاقات أو كبار السن، تستوعب الكرسي المتحرك مع مرافقة للمساعدة	تجنباً للسقوط، خاصة بالنسبة للمعاقات أو كبار السن أو الحوامل
26	توفير مكان خاص، مزود بتأمين للطفل من السقوط، لتغيير الأطفال في المصليات التي تسمح باصطحاب الأطفال	تفادياً لقيام الأمهات بالتغيير لأطفالهن في أماكن غير مهيأة لذلك، تفادياً للروائح أو النجاسة
27	توفير معاليق للعباءات قريباً من دورات المياه	حماية لها من البلل أو النجاسة أو الأوساخ

الدرج والمصعد

28	وضع المصلى في الدور الأرضي إلا عند وجود حاجة لوضعه في الدور العلوي	تقليلاً للجهد أثناء الصعود والنزول، وتسهيل الأمر على المعاقات وكبار السن والحوامل
29	عند وضع المصلى في الدور العلوي يجب توفير مصعد	ليكون الانتقال إلى الدور العلوي سهلاً ودون مشقة
30	لا يقل حجم المصعد عن مساحة كافية لكرسي متحرك مع امرأة أخرى مرافقة	لتمكين المرافقة من الدخول إلى المصعد والخروج منه بسهولة أثناء دفعها صاحبة الكرسي المتحرك
31	وضع مقابض أيدي على جانبي الدرج	لمساعدة المصليات في المحافظة على الاتزان
32	تخشين حواف الدرج منعاً للانزلاق والسقوط	تفادياً للانزلاق أو السقوط
33	تمييز بلاط الدرج بألوان متباينة مع بلاط الأرضية عند بداية ونهاية الدرج	للتنبه البصري للمصليات بوجود تغير في المستوى، خاصة كبار السن أو ضعيفات البصر

قاعة الصلاة

34	توفير مساند ظهر ثابتة (إما مبنية أو مركبة مغطاة بقماش ومبطنة بالإسفنج) في الصف الأول، بارتفاع (40 سم)	للاستناد إليها لمن تريد الجلوس على الأرض قبل أو بعد الصلاة، كما يمكن استخدامها للجلوس عليها لمن يمكنها الوقوف ولكن لا تستطيع السجود
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35	توفير كرسي ثابتة ضمن المساند في الصف الأول	لجلوس كبيرات السن أو المعاقات ممن لا يستطعن الوقوف
36	تقسيم قاعة الصلاة في المصليات الكبيرة إلى جزئين: للنساء بدون أطفال، وللنساء مع أطفال	لتقليل الإزعاج في صلاة التراويح وزيادة خشوع النساء اللواتي يأتين للصلاة بدون أطفال
37	لا تقل المساحة المخصصة للمرأة المصلية عن 1,20 متر مربع	لاستيعاب الملابس الفضفاضة التي ترتديها النساء أثناء الصلاة، فلا تسجد امرأة على عباءة الأخرى، وتبتعد عن مكان أقدام النساء في الصفوف المجاورة
38	وضع بابين على الأقل في المصليات متوسطة الحجم، وثلاثة إلى أربعة أبواب في المصليات الكبيرة	سهولة الانصراف بعد انتهاء الصلاة دون نزاحم، والخروج السريع عند وقوع أي طارئ يستدعي إخلاء المبنى
39	شاشة لمتابعة الإمام	لمساعدة النساء في التعرف على تكبيرات سجود التلاوة وتمييزها عن تكبيرات الركوع
40	ركن طوارئ واسعافات أولية	في المساجد المتوسطة والكبيرة، تحسبا لأي ظرف يطرأ لإحدى النساء ريثما يتم التعامل معه بشكل مناسب

الخاتمة والتوصيات

قدمت الدراسة استعراضاً لأهم العناصر المعمارية والوظيفية استناداً إلى مراجعة الأدبيات وإلى المقابلات الاستكشافية ومراجعة الصحافة ووسائل التواصل الاجتماعي. بعد ذلك جمعت آراء المشاركين حول الوضع الراهن للمصليات النسائية، وما احتاجتهن ورغباتهن في تلك المصليات.

رأت الدراسة أن هناك عديد من التوصيات التي من الضروري الاهتمام بها لجعل مصليات النساء مناسبة لاحتياجات المستخدمات، وهذه التوصيات تتراوح في أهميتها وإمكانية تطبيقها بحسب حجم المصل، وموقعه، وطبيعة استخدامه، والنشاطات المصاحبة التي تمارس فيه. كما اقترحت الدراسة عدداً من المعايير التصميمية الأولية لمصليات النساء، بناءً على إفادة المستفيدات من النساء اللواتي يرتدن مصليات النساء، ومراجعة الأدبيات، ومتابعة التقارير واستطلاعات الرأي حول مشكلات مصليات النساء ومعالجتهن عند الصلاة فيها.

ولذلك فإن من التوصيات المهمة في هذه المقام أن يكون هناك تمييز وتصنيف للمصليات، بحيث يكون التعامل مع كل فئة منها بحسب وظيفتها وطبيعة استخدامها. ومن التقسيمات المقترحة، على سبيل المثال: مصليات رضائية، مصليات ثقيلة (تستخدمها النساء أوقات التنقلات، مثل المغرب والعشاء في الغالب)، مصليات مستمرة (الموجودة في المساجد الكبرى، وتقام فيها نشاطات أخرى غير الصلاة، مثل المحاضرات والدروس)، وهناك مصليات الجنائز الكبرى (وهي التي تشمل المصليات المستمرة ويضاف إليها مكان للنساء لصلاة الجنائز، مما يتطلب استعدادات خاصة، من حيث الحجم والمساحة وطبيعة الاستخدام للعزبة مثلاً، وإضافة مكان لذوات الأعدار لحضور العزاء).

كما ترى الدراسة إمكانية التفكير في وضع مصلى رمضاني مؤقت في المساجد التي لا تحتاج مصليات النساء إلا في رمضان، ويمكن أن يكون في خلف قاعة الصلاة نفسها، مع وضع حواجز بصرية وصوتية بدرجة كافية ومناسبة بحسب المكان وطبيعة المستخدمين. أما في المصليات الصغيرة فيمكن ربطها ولو بشكل جزئي بمصلى الرجال، بحيث يمكن سماع صوت الإمام بوضوح أثناء الصلاة، وأيضاً قدرة النساء على التواصل صوتياً مع قسم الرجال عند الحاجة.

كما أن طبيعة استخدام مصليات النساء، التي تركز خاصة في مساجد الأعياء، تستدعي أهمية جدولة الصيانة بشكل متزامن مع صيانة مصلى الرجال، بحيث لا تترك مصليات

النساء لفترة طويلة دون صيانة (قبيل رمضان فقط)، لاسيما أن قلة الصيانة قد تسبب تراكماً للمشكلات، مثلما يحدث لدورات المياه، شبكات تغذية المياه والصرف الصحي، سجاد الأرضيات، وغيرها. وقد يكون من الجدير بالتأمل استخدام سجاد غير ثابت، يمكن طيه وتنظيفه وتعقيمه قبل رمضان تجنباً لتراكم الغبار والروائح الأخرى بسبب طول فترة عدم الاستخدام، أو بسبب قلة العناية بها مقارنة بأقسام الرجال. ومن الممكن وضع دورات المياه النسائية منعزلة عن مبنى المسجد، ولكن قريبة منه وسهلة الوصول، للاستخدام خارج أوقات استخدام المصلى نفسه، كما هو الحال في المساجد التي تكون قريبة أو ملاصقة للحدائق العامة في الأحياء أو بالقرب من ملاعب الأطفال.

ومن الأمور التي ترى الدراسة ضرورة الاهتمام بها ووضع حلول شاملة لها الجانب الأمني في مصليات النساء، حيث يكثر قلق وتخوف النساء من استخدام بعض المصليات، وتزد من وقت لآخر شكاوى من مخاوف أمنية، ولاسيما في المصليات التي تقل فيها أعداد النساء اللواتي يرتدنها، مما يجعل صلاة المرأة بمفردها أو مع عدد قليل مخيفاً. ولاسيما أن بعضها يوفر مكاناً منعزلاً بعيداً عن أعين ومسمع الآخرين، سواء بسبب اختيار الموقع أو لوجود عوائق بصرية كالأشجار، بما يسهل الطريق أمام المجرمين لو أرادوا التسلل إلى مصلى النساء وقت الصلاة أو قبلها؛ مما يصعب الاستنجاد وقت الضرورة.

ونظراً لطبيعة استخدام المصليات، وأحوال النساء اللواتي يستخدمنها، فإنه يصبح من الضروري الاهتمام بتطبيق متطلبات الوصول الشامل، بحيث تستطيع جميع المستخدمات الوصول إلى جميع أجزاء المصلى بسهولة وأمان، ابتداءً من المدخل وما يتطلبه من تهئية كالمندحر ذي الميول سهل الاستخدام والدرج المريح المحاط بمقابض، مروراً بالأبواب سهلة الفتح، وانتهاءً بدورات المياه وأماكن الوضوء.

أما على المستوى البحثي، فمن التوصيات المهمة التي تراها الدراسة تشجيع الباحثات من النساء على القيام بدراسات أعمق وأدق حول مصليات النساء، باستخدام وسائل أكثر ملاءمة لهن مثل المراقبة والمشاركة والمقابلات الشخصية. إضافة إلى إجراء مزيد من الدراسات حول خصائص مصليات النساء من الناحية الفراغية والبيئية والسلوكية، بهدف نقل تصور نسائي أكثر دقة يساهم في تطوير معايير تصميمية معاصرة لمصليات النساء تراعي احتياجات المستخدمات في المصليات الحالية، أو التي يخطط لبنائها في المساجد تحت التصميم أو الإنشاء.

كما نرى أهمية البدء في مراجعة الاعتبارات التصميمية لمصليات النساء، وتطوير معايير تصميمية، ربما تكون القائمة الأولية المقترحة في هذه الدراسة نواة لها، بحيث يتم فحصها وتطويرها وتطويرها لتصبح قائمة متكاملة يلتزم المصممون بها عند تصميم المساجد عموماً، ومصليات النساء خصوصاً.

ملحق

في هذا الجزء نستعرض المقترحات التي رأَت النساء أهمية مراعاتها في تصميم المصليات، وتأثيرها تجهيزها تقنياً، تشغيلها وصيانتها، إدارتها فراغياً وبشرياً، تجهيزاتها وتموينها، كما توضح الجداول التالية:

التصميم المعماري

الرقم	المقترح	تكرار	التفصيل
1	مستودع	83	مكان مناسب وكاف لتخزين الأغراض الزائدة أو التي يستغنى عنها مؤقتاً، لاسيما أن معظم المساجد لا يوجد بها مكان كاف مخصص للتخزين
2	مكان خاص للأمهات مع أطفالهن	70	تقسيم قاعة الصلاة إلى جزء خاص بالنساء بدون أطفال، لتحقيق الخشوع والطمأنينة وقلة التشتت، ومكان آخر للأمهات مع أطفالهن مع العزل الصوتي الجيد بينهما
3	دورات مياه كافية ومناسبة	55	دورات مياه كافية لعدد المصلبات وحجم المصلى ومناسبة لكبيرات السن والمعاقات قريبة من قاعة الصلاة في كل دور لسهولة الوصول، ولكن تكون معزولة عنها وغير مرتبطة بها مباشرة مغاسل أيدي ومرابيا كافية مفصولة عن منطقة دورات المياه، استخدام نظام تفرغ مياه المراحيض (السيفون) آلياً مكان لتغيير للأطفال حتى لا تستخدم قاعة الصلاة لذلك
4	مكان خاص للأطفال	50	مكان خاص ومنعزل للأطفال، يتولى رعايتهم ومتابعتهم مع مشرفة/ مشرفات ويفضل تقديم ألعاب وتلون وقصص لشغل الأطفال أثناء صلاة الأمهات حضانة للأطفال الصغار خاصة في المساجد الكبيرة
5	توسيع مصلى النساء	43	يهو واسع للمدخل أو قاعة قبل المصلى، أو على الأقل ممر عريض واسع والمدخل المؤدي إليه مع الدرج إن وجد زيادة مساحة مصلى النساء زيادة المسافة بين الصفوف بما يتيح الصلاة دون سجود امرأة على عباءة الأخرى
6	أماكن خاصة بالوضوء	40	أماكن خاصة بالوضوء خارج دورات المياه استخدام أرضيات متوسطة الخشونة حتى تقلل الانزلاق مجهزة بمغاسل أقدام أرضية لتقليل السقوط توفير العناصر الضرورية، مثل معاليق عباءات، مناديل، صابون، أحذية خاصة، مرابيا
7	العناية بالمدخل وسهولة الدخول	38	توضيح مدخل النساء وتمييزه بصريا عن مدخل الرجال تقاديا لدخول الرجال غير المقصود، وإتارته ليلا إبعاد مدخل الرجال عن مدخل النساء إبعاد مكان الرجال عن مصلى النساء لتحقيق الخصوصية، خاصة السمعية، في المساجد الكبيرة ذات الحضور النسائي الكثيف بحيث تشعر النساء بالأمان، ويمكن تخصيص دور خاص للنساء بأكمله منحدر للعربات درابزين للدرج
8	تهوية كافية	37	توفير قدر كاف من التهوية، سواء الطبيعية عبر النوافذ أو عبر أجهزة التهوية، مع مراعاة إمكانية الاختيار بحسب الجو الخارجي (معتدل، غبار، حار)
10	توفير مصاعد كافية	28	مصاعد في المساجد التي يوجد مصلى النساء في الدور العلوي مصاعد واسعة تكفي للكروسي المتحرك مع مساعدة تدفعها
11	إضاءة كافية	27	إضاءة كافية متوسطة الشدة وغير مجهزة للعين، مع تفضيل الإضاءة الصفراء على البيضاء (أو على الأقل الأبيض المصفر)
12	مصلى النساء خلف مصلى الرجال	25	جعل مصلى النساء خلف مصلى الرجال، مفصول بحواجز زجاجية أو مشربيات خاصة في المساجد الصغيرة أو التي يكون حضور النساء فيها قليل مراعاة أن الحاجة لمصلى النساء أحيانا مؤقتة، ولذلك قد يكتفى بحاجز مؤقت بين الرجال والنساء في رمضان

13	حواجز الصلاة	16	حواجز لمنع قطع الصلاة وللعربات مسار خاص إزالة الحواجز غير الضرورية، والاقتصر على وضعها في مكان مناسب يحقق الهدف منها دون إعاقة للحركة، خاصة بالنسبة لكبيرات السن أو مستخدمات الكراسي المتحركة
14	المعتكفات في رمضان	9	غرف للمعتكفات وأثاث مناسب لهن: طاولات ودواليب وجلسات أرضية، مع مكان لتناول المأكولات والمشروبات
15	موقع المصلى	8	وضع المصلى في الدور الأرضي
16	مخرج طوارئ	3	مخارج طوارئ بحسب حجم المصلى، والمواقع المناسبة لها
17	الأبواب	3	باين لمنع التزاحم خاصة للمصلين الكبيرة أبواب خفيفة الوزن، صغيرة الحجم، سهلة الفتح، بدون المقابض التي تتطلب قوة بدنية لفتحها
18	ارتفاع النوافذ	1	الاهتمام برفع الشبايك عن مستوى النظر من الخارج، حفظا للخصوصية البصرية للنساء داخل المصلى

التجهيزات التقنية والأثاث

	المقترح	تكرار	التفصيل
1	كراسي مناسبة وكافية	69	كراسي مناسبة وكافية والتفكير في الكراسي الالكترونية
2	رفوف للأحذية	60	رفوف مناسبة وكافية للأحذية
3	تحديد مكان الكراسي في الصفوف	38	تحديد مكان الكراسي في الصفوف
4	توفير مصاحف مع ترتيبها	30	مصاحف، مع أرفف للمصاحف تكون بارتفاع مناسب قريبا من المصلين وبعيدا عن عبث الأطفال مع مصاحف كبيرة الحروف وحوامل مرنة
5	وضوح صوت الإمام	24	مكبرات صوت واضحة لنقل صوت الإمام دون ارتفاع أو انخفاض
6	مساند للظهر	11	مساند للظهر للمصلين، خاصة للراحة أثناء قراءة القرآن الكريم، وأثناء انتظار الصلاة
7	معلق للعباءات	11	معلق للعباءات قريب من أماكن الوضوء وأيضا دورات المياه
8	شاشة لمتابعة الإمام	10	شاشة لمتابعة الإمام
9	علامات الصفوف	7	علامات توضح أماكن الصفوف
10	ساعة حائط	5	ساعة حائط، توضح أوقات الصلوات
11	كراسي بجانب دواب الأحذية	4	كراسي عند الأحذية لمساعدة كبيرات السن في ارتداء أحذيتهم براحة وأمان
12	كاميرات مراقبة	3	كاميرات مراقبة يراعى في مواقعها حماية خصوصية المصلين، مع إمكانية متابعة ما يحدث أمام المدخل وفي الممرات والمصلى نفسه
13	ركن طوارئ واسعافات أولية	1	ركن طوارئ واسعافات أولية، مع تدريب إحدى المشرفات على القيام بالإسعافات الأولية خاصة في المساجد الكبيرة
14	شراشف وسجاجد معقمة ومغلقة	1	شراشف وسجاجد معقمة ومغلقة، خاصة في أوقات انتشار الأوبئة أو أوقات العدوى
15	الاستعداد للطوارئ	1	الاستعداد للطوارئ (كالإخلاء دون تزاحم أو تدافع)
16	جرس طوارئ	1	جرس طوارئ في مكان واضح للتنبيه عند وقوع أمر يستدعي التدخل من قبل الرجال للمساعدة

التشغيل والصيانة

المقترح	تكرار	التفصيل
1	172	المحافظة على النظافة وخاصة مكان الصلاة ودورات المياه
2	73	تكييف مناسب يكون بدرجة حرارة مناسبة ومتوسطة بين رغبات الجميع، والتحكم فيها لدى المسؤول. وربما التفكير في تخصيص منطقة باردة وأخرى أقل برودة لمراعاة اختلاف الرغبات وتوفير الراحة لأغلب المصلين
3	74	تبخير وتعطير المصلى وتبخير والمنطقة المحيطة به، مثل أماكن الوضوء ودورات المياه، بروائح هادئة غير قوية ولا مزعجة، تلتطف الرائحة ولا تلتصق بالعباءات أو الملابس (نظرا لخروج بعض المصلين مع السائقين)
4	55	توفير سجاد مريح، وتنظيفه دوريا بالبخار لإزالة الروائح العالقة، وإبعاد الغبار، وتغييره عند الحاجة إذا صار قديما ربما يفكر في استخدام سجادات قابلة للطي أو سجادات توضع واحدة إلى جانب أخرى، تستأجر قبل رمضان فترة صلاة التراويح لضمان نظافتها وجودتها

الجوانب الإدارية والبشرية

المقترح	تكرار	التفصيل
1	187	مشرفات لتناحية النظام وتنظيم الصفوف ومنع العبث بمحتويات المصلى مع الإشراف والمتابعة
2	48	عاملات نظافة للعناية المستمرة بالمصلى وخاصة دورات المياه، مع الإشراف والمتابعة
3	48	منع اصطحاب الأطفال ومرافقتهم الأمهات في صلاة التراويح
4	25	حارس أو حارسة أمن، يكون الحارس عند الباب ويضبط حركة الدخول والخروج لاسيما وقت الطوارئ (اشتباه في سرقة أو دخول رجل) ووجود حارسة أمن تراقب المصلى (خاصة المصلين الكبيرة) لمنع السرقات خاصة، وغيرها من المشكلات
5	7	متطوعات لمساعدة كبريات السن والمشاركة في التنظيم
6	2	عدم استخدام مصلى النساء لتناول الإفطار والسحور للمعتكفين، ولا يكون إفطار الصائمين في جزء النساء، حفظا للمصلى من بقايا الطعام وإبقائه برائحة جيدة

التجهيزات والتموينات والنشاطات

	المقترح	تكرار	التفصيل
1	مناديل	85	توفير مناديل وجه ومناديل لدورات المياه
2	ماء للشرب	65	وضع ماء للشرب في مكان غير معيق للحركة، ولا يسبب ازدحامات تعيق الصلاة، خاصة البرادات أو الثلجات، مع الحرص على توفيرها مبردة وعادية
3	محاضرات ودروس علمية	30	إقامة محاضرات ودروس علمية في مصلى النساء خاصة بهن
4	لوحات إرشادية وتعليمية	29	لوحات تعليمية عن أحكام الصلاة وإرشادية لتنظيم الصفوف
5	صابون	26	صابون أيدي لضمان النظافة والتعقيم بعد استخدام دورات المياه
6	سلال نفايات	22	سلال نفايات بعدد كاف وفي جميع الأماكن التي يتوقع الحاجة فيها لرمي المهملات
7	حلقات قرآنية وتحفيظ	19	حلقات دراسات قرآنية وتحفيظ للقرآن الكريم



معايير تصميمية مقترحة للمساجد للحد من تفشي العدوى، وباء كورونا (covid19) حالة دراسية.

الدكتور أحمد طومان
جامعة الملك سعود - الرياض

ملخص دراسة:

عم وباء كورونا العالم، واستوجب تغييراً لأنماط الحياة، ومنها المساجد، حيث أغلقت لعدة أسابيع في عدد من الدول بما فيها المملكة العربية السعودية، ثم أعيد فتحها بشروط احترازية وضعتها وزارة الشؤون الإسلامية والدعوة والإرشاد في المملكة العربية السعودية.

تهدف الدراسة إلى استكشاف مدى قابلية المساجد لنقل العدوى بشكل عام، وأثر ذلك على المعايير التصميمية للمساجد مستقبلاً، إضافة إلى تحديد مدى كفاية تعليمات الوزارة للحد من تفشي الفيروسات.

باستعراض الدراسات المتعلقة بالمعايير التصميمية للمساجد لم يتم الوقوف على معايير تتعلق بالحد من تفشي العدوى بين المصلين، ووجد أن المباني الأقرب لقياس المسجد عليها في هذا المجال هي المباني الصحية، ومن تعليمات وزارة الصحة بشأن فيروس كورونا، ومن معاييرها التصميمية التي تحد من تفشي العدوى في مبانيها، تم تحليل سلوك الفيروس الانتشاري، وربطه بالمعايير التصميمية الوقائية، ومن ثم موافقتها مع وظيفة المسجد للوصول إلى معايير تصميمية للمساجد، وتم التوصل إلى جزئين من المعايير:

• الجزء الأول: للمسجد ودورات المياه (ج). وتضمن أحد عشر معياراً أساسياً، وتحت كل منها معايير فرعية.

• الجزء الثاني: لمغسلة الموى (غ)؛ وتضمن عشرة معايير أساسية تحت كل منها معايير فرعية.

خلصت الدراسة إلى ضرورة بذل المزيد من البحث في مجال تطوير المعايير التصميمية للمساجد للحد من تفشي العدوى بشكل عام، إضافة إلى التوصية بمراجعة وزارة الشؤون الإسلامية والدعوة والإرشاد لتعليماتها الصادرة بشأن التعامل مع فيروس كورونا لتكون تعليمات موحدة، وأكثر شمولية، وترقى إلى مستوى المعايير التصميمية .

كلمات مفتاحية: مسجد - كورونا - عدوى - معايير تصميمية.

أولاً: تمهيد.

المسجد هو المكان المهيأ للصلاة، وقد ورد في القرآن الكريم بهذا اللفظ في مواضع عدة منها قوله تعالى (لَتَسْجِدَ لِرَبِّكَ عَلَى التَّقْوَى مِنْ أَوَّلِ يَوْمٍ إِحْقًا أَنْ تُقَوْمَ فِيهِ ... الآية)، (التوبة، 108). وفي السنة النبوية في صحيح البخاري: «عن عثمان بن عفان رضي الله عنه: إني سمعت النبي صلى الله عليه وسلم يقول: مَنْ بَنَى مَسْجِدًا بَنَى اللَّهُ لَهُ مِثْلَهُ فِي الْجَنَّةِ» (البخاري، 1410هـ). وقال الزركشي رحمه الله: وَلَمَّا كَانَ السُّجُودُ أَشْرَفُ أَعْمَالِ الصَّلَاةِ، لِقُرْبِ الْعَبْدِ مِنْ رَبِّهِ، اشْتَقَّ اسْمَ الْمَكَانِ مِنْهُ فَقِيلَ: مَسْجِدٌ (الزركشي، 1427هـ).

واليعيار: (اسم)، والجمع: معايير، واليعيار: نموذجٌ مَحَقَّقٌ أو مُتَّصِرٌ لما ينبغي أن يكون عليه الشيء، (معجم المعاني، 1442هـ)، ويقصد بها هنا: مجموعة من الضوابط التي يجب مراعاتها عند تصميم المساجد.

«ولقد مر المسجد عبر العصور الإسلامية بعدد من الأطوار غيرت في بنينه الأول وشكله الذي عرف به في زمن النبي صلى الله عليه وسلم، ورافق هذا التغيير في الشكل ومواد البناء تغيير في الوظيفة، فبعد أن كان المسجد مكاناً للصلاة، وداراً للحكم والقضاء، ومأوى للفقراء، تحول عبر العصور إلى أداء وظائف مختلفة تنحصر في جوانب وتوسع في أخرى، بحسب الأحوال المحيطة والظروف القائمة»، (الصاوي، 1419هـ).

والوباء: (اسم)، والجمع: أوبئة، وأوبئة، وهو كُلُّ مَرِيضٍ شَدِيدِ الْعَدْوَى، سَرِيعِ الْإِنْتِشَارِ مِنْ مَكَانٍ إِلَى مَكَانٍ، يَصِيبُ الْإِنْسَانَ وَالْحَيَوَانَ وَالنَّبَاتَ، وَعَادَةً مَا يَكُونُ قَاتِلًا كَالظَّلَامُونَ. (معجم المعاني، 1442هـ)

وباء كورونا (كوفيد-19) هو "مرض معد يسببه فيروس كورونا المُكتشف مؤخراً. ينتقل الفيروس الذي يسبب المرض بشكل رئيسي عن طريق القطرات التي يفرزها الشخص

المصاب بالعدوى عندما يسعل أو يعطس أو يتنفس. يمكن الإصابة بالعدوى عن طريق التنفس أو ملامسة الأسطح الملوثة، ويُقصد بالتباعد الاجتماعي الحفاظ على مسافة أو مساحة بين الأشخاص للمساعدة على منع انتشار المرض. ويعد الحفاظ على التباعد الجسدي أمرًا مهمًا للاحتراز من هذا المرض، والمساعدة على إبطاء انتشاره وتقليل خطر الإصابة به، من خلال الابتعاد عن الآخرين مسافة 6 أقدام (1.8 متر) على الأقل، ويمكن الحد من انتشاره من خلال ممارسة العادات الصحية الجيدة» (وزارة الصحة، 1442هـ).

ثانيا: رصد تاريخي لأثر جائحة كورونا على المساجد في المملكة العربية السعودية.

- في هذا الجزء تتبع تاريخي للتعليمات والتوجيهات الصادرة بشأن التعامل مع الفيروس فيما يخص المساجد، وقد كانت على النحو الآتي:
- 1441/7/23هـ (2020/3/17م) أعلن عن إغلاق المساجد، وأصدرت هيئة كبار العلماء في المملكة العربية السعودية قرارها رقم (247) بشأن إيقاف صلاة الجمعة والجماعة لجميع الفروض في المساجد والاكتفاء برفع الأذان ويستثنى من ذلك الحرمان الشريفان (واس، 1442هـ).
- 1441/10/29هـ، (2020/6/20م) إعادة فتح المساجد وفق إجراءات احترازية. ويوضح شكل 1 التعليمات الصادرة بهذا الشأن:



شكل 1

التعليمات التي فرضتها وزارة الشؤون الإسلامية في المملكة العربية السعودية لفتح المساجد، بعد إغلاقها بسبب فيروس كورونا.

المصدر: حساب وزارة الشؤون الإسلامية على تويتر

• 1441/11/5 هـ (2020/6/26 م) أداء أول صلاة الجمعة في المساجد بعد الإغلاق، وقد صدر التوجيه بفتح بعض المساجد المحلية لصلاة الجمعة لتوزيع المصلين على المساجد تحقيقاً للتباعد، ويوضح شكل 2 التعليمات الصادرة بهذا الشأن:



شكل 2

التعليمات الخاصة بأداء صلاة الجمعة التي فرضتها وزارة الشؤون الإسلامية في المملكة العربية السعودية لفتح المساجد، بعد إغلاقها. المصدر: حساب وزارة الشؤون الإسلامية على تويتر

وقد كان إغلاق المساجد وفتحها بناء على فتوى هيئة كبار العلماء الصادرة بتاريخ 22 رجب 1441 هـ الموافق 17 مارس 2020 م وهذا نصها:

أصدرت هيئة كبار العلماء قرارها رقم (247) في 22 / 7 / 1441 هـ فيما يلي نصه: الحمد لله رب العالمين. والصلاة والسلام على نبينا محمد وعلى آله وصحبه أجمعين. أما بعد: فقد اطلعت هيئة كبار العلماء في دورتها الاستثنائية الخامسة والعشرين المنعقدة بمدينة الرياض يوم الثلاثاء بتاريخ 22 / 7 / 1441 هـ على ما يتعلق بجائحة كورونا وسرعة انتشارها وكثرة الوفيات بها واطلعت على التقارير الطبية الموثقة المتعلقة بهذه الجائحة المشمولة بإيضاح معالي وزير الصحة لدى حضوره في هذه الجلسة التي أكدت على خطورتها المتمثلة في سرعة انتقال عدواها بين الناس بما يهدد أرواحهم وما بينه معاليه من أنه ما لم تكن هناك تدابير احترازية شاملة دون استثناء فإن الخطورة ستكون متضاعفة مبنياً أن التجمعات تعتبر السبب الرئيس في انتقال العدوى ... وبناء على ما تقدم فإنه يسوغ شرعاً إيقاف صلاة الجمعة والجماعة لجميع الفروض في المساجد والاكتفاء برفع الأذان، ... هذا وتوصي هيئة كبار العلماء الجميع بالتقيد التام بما تصدره الجهات المختصة من الإجراءات الوقائية والاحترازية والتعاون معها ... (هيئة كبار العلماء، 1442 هـ)

وبناء على فتوى هيئة كبار العلماء أصدرت وزارة الشؤون الإسلامية والدعوة والإرشاد مجموعة من التعليمات يوضحها الشكل 3 الآتي:



كنا مسؤول

متى تبدأ أول صلاة في المساجد
والجوامع بعد رفع إيقاف صلاة
(الجمعة والجماعة)
لجميع الفروض؟

صلاة فجر يوم
الأحد الموافق 8 شوال

يوم التطوير التخصصية للتوعية والتدريب
وإدارة الأزمات الطوارئ الصحية



كنا مسؤول

من خشبي أن يتضرر أو يضر غير
مفروض له في عدم شهود
الجمعة والجماعة لقوله صلى
الله عليه وسلم:
(لا ضرر ولا ضرار)
رواه ابن ماجه
من فرائض هيئة كبار العلماء رقم 246

يوم التطوير التخصصية للتوعية والتدريب
وإدارة الأزمات الطوارئ الصحية



تعود بجد

من قررت عليه جهة الاختصاص إجراءات
العزل فإن الواجب عليه الالتزام بذلك،
وترك شهود صلاة الجماعة والجمعة
ويطلي الصلوات في بيته أو موطن
عزله، لما رواه الشريد بن سويد الثقفي
رضي الله عنه قال:
«كان في وفد ثقيف رجل محدوم
فأرسل إليه النبي صلى الله عليه وسلم
إننا قد بايعناك فأرجع»
أخرجه مسلم

من فرائض هيئة كبار العلماء
رقم 246

يوم التطوير التخصصية للتوعية والتدريب
وإدارة الأزمات الطوارئ الصحية

شكل 3

تعليمات وزارة الشؤون الإسلامية في المملكة العربية السعودية بناء على
فتوى هيئة كبار العلماء فيما يخص جائحة كورونا.
المصدر: حساب وزارة الشؤون الإسلامية على تويتر

ثالثاً موضوع البحث وأهدافه.

موضوع البحث

بنيت المساجد (في الأغلب) وفقاً لمعايير تصميمية عامة وضعت طبقاً للأحوال الحضرية الطبيعية، ويقدر الله سبحانه على عباده ابتلاءات تتطلب العمل إزاءها باحترازاات تناسبها لتجاوز المرحلة.

وقد عم العالم في العام الهجري 1441/1442 هـ (2020م) وباء كورونا سريع الانتشار بين البشر، الأمر الذي استدعى تغييرات كبيرة في سلوك الناس على مختلف الأصعدة، طالت هذه التغييرات المساجد، ومن هنا ظهر موضوع هذه الدراسة والذي يتمثل في الاحتياجات التصميمية وخاصة في المساجد لتحقيق متطلبات الاحتراز من تناقل العدوى.

أهداف البحث.

يهدف هذا البحث إلى الآتي:

1. تحديد طبيعة وسلوك الفيروس من منظور طبي، والطرق اللازمة للحد من انتشاره.
2. حصر الأنشطة والعناصر المعمارية في المسجد، وتحديد مدى قابليتها لنقل العدوى وفقاً للمنظور الطبي لسلوك الفيروسات.
3. وضع معايير تصميمية للمساجد لضمان مواجهتها لانتشار العدوى بشكل عام.
4. تحديد مدى كفاية تعليمات وزارة الشؤون الإسلامية للاحتراز من العدوى.

رابعاً: منهجية البحث:

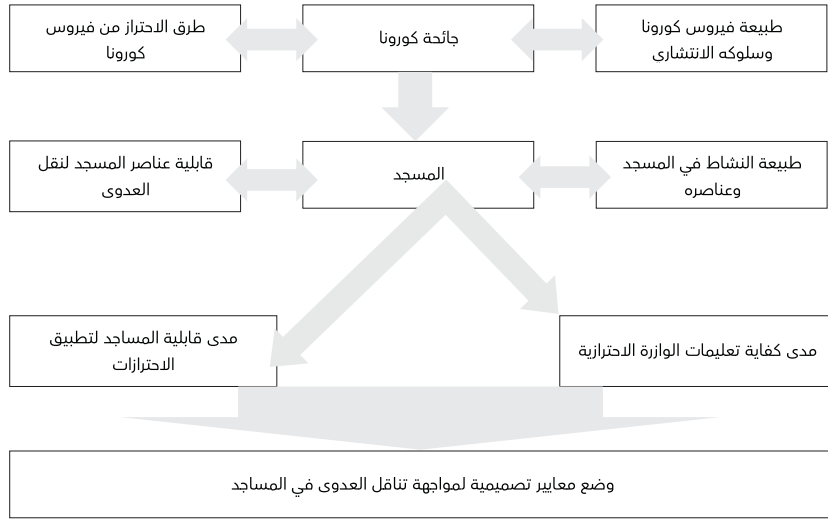
اعتمد البحث على الأساليب الآتية:

الأول: التوثيقي، وذلك بمراجعة القرارات والتعليمات والتوجيهات الحكومية التي تسهم في الحد من انتشار الوباء، والتعليمات الطبية الواصفة لسلوك الفيروس، والدراسات البحثية المتعلقة بالمعايير التصميمية للمساجد، وبالتحديد ما يخص تفشي العدوى.

الثاني: المقابلة والتحليل، وذلك بمقابلة سلوك فيروس كورونا الانتشاري من المنظور الطبي مع الأنشطة والعناصر المعمارية في المسجد.

الثالثة: الاستنتاج، ويتضمن وضع معايير تصميمية للمساجد تساهم في/ أو تحد من تناقل الفيروسات والعدوى، وفي المقابل تحديد مدى كفاية تعليمات وزارة الشؤون الإسلامية للاحتراز من العدوى.

وشكل 4 الآتي يوضح منهجية الدراسة:



شكل 4

منهجية الدراسة

خامساً: الدراسات السابقة

أثر وباء كورونا على المساجد أمر طارئ وحديث، ولم يقف الباحث على أي دراسة تناولت هذا الأمر، في مقابل ذلك حظيت المعايير التخطيطية للمساجد بعدد من الدراسات تفاوتت في درجة تناولها من متخصصة في المعايير التخطيطية للمساجد، بل ولجزئية محددة منها إلى كتابات أكثر عمومية، ومن ذلك وكجهود حكومي: «المعايير التخطيطية للمساجد» الصادرة عن وزارة الشؤون البلدية والقروية في عام: 1399هـ (وزارة، 1399هـ). تبعتها إصدار من أمانة مدينة الرياض باسم «الضوابط والمعايير التخطيطية لإعداد مخططات تقسيمات الأراضي» (أمانة، 1421هـ). يضاف إليها المخطط الاستراتيجي الشامل لمدينة الرياض الصادر عن الهيئة العليا لتطوير مدينة الرياض بتقاريره العشرين للمرحلة الأولى، والثلاثة عشر للمرحلة الثانية، وكان مما تناوله تقرير استراتيجية الخدمات العامة (مجلد 6) فيما يخص المساجد: الجهة التي تتولى توفير وإدارة الخدمات الدينية بالرياض هي وزارة الشؤون الإسلامية والأوقاف، وتعمل هذه الوزارة مع أمانة مدينة الرياض على تحديد مواقع المساجد (الهيئة العليا، 1424هـ).

ومن الدراسات التي اعتنت بالمعايير التخطيطية والتصميمية دراسة إدارة مشروع ينبع التابع

للهيئة الملكية للجيبيل وينبع (الهيئة الملكية 1، 1421هـ)؛ فقد تناولت المعايير التخطيطية والتصميمية للمساجد في مدينة ينبع الصناعية، وبالأخص مساجد الحي السكني والبالغ عددها 29 مسجداً، دون باقي المدينة والتي تشمل: المنطقة الصناعية، ومنطقة المكاتب الإدارية، إذ يصدق على أماكن الصلاة في هذه الأجزاء من المدينة أنها مصليات خاصة وليست مساجداً (الهيئة الملكية 2، 1421هـ).

وفي سياق المعايير أعدت رسالة ماجستير بعنوان «تقويم المعايير التخطيطية للمساجد في مخططات تقسيم الأراضي - مدينة الرياض حالة دراسية»، وقد ركز فيها على المقارنة بين اشتراطات بناء المساجد لدى وزارة الشؤون البلدية والقروية وأمانة مدينة الرياض. وكما يتبين من العنوان فقد أخذت الدراسة بعداً تخطيطياً أكثر من البعد التصميمي (طومان، 1422هـ).

بمثل المنحى التخطيطي للدراسة السابقة؛ جاء كتاب «معايير تصميم المساجد والمراكز الإسلامية» مهتماً بالجانب التخطيطي لمنطقة المسجد وجوانب ربط المفاهيم المعمارية بالمفاهيم الدينية في بناء المسجد (Kahera, 2009).

وكدراسة تفصيلية تضم معايير بناء يمكن تطبيقها في التصميم جاءت دراسة: «المعايير التصميمية لمآكن الوضوء في المساجد وقاعات الصلاة» والتي كما يتبين من عنوانها جاء تركيزها على أماكن الوضوء دون غيرها، وجاءت الدراسة بحصر التصاميم المتوفرة للمواضع. (حنفي، 1426هـ).

وقد استقصى الباحثان الدكتور على باهمام والدكتور محمود إدريس 52 مسجداً في 25 حياً من أحياء مدينة الرياض ووجدوا أن 11.7% من مساجد الدراسة احتاجت إلى تغطية الفناء لاحقاً لغرض توسعة المسجد أو لاستخدامه كمصلى للنساء أو لإقامة مشروع إفطار الصائم في رمضان. كما وجدت الدراسة أن 1.3 % من المساجد فقط احتاجت إلى إضافة مصلى نساء خصوصاً في رمضان، وهذه النسبة وإن كانت لم تصل إلى حد الدلالة الحرجة إلا أنها تعطي إشارة إلى ضرورة تعميق دراسات تعنى بمصليات النساء وتحديد مدى الحاجة إليها (إدريس وآخرون، 1419هـ).

أما مؤلف: «الرؤية الحديثة في بناء المساجد» فقد تم فيها حصر وتصنيف مصور لمشاكل وعوائق الاستفادة من مكونات المسجد ركّز فيها الكاتب على مساجد منطقة الرياض بالملكة العربية السعودية لتقديم رؤية جديدة ومصورة لبعض الحلول (المشيح، 1419هـ).

وتأتي الدراسات والأبحاث المقدمة في ندوة عمارة المساجد التي نظمتها وعقدتها كلية العمارة والتخطيط بجامعة الملك سعود سنة 1419 هـ في مقدمة المراجع التي يستند إليها، حيث ضم المجلد الرابع أربعة عشر بحثاً غطت التصميم المعماري للمساجد في نماذج معينة من بلدان إسلامية مختلفة مع التركيز على المئذنة كرمز ودالة للمسجد. وقد جاء المجلد الخامس من سجل بحوث ندوة عمارة المساجد بعنوان: «المعايير التخطيطية والتصميمية لعمارة المساجد» ولكن خلافاً للعنوان كانت معظم أبحاث هذا المجلد الثلاثة عشر تركز على الجانب التخطيطي لعمارة المساجد، وبعضها كان عبارة عن دراسات إحصائية، وتميز من بينها بحث «المعايير التصميمية لعمارة المساجد»، إلا أنه لم يستوعب جميع عناصر المسجد (نوفل، 1419هـ).

وفي دراسة لوائح تطوير مساجد أبو ظبي، دليل المستخدم، تناولت اللائحة ثلاثة أدلة: التخطيط، والتصميم، والتشغيل، وقد جاء على شكل قوائم مراجعة تحتوي على: القسم، والمرجع، والمعيار، تحديد مدى التوافق، والحلول البديلة (لجنة تطوير المساجد، 1428هـ).

وفي دراسة بعنوان: خصائص التفكير في تصميم الحيز الداخلي للمسجد، اعتمدت بصورة أساسية على المنهج التحليلي، من خلال تصنيف خصائص التفكير في تصميم

الحيز الداخلي للمسجد في أربعة عناصر أساسية هي، التقييد لا الإطلاق، والبساطة لا التعقيد، والوظيفة لا الشكل، والتوافق لا التعارض، والتي درست مدى وإمكانية تطبيقها على العناصر المختلفة للحيز الداخلي للمسجد. ومن أهم النتائج التي توصل إليها البحث، أن عملية التفكير في تصميم الحيز الداخلي للمسجد هي عملية مقيدة بضوابط معينة وغير متروكة لانتقالات الفكر المعماري. كما أن المشكلة التصميمية التي تناولها تسم بالبساطة وعدم التعقيد، وأنها ذات اتجاه واحد لاعتبار الوظيفة أولاً، وأخيراً أنها متوافقة مع ظروف البيئة والتقنيات المتطورة (حسن، 1419هـ).

وفي دراسة بعنوان: المسجد كمؤسسة إسلامية بين الثوابت والمتغيرات، دُرست الملامح الرئيسية لمسجد النبي صلى الله عليه وسلم كمؤسسة من حيث: الجانب التعبدي، والجانب المجتمعي، والجانب السياسي التشريعي، وما اعترى هذه الوظائف من تغير حتى فقد المسجد في القرن التاسع عشر (من وجهة نظر الدراسة) دوره المؤسسي (الصاوي، 1419هـ).

أما دراسة تطور الفراغ والنظام الإنشائي لعمارة المساجد في تركيا خلال العهد الكلاسيكي، فقد ركزت على القبة كعنصر داخلي ومحمور ارتكاز لعمارة المساجد في ذلك العصر (Erzan, 2009).

أما من المنظور الشرعي، فهناك دراسات كثيرة عنيت بالعناصر الداخلية للمساجد من أهمها وأشملها دراسة بعنوان: الضوابط الشرعية لعمارة المساجد، وقد تناولت بالأدلة الشرعية ضوابط لكل من: المنبر، المحراب، القبة، رحبة المسجد، الرواق، المئذنة، السوراي (الأعمدة)، الشرفات، النوافذ، المقاصير، المرافق الصحية، الأبواب (السدان، 1419هـ).

أما الدراسات المتخصصة في عنصر محدد من هذه العناصر فقد تناولتها دراسات عدة منها دراسة: المعايير التصميمية للإضاءة الطبيعية في المساجد، وقد ركزت على كل من الإضاءة الأقفية (القباب) والإضاءة الرأسية (النوافذ) من منظور كمي حسب شدة الإضاءة ومعاملاتها (الردادي، 1419هـ).

وفي دراسة لتطور العمارة بالمملكة العربية السعودية عبر العصور المختلفة، وصفت المسجد النجدي بالآتي: «ساقطها المستطيلة أو المربعة بالعديد من العناصر فالمسجد يتكون من صحن مربع غالباً، تليه مظلة أو عريشه مسقوفة جهة رواق القبة. بسقف أفقي من الطين المصبوب على عوارض خشبية من جذوع النخيل، يحيط المسجد سور تعلوه شرفات مسننة مثلثة، به فتحات صغيرة عميقة، مربعة الشكل أو مثلثة، في الطرف الأعلى من الجدار الطيني (إبراهيم، 1405هـ).

ونشرت جمعية عمارة المساجد | مساجد؛ مطوية تتضمن إرشادات عامة لتصميم المساجد لا ترقى لتسميتها معايير تصميمية، وهناك محاولة أخرى من قبل الجمعية الخيرية للخدمات الهندسية (هندسية) إلا أنها كانت نواة مشروع لم يكتمل. ومحاولة ثالثة من قبل شركة المساجد المتكاملة إلا أنها وقفت عند ورشة عمل أدارها معالي وزير التجارة في عام 1434هـ، وأعلن فيها عن إنشاء شركة المساجد المتكاملة لتقديم خدمات هندسية شاملة للمساجد، وهناك مشروع لوضع معايير تصميمية للمساجد بتعاون مشترك من جائزة عبد اللطيف الفوزان لعمارة المساجد بتعاون مع وزارة الشؤون الإسلامية في المملكة العربية السعودية وكود البناء السعود، إلا أنه لم ينشر للعموم حتى لحظة إعداد هذا البحث.

إن أشمل معايير تصميمية للمساجد تلك التي نشرها وقف سعد وعبد العزيز الموسى على موقع خاص بها <https://mosque-design.com/> وقد تناولتها دراسة محكمة بعنوان: منهجية مقترحة لوضع معايير تصميمية شاملة للمساجد، تجربة وقف سعد وعبد العزيز الموسى نموذجاً (طومان، 1439هـ).

أما أثر الأوبئة، وباء كورونا على وجه التحديد على المعايير التصميمية للمساجد فلم يتم

الوقوف على أي بحث في هذا الصدد.

سادسا: إجراء البحث، وحدوده

من الوصف الطبي لفيروس كورونا الوارد في التمهيد يمكن فهم سلوكه على الآتي:

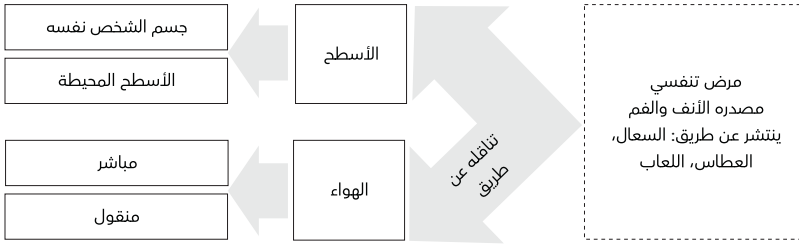
مرض معد.

ينتقل الفيروس عن طريق القطرات التي يفرزها الشخص المصاب بالعدوى عندما: يسعل، أو يعطس، أو يتنفس.

يمكن الإصابة بالعدوى عن طريق التنفس أو ملامسة الأسطح الملوثة

التباعد الجسدي أمر مهم للاحتراز من هذا المرض، والمساعدة على إبطاء انتشاره وتقليل خطر الإصابة به، من خلال الابتعاد عن الآخرين مسافة 6 أقدام (1.8 متر) على الأقل.

وشكل 5 الآتي يلخص سلوك الفيروس الانتشاري من المنظور الطبي:



شكل 5

سلوك فيروس كورونا الانتشاري من المنظور الطبي

المصدر: الباحث

من دراسة "منهجية مقترحة لوضع معايير تصميمية شاملة للمساجد" آفة الذكر، تم تحديد عناصر المسجد وملحقاته على النحو الآتي:

جدول 1 عناصر المسجد الرئيسية والفرعية، وقد تم إضافة لون للعنصر الذي يمكن أن يساهم في تناقل الفيروسات حسب التعبير الآتي.

انتقال الفيروس عن طريق الهواء

انتقال الفيروس عن طريق الأسطح

المصدر: طومان، 1439هـ

عناصر رئيسة	عناصر فرعية أولية	عناصر فرعية ثانوية
الموقع العام للمشروع		1
المصلى (مصلى الرجال ومصلى النساء على حدٍ سواء)	الأرضية	2 الممرات 3 الصفوف
	المدخل	4 الجدران 5 الأعمدة 6 السقف
	المحراب	7 الأبواب
	المنبر	8 دواليب الأحذية
	الممرات	9
	الأثاث	10 المدخل
		11
		12 القرش
		13 مساند الجلوس
		14 كراسي الصلاة
		15 دواليب المصاحف
	التكييف والتهوية	16 لوحة الإعلانات
	الكهرباء (إنارة، مأخذ، أقباش، ...)	17
	الصوتيات	18
	الإضاءة والنوافذ	19
		20 إضاءة طبيعية نوافذ ثابتة
		21 إضاءة طبيعية نوافذ متحركة
		22 إضاءة طبيعية قبب
23 إضاءة صناعية		
المواقف	24	
	25 السكن	
	26 المستودع	
	27 المنارة	
	28 البرادة	
	29 المدخل	
	30 الإضاءة	
دورات المياه (للرجال وللنساء على حدٍ سواء)	المبنى	31
	الأرضيات	32
	التهوية	33
	ملحقات المبنى	34 نشاف
		35 مرآة
		36 ركن غيار الطفل
	الحمامات	37 الحمام
		38 الباب
		39 كرسي أرضي
		40 كرسي أفرنجي
		41 الشطاف
		42 السيفون
المواضي	43 الحنفيات	
	44 الجدران	
	45 موضي عام وقوف	
	46 موضي عام جلوس	
	47 موضي كبار السن وذوي الحاجة	
	48 موضي الكراسي المتحركة	
مجري مياه الوضوء	48	

من الجدول السابق؛ وبمقابلة هذه العناصر مع الشكل الذي يوضح سلوك فيروس كورونا الانتشاري وجد أن هناك 31 عنصراً من أصل 47 عنصراً من عناصر المسجد قابل لتناقل العدوى بشكل أو بآخر، مباشر أو غير مباشر.

ومن مجمل التحليل السابق يتضح أن المساجد كمكان للتجمعات العامة بحاجة إلى احتياطات لمنع تناقل العدوى، وكما سبق توضيحه في أدبيات الدراسة؛ فإن هناك نقص في المعايير التصميمية للمساجد بشكل عام، وفيما يخص الجانب الصحي فيها بشكل أكد.

لذلك نحى البحث إلى عدة إصدارات يمكن أن تكون مظنة لوضع معايير لمنع تناقل العدوى في المباني بشكل عام، ويمكن تطبيقها على المساجد، وهي أربعة مصاد على النحو الآتي:

1 - **المعايير التصميمية للمساجد** أنفة الذكر في أدبيات البحث، وقد وجد أنها لا تتضمن أي معايير تصميمية تخص مكافحة العدوى في المساجد بشكل عام، وفيروس كورونا على وجه التحديد.

2 - **كود البناء السعودي**؛ والمعايير التصميمية للمنشآت الصحية؛ وبمراجعة مجلدات كود البناء السعودي لم يتم الوقوف على كود خاص بالمنشآت الصحية، على إثر ذلك تمت زيارة اللجنة الوطنية لكود البناء السعودي ومقابلة الأمين العام، وقد أفاد بعدم وجود جزء مخصص للمباني الصحية، وأن اللجنة الوطنية تعكف على إصداره بالتعاون مع وزارة الصحة، والمركز السعودي لاعتماد المنشآت الصحية (سباهي) على غرار كود المباني السكنية SBC1101 الذي أصدر مؤخرا.

Key List of the Saudi Codes: Designations and brief titles			
Title	Code Req. ¹	Code & Com. ²	Arabic Prov. ³
The General Building Code	SBC 201-CR	SBC 201-CC	SBC 201-AR
Structural – Loading and Forces	SBC 301-CR	SBC 301-CC	SBC 301-AR
Structural – Construction	SBC 302- CR		SBC 302-AR
Structural – Soil and Foundations	SBC 303- CR	SBC 303-CC	SBC 303-AR
Structural – Concrete Structures	SBC 304- CR	SBC 304-CC	SBC 304-AR
Structural – Masonry Structures	SBC 305- CR	SBC 305-CC	SBC 305-AR
Structural – Steel Structures			
Electrical Code	SBC 401- CR		SBC 401-AR
Mechanical Code	SBC 501- CR	SBC 501-CC	SBC 501-AR
Energy Conservation-Nonresidential	SBC 601- CR	SBC 601-CC	SBC 601-AR
Energy Conservation-Residential	SBC 602- CR	SBC 602-CC	SBC 602-AR
Plumbing Code	SBC 701- CR	SBC 701-CC	SBC 701-AR
Private sewage Code	SBC 702- CR		SBC 702-AR
Fire Protection Code	SBC 801- CR	SBC 801-CC	SBC 801-AR
Existing Buildings Code	SBC 901- CR	SBC 901-CC	SBC 901-AR
Green Construction Code	SBC 1001- CR	SBC 1001-CC	SBC 1001-AR
Residential Building Code*	SBC 1101- CR	SBC 1101-CC	SBC 1101-AR
Fuel Gas Code*	SBC 1201- CR	SBC 1201-CC	SBC 1201-AR
1. CR: Code Requirements without Commentary 2. CC: Code Requirements with Commentary 3. AR: Arabic Code Provisions * Under Development			

شكل6

محتويات كود البناء السعودي
المصدر: كود البناء السعودي

3 - المركز السعودي لاعتماد المنشآت الصحية (سباهي)

تم التواصل مع إدارة التصميم في وزارة الصحة، وأحالوا إلى مستشارين في المركز السعودي لاعتماد المنشآت الصحية (سباهي)، وقاموا مشكورين بالتزويد بنسخة من المعايير الوطنية للمستشفيات، ونسخة من دليل مكافحة العدوى في تصميم المنشآت الصحية، إلا أنه دليل إجرائي إداري لاعتماد نشاط المنشآت

الصحية، ولا يتضمن معايير تصميمية، ويوضح شكل7 الآتي غلاف ومحتوى هذا الإصدار.



4 - وزارة الصحة

شكل7 إصدارات المركز السعودي لاعتماد المنشآت الصحية المتعلقة بالمعايير الخاصة بالمنشآت الصحية
المصدر: موقع المركز السعودي لاعتماد المنشآت الصحية

أصدرت وزارة الصحة عدة أدلة من قبيل: الشروط الهندسية والفنية لمبنى المستشفى، "دليل التصميم للمستثمرين بالمستشفيات الخاصة" إلا أنه دليل فني هندسي عام لم يركز على مكافحة العدوى وإنتشار العدوى، ويوضح شكل8 الآتي غلاف هذا الإصدار.



شكل8 الشروط الهندسية والفنية لمبنى المستشفى.
المصدر: منشورات وزارة الصحة على موقعها

في مقابل ذلك وجد إصدار متخصص بعنوان: دليل مكافحة العدوى في تصميم المنشآت الصحية صادر على الإدارة العامة لمكافحة عدوى المنشآت الصحية، وهو الذي تم اعتباره المنطلق لإتمام هذه الدراسة، ويوضح شكل9 الآتي غلاف هذه الدراسة.



شكل9 دليل مكافحة العدوى في تصميم المنشآت الصحية.
المصدر: موقع الإدارة العامة لمكافحة عدوى المنشآت الصحية

ومن هذا الإصدار تم استخلاص التعديلات المقترحة على المعايير التصميمية للمساجد في مواجهة تناقل العدوى والأوبئة بين المصلين، مع مراعاة التالي:

• للمسجد وظيفته الخاصة به، ولا يعامل كالمنشأة الصحية بشكل مطلق.

• للمصلي احتياجات سلوكية تفرضها طبيعة أداء الصلاة.

• استحدثت في المساجد ممارسات من قبيل الفرش بالسجاد، والكراسي المكسية بالنسيج، والركييات (مساند الجلوس)، ولم تكن موجودة في المسجد الأول؛ مسجد النبي صلى الله عليه وسلم، ولا هي أيضا ملزمة في كل المساجد، ومن أولها وأولها المسجد الحرام. هذه الإحداثيات يمكن إعادة النظر فيها وفقا لضرورة المحافظة على الصحة العامة.

• لا يعني الاقتباس من هذا الإصدار أنه استوفى جميع المعايير المطلوبة للمساجد، وإنما لكونه الأقرب، مع التوصية ببذل مزيد من الجهد والعمل البحثي لاستيفاء معايير صحية خاصة بالمساجد.

سابعا: استخلاص المعايير التصميمية للمساجد للحد من انتشار العدوى:

جاء دليل مكافحة العدوى في تصميم المنشآت الصحية الصادر على الإدارة العامة لمكافحة عدوى المنشآت الصحية في خمس عشرة صفحة، وتضمن معايير عامة، ومعايير مخصصة لكل من: أجنحة التنويم، غرف العزل، العيادات الخارجية، العناية المركزية، وحدة الحضنة، غرف العمليات، وحدة الغسيل الكلوي، التعقيم المركزي، التكيف، وحدة المناظير، المختبرات، المغسلة، المطبخ، النفايات، المشرحة.

وقد تم استخلاص المعايير التصميمية للمساجد للحد من انتشار العدوى من هذا المرجع وفق الآتي:

• اختيار ما يناسب المساجد منها، مع الحرص على الإبقاء على النص المعياري كما هو دون تغيير كونه صادر من جهة فنية هندسية ومتخصصة في المجال الصحي، ولا يتم التغيير إلا في أضيق الحدود مع توضيح التغيير بإبقاء الأصل مشطوبا، وإدراج النص الذي يناسب المساجد بين قوسين.

• تم سرد المعايير التصميمية في هذا الدليل وفقا للأقسام الطبية في المستشفيات، وبالتالي كان المعيار يتكرر في بعض الأحيان، وعملت الدراسة على حذف التكرارات، والاكتفاء بنص واحد فقط.

• ترتيب المعايير في هذا الدليل تم وفق الفضاءات الطبية، وقد عملت الدراسة على إعادة تبويبها وترتيبها بما يناسب الفضاءات المعمارية في المسجد، دون المساس بجوهر المعيار.

• أضاف المرجع معايير خاصة بالمشرحة وهي موازية لمغسلة الموق الملحقة ببعض المساجد، ولأهمية وضع معايير خاصة لها كونه من أكثر الأماكن التي تحتاج إلى عناية لمنع نقل العدوى فقد تم إدراجها في هذا البحث.

• تم تقسيم المعايير إلى جزئين، الأول للمسجد ودورات المياه، ورمز له برمز (ج)، والثاني لمغسلة الموق، ورمز لها بالرمز (غ)، وإعطاء رمز تسلسلي بعد ذلك لكل معيار يندرج تحتها.

وبناء على ما ذكر؛ ففيما يلي المعايير التصميمية للمساجد للحد من نشي العدوى:

الجزء الأول: المسجد ودورات المياه (ج).

ج-1	الأرضيات والأسطح
ج-1-1	يجب أن تكون غير منفذة للمياه مغطاة بمادة لا تسبب الانزلاق ومرفوعة عند حد الأرض مع الحائط.
ج-2-1	تغطي باستخدام ألواح مصنوعة من البوليفينيل كلورايد مع إحكام لصق الفواصل.
ج-3-1	تصميم الأرضيات بطريقه تضمن عدم نفاذ / تسرب المياه، مع أسطح نظيفة تتحمل عملية التنظيف اليومي .
ج-4-1	الأرضيات ملساء، ولا تسمح بالانزلاق، أو ركود المياه، وتحمل التنظيف المتكرر.
ج-5-1	تجنب وجود السجاد أو غطاء الأرضيات الناعمة المشابهة للسجاد.
ج-2	الحوائط
ج-1-2	طلاء الحوائط والأرضيات بطلاء مضاد للبكتريا ومصنوع من مادة الإيبوكسي غير المولد للكهرباء
ج-2-2	يجب تجنبوصلات بين الأرضيات والحوائط لأنها تساعد على وجود الرطوبة وتشجع على نمو الميكروبات .
ج-3-2	يجب أن تكون الأسطح ناعمة، خالية من الشقوق.
ج-4-2	تجنب وجود وصلات أنابيب مكشوفة.
ج-5-2	استخدام مادة الإيبوكسي المطلي (البلاستيك المقوى بالفير) أو استخدام الطلاء بواسطة الرش.
ج-3	الممرات
ج-1-3	فصل الممرات النظيفة والممرات المتسخة مع تحديد مسارات منفصلة لنقل الأشياء النظيفة والأشياء الملوثة كل على حدة.
ج-4	الأسقف
ج-1-4	يجب أن تكون الأسقف مقاومة للرطوبة في المناطق التي يمكن حدوث البخار أو الرطوبة.
ج-2-4	يجب عدم استخدام الأسقف المستعارة ذات البلاطات المنفصلة لكونها صعبة التنظيف وغير محكمة الغلق .
ج-5	الإضاءة
ج-1-5	يجب اختيار تجهيزات الإضاءة بعناية في مناطق المعالجة والتخزين لتجنب الشقوق التي تسمح بتجمع الأتربة.
ج-6	الأبواب
ج-1-6	غلق الأبواب ذاتيا بواسطة قفل هوائي يوفر حاجز ضد فقدان الضغط وضد دخول الهواء الملوث في المناطق النظيفة.
ج-2-6	أن تكون جميع الأبواب ناعمة مزودة بغلاف معدني يصل إلى النصف السفلي من الباب مع عدم وجود أقفال أو مقابض للأبواب (الداخلية).
ج-7	النوافذ
ج-1-7	سهولة الوصول للنوافذ داخليا وخارجيا لضمان سهولة عملية التنظيف.
ج-2-7	جميع النوافذ مغطاة بسلك واقي من دخول الحشرات.
ج-8	أحواض الغسيل
ج-1-8	أحواض غسيل الأيدي تحتوي على ماء بارد وداقئ.
ج-2-8	يجب وجود أحواض بمعايير قياسية تضمن عدم تآثر الماء، ويتم تشغيلها بدون ملامسة الأيدي باستخدام المرفق أو الأشعة تحت الحمراء.
ج-3-8	تعلق الحنفيات على الحائط ويتم التشغيل بدون استخدام الأيدي.
ج-4-8	يكون حجم الحوض متوسط ومعلق على الحائط وتكون الحنفيات إما معلقه على الحائط أو على الحوض .
ج-9	غرف النظافة
ج-1-9	توفير غرفة واحدة على الأقل لمستلزمات نظافة البيئة داخل كل وحدة وتحتوي كل غرفة على حوض خدمة مخصص لأغراض نظافة البيئة ومستلزمات التنظيف ومكان لتخزين المنظفات وأدوات النظافة.

ج-9-2	الحوائط والأرضيات من مواد غير مسامية سهلة الغسيل.
ج-9-3	غرفة النظافة تحتوي على بالوعة ومواد نظافة وتطهير البيئة.
ج-10	الصرف الصحي
ج-10-1	تجنب وجود بالوعات مكشوفة خاصة في النطاق النظيف.
ج-11	التكييف والتهوية:
ج-11-1	يجب أن يتم دفع الهواء بصفة عامة من المناطق النظيفة إلى المناطق المتسخة (وخاصة في أماكن الرعاية الحرجة) وذلك للمحافظة على منع انتشار العدوى.
ج-11-2	منع دخول هواء غير نظيف من المناطق المجاورة بواسطة وجود ضغوط هواء مختلفة.
ج-11-3	يتم تغير الهواء بمعدل 10 دورات في الساعة ويوصى بفارق ضغط مقداره 15 باسكال بين وحدة العزل ووحدة الرعاية الحرجة الأساسي.
ج-11-4	وجود نظام مكيفات هواء مركزي مزود بفلتر للهواء عالية الكفاءة.
ج-11-5	نظام التهوية اللامركزي يتم تزويده بفلتر دائم قابل للغسل أو بفلتر قابل للاستبدال بحيث لا تقل كفاءته عن 68%.
ج-11-6	عندما يتم وضع عدد 2 فلتر في أجهزة التهوية فإنه يتم وضع الفلتر الأول في أعلى التيار في جهاز تكييف الهواء ويوضع الفلتر الثاني أسفل التيار.

الجزء الثاني: مغسلة الموتى (غ):

غ-1	الموقع والمداخل والممرات
غ-1-1	موقع المشرحة (مغسلة الموتى) منفصل في مبنى (مستقل) بجوار معمل الباثولوجيا التشريحية في الدور الأرضي.
غ-1-2	وجود مدخل للمشرحة (مغسلة الموتى) منفصل عن المخرج لدخول أقارب المتوفي وعربات نقل الموتى.
غ-1-3	لا يقل عرض الردهات عن 2.40مترًا لسهولة مرور التروليات مع حماية الجدران.
غ-2	الأرضيات
غ-2-1	تجهيز الأرضيات بطريقة قابلة للنظافة الدورية وتحمل المواد المستخدمة في التنظيف ومضادة للبلل ومتصلة بمصرف المياه.
غ-3	الحوائط
غ-3-1	حوائط المشرحة (مغسلة الموتى) يجب أن تكون من مادة تضمن سهولة التنظيف وغير منفذة للسوائل وقابلة لتحمل مواد التنظيف.
غ-3-2	يجب تجنب وصلات بين الأرضيات والحوائط.
غ-4	الأسقف
غ-4-1	تصميم الأسقف بطريقة يسهل تنظيفها وعلى ارتفاع ال يقل عن 2.50متر في الغرف المساعدة و3.0متر في ردهة الانتظار وغرف التشريح وغرف الأطباء.
غ-5	الأبواب
غ-5-1	تصميم أبواب المشرحة (مغسلة الموتى) بحيث تكون مزدوجة ويتم تشغيلها بالانزلاق ولا يقل عرضها عن 1.50متر ليسمح بدخول التروليات.
غ-6	النوافذ
غ-6-1	يجب أن تكون النوافذ منفذة لضوء النهار ومجهزة بزجاج معتم وشبكة سلك غير منفذة لدخول الحشرات

غ-7	تهوية والتكييف	
غ-7-1	توفير تهوية طبيعية كافية عن طريق نوافذ غير منفذة للحرارة ماعدا في غرف حفظ الموق حيث يجب توفر نظام شفط هوائي لدفع الهواء خارج الغرفة.	
غ-7-2	تصميم المراوح بحيث يتم تدوير الهواء 10 مرات في الساعة مع ضمان عدم وصول الهواء للمناطق / المباني المجاورة	
غ-8	أحواض الغسيل والتغسيل	
غ-8-1	توفير أحواض لغسيل أيدي العاملين بالمواصفات القياسية داخل غرف التشرية (مغسلة الموق)	
غ-8-2	طاولة التشرية (حوض الغسيل) مصنوع من مادة يسهل تنظيفها.	
غ-9	التغذية	
غ-9-1	إمداد المشرحة (مغسلة الموق) بمياه ساخنة وباردة، وتزود طاولات المشرحة بخراطيم المياه على أن يتم تشغيل صانبر المياه في منطقة العمل بواسطة كوع العاملين أو التشغيل الأوتوماتيكي.	
غ-10	عناصر القسم الإداري	
غ-10-1	مكتب لمشرف المشرحة (مغسلة الموق)	
غ-10-2	غرفة للعاملين الصحيين بالمشرحة (بمغسلة الموق)	
غ-10-3	دورات مياه ومحطات شرب المياه بالقرب من أماكن الانتظار ومكاتب العاملين الصحيين	

والجدول 2 التالي يلخص عناصر المسجد القابلة لتناقل العدوى؛ وكيفية تجنب أو التقليل من ذلك، مع توضيح المعيار الصحي اللائم لها:

جدول2: عناصر المسجد القابلة لتناقل العدوى، وما يناسبها من معايير تصميمية تحد من انتشار العدوى، والمتطلبات العامة لمنع تناقل الفيروسات من خلال كل عنصر

المصدر: الباحث

العنصر	رمز المعيار الصحي	المتطلبات للتقليل من قابليته لنقل العدوى
1 الممرات (الخارجية)	ج-3	الحد أو التقليل من قابليتها للاحتفاظ بالفيروس ونقله
2 الصقوف	ج-1	الحد أو التقليل من قابليتها للاحتفاظ بالفيروس ونقله.
3 الجدران (للمسجد)	ج-2	الحد أو التقليل من قابليتها للاحتفاظ بالفيروس ونقله.
4 الأعمدة	ج-2	الحد أو التقليل من قابليتها للاحتفاظ بالفيروس ونقله.
5 السقف	ج-4	الحد أو التقليل من قابليتها للاحتفاظ بالفيروس ونقله.
6 الأبواب	ج-6	إمكانية فتح الباب دون لمس المقبض باليد. رعاية المداخل لضمان التباعد المطلوب عند الدخول والخروج.
7 دواليب الأحذية	ج-1	الحد أو التقليل من قابليتها للاحتفاظ بالفيروس ونقله.
8 الممرات (الداخلية)	ج-3	الحد أو التقليل من قابليتها للاحتفاظ بالفيروس ونقله.
9 الفرش (السجاد)	ج-1	بدائل أرضيات المساجد (ليونة ونظافة وتغيير) فينيل، بلاط، حصي).
10 مساند الجلوس	ج-1	الحد أو التقليل من قابليتها للاحتفاظ بالفيروس ونقله.
11 كراسي الصلاة	ج-1	الحد أو التقليل من قابليتها للاحتفاظ بالفيروس ونقله.
12 دواليب المصاحف	ج-1	الحد أو التقليل من قابلية المصاحف والمطبوعات للاحتفاظ بالفيروس ونقله.

13	التكييف والتهوية للمسجد	ج-11 / ج-7	تجديد الهواء بشكل مستمر. التهوية الطبيعية، وقابلية النوافذ للفتح، ومدى كفايتها لتجديد الهواء. فتح النوافذ وتعارضه مع التكييف. أنظمة التكييف الطبيعية (ملاقف). قابلية الأماكن المغلقة لنشر الفيروس:
14	الكهرباء (إنارة، مأخذ، أقياش،)	ج-1	الحد أو التقليل من قابلية الأقياش للاحتفاظ بالفيروس ونقله.
15	إضاءة طبيعية نوافذ متحركة	ج-5 / ج-7	الإضاءة الطبيعية والسماح بدخول أشعة الشمس للتعقيم.
16	إضاءة صناعية	ج-5 /	مئاته التثبيت وعدم وجود فراغات بين السقف والجدران ووحدات الإضاءة تجمع الفيروسات والأتربة.
17	البرادة	ج-1	قابلية برادات الماء والأكواب متعددة الاستخدام لنشر الفيروسات.
18	المدخل	ج-1	الحد أو التقليل من قابليتها للاحتفاظ بالفيروس ونقله من خلال توسيع المداخل وتكثيرها للتقليل من التزاحم.
19	التهوية للحمامات	ج-11	تجديد الهواء بشكل مستمر. نظام التهوية لدورات المياه: ميكانيكي (مراوح شفط منفصلة، شفط مركزي)، طبيعي.
20	ركن غيار الطفل	ج-1	الحد أو التقليل من قابليتها للاحتفاظ بالفيروس ونقله.
21	الحمام	ج-1	الحد أو التقليل من قابليتها للاحتفاظ بالفيروس ونقله.
22	الباب	ج-6	قابلية فتح الباب دون لمس المقبض باليد.
23	كرسي أفرنجي	ج-1	الحد أو التقليل من قابليتها للاحتفاظ بالفيروس ونقله.
24	الشطاف	ج-1 / ج-8	الحد أو التقليل من قابليتها للاحتفاظ بالفيروس ونقله.
25	السيفون	ج-1	قابليتها للفتح والإغلاق دون الحاجة لاستخدام الكف.
26	الحنفيات	ج-8	قابليتها للفتح والإغلاق دون الحاجة لاستخدام الكف.
27	الجدران (للحمامات)	ج-2	الحد أو التقليل من قابليتها للاحتفاظ بالفيروس ونقله.
28	موضي عامر وقوف	ج-8	قابليتها للفتح والإغلاق دون الحاجة لاستخدام الكف.
29	موضي عامر جلوس	ج-8	قابليتها للفتح والإغلاق دون الحاجة لاستخدام الكف.
30	موضي كبار السن وذوي الحاجة	ج-8	قابليتها للفتح والإغلاق دون الحاجة لاستخدام الكف.
31	موضي الكراسي المتحركة	ج-8	قابليتها للفتح والإغلاق دون الحاجة لاستخدام الكف.
32	مغسلة الموي (مضافة)	غ-1 إلى 10	الحد أو التقليل من قابليتها للاحتفاظ بالفيروس ونقله.

ثامنا: مدى كفاية تعليمات الوزارة للحد من انتشار الفيروسات

بحسب شكل 1 السابق، والذي وضع التعليمات التي فرضتها وزارة الشؤون الإسلامية في المملكة العربية السعودية لفتح المساجد، بعد إغلاقها لفترة زمنية بسبب فيروس كورونا وجد أن هذه التعليمات صدرت في شهرين مختلفين؛ في كل منها زيادة ونقص عن الأخرى، وتم الدمج بينهما لغرض الدراسة. ويمكن حصر هذه التعليمات في البنود الآتية:

1. الوضوء في المنزل.
2. لبس الكمامة.
3. غسل اليدين جيدا أو استعمال المعقمات قبل الحضور إلى المسجد وبعده.

4. عدم التزاحم عند دخول المساجد أو الخروج منها.
5. إبقاء مسافة لا تقل عن 1.5مترًا لينك وبين كل متصل، وفي نشرة أخرى ترك مسافة 2متر بين كل متصل وآخر، وأضافت أيضا هذه النشرة: ترك فراغ صف بين كل صفين.
6. القراءة من المصحف الإلكتروني بالجوال أو إحضار المصحف الخاص بك. وفي نشرة أخرى رفع المصاحف والكتب مؤقتًا من المساجد.
7. تجنب المصافحة.
8. فتح المساجد قبل الأذان ب 15دقيقة، وإغلاقها بعد الصلاة ب 10دقائق.
9. مدة الانتظار بين الأذان والإقامة 10دقائق.
10. فتح النوافذ والأبواب من دخول وقت الصلاة إلى نهاية الصلاة.
11. إغلاق جميع برادات وتلجيات المياه.
12. عدم السماح بتوزيع المياه والمأكولات أو أي شيء آخر من طيب وسواك.
13. إغلاق دورات المياه وأماكن الوضوء.
14. الإبقاء على تعليق الدروس والبرامج والمحاضرات وحلقات التحفيظ.

إن جميع العناصر آفة الذكر تعليمات سلوكية، تتعامل مع الفيروس بشكل لحظي، وليس فيها معيار تصميمي يساعد على منع انتشار الفيروسات بشكل مستمر، ولا يمكن إدراج أي منها في الجدول 2 السابق الذي استنبط ولخص المعايير التصميمية الصحية المقترحة للمساجد للحد من انتشار الفيروسات.

تاسعا: النتائج والتوصيات

النتائج

توصلت الدراسة إلى ثلاثة نتائج رئيسة هي:

1. من خلال استعراض الدراسات السابقة في مجال المعايير التصميمية للمساجد وجد أنه لم يتم التطرق لمعايير صحية تحد من تناقل العدوى بين المصلين.
2. المرجح الأمثل لوضع معايير تصميمية للمساجد تمنع تناقل العدوى هو معايير وزارة الصحة لمنع تناقل العدوى في منشأتها، وقد وجدت بالفعل معايير محددة بهذا الشأن تم تكييفها مع عناصر المسجد في مقابل سلوك الفيروس الانتشاري وسلوك المصلين. وبناء على ذلك وضعت معايير من جزئين:
 - الجزء الأول: للمسجد ودورات المياه (ج). وتضمن أحد عشر معيارا أساسيا، وتحت كل منها معايير فرعية.
 - الجزء الثاني: لمغسلة الموق (غ): وتضمن عشرة معايير أساسية تحت كل منها معايير فرعية .
3. بتطبيق المعايير المستخلصة آفة الذكر على تعليمات وزارة الشؤون الإسلامية وجد أنها تعليمات سلوكية لا علاقة لها بالمعايير التصميمية.

التوصيات

توصي الدراسة بالآتي:

- بذل المزيد من البحث في مجال تطوير المعايير التصميمية للمساجد للحد من تفشي العدوى بشكل عام، وبما يتلاءم مع وظيفة المسجد وسلوك المصلين، ويوصى أن تبنى جائزة عبد اللطيف الفوزان لعماره المساجد تحفيز الباحثين على إجراء هذه الأبحاث، وعكسها في كود بناء المساجد المترقب صدوره قريبا إن شاء الله.
- مراجعة وزارة الشؤون الإسلامية والدعوة والإرشاد لتعليماتها الصادرة بشأن التعامل مع فيروس كورونا لتكون تعليمات موحدة، وأكثر شمولية، وترقى إلى مستوى المعايير التصميمية .



نهج المحاكاة الحيوية لتحسين جودة الهواء الداخلي ومنع انتشار الأمراض المعدية بالمساجد

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الملخص:

واجه العالم مجموعة من التحديات والأزمات المختلفة، من أوبئة وكوارث طبيعية كان لها تأثير كبير في حياة الإنسان وسلوكه. وفي ظل جائحة كورونا التي أمت بالعالم وأثرت سلباً في قطاعات عديدة في كافة جوانب الحياة اليومية مؤخرًا، وكان من أهمها الجانب الديني وأداء الشعائر والعبادات، حيث أغلقت المساجد، وهذا ترك شعورًا بغربة الإنسان المسلم داخل المدينة. وشكلت هذه العوامل نوعاً من العاطفة المحفزة نحو البحث عن حلول لعدم اللجوء إلى غلق المساجد أثناء الجائحة، وهذا ما دعا المخططين والمعماريين للبحث من أجل التطوير والابتكار في مجالات التجديد والإصلاح الصحي والبناء لتقليل مخاطر الإصابة بالأمراض المعدية بالمساجد.

وحيث كانت الطبيعة على مر التاريخ مصدر إلهام للحلول المعمارية. ويفهم كيفية عمل العالم الحي وما تفعله النظم الطبيعية ودمجها في التصميم المعماري والحضري ظهرت اتجاهات معمارية تهدف إلى إنقاذ البيئة، وكان من أهم تلك الاتجاهات هندسة المحاكاة الحيوية (Biomimicry)، ومن هذا المنطلق تناقش هذه الورقة سبل تحسين جودة الهواء الداخلي بالمساجد لتكون قادرة على مواجهة الأوبئة.

وتهدف الدراسة إلى اقتراح رؤية جديدة في تصميم المسجد، ليكون قادراً على مواجهة الظروف القاسية خصوصاً في عصر عمارة ما بعد الجائحة، وذلك من خلال تفعيل نهج المحاكاة الحيوية لتحسين جودة الهواء الداخلي ومنع انتشار الأمراض المعدية في المساجد. ولتحقيق ذلك الهدف تتناول الدراسة التعريف بعلم هندسة المحاكاة الحيوية وأهم تقنيات التصميم الحيوي المستخدمة عالمياً، وتحديد الاستراتيجيات البيولوجية التي تساعد في تنقية الهواء وتنظيم معدلات تدفقه بما يسمح بتجده. وينتهي البحث باقتراح آليات ضمن المحاكاة الحيوية يتم من خلالها تحديد معدلات التهوية المناسبة وتنقية الهواء التي تضمن التقليل من احتمالية انتشار الفيروسات ومنع العدوى في الفراغ الداخلي للمسجد أثناء الجائحة.

الكلمات الدالة: عمارة المساجد - هندسة المحاكاة الحيوية- عمارة ما بعد الجائحة- التكنولوجيا الحيوية- جودة الهواء الداخلي

Abstract:

The world has faced a variety of challenges and crises from epidemics and natural disasters that have had a major impact on human life and behavior. And during the Corona pandemic, which has affected the world and has adversely affected many sectors in all aspects of daily life recently, the most important of which was the religious aspect, the performance of rites and worship, where Masjid was closed down, leaving a sense of the alienation of Muslim human within the city. These factors were a catalyst for finding solutions not to close Masjid during the pandemic, which directed planners and architects to research for development and innovation in regeneration, health reform and construction to reduce the risk of infectious diseases in Masjid.

And that's where nature has historically inspired architectural solutions. By understanding how the living world works and what ecosystems do and integrating them into architectural and urban design, architectural trends have emerged aimed at saving the environment, most importantly Biomimicry. It is in this spirit that this paper discusses ways to achieve indoor air quality in Masjid to be able to cope with Epidemics.

The aim of the study is to propose a new vision in the design of the Masjid to be able to cope with the harsh conditions, especially in the post-epidemic architecture, through the activation of bio-simulation approaches to improve indoor air quality and prevent the spread of infectious diseases in Masjid. To achieve that goal, The study deals with the definition of biomimicry engineering and the most important bio-design techniques used globally, the identification of biological strategies that help to purify the air and regulate its flow rates

to allow for its regeneration. The research ends with the proposal of tools inspired by biomimicry engineering through which suitable ventilation rates and air purification will be established to ensure reduce the probability of virus spread and infection in the internal vacuum of the Masjid during the pandemic is prevented.

Keywords: Masjid architecture – biomimicry - post-pandemic architecture- indoor air quality

1. المقدمة:

حدد القرآن الكريم الوظيفة الأساسية للمسجد قال الله تعالى (في يُؤْتِي أذنَ الله أن تُرْفَعَ وَيُذْكَرَ فِيهَا اسْمُهُ يُسَبِّحُ لَهُ فِيهَا بِالْغُدُوِّ وَالْآصَالِ*رِجَالٌ لَا تُلْهِيهِمْ تِجَارَةٌ وَلَا بَيْعٌ عَنْ ذِكْرِ اللَّهِ وَإِقَامِ الصَّلَاةِ وَإِيتَاءِ الزَّكَاةِ يَخَافُونَ يَوْمًا تَتَقَلَّبُ فِيهِ الْقُلُوبُ وَالْأَبْصَارُ)القرآن الكريم- سورة النور- الآيات 36: 37)

وتمثل القيمة الرمزية في المسجد بعداً هاماً فهو بيت الله المسموح للجميع علي اختلافهم دخوله وممارسة الشعائر فيه بمساواة تامة لذلك فهو مفتوح طوال الوقت، وإن ما يعلن في المساجد من الأذان في أوقات الصلوات الخمس، وما يقام فيها من صلاة الجماعة ليمثل شعار الإسلام والعلامة المميزة لبلاده وهذا الاجتماع علي القيم السامية والمرتبطة بفكرة الإلتفاف حول هدف واحد هو ما يقوي روح الجماعة وما يجعل الرسول الكريم صلى الله عليه وسلم يشير إلى أهمية صلاة الجماعة في عدد من الأحاديث الشريفة. ("المؤتمر الأول عمارة المساجد.2016 Pdf")

والآن في ظل جائحة كورونا التي أمتت بالعالم وأثرت سلبيًا علي قطاعات عديدة في كافة نواحي الحياة اليومية، منها الجانب الديني وأداء الشعائر والعبادات، فأغلقت المساجد والكنائس والمعابد، مما ترك شعورًا بالغبرة داخل المدينة، وشكل نوعًا من العاطفة المحفزة نحو البحث عن حلول لتطوير أفكار للمسجد تجنبنا هذا الانقطاع في المستقبل. ونظرًا لارتباط العمارة بالفكر الابتكاري فالتوجه اليوم نحو ابتكار حلول معمارية بسيطة تسمح للمسجد كفضاء معماري بمواجهة الأوبئة، وجاء دور العمارة لتظهر أهم قدراتها لتكون من أهم رواد المقاومة ضد الأوبئة والأمراض المنتشرة مؤخرًا. (Elatta 2020)

وحيث أن المسبب الأساسي في الإغلاق هو العلاقة الطردية بين زيادة عدد وفيات جائحة كورونا والتعرض طويل الأمد لتلوث الهواء، أي أن التهوية السيئة في المباني تؤدي إلى زيادة انتشار الفيروس، لذلك أصبحت الوقاية عُنصرًا فعالاً للحد من انتشار المرض، وجدنا أيضاً أنه بإمكاننا تحقيق 70% من الفوائد الصحية وضمان انخفاض احتمالية انتشار الأوبئة من خلال ضمان بيئات أنظف وأكثر أماناً وجودة هواء أفضل وسلوكيات أكثر صحة.

وحيث كانت الطبيعة علي مر التاريخ مصدر إلهام للحلول والطرق الذكية التي طورت جميع المجالات باستراتيجيات موهوبة لا حصر لها، لتمييز مخلوقات الله عز وجل التي ما زالت مثالاً للكمال وكنزاً لا ينفى ومصدرًا لا ينضب من الأفكار والاشكال والنظم والآليات، ومن خلاله سعى المعماريون دائماً لمحاكاة الطبيعة والاستلها من أجل لخلق توازن وتجاذب وانسجام بين البيئة الطبيعية والمبنية، وبفهم طبيعة العالم الحي وما تفعله النظم الطبيعية ودمجها في التصميم المعماري والحضري ظهرت اتجاهات معمارية تهدف إلى إنقاذ البيئة، وكان من أهم تلك الاتجاهات هندسة المحاكاة الحيوية (Biomimicry).

1.1 اشكالية البحث:

تتبلور إشكالية البحث في عدم وجود آلية واضحة (نهج شامل) يتم من خلالها مواجهة التحديات والأوبئة والتعامل مع الفراغات المعمارية الداخلية للمساجد أثناء الخطر دون توقف العمل بها. حيث تلجأ الحكومات إلى غلق المساجد ووقف عدد من المهام اليومية دون التفكير في طول ممكنة يتم من خلالها استمرار العبادات بما يحفظ سلامة المستخدمين بشكل دقيق وموضوعي ويحقق استدامة المبنى. حيث أن انخفاض جودة الهواء الداخلي والتلوث البيئي للأماكن المغلقة تعتبر السبب الرئيسي في زيادة انتشار الأمراض المعدية، فبالرغم من زيادة الوعي لدى المعماريين بمبدأ الاستدامة وضرورة تحقيقها في تصميم المساجد إلا أن هذه التصميمات غير قادرة على مواجهة الأوبئة بشكل واقعي يسمح بتشغيل المساجد وقت الجائحة مما أدى إلى (الإغلاق والتباعد الإجتماعي).

1.2 هدف البحث:

يهدف البحث إلى رؤية جديدة لمسجد المستقبل القادر على مواجهة العوامل القاسية خاصة في عصر عمارة ما بعد الوباء، والاستجابة للسياق ثقافيًا واجتماعيًا وبيئيًا، مما يضيف التفرد إليه ويضع المسجد في موقعه لإرشاد المسلمين وتحسين انتمائهم والتواصل الاجتماعي مع بعضهم بعض، وذلك من خلال الوصول إلى إطار نظري لتفعيل نهج المحاكاة الحيوية بالمساجد لرفع جودة البيئة الداخلية ومنع انتشار الأمراض المعدية في مساجد ما بعد الجائحة. عن طريق تحقيق الأهداف الفرعية التالية:

• دراسة العوامل المسببة في انتشار الأمراض المعدية داخل المباني والمؤثرة على جودة هوائها.

• التعرف على مفهوم محاكاة الطبيعة-الحيوية (Biomimicry) ودورها كأسلوب تصميم مستديم في تحسين جودة الهواء الداخلي ومنع انتشار الأمراض المعدية.

• دراسة آليات هندسة المحاكاة الحيوية وتوظيفها بالعناصر المعمارية بالمسجد لمنع انتشار العدوى وتحسين جودة الهواء الداخلي IAQ وزيادة معدلات تدفق الهواء بالفراغ الداخلي.

1.3 دوافع الدراسة:

تفعيل دور المحاكاة الحيوية كأداة تصميم في مساجد المستقبل، في محاولة الدراسة للتحقيق هدف البحث في مجال تحسين جودة الهواء الداخلي ومنع انتشار الأمراض المعدية باستخدام تقنيات حيوية وعلاقته بالتصميم المعماري ظهر عاملين رئيسيين يعززان من أهمية إجراء الدراسة، هما:

• زيادة معدلات اندلاع جوائح الأمراض التنفسية المعدية، التي يمكن أن تؤدي بحياة ملايين من البشر في العالم، مع ما يصاحبها من آثار اجتماعية واقتصادية واسعة النطاق حسب الاستراتيجية الجديدة لمنظمة الصحة العالمية 2018-2030 ("8 أشياء ينبغي أن تعرفها عن الأفلونزا الجائحة" 2019)

• اختص البحث بالمسجد لكونه محرك الأحداث الأساسي في المجتمع الإسلامي، فهو قبلة أفراد هذا المجتمع خمس مرات يوميًا يرتاده المسلمون في إيقاع دوري متكرر لتوثيق الصلة بين العبد وربّه في رابطة روحانية سامية ميزت المجتمع المسلم من غيره، فكان إلزامًا علينا الاهتمام بالبيئة التي من الله بها علينا والحفاظ عليها لتمكينها من أداء وظيفتها بشكل كامل دون انقطاع، وذلك من خلال تحسين جودة الحياة والهواء بها.

• أكد التقرير الصادر من مؤتمر المعرفة في دبي 2022 م على أهمية هندسة المحاكاة الحيوية حيث قامت بجمع ملايين المعلومات والبيانات في كافة العلوم والمجالات نتج عنها إصدار تقرير: «استشراف مستقبل المعرفة» الذي يحدد التكنولوجيات الحديثة التي

تتضمن الاستعداد لمواجهة المخاطر العالمية وهي: الذكاء الصناعي، والأمن السيبراني، والتكنولوجيا الحيوية.

1.4 منهجية الدراسة:

لوصول إلى أهداف البحث رأينا أنه من الأفضل الاعتماد على المنهج الوصفي التحليلي من خلال التعرف على الأسباب الرئيسة لانتشار الفيروسات بالفراغ الداخلي والوصول لنهج تصميمي شامل لمواجهة تلك المشكلة، فتوجه البحث لدراسة مفهوم هندسة المحاكاة الحيوية والأساس النظري لمستوياتها المختلفة وأساليب تصميم التقليد الحيوي بالمساجد ودوره في تحسين جودة الهواء الداخلي لمنع انتشار العدوى، كأداة لتحقيق الاستفادة في عمارة ما بعد الجائحة (عمارة المستقبل) ودراسة بعض تطبيقات المحاكاة الحيوية ودورها في مواجهة الجائحة.

2. العوامل المسببة في انتشار الأمراض المعدية داخل المسجد (أو) المؤثرة في جودة الهواء الداخلي):

من خلال الدراسات السابقة وجدنا أن هناك 3 عوامل رئيسة تتسبب في انتقال الأمراض المعدية داخل المباني (Megahed and Ghoneim 2021) the highlight to crucial is it (occupants to threats mitigating in strategies design building of effectiveness Air Indoor poor how on focus actions and research pandemic ongoing The Quality (IAQ)، (D'alessandro et al. 2020) والتي تؤثر على جودة الهواء الداخلي وهي:

2.1 عدم توافر تهوية طبيعية:

- بدءاً من مشكلة أنظمة تكييف الهواء الداخلية، خصوصاً خلال موسم الصيف والزيادة المحتملة لمخاطر انتقال الفيروس بين المصلين.
- الغلق التام لبعض الفراغات التي لا تحتوي على فتحات مثل (الحمامات والمخازن وما إلى ذلك). فخلال وباء السارس عام 2003 في هونغ كونغ تم إثبات انتقال الفيروس من خلال المراحيض لذلك من الضروري تنظيفها بانتظام. (D'alessandro et al. 2020)

2.2 عدم توافر العناصر الخضراء:

- من أهم آثاره التخفيف من حدة المناخ الحضري، مما يساعد على تقليل الآثار الصحية لموجات الحرارة، وزيادة محتوى الرطوبة في الهواء وخفض درجة الحرارة في الفترات الحارة.

2.3 تلوث الهواء الداخلي :

- وجود مصادر داخلية للانبعاثات وانتشار الملوثات، مع تركيز الملوثات الكيميائية والبيولوجية: مثل الغازات الصادرة من مواد التنظيف والتطهير وفي السجاد والموكيت ومنتجات الخشب الصناعي والدهانات والصبغات والمواد العازلة.
- بعد تجربة جائحة covid 19 لاحظ المصممون والمستخدمون أن مواد البناء، ولا سيما مواد التشطيب والمفروشات تبعث منها المركبات العضوية المتطايرة، وفي ظل وجود درجات حرارة عالية ويسبب التعرض لأشعة الشمس تزداد انبعاثاتها.

3. هندسة المحاكاة الحيوية:

ظهرت كلمة محاكاة الطبيعة لأول مرة في الأدبيات العلمية في أوائل الستينيات (pawlyn)

(2011). لها جذورها من كلمتين يونانيتين «bios» التي تعني «الحياة» و «mimesis» تعني «التقليد» بكل بساطة تعني المحاكاة الحيوية «تقليد الحياة»؛ فكان الهدف دراسة كيف تمكنت الكائنات البيولوجية من التغلب على التحديات وتكيفها للبقاء على قيد الحياة والازدهار في بيئتها، وغالبًا ما وجد أن الكائنات الحية قادرة على تحقيق ذلك باستخدام كميات قليلة من الطاقة - ومنها يتم محاكاة هذه الاستراتيجيات في التكنولوجيا البشرية. (and A. 2019 , Okekeogbu C. J, Okeke)

حيث تعتمد محاكاة الطبيعة على حجة مقنعة للغاية تفيد بأنه بعد 3.8 مليار سنة من التطور، تعلمت الطبيعة: ما الذي ينجح و ما هو المناسب؟ وما الذي يدوم؟ (Benyus 1997). وكما أكدت دراسة (Ayat Abdul Rahim) عام 2010 على أن هناك اهتمام متزايد بالمحاكاة الحيوية، كنظام جديد يتطلع إلى الطبيعة خاصة أساليب المحاكاة الحيوية في التصميم. وكان من أهم نتائج البحث أنه ينبغي بذل الجهود لإنشاء قاعدة بيانات معمارية لتقليد الطبيعة، فاعتمدت على دراسة الطرق الطبيعية لكشف التناقضات، استكشاف مفهوم التصميم المستوحى من الحيوية ومنهجيته المختلفة، للوصول إلى بيئة مبنية أكثر كفاءة تحاكي التقنيات الفعالة، والتي يتم اكتشافها يوقًا بعد يوم في مخلوقات الله. وفي عام 2012 اتجهت (نيفين رمضان) حول إجراء تحقيق تشابه بين الهندسة المعمارية والطبيعة، بحيث ينقل الخصائص البيولوجية للحياة إلى العمارة. كما أكد (Gehan.A. , 2016) أن التقليد الحيوي هو أحد الأساليب المبتكرة لإيجاد حلول لإدارة استهلاك الطاقة في المباني، والذي يُعد العلم التطبيقي الذي يستمد الإلهام من إيجاد حلول لمشاكل الإنسان من خلال دراسة التصاميم والأنظمة والعمليات الطبيعية. كما اهتمت (Hala Sayed, 2021) بمحاكاة الطبيعة في الهندسة المعمارية لغرض الوظيفة بدلاً من الشكل، لتحقيق أنظمة بناء المحاكاة الحيوية التي توفر كفاءة سلوك بناء محسنة تقليدياً، وأيضاً أكدت على أن نهج المحاكاة الحيوية في العمارة قد اقتصر على التقليد البسيط. وذكر (Rajneet Sidhu & Vidya Singh, 2021) أنه غالبًا ما يستلهم الجنس البشري من الطبيعة لحل المشكلات نظرًا لأن الطبيعة لها آليات معقدة تم إتقانها على مدى آلاف السنين. من ناحية أخرى ، تجسد العمليات الطبيعية قيم الاستدامة، ولكن هناك عدد من الدروس التي يمكن تعلمها من الطبيعة لحل تحديات التصميم وبناء مستقبل أكثر استدامة. كمنهجية تصميم المحاكاة الحيوية التي تحافظ على هذا الوعد.

1.3 مفهوم هندسة المحاكاه الحيوية:

تطرقنا أعداد من الدراسات إلى صياغة مفهوم لهندسة المحاكاة الحيوية، تجدر الإشارة هنا إلى أنها مجال حديث العهد نسبياً وهي جزء من مجال أكبر للتقليد الحيوي أو علم الأجهزة الإلكترونية، ظهر كلا المصطلحين (تقليد الطبيعة وعلم الأجهزة الإلكترونية) خلال الخمسينيات والستينيات من القرن الماضي ويصفان فعل التعلم من الطبيعة أو إنتاج وظائف شبيهة بالطبيعة. (Vincent et al. 2005). بينما ذكرت دراسة باكينام بركات عام 2013 أن تقليد الطبيعة هو علم تطبيقي يستمد الإلهام من إيجاد حلول لمشاكل الإنسان من خلال دراسة التصاميم والأنظمة والعمليات الطبيعية. وأيضاً ذكرت دراسة (نوال السيد، 2019) تقليد الطبيعة على أنه علم تطبيقي يستمد الإلهام من إيجاد حلول لمشاكل الإنسان من خلال دراسة التصميم الطبيعي والأنظمة والعمليات. لسوء الحظ ، هناك سوء فهم لمحاكاة الطبيعة كما عرف (Rajneet Sidhu, 2021) (التصميم الحيوي أنه نهج تصميم آخر يتضمن دمج العناصر الطبيعية في التصميم.

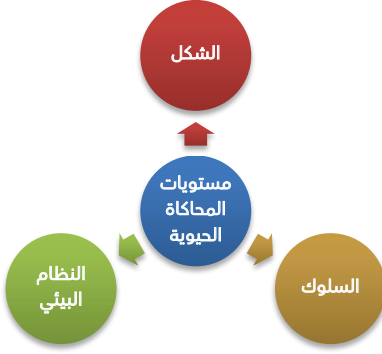
في هذه الدراسة، تم استخدام تعريف هندسة المحاكاة الحيوية في الهندسة المعمارية الذي اقترحه pawlyn في كتاب "محاكاة الطبيعة في الهندسة المعمارية" تقليد الطبيعة كما هو محدد في الكتاب "هو محاكاة الأساس الوظيفي للأشكال والعمليات والأنظمة البيولوجية لإنتاج حلول مستدامة". (pawlyn 2011)

2.3 مفهوم التكنولوجيا الحيوية:

التكنولوجيا الحيوية تعد حلاً مستوحاة من علم المحاكاة الحيوية وهو مجال متعدد التخصصات في علم الأحياء والتكنولوجيا والذي يغطي الدراسات المنهجية للوظائف والعلاقات والهياكل والعمليات في النظم البيولوجية وتحولها إلى حلول للمشكلات التقنية والتكنولوجية الأولية، وهي المستقبل والمفتاح الأساسي لحل المشكلات البيئية، حيث يلعب كل من علماء الأحياء والمهندسين المعماريين دوراً محددًا، حيث يتمثل دور علماء الأحياء في توفير قاعدة بيانات المعرفة البيولوجية، بينما يتمثل دور المهندسين المعماريين في توفير المعرفة بالتصميم المعماري بشكل متواز (Megahed and Ghoneim 2021) crucial is it threats mitigating in strategies design building of effectiveness the highlight to poor how on focus actions and research pandemic ongoing The .occupants to .IAQ) Quality Air Indoor.

3.3 مستويات المحاكاة الحيوية في العمارة:

يلهم التقليد الحيوي العمارة في مستويات مختلفة كما يفعل علم الأحياء في الطبيعة ويمكن تلخيص هذه المستويات في ثلاث فئات كما يوضح الشكل (1): مصدر إلهام للشكل ، وتقليد سلوك الكائن الحي، وتقليد النظام البيئي (Benyus 1997).



شكل (1)
مستويات المحاكاة الحيوية في العمارة

1.3.3 مستوى الشكل أو الهيكل:

في المستوى الأول من محاكاة الطبيعة، يشير إلى الكائن الحي من نبات أو حيوان، وقد يتضمن محاكاته

شكل 2:

مطعم في اليابان على شكل سمكة. - Fish Dance <https://i.pinimg.com/25/com/564x/79/a4/79a4250df8c0d524844a1e07676952c/> jpg

بالكامل أو جزء منه، بحيث يتم تقليد شكله وتطبيقه في التصميم المعماري (Vavan, Milošević, and Minić 2019) مثال على ذلك مطعم Kobe ، Fish Dance ، اليابان ، للمهندس المعماري فرانك جيري شكل (2)، قام غاري في البداية بتصميم وبناء مطعم Fish Dance بالقرب من ميناء كوبي باليابان ، وقد تم تصميم المطعم على شكل سمكة شبوط قافزة ، وهو يمثل الرمز الميمون «لقفز سمك الشبوط فوق بوابة التين». ومع ذلك ، بعد زلزال كوبي ، على الرغم من عدم تدمير مطعم الأسماك ، فقد تم إغلاقه. من أجل الحفاظ على مبنى هذا المصمم الشهير ، الآن أصبحت هذه السمكة جزءًا مهمًا من ميناء كوبي. ("2009 Night Beauty Silver Jewelry")

2.3.3 مستوى السلوك أو الوظيفة:

في المستوى الثاني من محاكاة الطبيعة، يشير إلى محاكاة سلوك الكائن الحي، وقد يشمل تفسير جانب من كيفية تصرف الكائن الحي أو ارتباطه بسياق أكبر، تقليد الطبيعة ليس مجرد تقليد غير هادف، ولكنه ملاحظة وتحليل للأنماط والعمليات العامة في الطبيعة والتي تسمى مبادئ الحياة، وتحويل وتطوير وتطبيق هذه المبادئ في حلول تكنولوجية متطورة، (Vavan, Milošević, and Minić 2019) مثال على ذلك: مركز Eastgate ، الذي صممه المهندسون المعماريون Mick Pearce و James McComish ، في زيمبابوي شكل (3)، يعتمد هذا المبنى بالكامل على استخدام وسائل طبيعية للتبريد والتدفئة ، ويتكون المبنى من 4 حوائط حجرية خارجية ، وقاعة داخلية بارتفاع سبعة طوابق ، ويتم سحب الهواء من الخارج للداخل من خلال فتحات التهوية ، ثم يتم تبريده أو تدفئته خلال كتلة المبنى، وذلك اعتمادا على درجة حرارة خرسانة المبنى والهواء ، وترتب على استخدام هذه الطريقة تقليل استهلاك الطاقة بنسبة تقل عن 35% عن استهلاك 6 مباني تقليدية ، كما خفضت تكلفة الاستهلاك لعشر تطفه استخدام مكيفات الهواء.(Okeke, Okekeogbu C. J., and A. 2019)



3.3.3 مستوى النظام البيئي:

شكل 3: حيث تحاكي النظم البيئية بأكملها والمبادئ

تطبيق تقنيات التهوية السلبية والتحكم في درجة الحرارة، بمحاكاة أكوام النمل الأبيض وأدائها. https://www.buildinggreen.com/sites/default/files/articles/ch2_2520and%2520eastgate.png

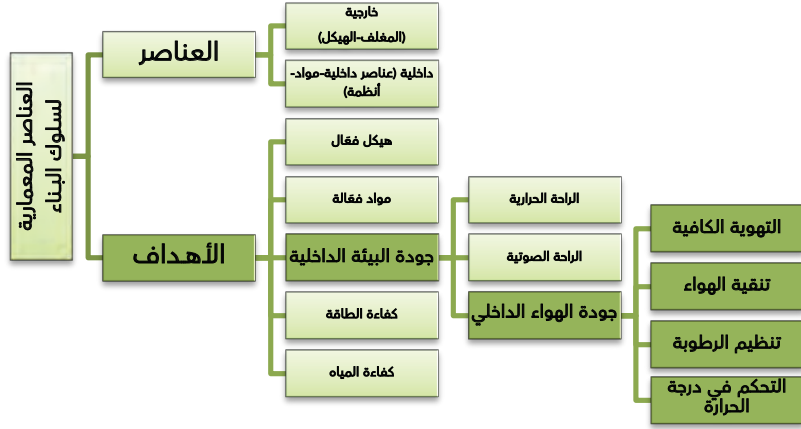
المشتركة التي تسمح لها بالعمل بنجاح، ستتمكن هذه التكنولوجيا المباني المستقبلية من محاكاة الأنظمة المعقدة لإدارة استهلاك الطاقة والاستجابة

لدرجة الحرارة وشدة ضوء النهار وسرعة الرياح والقوة والتغيرات الأخرى في البيئة (Vavan, Milošević, and Minić 2019) ، ويتم تطبيق مستوى النظام البيئي في التصميم الحضري المتجدد ومثال على ذلك ما تم تقديمه في مشروع Lloyd Crossing Urban Design ، بورتلاند ، أوريغون ، الذي صممه فريق Mithūn Architects و Green Works Landscape Architecture Consultants شكل (4)، (5)، يهدف هذا المشروع إلى تطوير متعدد الاستخدامات يتضمن صياغة عمران متكامل، حيث ستستخدم المباني مجموعة متنوعة

من الاستراتيجيات المستدامة المصممة، مع المشروع الأصلي، من المتوقع أن تكون هناك تحسينات عامة ، اعتمد المشروع على استراتيجيات مثل تصميم الشوارع الخضراء، والمساحات الخضراء العامة الجديدة، والأسطح الخضراء، والاتصال بالشبكة الخضراء الحضرية الموجودة في المنطقة. كانت الاستراتيجيات الأخرى هي زيادة الموائل من خلال استعادة المناطق الخضراء واستعادة ضفاف الأنهار. كان من المهم أيضاً تحسين تدفقات المياه، واحترام مياه الأمطار المتاحة في الموقع من خلال تقليل استهلاك المياه ، وجمع مياه الأمطار ومعالجتها وتخزينها. تم اقتراح استراتيجية مماثلة فيما يتعلق بالطاقة ، التركيز على إنتاج الطاقة الشمسية وتحسين الأداء للمباني ، والحد من الاستهلاك لمطابقة الموارد المتاحة محلياً. أخيراً ، حدد المشروع 15 فائدة يمكن أن تكون للإجراءات المقترحة للمجتمع بما في ذلك تحسين الرفاهية، وخلق موائل لأنواع الحياة البرية ، وتنظيم التلوث، والتي يمكن فهمها أيضاً على أنها خدمات النظام البيئي. (Blanco et al. 2021)



وهنا ستركز الدراسة في هندسة المحاكاة الحيوية على مستوى سلوك الكائن الحي، والذي يمثل الفهم العميق للاستراتيجيات والعمليات والوظائف والأنظمة البيولوجية، إلى جانب ذلك يركز هذا المستوى في طرق الحل الأكثر احتمالية والمقارنات المتعددة المركبة والتطور المشترك للمشكلات والحلول التي يمكن أن تتعامل مع أنظمة البناء لتعزيز سلوك البناء، حيث يتكون سلوك البناء من عناصر مادية وأخرى وظيفية ويوضح الشكل (6) عناصر وأهداف سلوك البناء (Sayed 2021).



شكل 6:

العناصر المعمارية التي تعزز سلوك البناء (Sayed 2021)

4.3 استراتيجيات المحاكاة الحيوية لتحسين جودة الهواء الداخلي:

أكدت الأبحاث العالمية أن تغير المناخ قد يؤدي إلى انتشار الأوبئة العالمية (Khai 2016). وأن ضمان معدل تهوية مناسبة أمرًا ضروريًا لتقليل مخاطر الإصابة بالعدوى في الفراغات الداخلية، فلا يمكن تجاهل انتقال العدوى عبر الهواء باللجوء إلى تدابير وقائية فعالة للحد من مخاطر العدوى (Dai and Zhao 2020). وبالرجوع لهدف الدراسة وهو تصميم مباني المساجد المستقبلية لتحسين جودة الهواء الداخلي IAQ ومنع انتشار العدوى، يمكننا تحديد الهدف المعماري المراد تحقيقه وهو جودة البيئة الداخلية وبشكل دقيق وموضوعي بدراسة استراتيجيات تحقيق جودة الهواء الداخلي سواء في العناصر المعمارية الخارجية أو الداخلية والتي تنقسم إلى: حركة الهواء (التهوية الكافية) وتنقية الهواء والتحكم في درجة الحرارة وتنظيم الرطوبة (Brittain et al. 2020)

1.4.3 حركة الهواء:

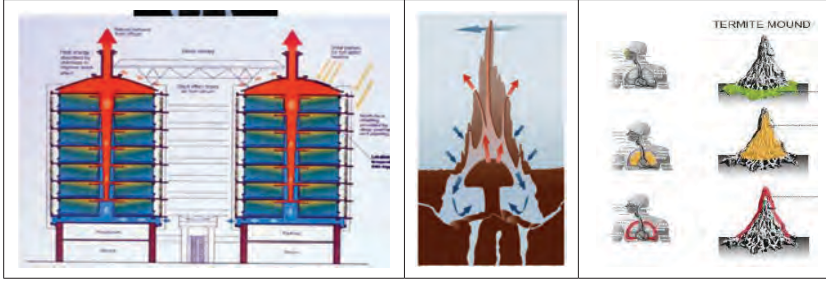
تسهم التهوية المناسبة في تحسين جودة الهواء الداخلي وتساعد على منع تراكم الجزيئات التي يحتمل أن تكون معدية في الأماكن المغلقة وبالتالي تقلل من احتمالية انتشار الفيروسات، وبحسب معدلات التهوية الموصى بها من ASHRAE تتراوح من 0.35 - 8 تغيرات هواء في الساعة، وكذلك أثبتت الدراسات أن معدل التهوية الذي يضمن أقل من 1% إصابة بالعدوى يلزم أن يكون من القيم الشائعة (100-350 م³ / ساعة و 1200-4000 م³ / ساعة) لمدة 15 دقيقة و 3 ساعات من التعرض ، على التوالي (Dai and Zhao 2020) ، وهو ما يسهل تحقيقه من خلال وضع التهوية الطبيعية وفي بعض الأحوال نلجأ لتعزيزها بالأنظمة الميكانيكية.

كما تولي الأنظمة الطبيعية اهتماماً خاصاً لأنظمة التهوية (تبادل الهواء) والتي يمكن العثور عليها في عدد من الكائنات الحية، هناك أنماط مختلفة للتهوية والتكامل في الطبيعة، حيث تمتلك عدد من الكائنات الحية آلية لتبادل الهواء (الشهيق والرفير) ومن الأمثلة الشهيرة التي تم تقليدها في مجال التهوية: تلال النمل الأبيض.

أ. التهوية الطبيعية المستوحاة من تلال النمل الأبيض:

هناك عدد من المشاريع المستوحاة من تلال النمل الأبيض كوظيفة مشابهة لوظيفة رثة الإنسان، عندما يتم دفع الهواء عبر الطبقات تصبح الأنابيب داخل الطبقات أصغر وأكثر عددًا، كوسيط ترشيح.

تحدث التهوية الطبيعية من خلال الاختلاف في ضغط الهواء الداخلي والخارجي، حيث ينتقل الهواء من مناطق الضغط العالي نحو مناطق الضغط المنخفض من خلال أسلوب الحث على التدفق وتأثير المدخنة، التي تحدث في المباني التي تحتوي على فتحة مدخنة علوية فيها، ومتصلة بنفق يخترق جسم المبنى رأسياً هابطاً إلى الأسفل، فيخرج الهواء من داخل المبنى من خلال الفتحة العلوية، ويؤدي ذلك إلى سحب هواء جديد من خلال فتحات صغيرة موجودة عند أجزاء المبنى السفلية، يمكن تطبيقها في صورة المدخنة العلوية والقنوات الهوائية الرأسية، والأرضية تحت مستوى سطح الأرض، وكذلك فتحات تهوية إضافية في القاعدة العريضة للمبنى، يؤدي هذا النظام من التهوية الطبيعية إلى زيادة تدفق الهواء الطبيعي إلى الداخل لأقصى حد وبالتالي تقليل استخدام أنظمة التهوية الميكانيكية في أوقات معينة من العام (علي 2017). مثال على هذه التقنية هو مركز Eastgate Office Building ، وهو مكتب كبير ومركز تسوق في زيمبابوي شكل (7).



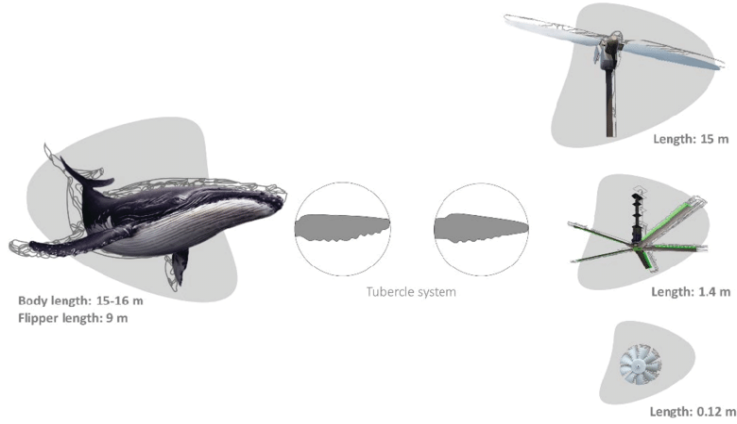
شكل 7:

محاكاة عملية التهوية المستوحاة من رئة الانسان وتلال النمل الأبيض (eastgate office building (Sayed 2021

ب. التهوية الميكانيكية المستوحاة من زعانف الحوت الأهدب:

نظراً لأن تدفق التهوية الطبيعية يعتمد على الظروف البيئية، فقد لا يتوفر دائماً كمية مناسبة من التهوية، في هذه الحالة يمكن استخدام الأنظمة الميكانيكية لتكملة أو تنظيم التدفق الطبيعي للهواء في أوقات مختلفة من اليوم، أو في مواسم مختلفة من السنة، حيث يمكن الاستعانة بالأنظمة الميكانيكية والطبيعية في نفس الوقت.

فبالنظر إلى الحوت الأهدب نجد أنه يمتلك زعانف فريدة ذات درنات تقع عند الحواف الأمامية قادرة على المناورة العالية والأداء الهيدروديناميكي الفريد لتنفيذ المنعطفات الضيقة والسباحة الفعالة، حيث تعتبر زعانف الحوت الأهدب الأطول بزعانفة الحيتان، ويتراوح من 25% إلى 33% من إجمالي طول جسمه، تسمح الحديبات الموجودة للزعانف بالانزلاق بسلاسة وبشكل طبيعي، قامت شركة ناشئة تسمى Whale Power باستخدام تقنية زعانف الحوت الأهدب في تطوير شفرات مروحة تنتج قوة رفع أكبر، وبالتالي تحرك المزيد من الهواء، بفضل التصميم الوعر لزعنفة الحوت الأهدب شكل(8)، وتتميز تلك المراوح بقدرتها العالية على تحريك هواء أكثر بنسبة 25% من المراوح التقليدية، واستخدام طاقة أقل بنسبة 20%، وبالتالي توفر تدفق هواء مرتفع، ويرتبط تحقيقها للتهوية الجيدة بعددها وتوزيعها وقدرتها وكم استهلاكها للطاقة (HOWARD 2013).



2.4.3 تنقية الهواء

أكدت عدد من الدراسات على قضية تلوث الهواء وأثره في انتشار العدوى بالفراغات الداخلية، وكذلك دور الهندسة المعمارية (هندسة المحاكاة الحيوية) التي تعمل على غرار الكائنات الطبيعية لتخلق بنية حية تعمل على التحول والتنفس والتنظيف الذاتي لحماية المبنى الداخلي ومساعدة المستخدمين على الوصول إلى نتائج أفضل، بإنتاج أنظمة حيوية لمعالجة وتنقية الهواء (Bazaïd et al. 2020) تتم في 3 مراحل بمحاكاة عملية التنفس للكائنات الحية.



شكل 7:

مراوح هوائية فعالة مستوحاة من درنات زعانف الحوت الأحدب
<https://www.researchgate.net/profile/Valentina-Perricone/publication/354909240/figure/fig2/AS:1073223747788800@1632887889854/Biomimetic-scaling-of-the-tubercle-effect-Tubercle-system-of-humpback-whale-fin-provided.png>

أ. تنقية الهواء الخارجي المحيط بالمبنى :

تستخدم هذه الإستراتيجية في التصميم لتنقية الهواء قبل دخوله إلى المساحات الداخلية باستخدام شجرة الطحالب في خارج المبنى شكل(9)، تقوم بإنتاج الأوكسجين بقدر مئات

الأشجار بمحاكاة عملية التمثيل الضوئي حيث انها لديها قدرة على تصفية الملوثات مثل الجسيمات وأكاسيد النيتروجين وثنائي أكسيد الكربون من الهواء وإنتاج الأوكسجين مما يجعلها بمنزلة أجهزة تنقية هواء طبيعية مثالية، يمكن استخدام نفايات الطحالب الدقيقة كمواد خام لإنتاج منتجات ذات قيمة مضافة مثل الغاز الحيوي والوقود الحيوي. (HOWARD 2013)

ب. ترشيح الهواء المنتقل إلى الداخل:

يصمم غلاف المبنى بمحاكاة خواص الأغشية البيولوجية التي تقوم بتصفية الهواء من الملوثات باستخدام طبقة رقيقة من ثنائي أكسيد التيتانيوم في شكل جزيئات نانوية (Nano-TiO₂) على الأسطح الخارجية لفترة طويلة شكل (8)، بحيث تقوم الهياكل النانومترية بتدمير ملوثات الهواء العضوية وتحليلها بشكل فعال مثل: الفورمالديهايد والبنزين والمركبات العضوية المتطايرة الإجمالية والفيروسات والبكتيريا وغيرها، تدوم تلك الجسيمات لأكثر من 25 عاماً. ("2019 BlueTech Award Winner" 2019 Air Purification Technology)



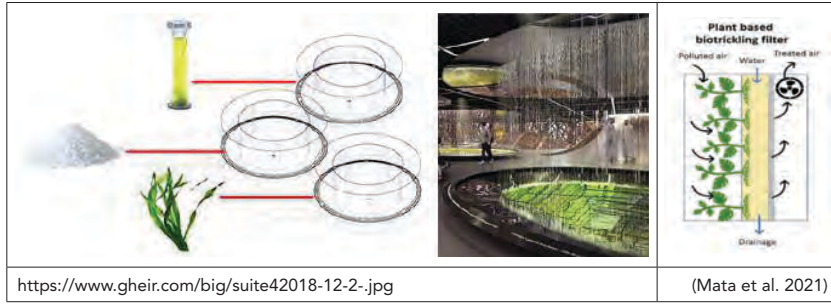
شكل 8:

تكنولوجيا اللصق النانوي Nano-TiO

https://media-exp1.licdn.com/dms/image/1/0/C4E1BAQEITeQNwbeYdQ/company-background_10000e=2147483647&v=beta&t=ifGa8Yz4lUBVQW?550815358439Af-x0oZLEvexSS7jDIUH2RB4tXdb0

ج- تنظيف الهواء الداخلي من الملوثات الناتجة عن العمليات الحيوية :

زراعة الطحالب سواء في الجدران بدمجها في الشبائيك، أو الزراعة الداخلية بعدد من الأنظمة التي ثبتت فعاليتها بالدراسات (Mata et al. 2021) شكل (9)، حيث تعمل الطحالب الدقيقة كمرشح هوائي حيوي من خلال عملية التمثيل الضوئي، تلتقط ثاني أكسيد الكربون والملوثات من الهواء الداخلي، وتقوم بإنتاج الأوكسجين النقي في الهواء، يتم توصيل الهواء الخارجي من نظام الطحالب بأنظمة التهوية في المبنى، وتتغذى هذه الطحالب على المياه الرمادية ويمكن استخدامها فضلاتها كوقود حيوي، إن هذه الأنظمة النباتية لها أيضاً فوائد أخرى، بسبب التبخر الناتج للنباتات، بما في ذلك خفض درجة الحرارة حول النباتات، يمكن أن تساعد النباتات في تبريد الهواء والتحكم في الرطوبة، ويمكن أيضاً أن تكون بمثابة عازل صوتي، وبذلك نجد أن نظام الترشيح الحيوي من الطحالب ينقي الهواء الداخلي من الملوثات بنسبة تصل إلى 95% مما يؤدي إلى تحسين جودة الهواء الداخلي الذي بدوره يحسن من صحة المستخدمين وكذلك يستخدم طاقة أقل بكثير من أنظمة التدفئة والتهوية وتكييف الهواء التقليدية. (Mata et al. 2021)



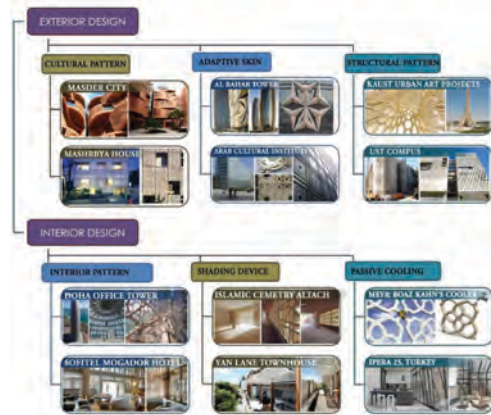
شكل 9:

أنظمة دمج نباتات الطحالب في الواجهات وزراعتها داخلياً

3.4.3 التحكم في درجة الحرارة وتنظيم الرطوبة:

أكدت الدراسات على أن الارتباط بين عوامل الأرصاد الجوية وفيروس كورونا مهم للوقاية منه والسيطرة عليه، مثل متوسط درجة الحرارة والرطوبة النسبية (ARH) ومؤشر جودة الهواء (IAQ). حيث تم العثور على ارتباط سلبي بين متوسط درجة الحرارة والحالات المؤكدة اليومية لفيروس كورونا، كما ارتبطت زيادة بنسبة 1% في الرطوبة النسبية بزيادة قدرها 1.7% ~ 3.7% في الحالات المؤكدة اليومية للفيروس، ومن هنا نجد عوامل الأرصاد الجوية يمكن أن تؤثر بشكل واضح على انتشار الفيروس، وأن الحد من تأثيرات عوامل الأرصاد الجوية على الفيروس إجراء مهمًا للصحة العامة للوقاية منه ومكافحته. (Tong et al. 2021)

ينقسم التنظيم الحراري في المجال المعماري إلى عنصرين: العناصر الخارجية والداخلية، تتمثل العناصر الخارجية في غلاف المبنى وهيكله، بحيث يعمل غلاف المبنى على فصل المساحات



شكل 10:

التحكم في درجة الحرارة من خلال التكامل بين التصميم الخارجي والداخلي المستوحى من الطبيعة
(Semary 2019) المصدر

الداخلية المشغولة عن البيئة الخارجية المستوحاة من جلد الكائنات الحية، وغالباً ما تُعتبر أغلفة المباني بمثابة حواجز أو دروع حرارية من خلال محاكاة استراتيجيات الطبيعة. يمكن رؤية الأمثلة في الأنماط المستوحاة من الطبيعة في مدينة مصدر، وبيت المشربية، واستجابة الجلد المتكيف مع الظروف البيئية في أبراج البحر والمعهد الثقافي العربي، ومن ناحية أخرى تتكامل العناصر الداخلية مع العناصر الخارجية لتحقيق هدف الراحة الحرارية، حيث يمكن رؤية العناصر الداخلية المستوحاة من الحيوية في أمثلة، مثل: النمط الداخلي وأنظمة التبريد السلبي وأجهزة التظليل شكل (10) (Sayed 2021).



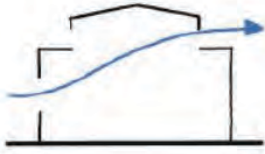
كما يتم الاستفادة من استراتيجية النباتات في المحافظة رطوبتها حيث انها تمتلك خاصية التبخير السلبي مما ينتج عنها خفض درجة الحرارة حول النباتات، يمكن أن تساعد في تبريد الهواء والتحكم في الرطوبة، ذكرت بالتفصيل في الفقرة (2-3-4).

تطبيق استراتيجيات المحاكاة الحيوية بالعناصر المعمارية للمسجد:

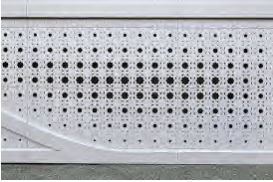
بعد دراسة هندسة المحاكاة الحيوية وتحديد الاستراتيجيات البيولوجية التي تساعد في تحسين جودة الهواء الداخلي في الفراغات الداخلية للمباني بالمعدلات التي تقلل من احتمالية انتشار الفيروسات كما تم الوصول لها في الأبحاث المتعلقة بذلك، يمكننا اقتراح بعض الآليات و التقنيات المستوحاة من التكنولوجيا الحيوية بحيث يتم دمجها في العناصر المعمارية للمسجد المرتبطة بجودة الهواء الداخلي.

اعتمد البحث في التحليل علي الرجوع إلي النموذج الأول الذي قدمه رسول الله (صلى الله عليه وسلم) من خلال مسجده بالمدينة المنورة في صدر الإسلام بوصفه جانب من سنته الشريفة في رؤية مايجب أن تكون عليه المساجد حيث يرجع بعض الباحثين أن أكثر المساجد قد بنيت وتطورت بناء على التصميم الأساسي للمسجد النبوي الشريف، الذي تكون من مستطيل بسيط يتوسطه صحن مفتوح إلى السماء، أحاطت به لاحقاً به أيوانات جانبية مغطاة، والمآذن والقباب، إلا أن دراستنا تحتم علينا الحديث عن مكونات وتفصيل أخرى أكثر وأدق والتي من شأنها التحكم في جودة الهواء الداخلي أو زيادة تقيّة الهواء وتنظيم معدلات تدفقه ، والتي نصفها كما يلي:

أمثلة	الهدف المعماري	الاستراتيجية	الفرغ أو العناصر المعمارية بالمسجد
<p>ومثال على ذلك :المسجد المستدام في الطائف-المملكة العربية السعودية، والحائز على جائزة تميز الهندسة المعمارية الذكية في دبي عام 2018 حيث تم تصميم المسجد بمراعاة معايير الاستدامة البيئية، واستخدم جسم المئذنة كملقف لتوفير الهواء المبرد الطبيعي كما في الشكل (11).</p>   <p>شكل (11) : https://www.youtube.com/watch?v=pOUXz4oJffQ</p>	<p>التهوئة الطبيعية وتنظيم تدفق الهواء وتنظيم درجة حرارته</p>	<p>تعزيز التنفس (نظام حيوي) بوصف المأذنة ملقفاً هوائياً يعمل على تحريك الهواء الداخلي للمسجد نحو الأعلى عند دمجها مع المحراب أسفل منها، أو ملقفاً يعمل على صيد الهواء وتبريده بالتبخير قبل وصوله إلى ساحة المسجد الخارجية أو فراغ الصلاة الداخلي، وذلك في حال دمجها مع المدخل الرئيسي للمسجد. ولاستخدام هذا العنصر في تحسين جودة الهواء الداخلي يتم تطبيق أربعة أنظمة مستوحاه من طبيعية: شكل (21) مفهوم فغرة النباتات لمعالجة تغيرات الضغط التناضحي والتحكم في فتحات التبخر، ومفهوم كوز الصنوبر لمعالجة تغيرات الرطوبة النسبية، ومفهوم الشعر حول العينين (الرموش) للحماية من الجزيئات الصغيرة من الغبار والرمل والملوثات) أخيراً، ينطبق مفهوم جلد الإنسان على نقل الحرارة الكامن - التبريد من خلال التبخر</p> <p>(Bazaid et al. 2020)</p>  <p>شكل (12): نظام التنفس الحيوي</p>	<p>1 - المئذنة أو المئذنة من العناصر المعمارية التي يمكن دمجها مع عناصر أخرى بهدف إعادة توظيفها في المسجد.</p>

<p>ومثال على ذلك : مسجد المجتمع المناخي الحيوي - اندونيسيا 2020- شكل (14)، استخدم في تصميمه التقنية التفصيلية للتهوية المتقاطعة (تباين المدخل والمخرج، واستخدام القائمة، والفتحة المظللة الجانبية والعلوية فوق المحراب (Abdel 2020)</p>   <p>شكل (14) : مسجد المجتمع المناخي الحيوي-اندونيسيا</p>	<p>التهوية الطبيعية وتنظيم تدفق الهواء</p>	<p>أسلوب الحث على التدفق</p> <p>استغلال القبة التي فوق المحراب في الإضاءة الطبيعية والتهوية بتزويدها بفتحات جانبية من ناحية السقف لتقوم بسحب الهواء للخارج ليدخل الهواء النقي وبالتالي نضمن عدم انتشار الفيروسات داخل فراغ المسجد شكل(13).</p>  <p>شكل (13) : أسلوب الحث على التدفق المصدر(الباحث)</p>	<p>2- المحراب والقبة:</p> <p>من الثوابت في عمارة المساجد وجود المحراب، وهو التجويف الغائر في حائط القبلة، ويتم تحديد اتجاه القبلة بتغطية رواق القبلة بقبة كبيرة أمام المحراب ناقلًا بذلك مركز الثقل إلى جدار القبلة. ("المؤتمر الاول عمارة المساجد. Pdf" (2016</p>
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مثال على ذلك : جامع محمد بن جاسم الكبير في الكويت، حيث تم تغطية نوافذ المسجد بستائر خارجية مستوحاة من الأشكال الهندسية للمشربية والتي بدورها تعمل على تنظيم دخول الهواء من النوافذ .



شكل (15) : جامع محمد بن جاسم الكبير في الكويت

تفقية الهواء
وترشيحه من
الملوثات
مع التظليل
والتحكم في
درجة الحرارة

أ. تكنولوجيا اللصق النانوي في الواجهات

يمكننا استخدام المركبات النانوية التي أثبتت كفاءتها في معالجة تلوث الهواء، حيث أنها تمتاز بكفاءة بيئية عالية والتي تجعلها البديل الأنسب لمواد الطلاء التقليدية، وهذا من خلال خصائص التنظيف الذاتي للأغشية البيولوجية المستوحاة من الكائنات الحية، وهذه المادة تفكك الملوثات وتحولها إلى مواد غير ضارة، عن طريق تفاعل محفز يدمر جزيئات الملوثات بما فيها من أكاسيد النيتروجين المسببة في انتشار الفيروسات، ويمكن استخدام المادة ذاتها في صناعة شرائح رقيقة من ثنائي أكسيد التيتانيوم بتصميمات مختلفة يتم تركيبها على الواجهات الخارجية التي تحتوي على فتحات تهوية، بحيث تعمل كمرشحات بيولوجية لتنقية الهواء من الملوثات، وتدمير المركبات العضوية وتحليلها بشكل فعال، ويمكن التحكم في تصميمها بأشكال هندسية وزخارف نباتية تتماشى مع تشكيل الطراز المعماري المتبع في تصميم المسجد.

3- الحوائط

تشكل الحوائط الغلاف الخارجي للمسجد، ويمكن استخدام الحلول وتقنيات التكنولوجيا الحيوية في الحماية للفراغات الداخلية من العوامل الخارجية، وتمثل خط الدفاع الأول الذي يمنع دخول الفيروسات لداخل المسجد.

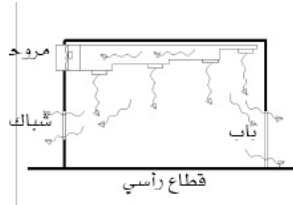
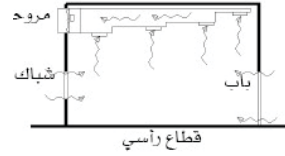


شكل (16) تركيب مراوح التهوية بالحوائط الخارجية

شفرات المروحة قادرة على إنتاج قدرًا أكبر من رفع الهواء، وبالتالي تحرك المزيد من الهواء، بنسبة 25% من المراوح التقليدية بينما تستخدم طاقة أقل بنسبة 20% (HOWARD) (2013)

ب. التهوية الميكانيكية المستوحاة من زعانف الحوت الأحدث

تزويد نظام التهوية ببعض المراوح الهوائية الحيوية في الحوائط أو سقف المسجد لتزيد التدفق الطبيعي للهواء بنسبة أكثر من المراوح التقليدية، تلك المراوح يجب أن لا تقل المسافات بينهم عن 5 م لتحسين التوزيع ولمنع التهوية المباشرة المسلطة على وجوه المصلين ولتقليل الإزعاج، مما يضمن تجدد الهواء باستمرار وبالتالي تقليل احتمالية انتشار الفيروسات بنسبة تصل إلى 99% (Dai and Zhao) (2020)



شكل (17) : دخول الهواء وخروجه بدمج التهوية الطبيعية والميكانيكية



شكل (17) خلية النحل-مبرد المحاكاة الحيوية وتنقية الهواء

تنقية الهواء
والتحكم في
درجة الحرارة

ج- خلية النحل-مبرد المحاكاة الحيوية وتنقية الهواء

تعمل خلية النحل على التبريد التبخيري النشط والمباشر. تستخدم الأواني الترابية تقليدياً لتبريد المياه. يتم تبريد الماء داخل الأواني بشكل طبيعي بسبب التبريد التبخيري. بمرور الهواء عبر الأواني الترابية المنقوعة في الماء. يمكننا تقليل استهلاك الطاقة والبصمة الكربونية للتبريد بشكل كبير. تسمح المرونة في التصميم بتغيير حجم التثبيت على نطاق واسع يتراوح من الأماكن العامة المفتوحة إلى المساحات الداخلية شبه المفتوحة. يتيح التصميم المعياري إمكانية تصنيع التركيب في أجزاء يمكن تجميعها في المكان المطلوب. يتكون البيوفيلم بشكل طبيعي على هذه الأواني الفخارية. يمكن أن تساعد زراعة الطحالب الدقيقة على سطح هذه الأقماع في تنقية الهواء في الأماكن العامة. وقد يستهلك طاقة أقل بنسبة 40٪ مقارنة بالأنظمة الأخرى.

<p>مسجد بيت الروؤف - دكا - بنجلاديش - تتركز قاعة الصلاة الخالية من الأعمدة على ثمانية أعمدة مبنية في الخارج، إضافة إلى أربعة فناءات مضيئة، وفتحات السقف الدائرية العشوائية التي تسمح بدخول ضوء النهار إلى قاعة الصلاة، ويتضح فيها الأبنية الداخلية التي توفر التهوية الطبيعية للقاعة، وكذلك استخدام المراوح الهوائية لزيادة تدفق الهواء وسرعة خروجه من الفناء ليتم استبداله بهواء نظيف من الخارج.</p>   <p>شكل (18) : مسجد بيت الروؤف - دكا - بنجلاديش</p>	<p>التهوية الطبيعية وتنظيم تدفق الهواء وتنظيم درجة الحرارة</p>	<p>الحث على التدفق المستوحى من تلألؤ النمل الأبيض</p> <p>لتحقيق التهوية الطبيعية يفضل توجيه الفتحات لتكون باتجاه الرياح السائدة وهي شمالية أو شمالية غربية في مصر، وحيث أن اتجاه القبلة في مصر ما بين الشرقية والجنوبية الشرقية لذلك فإن الفتحات ستكون في الجدار الخلفي للمسجد المتعامد مع حائط القبلة، والحفاظ على الواجهات الجانبية مصممة بدون أي فتحات، وإضافة فتحة سقف علوية في جدار القبلة وفتحات صغيرة على جوانب السقف بحيث تعمل كمخزنة علوية تسحب الهواء بنظام الحث على التدفق الذي يعتمد على حركة الهواء المستوحى من تلال النمل الأبيض، فيخرج الهواء الساخن المحمل بالملوثات من داخل المسجد من خلال فتحات السقف العلوية، ويؤدي ذلك إلى سحب هواء جديد من خلال الفتحات الموجودة في الجدار الخلفي للمسجد، بحيث لا يقل ارتفاع الفتحات عن 1 م. (Dai -article": "type"(and Zhao 2020 //:http": "uris", {"journal /com.mendeley.www -cf8e99bd=uuid?/documents "807573fcc5a3-b299-4561-a790 formattedCitati"}: "mendeley", [{" 2020 Zhao and Dai)": "on</p>	<p>4- النوافذ</p> <p>إن وضع النوافذ يؤثر بشكل قاطع على وظيفة المسجد، ويحدد الاتصال بين حيز الصلاة والفراغ الخارجي، تؤثر شكل الفتحات على التشكيل العام، كما ان لها دور هام في التصميم الداخلي لعمارة المسجد، والتوجيه الأفضل للفتحات يكون باتجاه متعامد على حائط القبلة ("المؤتمر الاول عمارة المساجد. 2016 "Pdf)</p>
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مسجد كامبريدج المركزي في بريطانيا أول مسجد صديق للبيئة في أوروبا تم افتتاحه في عام 2019، اعتمدت الفكرة التصميمية على اعتبار المسجد كواحة هادئة داخل بستان من الأشجار، عند دخول المسجد تجد ساحة خضراء على طراز الحديقة الإسلامية مع سياج أخضر من النباتات والأشجار مما يساهم في تلطيف الجو وتنقية الهواء كما في الشكل (19).



شكل (19) : مسجد كامبريدج المركزي في بريطانيا

تنقية الهواء
وترشيحه من
الملوثات
وتنظيم الحرارة
والرطوبة

المسطحات الخضراء (شجرة الطحالب)

لضمان عدم انتقال الفيروسات مع الهواء من خارج المسجد لدخله من خلال المداخل يجب تزويد ساحات المساجد وأمنيتها بمناطق خضراء، تقوم بدورها بعملية تنقية وترشيح للهواء ويتم ذلك بزراعة ساحة المدخل أو فناء المسجد بعدد من الأشجار والنباتات الطبيعية التي تقوم بتصفية الهواء من الملوثات، ويتم دعمها بتقنية المفاعلات الحيوية من الطحالب الدقيقة وهي عبارة عن أشجار بلاستيكية ضخمة تحمل في داخلها نظام المفاعل الحيوي الضوئي لزراعة الطحالب الدقيقة التي تقوم بإنتاج الأكسجين بغزارة مما يجعلها بمثابة أجهزة تنقية هواء طبيعية مثالية تصل إلى 95% (Mata et al. 2021) ما يفعله هذا النظام ، من خلال التكنولوجيا ، هو استنشاق تلوث الهواء واستخدام المحاكاة الحيوية لتنفيذ العملية الطبيعية (لعملية التمثيل الضوئي

5- الساحات والأفنية والمداخل:

دخول المسجد هي تجربة من الأكثر عمومية الي الأكثر خصوصية في علاقة الفرد بالمجموعة من جهة وعلاقة الفرد بالخالق، كما يمثل العلاقة بين العالمين داخل وخارج المسجد. ("المؤتمر الاول عمارة المساجد. 2016 Pdf")

النتائج:

في ظل جائحة الكورونا التي أمتت بالعالم وأثرت سلبيًا على قطاعات عديدة في كافة نواحي الحياة اليومية، والتي من أهمها الجانب الديني، فأغلقت المساجد مما ترك شعورًا بالغربة داخل المدينة، وشكّل نوعًا من العاطفة المحفزة نحو البحث عن حلول لتطوير أفكار تصميمية لعناصر المسجد تجنبنا هذا الانقطاع في المستقبل. حيث يمكن الاستفادة من التطورات التكنولوجية ومواد وتقنيات البناء الحديثة كالتكنولوجيا الحيوية لتحقيق عمارة بنائية للمسجد على درجة عالية من الكفاءة بحيث تتوافق مع الجانب المعنوي والاجتماعي لعمارة المسجد، من دون ان تخرج به عن مضمونه الروحي والحسي الذي انطلق من تعاليم الدين الاسلامي، وفي نفس الوقت يمكن تحقيق بيئة آمنة صحية لا تتسبب في نقل الأمراض والعدوى. فكان المسبب الأساسي في الإغلاق هو العلاقة الطردية بين زيادة عدد وفيات جائحة كورونا والتعرض طويل الأمد لتلوث الهواء، أي أن التهوية السيئة في المباني تؤدي إلى زيادة انتشار الفيروس.

فاهتمت الدراسة بالتعرف على العوامل المسببة في انتشار الأمراض المعدية داخل المسجد والتي تؤثر بالتالي على مستوى جودة الهواء الداخلي وهي عدم توفر تهوية طبيعية، وقلة استخدام العناصر الخضراء، وتلوث الهواء الداخلي والخارجي. ومن ثم اتجه البحث إلى محاولة تفعيل الاستراتيجيات الحيوية لتحسين التهوية في مباني المساجد، والتي لا تمنع الاستمرار في اتباع الإجراءات الاحترازية مثل: غسل اليدين وارتداء الأقنعة وتقليل الاتصال والتباعد كما نصحت به الوكالات الحكومية. فكانت من أهم المقترحات:

- "تبسيط عمارة المسجد" والتي تعد الفكرة الأشمل وجعله أكثر انفتاحا على الخارج والتركيز على التهوية الطبيعية كخيار صحي.
- العودة إلى المساجد التاريخية، التي كانت منتشرة قبل عقود قليلة وتمثل امتدادا لمسجد الرسول صلى الله عليه وسلم، أحد الحلول الفراغية المبسطة الذي يمكن أن يمتزج بالتقنيات المتطورة لبناء جيل جديد من المساجد.
- تطوير العناصر المعمارية للمسجد التي من شأنها التحكم في جودة الهواء الداخلي أو زيادة تنقية الهواء وتنظيم معدلات تدفقه هي: الساحات والأفنية، المدخل، والحوائط، والفتحات، والمئذنة، والمحراب والقبة.
- دمج استراتيجيات التكنولوجيا الحيوية في العناصر المعمارية للمسجد هي نظام التهوية السليبي المستوحاة من تلال النمل الأبيض في الفتحات والمداخل التي تعمل على تجديد الهواء باستمرار وتبريده، والمراوح الهوائية المستوحاة من زعانف الحوت الأهدب في سقف المسجد لتبريد الهواء وزيادة تدفقه بالمعدلات التي لا تسمح بانتشار الفيروسات، وزراعة الواجهات والاسقف والأفنية الداخلية بالطحالب الدقيقة لترشيح الهواء، وتكسية الواجهات بالمركبات النانوية لحل مشكلة تلوث الهواء.
- هناك حاجة إلى مزيد من الاستثمار في تطوير هذه التقنيات. في الواقع، تمتلك التقانات الحيوية القدرة على التعامل بنجاح مع ضعف جودة الهواء والصعوبات والقيود المرتبطة بهذه المشكلة. ومع ذلك، من الضروري إجراء مزيد من التحقيق. أولاً، تطوير التقنيات وتحسينها على مستوى المختبر، ومن ثم، دمجها في أنظمة فعالة من حيث التكلفة يمكن دمجها في المساحات الداخلية التي تجمع بين الأداء الأمثل والجماليات المقبولة. سيكون لتطبيق التقنيات الحيوية في المساحات الداخلية فوائد في IAQ، والتي ستؤدي في النهاية إلى زيادة راحة وصحة المستخدمين وتقليل نفقات الطاقة للمباني.

فمن واجبنا نحن كمسلمين الاهتمام والمحافظة لقوله صلى الله عليه وسلم ((لا تسرف ولو كنت على نهر جاري)). وهذه دعوة صريحة وواضحة وإضافة لنا كمعماريين مسلمين

يجب علينا التعامل مع معطيات البيئة الطبيعية بإيجابية وواقعية. وذلك بتأمين التوافق بين العناصر المشيدة وعناصر البيئة المختلف. والتوافق يشمل جميع العوامل الجغرافية والطبيعية مع الاستفادة من جميع العناصر الطبيعية وإدخالها كجزء أساسي في عملية التشييد.

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