



UNIVERSITI PUTRA MALAYSIA

***DESIGN FRAMEWORK AND CONSIDERATION FOR URBAN MOSQUES
IN KUALA LUMPUR AS A MODEL OF COMPACT CITY***

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By

ARMAN SARRAM

**Thesis submitted to the School of Graduate Studies, Universiti Putra Malaysia ,
in Fulfilment of the Requirements for the Degree of Master of Science**

May 2017

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DEDICATION

Dedicated to:
Those who have special place in my heart;

My beloved parents



Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment
of the requirement for the Degree of Master of Science

DESIGN FRAMEWORK AND CONSIDERATION FOR URBAN MOSQUES IN KUALA LUMPUR AS A MODEL OF COMPACT CITY

By

ARMAN SARRAM

May 2017

Chairman : Associate Professor Nangkula Utaberta, PhD
Faculty : Design and Architecture

For every Muslim community mosque is vital part of the daily life. Since the early period of mosques' establishment, the institution had been through changes in its planning and design to adopt the contextual requirements of the expanding Islamic territories. Thousands of years 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 architects to reconsider its planning and implementation in regard with limited land availability, shortage of resources, accessibility and appropriate architectural expression. Which results a deviation from the usual architectural conventions while faced with the challenge of retaining the integrity of its fundamental functionality, purpose and appropriateness. This study provides insight on the merits as well as the challenges of modern day planning, executing and building of mosque in urban areas. The study focuses particularly on compact cities where the issue of land insufficiency and resource shortage is most intense. Information of the selected mosques within the chosen areas are based on collected primary and secondary data which are specifically based on the (1) layout and capacity of the mosque, (2) facilities provided by the mosque and (3) activities within the mosque. Primary data was collected from three mosques within the city of Kuala Lumpur. Secondary data are collected from three different sites from several countries were considered for this study all of which are situated inside compact cities and have high density of population. The study adopts qualitative research strategy with the focus on interview and observation as data collection method. The selected mosque for secondary data from foreign countries are Ishtiqal Mosque, Jakarta, Indonesia; Kowloon Mosque, Hong Kong; Masjid Al-Islah, Punggol, Singapore and the selected mosque within Kuala Lumpur are Masjid Al Imam Asy-Syafei, Masjid Jamek Kg. Baru and Masjid Jamek Pakistan. Outcome of this research proposes appropriate definition for urban mosques in compact cities, especially for the city of Kuala Lumpur. The research also found that every mosque in compact cities must consider some factors such as, (1) vertical development with

integrated spaces, (2) visual and physical connections both horizontally and vertically, (3) accessibility in design, (4) flexible spaces designed for multipurpose activities, (5) providing plaza areas to avoid congestion in design and (6) use of online media to reach out to the community without necessitating to be physically present for basic information. This study evaluates the viability of urban mosque in compact city setting to learn further on the efficient utilization of space and how structures such as mosque can function optimally in its capacity to serve its purpose for the population. Hence this study supplements to current knowledge of planning mosque in compact cities by proposing design framework for optimal spatial utilization. Further studies on this topic are recommended for better understanding and more specific guideline for developing urban mosques in compact cities.



Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk Ijazah Master Sains

KERANGKA REKA BENTUK DAN PERTIMBANGAN UNTUK MASJID BANDAR DI KUALA LUMPUR SEBAGAI MODEL BAGI BANDAR YANG PADAT

Oleh

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Bagi setiap masyarakat Islam, masjid adalah sebahagian daripada kehidupan seharian. Sejak awal penubuhan masjid, institusi tersebut telah melalui perubahan dalam perancangan dan reka bentuknya untuk menerima pakai keperluan kontek melalui perkembangan wilayah Islam. Beribu-ribu tahun selepas pembinaan tempat ibadat Islam, isu dan masalah penubuhannya yang berterusan berpunca dari kerumitan kehidupan moden yang telah memaksa perancang dan arkitek bandar untuk menimbang semula perancangan dan pelaksanaan yang berkaitan dengan ketersediaan tanah yang terhad, kekurangan sumber, akses dan ekspresi seni bina yang sesuai. Yang mana hasil penyimpangan dari konvensyen seni bina kebiasaannya akan menghadapi cabaran untuk mempertahankan keutuhan fungsi, tujuan dan kesesuaiannya. Kajian ini memberikan matlamat melalui merit serta cabaran perancangan moden, pelaksanaan dan pembinaan masjid di kawasan bandar. Kajian ini memberi tumpuan khusus kepada bandar padat di mana masalah kekurangan tanah dan kekurangan sumber adalah paling sengit. Maklumat mengenai masjid terpilih di dalam kawasan terpilih adalah berdasarkan kepada data primer dan sekunder yang diketengahkan berdasarkan (1) susun atur masjid, (2) kemudahan yang disediakan oleh masjid dan (3) aktiviti di dalam masjid. Data utama dikumpulkan daripada tiga buah masjid di sekitar Kuala Lumpur. Data sekunder dikumpulkan daripada tiga tapak binaan yang berbeza daripada beberapa negara yang dipertimbangkan untuk kajian ini yang kesemuanya terletak di dalam bandar padat dan mempunyai kepadatan penduduk yang tinggi. Kajian ini menggunakan strategi penyelidikan kualitatif dengan memberi tumpuan kepada temubual dan pemerhatian sebagai kaedah pengumpulan data. Masjid terpilih untuk data sekunder daripada negara asing adalah Masjid Ishtiqal, Jakarta, Indonesia; Masjid Kowloon, Hong Kong; Masjid Al-Islah, Punggol, Singapura dan masjid terpilih di Kuala Lumpur adalah Masjid Al Imam Asy-Syafei, Masjid Jamek Kg. Baru dan Masjid Jamek Pakistan. Hasil penyelidikan ini mencadangkan definisi yang sesuai untuk masjid bandar di bandar padat, terutamanya untuk bandar Kuala Lumpur. Penyelidikan ini juga mendapati bahawa setiap masjid di

bandar padat harus mempertimbangkan beberapa faktor seperti, (1) pembangunan menegak dengan ruang bersepadu, (2) hubungan visual dan fizikal secara mendatar dan menegak, (3) kebolehcapaian dalam reka bentuk, (4) direka untuk aktiviti pelbagai guna, (5) menyediakan kawasan plaza untuk mengelakkan kesesakan dalam reka bentuk dan (6) menggunakan media dalam talian untuk berhubung dengan masyarakat tanpa memerlukan maklumat secara fizikal untuk maklumat asas. Kajian ini menilai daya maju masjid bandar dalam suasana bandar padat untuk mempelajari lebih jauh tentang penggunaan ruang yang cekap dan bagaimana struktur seperti masjid boleh berfungsi secara optimum dalam kapasiti untuk memenuhi keperluan penduduknya. Oleh itu, kajian ini menambah pengetahuan terkini tentang perancangan masjid di bandar padat dengan mencadangkan rangka kerja reka bentuk untuk penggunaan ruang yang optimum. Kajian lanjut mengenai topik ini adalah disyorkan untuk lebih difahami dan sebagai garis panduan yang lebih khusus untuk membangunkan masjid di bandar padat.

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CHAPTER 1

INTRODUCTION

1.1 Background

Mosques are vital part of every Islamic society and is primarily a place where spiritual and social connections among Muslims are expressed and established. In a historical context, mosque in a sizeable community have a significant influence beyond religious focus into most, if not all aspects of the life of the community. It is not solely a place of prayer but also a venue where the city's interaction takes place, it is a site for preaching and learning and a place of refuge where community work is also done (Morris, 2013). Architecturally, it is a structure uniquely Islamic which over time has evolved based on the socio-economic influences of eras, technological development and arising needs of the population and the environment.

Urban enclaves such as compact cities 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” (Kahera, 2002).

The concept of urban mosque stems from more extensive reasons that mostly come from the overall issues of industrialization. The development of industrial societies has changed conventional agrarian society into industrial cities that resulted to faster growth of cities together with its population. “This development of industrial society and urbanization has led to subsequent economic growth and the development of materialistic social specialization, but at the same time urban society has produced many problems” (Shin, 2013). What comes with it were the shift of population from rural to urban areas, thus work and daily living activities were concentrated in cities. As urban enclaves became denser because of increasing immigration, a greater concern for the lack of space to support the population's need became one of the important issues (Beck et al., 2003).

According to Asoka et al (2013) the rapid population growth of cities is often associated with population demands that outdo the infrastructure and service capacity thus leading to environmental degradation. Similarly it also affect efficient management from the government, rising costs in building and maintenance and most importantly a far reaching impact to future generations to come (Asoka et al., 2013).

The same consideration must be therefore applied to infrastructures vital to the community such as mosques. In a compact city setting, expansion must be considered in the context of a vertical development which is (1) within the boundaries of its intended capacity, (2) the needs of the population, and (3) serving and sustaining the function of the infrastructure whilst preserving the traditional and /or aesthetic style natural to the structure.

This study therefore attempts to evaluate modern urban mosque architecture in compact city setting in order to evaluate on the sensibility of its designs as well as address important issues relative to its purpose and how it can be improved for further optimal use. A review on the relevant theoretical concepts in architecture and examples of actual urban mosque in compact cities are presented and evaluated in this study which considers its location, layout and size, and functions. This research was also done based on qualitative approaches through three stages of research which are qualitative document analysis, physical survey, and interview. The expected outcome from this research is to establish a framework for possible design approach of urban mosque development and conserving traditional style as a basis for future mosques design in an urban context.

1.2 The Importance and Role of Mosques in Urban and Compact Cities

The Mosque is the first and the most important base of Muslims in the formation of global government. In the beginning this base was established by prophet Muhammad (PBUH) as the place of promoting and spreading Islam, a very strong structure that no other places in the world can reach its purity, sanctity and charm. Mosque is the place where people can have privacy with God, a place for reflection and prayer (Raeisian & Badreh, 2013). Over the years of transformation that Muslim society underwent, mosques have also taken many roles apart from its main spiritual function. "From rudimentary roles it evolved into a complex and institutional one" (Omer, 2012). Islamic society which adheres to Islamic principles as the primary guide for most of its activities from spiritual, economic to political have compelled the mosque's functions to overlap to accommodate basic and essential facets of life for Muslims. Old cities such as Baghdad, Cairo and Istanbul to new enclaves such as Kuala Lumpur eventually developed to become bustling cities and had to give way to urbanization, thus Mosque were eventually viewed to be as more than places of sanctity that influence moral aspect of the city, but it provided identity to a neighbourhood (Saeli Aleamin et al., 2014) and functions not only as a single element of architecture but serves a wider purpose of being an integral part of a Muslim-inhabited area that brings transformation within the vicinity. Ali Delavar (2012) also stated that mosque architecture plays an important role in religion and culture in the people's knowledge and establishes unity among Muslims because it provides a venue for communication between the mosque and the world (Saniei & Delavar, 2012). Furthermore, the role of mosque as an institution is highly important especially in Muslim majority population because it supports in solving social problems and develop a more integrated community (Asif & Utaberta, 2016).

1.3 Problem Statement

Modern life especially in urbanized areas is 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. It should be viewed and approached with the perspective of sustainability within the context of a modern culture and lifestyle (Barrett, 2000; Shaari et al., 2015).

Religious buildings, including temples, churches, synagogues and mosques have always been one of the integral components of the urban layout (Ayhan & Mert Cubukcu, 2010). The Mosque as a vital part of a Muslim majority area therefore helps support the change process. Its existences as part of urban landscape (1) improves quality of life and (2) fosters growth within the community in the social, moral and even economic sense (Ziari, 2004).

(Aina et al., 2013) highlighted the elements of an Islamic city as the obviation of the need for public buildings; the centring of city on mosques that provide a range of welfare and education functions. They also stated that the modern western style development in the Muslim countries brings challenges with regards to planning and utilization of urban spaces because the life style of Muslim majority countries are different from that of the western societies.

According to the department of Town and Country Planning (2005) in Malaysia, the concept layout utilization must create integrated use of space and optimal land use. This land use combined activities with business and educational institutions. According to local press reports, between the activities that were held in a mosque in Malaysia is like a religious funeral courses and at prime; nasyid cultural performances; health such as blood donation programs and free dental examinations; educational talk on "Implications of Smoking"; social collaborative and cook porridge Ashura; and others (Utusan Malaysia 2011, January 4, January 5, January 6).

However, there are reports on how the mosques are not functioning properly. This is due to the lack of provision for elderly and disabled, absence of required facility such as cooking space, less participation of community for lack of activity spaces and poor indoor environment quality. (The Straits Times in 2010, 29 September; Utusan Malaysia 2010, 16 December, 31 December). All of these issues are related to the planning and design of mosque which should be addressed from the architectural point of view.

According to Asoka, Thuo and Bunyasi, the rapid population growth of cities is often associated with population demands that outdoor the infrastructure and service capacity thus leading to environmental degradation. (Asoka et al., 2013)

The same consideration must be therefore applied to infrastructures vital to the community such as mosques. In a compact city setting, development must be considered in the context of a constrained situation which is (1) within the boundaries of its intended capacity, (2) the needs of the population, and (3) serving and sustaining the function of the infrastructure whilst preserving the traditional and /or aesthetic style natural to the structure. (M. F. Bin Ahmad et al., 2015; Kaji et al., 2003)

Concerning the architectural viewpoint, (Aina et al., 2013) suggested model for sustainable development of modern cities where Muslims are majority and the community is closely connected with mosque. They proposed mosque centred neighbourhood with proper accessibility, functionality and formal expression. However, framework for such modern mosque functioning in a compact settings is yet to be established.

Modern society issues are varied and complex, urban communities most especially are challenged with increasing issues of physical, social, economic and even moral nature due to the rising level of urbanization and population growth. Falconer and Savage cautioned that many of these problems require immediate action to prevent bigger problems in the future (Falconer & Savage, 1995). Additionally, contemporary times have brought with it other challenges which planners and architectures must consider such as possible immediate and future effects of the structure to its environment and its sustainability of maintenance and use in urban areas.

The structure plan for Kuala Lumpur 2020 illustrates the future requirements for building new facilities among which there are 309 mosque and surau (DBKL, 2015). While the land constraints remain for the city of Kuala Lumpur, the need of growing population cannot be overlooked. Current practice for planning and designing mosque in the compact urban settings, in particular within Kuala Lumpur, shows tendency for horizontal progression of layout despite the issue of land insufficiency (M. F. Bin Ahmad et al., 2015). Hence, for the context with urban mosque, apart from concerns such as management or finance, planning and design should consider, given the nature of the structure, the relationship between communities in compact cities and the institution of mosque in order to ensure a structure that can accommodate the needs of the population.

1.4 Research Questions

This research will be structured based on the following questions or problems. These questions are formulated on the background of the above discussion. In brief the research problem is focused on the evaluation of modern urban mosque architecture in compact city setting in order to evaluate on the sensibility of its designs as well as address important issues relative to its purpose and how it can be improved for further optimal use.

Main research question is formulated based on the research problem. The question is stated as follows, **“What are the factors that regulate and influence the design considerations for urban mosque in compact urban settings?”**

Sub research questions are:

1. What is urban mosque and what is its relevance to compact cities?
2. What are the key considerations for urban mosque to be developed in compact cities?
3. How can urban mosque retain functionality and aesthetical value while maximizing its space utilization?

The study attempts to identify the key factors that defines an urban mosque within the settings of a compact city and then analyse those factors to generate design framework for urban mosques with enhanced space utilization.

1.5 Research Objectives

The main objective of this research is to identify the merits and issues of urban mosque design in compact cities. This will allow an in-depth perspective on the activities, space usage and design communication of urban mosque to allow better planning design through proposal of design framework for urban mosque in compact cities.

The research objectives are formulated to guide the study in search for the answers of research questions.

Research aim:

Identify and analyse the factors that regulates and influences the design considerations for urban mosque in compact urban settings.

Sub research objectives:

1. To identify proper definition for urban mosque and its relevance with the compact urban settings.
2. To analyse the key considerations for urban mosque to be developed in compact cities.
3. To evaluate the functionality and aesthetic value of urban mosque while the utilization of its space has been maximized.

Therefore, the focus of this study will be on the mosques in urbanized areas and how it is associated with the usual issues of congestion, space constraints and socio-economic problems which makes planning and design a vital aspect in building urban mosque.

1.6 Scope of Research

The study's primary focus is evaluating urban mosque in compact cities. This is viewed in terms primarily through functionality and space utilization of mosques located in the compact city of Kuala Lumpur in Malaysia. Literatures on mosques in the compact cities outside Malaysia such as Hong Kong, Singapore and Indonesia are also reviewed. The scope is confined within qualitative analysis of the activities and spatial provisions of urban mosque. The selected urban mosque in this study are evaluated on parameters set against the backdrop of a compact city and therefore emphasized on the importance of location, scale, functionality and space utilization. Factors to be observed in the selected mosques are activities of the mosque, physical space layout where the activities are accommodated and the relationship of the mosques' planning and design with its surrounding compact settings. It provides the also the fundamental background of mosque and its transition into urban enclaves specifically compact cities.

1.7 Research Strategy

This research focuses on the relationship of urban mosques with their surrounding environment in terms of activity pattern, space usage, functional efficiency and architectural quality. Due to its genre, the study adopts case study as a qualitative research strategy as its research method. This research utilized both primary and secondary material sources for data collection. Primary source of data is based on survey of information through compilation of primary material on the selected mosques' architectural plans and interview from the relevant person associated with those mosques. Secondary data on the other hand were taken from previous academic research on the same topic as well as document analysis of selected mosque from outside Malaysia to present a comparative analysis on the situation. This covers studies from previous cases of actual research on mosque from various time periods, structural typology, culture and country to provide a wider context on the comparison. Information was analysed through collected data and comparison with other selected previous studies with similar cases.

The process to conduct this research are based on the parameters of (1) Providing examples of urban mosque in compact cities (2) Classify the spatial topology and functions of the mentioned mosque (3) Identify its functions, spatial topology and use and relate it to the population's needs and activities. (3) Compare the various distinctions of the selected urban mosque to evaluate further how such styles or distinctions can be applied and improved for future planning and use.

1.8 Significance of the Research

Contemporary life especially in urban areas in small countries are now gradually facing the impact of rapid modernization. The coming of new technology proved to be a “double edged sword” where the world must now face the issue of balancing the disadvantage and advantages it brings. Although it has brought convenience, streamlined work and faster pace of productivity, it also gave rapid development which diminishes resources, land and space. Society must therefore be careful to utilize the limited means that it possesses and find sustainable measures that can preserve and optimize resources for the current and future generation.

The government of Malaysia expects the population in Greater Kuala Lumpur will grow from six million to 10 million by 2020 under the Economic Transformation Programme (ETP). By that time, greater KL will need to be facilitated with more infrastructure (i.e. housing, institutions, transportation networks etc.) (DBKL, 2015). While the population increases rapidly, the available land for new developments remains limited. This accentuate the need to build more innovatively in restricted footprint while maximizing the space utilization.

Religious facility requirement for Vision 2020 states 309 new mosques and surau have to be established to fulfil the need of the growing population. Previous research was undertaken to develop a model that can be used as an instrument to manage effectively mosque in Kuala Lumpur in particular and Malaysia in general. Mosque is the existing physical resources that need to be managed in an inclusive to help achieve Vision 2020 and to maintain sustainable development of the country account for many aspects of life. Space management is one element in the management of the facility to ensure that the core objectives of the organization are achieved (Abdullah & Zulkefli, 2014; Barrett, 2000).

This study evaluates the viability of urban mosque in compact city setting to learn further on the efficient utilization of space and how structures such as mosque can be optimal in its capacity to serve its purpose for the population. A review of existing urban mosque in various compact cities were also made to identify their merits as well as points for improvement to possibly optimize their current capacity. This research utilizes both primary and secondary information to ensure strength of data used in the conducting and supporting this study, while recommendations were based on the data collected. These can also be used by future researchers and organizations as a source of information for reference purposes as well as a possible guide on the effectiveness of urban mosque concepts, possible challenges in compact city setting, vertical expansion and sustainable development.

1.9 Outline of the Thesis

This research consists five chapters. The abstract of the paper provides a brief description of the paper's main points. Chapter one will provide the main introduction of the related issues within the topic, primary objectives of this study as well as proposed approach of the study. It comprises of the exact order of research questions, objectives, significance of the study and research scope. The second chapter focuses on previous academic literature relative to the research subject which provide fundamental concepts of Mosque, its purposes, its description, it evolution until its introduction to modern urban enclaves and how it is impacting compact cities. Chapter three is composed of methodology on the approach on how the study was organized and undertaken, this includes data collection and how it was analysed. It also provides the specific focus group of mosques in this study. Chapter four describes in detail the findings of this study and the final chapter, Chapter five provides a discussion of the findings and also recommendation based on the collected data. Chapter six presents the summary of the entire research and provide the scope for further research on this issue.

REFERENCES

- Abdullah, A. H., & Zulkefli, Z. A. (2014). A Study of the Acoustics and Speech Intelligibility Quality of Mosques in Malaysia. In *Applied Mechanics and Materials* (Vol. 564, pp. 129–134). Malaysia. Retrieved from <http://www.scientific.net/AMM.564.129>
- Abel, C. (2003). *Sky High*. Royal Academy of Arts.
- Ahmad, A. G. (1999). The Architectural Styles Of Mosques in Malaysia: From Vernacular to Modern Structures. In *Proceedings of the Symposium on Mosque Architecture: The Historic and Urban Developments of Mosque Architecture* (pp. 147–169). Riyadh, KSA: King Saud University.
- Ahmad, M. F. Bin, Utaberta, N., Mohd Yunos, M. Y., Ismail, N. A., Ismail, S., & Ariffin, N. F. M. (2015). The Issue of Land Insufficiency for Building Mosques in Urban Context. *RESEARCH JOURNAL OF FISHERIES AND HYDROBIOLOGY*, 10(October), 100–104.
- Aina, Y. A., Al-Naser, A., & Garba, S. B. (2013). Towards an Integrative Theory Approach to Sustainable Urban Design in Saudi Arabia: The Value of GeoDesign. In M. Özyavuz (Ed.), *Advances in Landscape Architecture* (pp. 531–550). <https://doi.org/10.5772/55888>
- Al-Hathloul, S. (2004). Planning in the Middle East, moving toward the future. *Habitat International*, 28(4), 641–643. <https://doi.org/10.1016/j.habitatint.2004.04.004>
- al-Sijistānī, A. D. S. ibn al-A. (1952). *Sunan Abī Dā'ūd, Volume 2*. Sharikat Maktabat wa Matba'at Mustafa al-Babi al-Halabi wa Awlaḍuh. Retrieved from <https://books.google.com/books?id=o6O3AAAAIAAJ&pgis=1>
- Aquino, F. L., & Gainza, X. (2014). Understanding Density in an Uneven City, Santiago de Chile: Implications for Social and Environmental Sustainability. *Sustainability*, (6), 5876–5897. <https://doi.org/10.3390/su6095876>
- Asif, N., & Utaberta, N. (2016). *Masjid- The Spiritual and Physical Hub for Community Development* (First Edit). Kuala Lumpur: WARIS Research Group. Retrieved from https://www.academia.edu/30093777/Masjid-_The_Spiritual_and_Physical_Hub_for_Community_Development
- Asif, N., Utaberta, N., Mohd Rasdi, M. T., Mohd Yunos, M. Y., Ismail, N. A., & Ismail, S. (2015). The Concept of Mosque Based on Islamic Philosophy : A Review Based on Early Islamic Texts and Practices of the Early Generation of the Muslims. *Advances in Environmental Biology*, 9(April), 371–374. Retrieved from <http://www.aensiweb.com/AEB/>

- Asif, N., Utuberta, N., Yazid, M., Yunus, M., Ismail, N. A., & Ismail, S. (2015). Inactive Mosques : The Crisis of Contemporary Muslim Communities. *Advances in Environmental Biology*, 9(April), 367–370. Retrieved from <http://www.aensiweb.com/AEB/>
- Asoka, G. W. N., Thuo, A. D. M., & Bunyasi, M. M. (2013). Effects of population growth on urban infrastructure and services: A case of Eastleigh neighborhood Nairobi, Kenya. *Journal of Anthropology & Archaeology*, 1(1), 41–56.
- Ayhan, I., & Mert Cubukcu, K. (2010). Explaining historical urban development using the locations of mosques: A GIS/spatial statistics-based approach. *Applied Geography*, 30(2), 229–238. <https://doi.org/10.1016/j.apgeog.2009.05.002>
- Background: Masjid Jamek Kg Baru. (2013). Retrieved January 21, 2017, from <http://masjidmjkb.org.my/latar-belakang/>
- Baharudin, N. A., & Ismail, A. S. (2014). Communal Mosques : Design functionality towards the development of sustainability for community. *Procedia - Social and Behavioral Sciences*, 153, 106–120. <https://doi.org/10.1016/j.sbspro.2014.10.046>
- Barrett, P. (2000). Systems and relationships for construction quality. *International Journal of Quality & Reliability Management*, 17(4/5), 377–392.
- Beck, R., Kolankiewicz, L., & Camarota, S. A. (2003). *Outsmarting Smart Growth and the Problem of Sprawl About the Center*. Center for Immigration Studies.
- Bosworth, C. E. (1986). *The encyclopaedia of Islam* (Volume 5). Leiden Boston Brill 1986.
- Compact City Policies*. (2012). OECD Publishing. <https://doi.org/10.1787/9789264167865-en>
- Creswell, J. W. (2013). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. SAGE Publications. Retrieved from https://books.google.com.my/books?id=4uB76IC_pOQC
- Creswell, S. K. A. C., & Allan, J. W. (1989). *A Short Account of Early Muslim Architecture*. American University in Cairo Press. Retrieved from <https://books.google.com/books?id=KIWSIgAACAAJ&pgis=1>
- Crossette, B. (1987). A Neighborhood Tour of Jakarta. Retrieved January 24, 2017, from <http://www.nytimes.com/1987/07/05/travel/a-neighborhood-tour-of-jakarta.html>
- Dantzig, G. B., & Saaty, T. L. (1978). *Compact City: A Plan for a Livable Urban Environment*. W.H.Freeman & Co Ltd (March 1974).

- DBKL. (2015). Kuala Lumpur Structure Plan 2020: "Environment" Sector. (Intergovernmental Panel on Climate Change, Ed.), *Climate Change 2013 - The Physical Science Basis*. Cambridge: Cambridge University Press. <https://doi.org/10.1017/CBO9781107415324.004>
- European Commission. (2003). *Cities of tomorrow - Challenges, visions, ways forward Preface. Information Society Policy Link*. European Commission.
- Falconer, S. E., & Savage, S. H. (1995). Heartlands and Hinterlands: Alternative Trajectories of Early Urbanization in Mesopotamia and the Southern Levant. *American Antiquity*, 60(1), 37. Retrieved from <http://www.jstor.org/stable/282075>
- Flick, U. (2011). *Introducing Research Methodology: A Beginner's Guide to Doing a Research Project*. California: SAGE Publications. Retrieved from <https://books.google.com/books?id=-EeXiLAi4TgC&pgis=1>
- Forrest, J., & Dunn, K. (2011). Attitudes to Diversity: new perspectives on the ethnic geography of Brisbane, Australia. *Australian Geographer*, 42(4), 435–453. <https://doi.org/10.1080/00049182.2012.619957>
- Frishman, M., Khan, H.-U., & Al-Asad, M. (2002). *The Mosque: History, Architectural Development & Regional Diversity*. Thames & Hudson. Retrieved from https://books.google.co.in/books/about/The_Mosque.html?id=MLdmQgAACA AJ&pgis=1
- Given, L. M. (Ed.). (2008). *The Sage encyclopedia of qualitative research methods (VOLUMES 1)*. California: Rolf A. Janke, SAGE Publications, Inc.
- Hakim, B. S. (1989). *Arabic Islamic Cities Rev: Building and Planning Principles*. Routledge (1722).
- Haroon, H. (1995). *Transformation of Kowloon mosque and Islamic centre*. The University of Hong Kong, Pokfulam Road, Hong Kong SAR. https://doi.org/10.5353/th_b3198239
- Hillenbrand, R. (2004). *Islamic Architecture: Form, Function, and Meaning*. Columbia University Press. Retrieved from <https://books.google.com/books?id=81uo8Vc04gQC&pgis=1>
- Imamuddin, A. H., Hassan, S. A., & Sarkar, D. (1985). Community Mosque - A Symbol of Society. *Regional Seminar in the Series Exploring Architecture in Islamic Cultures*, 60–69.
- JAWI. (2017). Direktori Masjid. Retrieved January 21, 2017, from <http://www.jawi.gov.my/my/perkhidmatan-masjid-surau/direktori-masjid>
- Kahera, A. I. (2002). Urban Enclaves, Muslim Identity and the Urban Mosque in America. *Journal of Muslim Minority Affairs*, 22(2), 369–380. <https://doi.org/10.1080/1360200022000027320>

- Kahera, A. I. (2010). *Deconstructing the American mosque: space, gender, and aesthetics*. University of Texas Press.
- Kaji, H., Kanegae, H., Ishibashi, K., & Hara, N. (2003). *Compact City and Developing Countries - Is Compact City Approach Appropriate as an Urban Development Policy for Cities in Developing Countries?* Montreal, Canada.
- Katz, P. (1994). *The New Urbanism: Toward an Architecture of Community*. McGraw-Hill Education; 1 edition (October 22, 1993).
- Keskeys, P. (2016). 8 Modern Mosques That Blend an Age-Old Religion with Contemporary Design. Retrieved January 20, 2017, from <http://architizer.com/blog/8-modern-mosques/>
- KhanAcademy. (2016). Introduction to mosque architecture. Retrieved January 19, 2017, from <https://www.khanacademy.org/humanities/art-islam/beginners-guide-islamic/a/introduction-to-mosque-architecture>
- Kinuthia, B. (2009). Industrialization in Malaysia: Changing role of Government and Foreign Firms. *DEGIT XIV Conference Paper*, (March), 1–36. Retrieved from <http://degitxiv.cide.edu/PapersDegitXiv/IndustrializationMalaysiaBethuel.pdf>
- Kjeilen, T. (n.d.). Mosque. Retrieved January 19, 2017, from <http://i-cias.com/e.o/mosque.htm>
- Kotharkar, R., Bahadure, P., & Sarda, N. (2014). Measuring Compact Urban Form: A Case of Nagpur City, India. *Sustainability*, (6), 4246–4272. <https://doi.org/10.3390/su6074246>
- MALAYSIA: Administrative Division. (2010). Retrieved January 21, 2017, from <https://www.citypopulation.de/php/malaysia-admin.php>
- Mattson, I. (2014). Human Challenges – Divine Solutions. Mississauga, Ontario: Islamic Society of North America ISNA, Canada. Retrieved from <http://ingridmattson.org/events/40th-annual-isna-canada-convention/>
- Merriam-Webster. (2004). *Webster's Grammar Handbook*. Merriam-Webster Mass Market.
- Merriam, S. B. (1997). *Qualitative Research and Case Study Applications in Education: Revised and Expanded from Case Study Research in Education*. Wiley. Retrieved from <https://books.google.com.my/books?id=kYMtQgAACAAJ>
- Mohd Rasdi, M. T., & Utaberta, N. (2007). Mosque Architecture in Malaysia : *Jurnal Alam Bina*, 9(3), 1–24.
- Morris, A. E. J. (2013). *History of Urban Form Before the Industrial Revolution*. Taylor & Francis. Retrieved from <https://books.google.com/books?id=nRBEAgAAQBAJ>

- Mortada, H. (2003). *Traditional Islamic Principles of Built Environment*. New York: RoutledgeCurzon. Retrieved from <https://books.google.com/books?id=ZTuOWrmCkGoC&pgis=1>
- Muhammad, Y. (2014). Quba- the first mosque in the history of Islam. Retrieved August 10, 2017, from <http://www.arabnews.com/news/600996>
- Najafi, M., & Shariff, M. K. B. M. (2011). Factors influencing public attachment to mosques in Malaysia. *Archnet-IJAR*, 5(3), 7–24.
- Nash, M. (2007). Public Space, Muslims and the Urban Mosque in Newark, NJ: Engaging the American Public Square. *Community College Humanities Review*, 27, 128–148.
- Neuman, M. (2005). The Compact City Fallacy. *Journal of Planning Education and Research*, 25(1), 11–26. <https://doi.org/10.1177/0739456X04270466>
- Omer, S. (2010). Some Lessons from Prophet Muhammad (SAW) in Architecture : The Prophet's Mosque in MadĒnah, 115–140.
- Omer, S. (2012). Institutional Decentralization in the History of Islamic Cities: The Role of Political and Religious Schism. Retrieved January 18, 2017, from <http://medinanet.org/2012/10/institutional-decentralization-in-the-history-of-islamic-cities-the-role-of-political-and-religious-schism/>
- Omer, S. (2013). Studies in the Islamic Built Environment. Retrieved November 11, 2014, from <http://iiumpress.iium.edu.my/bookshop/wwwgooglecom-18>
- Peterson, J. A. (2016). Formwerkz Architects' Al-Islah mosque: "Changing with the world while keeping fundamental." Retrieved January 24, 2017, from <https://www.architectural-review.com/>
- Raeisian, G., & Badreh, M. (2013). The Role of Mosques in Urban Development. *Journal of Civil Engineering and Urbanism*, 3(3), 101–103.
- Ragin, C. C., & Amoroso, L. M. (2010). *Constructing Social Research: The Unity and Diversity of Method*. SAGE Publications. Retrieved from <https://books.google.com/books?id=SRqYAAAAQBAJ&pgis=1>
- Rajasekar, S., Philominathan, P., & Chinnathambi, V. (2006). Research Methodology. *Regional Anesthesia and Pain Medicine*, 36(4), 23. <https://doi.org/arXiv:physics/0601009v3>
- Rasdi, M. T. H. M. (1998). *The mosque as a community development centre: Programme and architectural design guidelines for contemporary muslim societies*. UK: Penerbit UTM. Retrieved from http://eprints.utm.my/29825/2/MohamadTajuddinMohamad1998_TheMosqueAsACommunityDevelopmentCentreProgrammeSYN.pdf

- Rasdi, M. T. H. M. (2010). *Rethinking Islamic Architecture*. Strategic Information and Research Development Centre. Retrieved from <https://books.google.com/books?id=dsDCSAAACAAJ&pgis=1>
- Rasdi, M. T. H. M., & Utaberta, N. (2010). The Design of Mosques as Community Development Centers from the Perspective of the Sunna and Wright's Organic Architecture. *Journal of Islamic Architecture*, 1(1), 1–7.
- Saeli Aleamin, A., Shamaei, A., & Bahmani, M. (2014). The Role of Mosques as Centers of Giving Identity in the Neighborhoods of Tehran City : A Case Study of Ahmadiéh Mosque in Narmak Neighborhood, Iran. *World Applied Programming*, 4(11), 224–229.
- Sahih International. (2004). *The Qur'an English Meanings*. Jeddah: Data, King Fahd National Library Cataloging-in-Publication.
- Saniei, M., & Delavar, A. (2012). Communicational Role of Mosques Architecture. *Asian Social Science*, 8(3), 137–141. <https://doi.org/10.5539/ass.v8n3p137>
- Shaari, N., Abdullah Mohd Asmoni, M. N., Afiq Lokman, M. A., Abdul Hamid, H., & Mohammed, A. H. (2015). PRACTICES FOR PROJECT QUALITY MANAGEMENT SYSTEMS (PQMS) IN CONSTRUCTION PROJECT. *Jurnal Teknologi*, 77(26), 69–76. <https://doi.org/10.11113/jt.v77.6862>
- Shin, S. W. (2013). Sustainable tall building and Vertical compact city. In L. Bragança, M. Pinheiro, & R. Mateus (Eds.), *PORTUGAL SB13 CONTRIBUTION OF SUSTAINABLE BUILDING TO MEET EU 20-20-20 TARGETS* (Vol. 1, pp. 677–698). Guimarães.
- Siddiqui, A. H. (1990). *Sahih Muslim, Being Traditions of the Sayings and Doings of the Prophet Muhammad as Narrated by His Companions and Compiled Under the Title Al-Jami'-us-sahih*. Sh. Muhammad Ashraf. Retrieved from <https://books.google.com/books?id=IjSsHAAACAAJ&pgis=1>
- Stacey, A. (2009). WHAT IS A MOSQUE? Retrieved January 20, 2017, from <https://www.islamreligion.com/articles/2748/what-is-mosque/>
- Stake, R. E. (1995). *The art of case study research*. Sage Publications. Retrieved from <https://books.google.com/books?id=sIMOAQAAMAAJ&pgis=1>
- Sutton, R. I., Staw, B. M., Quarterly, A. S., & Sep, N. (2007). What Theory is Not. *Administrative Science Quarterly*, 40(3), 371–384.
- Tajuddin, M., Rasdi, M., & Utaberta, N. (2010). The Design of Mosques as Community Development Centers from the Perspective of the Sunna and Wright's Organic Architecture. *Journal of Islamic Architecture*, 1(1).
- Utaberta, N., & Mohd Rasdi, M. T. (2010). Deskripsi tipologi, klasifikasi dan analisis perancangan masjid di malaysia. *El- Harakah Journal Budaya Islam*, 12(2), 85–100.

- Utaberta, N., & Othman, H. (2011). Analisis Hadith dalam Rekabentuk Masjid Modern di Malaysia. *Journal of Islamic Architecture*, 1(3), 107–122.
- Utaberta, N., Sojak, S. D. ., Surat, M., Che-Ani, A. I., & Tahir, M. M. (2012). Typological Study of Traditional Mosque Ornamentation in Malaysia – Prospect of Traditional Ornament in Urban Mosque. *International Journal of Civil, Architectural Science and Engineering*, 6(7), 43–50.
- Vahed, Y., & Vahed, G. (2014). The Development Impact of Mosque Location on Land Use in Australia: A Case Study of Masjid al Farooq in Brisbane. *Journal of Muslim Minority Affairs*, 34(1), 66–81.
<https://doi.org/10.1080/13602004.2014.888284>
- Ward, T. (2017). Istiqlal Mosque. Retrieved January 24, 2017, from <http://www.afar.com/places/istiqlal-mosque-daerah-khusus-ibukota-jakarta>
- Yin, R. K. (2011). *Qualitative Research from Start to Finish*. Guilford Press. Retrieved from <https://books.google.com/books?id=lyCGBeo8sI8C&pgis=1>
- Yin, R. K. (2013). *Case Study Research: Design and Methods*. SAGE Publications. Retrieved from <https://books.google.com/books?id=OgyqBAAQBAJ&pgis=1>
- Ziari, K. (2004). The Social - Economy Changes Based on Industrial Revolution in the Physical Development of Tehran. *Geography and Development*, 1(1).