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## Communal Mosques: Design functionality towards the development of sustainability for community

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### Abstract

The aim of this paper is to describe on the design of prominent communal mosque found in Muslim and non-Muslim countries and understanding on how these mosques are developed to fulfill the needs of the Muslim community and create a sustainable environment by using comparative studies. Many of mosque design in the present modern Muslim is interpreted as an object-centered form rather than emphasizing on the quality of space and function. This research is based on qualitative researches, text interpretation and observation. This study offers new insights by formulating new design approach and guideline in designing future communal mosques.

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### 1. Introduction

Mosque is a place for worship and to conduct multipurpose activities for Muslim. To date, the research on communal mosque only focuses on the historical development, elemental design involving ornamentation and style, technological and technical aspects of mosque design (acoustics, lighting and ventilation), conservation and preservation as well as guidelines for communal mosque design referring to religious sources (Hadith and Al Quran). This study is significant because the role and function of mosque

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in the present Muslim country is widely misinterpreted (Rasdi 1998). This can be seen from the function of the modern mosque which did not portray the role of sustainability to facilitate the development of the surrounding community (Alice, 2008; M.Zafrullah M.T, 2009). This situation occurs due to many political and social changes which happen in the modern society. As a result, mosques become the symbol of nation that is significantly built in monumental scale isolated from the urban fabric. It comes to be a dominant form in the landscape (Alice 2008) and acts as reference to Islamic symbols. In other words, mosques are treated as object-centred building which much emphasize on aesthetic rather than functionality (M.Tajuddin R. 2010; Alice, 2008; Spahic O, 2010). The function of mosque as a place to strengthen the “kinship” of Muslims began to lessen and portray lack of sustainable design values that cannot accommodate various needs of society. Since the function of mosque varies depending on its location- like mosques built in a non-Muslim country is to symbolize Muslim existence whereas mosques in a Muslim country functions as a tool to represent the identity of ‘Islamic nation’ to the world, hence it is vital to produce a sustainable mosque design. In regard to this, environmentally conscious design techniques which present moderate use of materials, energy, and space development must be present in the modern mosque design for the benefit of the Muslim society (Nangkula, 2011). By applying this idea of sustainability, it will enhance efficiency usage of space in a religious building and minimize the negative environmental impact produced by the building design. As an outcome, a conducive and functional quality of mosque’s architectural space and form can be created for the use of Muslim community. To elaborate further, the following section will define and discuss on the important criteria of communal mosque that can be applied in producing sustainable communal mosque architecture.

## **2. Mosque as a communal muslim catalyst**

The word community can refer to a small social unit of any size that shares common values also a group of interacting people living in a common location that utilize the same available facilities within the same locality. An addition they share same goals, skills and resources. To fulfill the community needs and desire, community spaces with multipurpose function are required to ensure a harmonious communal living environment (Peck, 1998). Wates, Neck (1987) considered these communal facilities as 'community architecture' and this term is commonly used to describe the architectural space for conducting communal activities. By the, this paper will focus on mosque as the main catalyst of Muslim community architecture. Mosque can be defined as 'sajada' which means “prostrate” where mosque is categorized as the place for sujud (Gazalba, 1975; Rasdi, 1998, 2000). Besides, mosque is referred as a place for worship regardless of any religions (Bosworth, D. & P.1991; M.Tajuddin R, 2008). In describing the mosque typology, Muslim scholars had categorized that there are four types of mosques (Alice, 2008). Communal mosque or djami' type is closest to the idea of ‘community mosque’. The idea of community mosque is actually evolved since the early era of Islamic development, and the 'Prophet mosque' is the most prominent example of communal mosque in terms of functionality and usage (Rozniza O, 2007). Not only serving as a holy-place for worship solely, but also meant for communal purposes with multiple functions (Spahic Omer, 2010). It becomes as a catalyst to the development of the surrounding area within the aspects of physical needs (Hamid, 2012). This was proven based on how the Prophet’s mosque became the dominant reason for the rapid development in Mecca and Medina in which through mosque as Islamic symbols transforms and attracts the surrounding community (Hamid, 2012). In designing communal mosque, there are past scholars who had outlined the criteria for sustainable mosque. The paper will discuss on both sustainable criteria’s involving sustainable form and space design in mosque as follows.

## 2.1. *Criteria of communal mosque towards a sustainable environment from the aspect of form and space-making*

The characteristics of communal mosque sustainable design much discuss and focus on architectural form rather than spatial organization. These characteristics of sustainable form design in communal mosques are widely defined by previous scholars in four main criteria's of form as follows:

### 2.1.1. *Form*

- Façade

Façade treatment like the arrangement of element such as doors and windows as opening may show the idea of sustainability in mosque design (Holod R & Khan, 1997). This is because the usage of ample openings arranged in vertical or horizontal manner will allow maximum entry of natural lighting and ventilation to the mosque interior. Hence, minimizes energy usage in mosques and decreases the cost of mechanical maintenance.

- Ornamentation, detailing, structural elements and material usage

The usage of local materials not only portrays building with naturalistic image but also may represent the building with local identity that responds to the existing culture, climate and landscape (M.Tajuddin R, 1998; Rosniza, 2007; Hamid 2012). Adaptation of ornamentation, detailing and structural element may also represent the idea of sustainability if it portrays a sense of functionality instead of merely for decorative purposes (Alice 2009).

- Setting

Sustainable design often relates to the idea of no wastage. Hence, building placement need to be carefully considered by the designer. The chosen location need to be within walking distance range. In this sense, the mosques need to be placed in the heart of the communal facilities. Hamid (2012) stated that the mosque must have accessible access route to and from the mosque, equipped with multiple entrances and without or less gated. The right setting will provide a sense of welcoming to the user, easy access and fully utilized mosque at all times

- Scale

Building scale within context will provide a friendly environment to the user. If the building is built too large or monumental, it maximizes the use of energy and building materials. For instance, more energy is needed to cool and lit up spaces in a larger building (Imamuddin, 1985 and Hamid, 2012). Therefore, to avoid energy and material wastage, building must always be built in proportion to the human scale and help to give comfort level to the user (Nadzirah et.al, 2011).

From the above, it is evident that the discussion on sustainable mosque form design had been outlined by past scholars. However, other sustainable factors involving spatial organization also need to be highlighted. Therefore, this paper will discuss and outline another sustainable aspect for mosque as below:

### 2.1.2. *Space (Spatial organization)*

The building layout should be fully functional to fulfill the needs of the user. The external space provided like passageway, corridor and veranda may be utilized as a multifunctional space in order for the user to maximize the usage instead solely functioned as circulation zone. Besides, the arrangement of interior and exterior spaces should also be well integrated with the existing landscape and land contour. Hierarchy of the building structure must be placed referring to existing land contour; hence avoid extra work of cutting hills and land. Maintaining the nature of the land and arrange it according to land hierarchy not only reduce excavation and land leveling cost also the existing area condition (M.Tajuddin R, 2008). The placement of space should not overpower the existing nature.

This will help to give a cooling effect and provide shade for the building due to the natural landscape and existing plants. Meehan (1987) outlined that the overall space and building arrangement should also be integrated in order to create an organic design form. Creating spaces such as courtyard and open air wells as an intermediate space will not only act as a green buffer which allows natural ventilation to cool the interior building but also may, reduce heat and maximize natural lighting into the space interior (M.Tajuddin.R,2010). This organic composition will produce sustainable space that can minimize the usage of mechanical energy and consumption (Alice, 2009).

### 3. Method of study

In conducting this study, pluralist approach is adopted since this study requires integrative method to analyse the architectural design form and space by referring to semiotics whilst revealing the ideology of designer implemented on the design of built of form and space denotes to hermeneutic. These two methods will be explained in detail in the following section. This is because pluralist approach hold beliefs that no single explanatory system or view of reality can account for all the phenomena of life. This approach is vital as it will provide a deeper understanding of the study.

#### 3.1. *Semiotic as research methodology*

Semiotic or semiology stresses on the study of sign and symbol (Fiske, 1990). This theory is used as it helps to describe how human reflects their thought and applies it to understand the meaning of 'sign'. According to Hawkes (2003) 'sign' may be an act, symbol or gesture used to convey an idea, a desire, information, or a command (Saussure). This is because Saussure's theory proposed a dualistic notion of signs, relating the *signifier* as the form of the word or phrase uttered, to the *signified* as the mental concept. In other words, the signifier is sound and the signified is the thought. Saussure's model of signs is of value for this study as there is a need to understand how the two communal mosques operate as a meaningful sign. Although Saussure's work is best suited for the present research as his model of signs forms the basis of understanding how signs work, there are limitations to his study. He did not describe in detail the social, cultural experience, expression and conventions when dealing with the understanding of signs. This is because Saussure's model of the sign focused on denotation at the expense of connotation (Fiske 1990). Due to this limitation, Gottdiener's work is referred to next as he elaborates on Saussure's model of signs in a more extensive way. Gottdiener stated that the bond between the signifier and signified (mental concept) is also dependent on social and cultural conventions. Gottdiener (1995) who is a scholar in socio-semiotics suggested that to understand the meaning of the built environment, one should define 'sign' as a symbol and much relates to building form. In this case, one should study how the built form as a 'sign' is shaped by social interests and ideologies, and how they are adapted as society changes. In this case, Gottdiener proposed that a sign can be read as a value system that correlated to the content and expression of a sign (Gottdiener 1995:27). In this case, to understand built form as a sign, one should define it from social ideology and an architectural ideology point of view. This architectural ideology aspect much relates to the architectural object itself and to the morphological elements that make the built form. Therefore, Ferdinand Saussure and Mark Gottdiener theory of semiotics and socio-semiotics is adapted as both theories will help to describe and define the meaning of communal mosque built form as a meaningful 'sign'. To collect data on communal mosque, this study will use direct observation method referring to the indicator on the following table (refer table 1). These indicators are important as it will help to reveal the sustainable aspect needed for a better mosque design in the future. Each of these indicators will be

analysed as described in the table below by referring to the underpinning theories as proposed by prominent architectural scholars.

Table 1. Theory for analyzing each indicator base on literature review

<b>Data collection method</b>	<b>Building indicator</b>	<b>Theory to analyse</b>	<b>Process</b>
Observation -Direct understand- -ing during field work (Mulhall Anne, 2002). -using five indicators establish-ed from the literature review on communal mosque. -indicators are justified based on their appropriate -ness in defining the mosque as community centre	<b>FORM</b>		
	-Façade	Shatha (2004) layering theory analyse the meaning and composi- tion of architectural elements	-Use layering system: -Clarify the basic structure, focusing on architectural morphological ele- ments, identify additional elements juxtaposed and within the façade -Identify the facade organisation.
	-Detailing, struc- tural and orna- mentation	Wright(1939) organic theory	-Observe and identify architectural elements-portray the usage of natu- ral materials
	-Setting	Wright(1939) organic theory	-Use layering system: -Clarify the basic structure, focusing on architectural morphological ele- ments, identify additional elements juxtaposed and within the façade -Identify the facade organisation.
	-Scale	Ching & Conway and Roesn- isch (1994) proportion theory Scale within building element -Identify the overall scale of the building interior-height, width and length referring 2 as- pects -Closure within interior space, Structural organization within the space interior also building element Scale within context -Comparative analysis with ex- isting building in context in	-Compare-size and scale of mosque with surrounding building -Analysis-building section and el- evation to determine the size of ele- ment within the building elements by comparing to human scale refer- ring to drawing and on site observa- tion
	<b>SPACE</b>	Theory to analyse	Process
	Spatial organiza- tion	(Hillier & Hanson, 1984) ; Dovey spatial syntax theory Branching system to determine the arrangement of spaces within the built form and iden- tify the movement within the interior space as well as an entry point and access to the cells.	Analyse the floor plan by iden- tify the entry point and move- ment pattern within the interior spaces on direct observation

### 3.2. *Hermeneutic as research methodology*

Hermeneutic is the theory of text interpretation that includes written, verbal, and nonverbal communication. It is a way of understanding text that was initiated by scholars like Scheleimacher, Dilthey, Heidegger and Gadamer. For this study, *Philosophical hermeneutics* phenomenology which refers primarily to the theory of knowledge initiated by Paul Ricoeur is adapted. This is because Ricoeur's theory proposed that to understand the meaning of the text; the researcher must involve and see for oneself. In this sense, interpretation of knowledge from written text must be in a cyclic manner which involves a series of phases. Firstly, from basic naïve understanding on the subject matter from textual reading is done. Then move on to the second phase of understanding which is coding the process and finally subdivide the subject matter into themes also sub-themes before re-summarizing it in a holistic manner. This theory is beneficial for this study because it will help the researcher to understand the ideology and the intention of the architect during the design process of the mosque as documented in design reports. Findings from this textual documentation will reveal the hidden reason behind the mosque design in portraying it as sustainable built form. To understand this, the next section will discuss on findings gathered from the two selected case study of communal mosque found in Muslim and Non-Muslim countries which are Seri Petaling mosque in Malaysia and AnNahdhah mosque in Singapore. These mosques are selected based on its active role in society as had been defined by preliminary studies referring to a questionnaire and interview with local authorities and communities. The chosen of mosque in a different type of country helps to define the same design character on designing the mosque with different culture and beliefs. Furthermore, these two mosques depict a sense of communal spirit with numerous functional architectural values in its building design.

## 4. Findings and discussion

### 4.1. *Seri Petaling mosque*

Seri Petaling mosque was built in the 1990's by the Tabligh group. This da'wah group was originally comprised of the Indian Muslims but in the late 1970's the local Malays begun to be part of this group (Abd. Rahman Abd., 2007). This mosque is registered under Islamic religious department (JAKIM) as 'jami' mosque.

#### 4.1.1. *Form*

- **Façade**

The mosque façade portrays repetitive layout of openings arranged in a horizontal manner. These openings are decorated with horseshoe arches made of plastered cement. These arches not only act façade treatment but also used to avoid rainwater flow into the building also sun shading. This series of wide openings placed below the roof ceiling in a tiered manner allows maximum lighting and natural ventilation into the building interior. Due to this, the mosque minimizes the usage of mechanical lighting and ventilation. This contributes to sustainable design factors while give comfort to the mosque user.



Fig .1. Facade of Seri Petaling mosque

- Detailing, structural and ornamentation

This mosque uses concrete as its main building material due to the available technology and construction during that period. Timber panelling is also used for the mosque interior for decorative purposes and function as a feature for heat absorption. This is because the wood panelling placed underneath the ceiling and internal wall façade in the main prayer hall help to reduce the hot temperature inside the main praying area since it absorbs the heat gain. In addition, the use of tiling and marble flooring in expandable areas like veranda and corridor way also helps to reflect light apart from giving cooling effect within the expandable areas so that the user can utilize this space for relaxation during a hot day. The mosque walkway is also covered with transparent roof made of polycarbonate material to allow natural lighting. These sustainable characteristics available in this mosque help to electricity consumption for lighting and cooling effect in the building interior. Mosque use tapered roof structure suitable for tropical climate as for rainwater flow. Furthermore, dome is not meant for decorative purpose or as a symbol of Muslim place of worship but it is equipped with propeller fan to extract the hot air in the mosque main prayer hall to the atmosphere. The dome is also designed in a tall manner about 3 meters high with a series of small openings on its sides and top. Openings on the dome also allow natural lighting to enter the main prayer hall. Mosque using tapered roof design suitable for tropical climate to allow rainwater flow



Fig .2. Dome for stack effect

- Setting

Seri Petaling Mosque is situated within walking distance from the housing areas and located at the center of a community hub near to shops, hotels, and community hall that can avoid use of cars for having fresh air environment. The mosque is located at higher ground about 3 meters from sea level according to the original land contour. The high placement reduces noise interference in order for the user performs activities freely. This mosque has multiple accesses located at the rear end of the mosque, on the

right hand side and at the front. Various accesses to enter the mosque resulted to fully functional spaces and utilized by the surrounding communities at all times. The main gate open 24 hours daily.

- *Building scale*

The mosque interior is double volume in scale. The scale of mosque design capable of accommodating 10,000 worshipers base on the active da'wah activity among Tabligh member. The mosques opening are also wide and tall in height to allow natural ventilation and maximum lighting to penetrate into the mosque interior. Although the scale of the mosque is large which horizontally spread covering almost 2 acres of land, the mosque is not vertically constructed in height. The mosque is built according to human proportion which is only six meters tall from floor to ceiling level except for the main prayer hall which is double in height due to the placement of a large dome. The moderate scale of the mosque size hence portrays non-wastage of structural elements and material usage. Moreover, since the building is built according to human scale it creates a homely and comfortable effect to the user.

#### 4.1.2. Space

- Spatial Organization

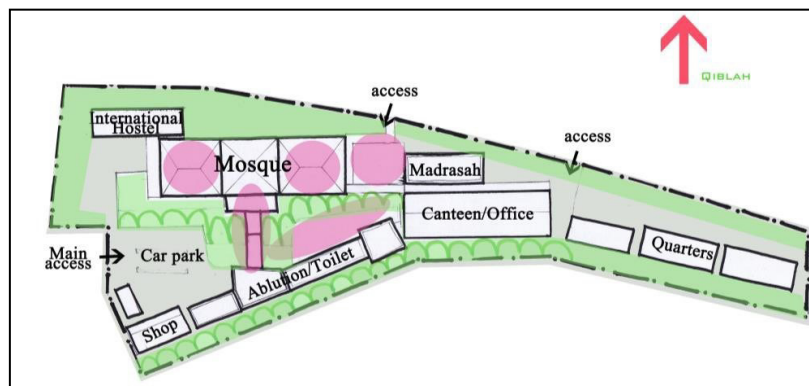


Fig. 3. Sketch plan on mosque access and allocation of multipurpose space

The mosque is built on existing ground, and no levelling works is done to level the existing land contour. Natural setting give benefit to create natural access, for the surrounding community to have direct access to the main prayer hall since it is located facing the residential area. The hierarchy of the mosques blends in well with the surrounding context and harmonize with the existing landscape.



Fig. 4. Land levelling of mosque



Furthermore, the mosque spatial organization is designed according to various zones and these zones are connected by covered passageway or corridor. In between the main spaces there are intermediate areas like open courtyards which acts as buffer zones to allow natural lighting and ventilation to enter the main spaces. Furthermore, the placement of intermediate spaces help to give a sense of direction to the mosque user as well as segregate the spaces from public to semi public and private spaces. Almost all spaces within the mosque are designated areas to conduct multifunctional activities. Corridor and staircase area is utilized as a place for overflow prayer, delivering da'wah and sleeping. This kind of spatial organization in a clustered manner hence creates various nodes and focal point that not only used to accommodate formal activities, but may also use for informal events like religious study. As a result, strong ukhuwah or brotherhood ties are evident among the da'wah members.

Finding on Seri Petaling mosque shows that sustainable aspects were considered during the building construction. The architectural elements adapted in the mosque design not only blends in with the surrounding context from the aspect of climatic consciousness but also reflected on the building design style that portrays sense of humbleness in its architectural form and space. The mosque design that reflects sustainable approach not only gives impact to its user but also may improve the life of the surrounding community. In other words, this mosque portrays good example of sustainable communal mosque that can be an exemplar for future mosque design.

#### 4.2. *An-Nadhah mosque*

An-Nahdhah Mosque is located in the heart of Bishan, Singapore. The mosque complex also houses MUIS's Harmony Centre where visitors could learn of the Muslim community and Islam as practiced in multi-cultural Singapore. An-Nahdhah Mosque is a new generation mosque serving both religious and spiritual needs of the Muslim community. The mosque was opened to the public on 6th January 2006.

##### 4.2.1. *Form*

- *Façade*

The placement of large panel glass at the front façade of the building allows maximum daylight into the interior of the building. It fully brightens the main pray area and the atrium which give a sense of calmness in human psychology during worship. Mosque façade used latest modern technology approach in order to integrate with surrounding building.



Fig. 5. Exterior wall of mosque

- Detailing, structural and ornamentation

The mosque mainly utilizes glass and concrete as building materials. This kind of material usage is not suitable in a tropical country since it does not contribute in reducing heat in the interior. The usage of glass material makes the building hotter and tendency to give glare to the human eyes. As a result, mechanical ventilation is needed. Besides, usage of a minaret in this building only acts as a landmark without any additional purpose. The use of Islamic geometry pattern is also mainly for aesthetic reason without any function.

- Setting



Fig. 6. Location plan of mosque

Regulation stated which for every 20,000 Muslim populations a mosque is needed to fulfill the need of the user. The mosque is located in the middle of Bishan area so visitors can access this mosque from the east, west, south and north side. The mosque is located on a flat land. The setting helps the resident nearby to easily access and use the mosque daily.

- Building scale

The mosque accommodates up to 4000 people at one time. The building has a triple volume height covering the 1st floor up to the 3rd floor. The opening is wide in tall in height to allow maximum natural lighting and ventilation to penetrate the building interior at the prayer hall and the atrium. The prayer hall and atrium use natural lighting, ventilation and did not rely on the usage of mechanical fixtures. This creates sustainable mosque design and provides comfort to the user.



Fig. 7. Volume of mosque interior

The mosque has a large void and wide open atrium punctured through the middle main pray area and mosque office. This allows natural ventilation to pass through this void area and enter the main prayer hall. The mosque also is designed facing the Qiblah wall and devoid direct penetration of morning and evening sunlight from the east and west direction. The building structure is also designed not

according to symmetrical grid lines hence allows many spaces to be juxtaposed and punctured through the solid platonic form.

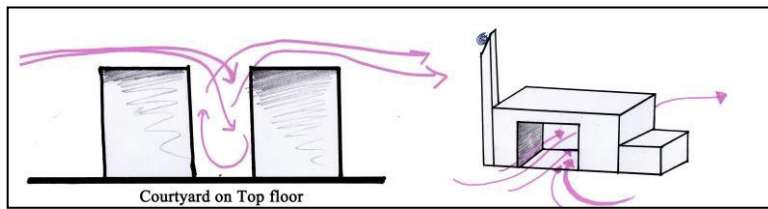


Fig. 8. Conceptual sketch on sustainable approach

- Spatial organization

Mosque is designed in a hierarchy manner in which each level comprise of multifunctional spaces to cater the needs for public, semi public and private usage. Due to limited land area, the mosque is designed in a vertical manner. Each level has easy access from every direction. The covered passageway act not only as linkages also as a waiting area and connected to the space. These resulted the maximum utilization of spaces thus devoid lost space within the building interior. The overall planning composition is simple and straightforward but it blends harmoniously with modern surrounding context. The allocation of the atrium as the core of the planning layout allows maximum penetration of lighting and natural ventilation to pass through the building thus creating an airy and comfortable environment within the building space. Almost all four levels of the mosque are optimally utilized even at the roof top level for public use. As a conclusion, An-Nahdhah mosque shows that the mosque considers the element of sustainable in its design construction. It can be seen on the planning of mosque building funded by the department of Islamic Religious Singapore(MUIS). Even though the mosque is located in non-Muslim country the mosque still able to give an impact to Muslim communal life due to its sustainable conscious design. From the above observation on 2 case studies, it clearly shows that these mosques do reflect mosque design that is sensitive to communal needs and the functional to cater for daily communal activities. The discussion continues with the table below base on similarity and different approach to understand how the mosque developed the designs in order to create the sustainable character.

Table 2. Comparative study on sustainable approach

		Sustainable approach		Sustainable Design Character	
Building Indicators		Similar	Diff	Seri Petaling Mosque	An-Nahdhah mosque
FORM	Subtopic				
Façade	Arrangement of element on the external façade		x	Window and door arranged in horizontal manner and in tiers -allow ample natural lighting and ventilation	Adopt large glass panel for lighting to allow natural lighting but trap heat and open concept building to allow free flow ventilation.
	Layers of openings on external		x	Coping surmount the openings -avoid flow of rainwater into the building and acting as sun shading device	-

		facade		
Detailing	Usage of natural materials	x	30% timber panelling in the internal façade wall at the main prayer hall -reduce absorb of heat and produce cool effect within the interior prayer hall Use of marble flooring -reflect light and cooling effect	-
		x		Use of ceramic tiling -reflect light and cooling effect
	Dome Minaret	x	Dome as stack effect and function as landmark. Glass at dome for natural lighting	-
	Roof Structure	x	Tapered roof designed- rainwater flow Transparent roof-natural lighting	Flat Slab for madrasah courtyard and use of gutter system for rainwater flow
Setting	Land Condition	x	Uses natural hill land setting and contour- reduce wastage	on natural flat land setting- reduce wastage
	Distance	x	In walking distance-avoid use of car and motorcycle for fresh air	-
	Circulation	x	2 access from the back and front can be access-utilize 24 hour/day -reduce use of car/motorcycle for having fresh air	access from basement, main access and the harmony centre -easy approach to community
Building scale	Positioning	x	Maximum area of façade on north and south -reduce heat absorption	
	Within user	x	Proportionate with large scale user -Homely and comfortable effect	
	Volume Space	x	Double volume interior -speed up the flow of hot and cold air into and out of the building	Triple volume atrium and prayer hall -maximum heat release to the exterior atmosphere
	Scale of Building Element	x	Has series of large, wide and tall openings -allow maximum natural lighting and ventilation into the building interior	Series of large opening at each pray area -allow maximum natural lighting and ventilation
	Massing	x	Solid and void puncture at right and side building for access of ventilation.	Solid and void punctured up to 3rd floor in the interior for access of ventilation.
SPACE (Spatial Organisation)				

Hierarchy	x	Floors arranged according to existing land contour. -comfort to user hence determine access to the building	Vertical hierarchy from limited land.
Building layout	x	Integrated each space including corridor, staircase, courtyard for multipurpose use -maximum use of space -buffer zone to avoid interrupted activity	Integrated vertical space including doorway, emergency staircase for multipurpose use -minimum wastage of space
Zoning	x	Use clustered arrangement to maximise intermediate space function and comfort of free flow ventilation and brighten the interior space	Use radial arrangement of space to allow maximum usage of space with bright space from natural lighting

Both communal mosques adopt passive design approach suitable for the comfort of the user even though it was located in different countries with diverse beliefs and culture. Both of these mosques manage to portray strong sustainable approach although faced with many limitations such as costing and authority restrictions. Mosque located in non-Muslim country may portray less sustainable approach due to the authority limitation. However, communal mosque design have majorly influence to be built according to the needs of the society in spite of the authority limitations due to the demanding needs of the society. This is because in democratic country, communal voice are much dominant and desire to live in a better quality environment is well put forth by the modern society regardless of age, gender or ethnicity. In brief, both Sri Petaling and An Nahdah mosque expresses how sustainable design can improve quality of space for the user and beneficial in increasing the communal quality of life. The above discussion also highlights how sustainable characteristics can be adopted in the future mosque design. This is vital because most of current mosque devoid the importance of sustainable design characteristics instead only emphasis on image making and aesthetical approach.

## 5. Conclusion

From the comparative study, it clearly shows that communal mosque should be designed according to sustainable design characteristics in terms of architectural form and space. To portray sustainable communal mosque design, the built form should have façade that allow natural lighting and ventilation into the building interior. This is important to minimize the usage of energy thus reduce cost for mechanical maintenance. The positioning of the communal mosque should also blend in harmoniously with the existing landscape within reachable walking distance and the mosque should have multi-functional space that can be fully utilized at all times to avoid wastage and lost space. For instance corridor and passageway also can be a functional space instead serving as circulation area. Hence the mosque design should reflect the true teaching of Islam as stated in the Quran and hadith either in Muslim or non-Muslim country. Sustainable mosque design gives big impact in enhancing the quality of life. By portraying the aspect that relates to the environment it not only improves the quality of space usage but also improves the quality of the Muslim community and their daily life. This is because religious building is closely related to the life of a Muslim believer and in Islamic religion, nature is the important factor that can bring mankind close to god. Hence a place of worship must have the elements of nature for improving better quality of life. By applying this guideline, we are able to experience the transition of

better communal mosque in the future which also contributes to the development of sustainable community.

## References

- Alice Sabrina I. (2008). The influence of Islamic political ideas on the design of state mosque in peninsular west Malaysia. Dissertation Doctor of Philosophy. University of Queensland Town.
- Alice Sabrina Ismail , M.Tajuddin M.R.(2009). Mosque architecture and political agenda in twentieth century Malaysia. *Journal of architecture*. 15(2), april,2010. 137-152
- Alice Sabrina Ismail and Mohamad Tajuddin Mohd rasdi (2009). Frank Lloyd Wright's Ideology Towards The Formation of National Architectural Identity in Malaysia. *Jurnal Alam Bina*, 15(1),2009.
- A.Ghasemi, M.Taghinejad, A.Kabiri & M.Imani (2011). Ricoeur's theory of interpretation: A method for understanding text(course text).*World Applied Sciences Journal*, 5(11), 1623-1627
- Fiske, John (1990) Introduction to Communication Studies. London : Routledge.
- Gazalba (1975). Masjid pusat Pembangunan Umat. Pustaka Antara.
- Hamid Garsivaz.G.(2012). The position of mosque in Islamic cities and its location design in new cities. *Damascus University Journal*,28(1).
- Holod R. & Khan H.U (1997). The Contemporary Mosque Architects, Clients, and Designs since the 1950s Imamuddin, Abu H., Shamim Ara Hassan and Debashir Sarkar (1985).Community Mosque-A Symbol Of Society. In Regionalism in Architecture. Robert Powell,ed.Singapore: Concept Media/The Aga Khan Award for Architecture.
- Kafle Narayan Prasad (2011). Hermeneutic phenomenological research method simplified. Kathmandu University Nepal.Bodhi. *Interdisciplinary Journal*, 5.
- Kneivtt Charles(1994).Shelter: Human habitat from around the world. Streatley-on-Thames : Polymath Publishing.
- Khan H.U.(1997). The architecture of the mosque, an overview and design directions. Expressions of Islam in building. The mosque. 109-127.
- M.Tajuddin R. (1998). The mosque as a community development centre: Programme and Architectural Design Guidelines for contemporary Muslim Societies. Universiti Teknologi Malaysia.
- M.Tajuddin R. (2003).Islamic architecture in south east Asia:Transformation of culture and forms, centre for the study of built environment in the malays world.KALAM papers,Johor Bahru:UTM
- M.Tajuddin R. (2008). The design of mosque as centre of community development centre from the perspective of sunna and Wright's organic architecture. *Journal of Islamic architecture*, 1(1).
- M. Zafrullah dan M.Tajuddin (2009). Islamic architecture Evolution: Perception and Behaviour. 1st National Conference on Environment-Behaviour Studies. Sciverse Science Direct: Procedia Social behaviour Sciences 49. Faculty of Architecture, Planning and Surveying, Universiti Teknologi Mara, Shah Alam Selangor.2009. 293-303.
- Meehan,Patrick. J(1987). Truth Against the World:Frank Lloyd Wright Speaks about organic architecture,U.S.A:Wiley Interscience Publications.
- Mulhall Anne(2003). In the Field: Notes on Observation in Qualitative Research. Methodological issues in nursing research. Blackwell Publishing
- Nangkula Utaberta (2011). Re-interpretation of sustainability in Islamic architectureLA critical analysis of the innovation in temporary praying platform project of 2nd year architecture students in the Universiti Kebangsaan Malaysia(UKM).
- Nadzirah Z., Siti Marina Abd. & Zarita A. (2011). Light and space: user's perception towards energy efficient buildings. Asean conference on Environment-Behaviour Studies,Savoy Homann Bidakara Bandung Hotel, Bandung, Indonesia. Sciverse Sciencedirect: Procedia Social behaviour Sciences. 15-17 June 2011.Pg 51-60.
- Peck M. Scott (1998). The different Drum: Community making and place. A Touchstone Book. Simon & Schuster.
- Rosniza O., Nila Inangda & Yahaya Ahmad (2007). A typological study of mosque internal spatial arrangement: A case study on Malaysian Mosque (1700-2007). Centre for conservation studies and Record: Faculty of Built Environment, University Malaysia.
- Robert Hillanbrand(1994), Islamic Architecture; Form, function and meaning. Columbia University press. Spahic Omer (2010). Some Lessons from Prophet Muhammad SAW in architecture: The prophet's Mosque in Madinah. *Intellectual Discourse* 2010, 18(1), 115-140.
- Wright Frank Lloyd. (1939).An Organic of Architecture: The architecture of Democracy.London:Land Humpries.

- Wates, Nick(1987). Community architecture: how people are creating their own environment. Wright, Frank Lloyd Wright(1908). In the cause of architecture.London:Mc Graw Hill Publishers Bosworth , C.E. 1986. The Encyclopedia of Islam. Leiden : E.J Brill.
- Yin (2009); Case Study Research Method. Design and Method,Sage Publications,Thousand oaks,4th edition, 240.