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CONTENTS

"Whoever travels in search of knowledge is on Jihād until he returns"

(Transmitted by Tirmidhi & Darimi)

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PREFACE

Sustainable Well-being in Architecture and Environmental Sciences

Sustainable Well-Being is broadly defined as the exploration of lasting happiness. It highlights the importance of a sustainable lifestyle that is environmentally friendly and socially advantageous. It requires us to pursue well-being in a much more holistic way and within the planetary boundaries.

Towards the end of the last millennium, the word 'sustainability' was, and still is, the most used phrase with regards to all aspects of our livelihood, and even more so in the built environment field. This was when we understood that progress and environmental conservation are symbiotic – one is supposedly benefiting the other. Well-being, on the other hand, carries the notion of happiness, healthy and comfortable. Well-being has long been a much researched areas, although mainly in the sociological and psychological domains. Of late, it has increasingly becoming an important agenda in the built environment field as well.

Acknowledging the importance of built environment in the pursuit of long lasting happiness, this issue of the Planning Malaysia Journal carries the theme of 'Sustainable Well-Being in Architecture and Environmental Sciences'. This issue focuses on the design and building of living place which are harmonious and in sync with the environment needs and conservation.

The contributions to the study of environmental sciences have come from diverse fields including architecture, town planning, transportation, engineering, legal matters, community development and psychology, and housing. Despite the diversity, each of the fields cannot be viewed as separate entities since they interweave in the broad framework of sustainable well-being. A broader yet explicit understanding of sustainable well-being from diverse research contexts would lead to better decisions, especially in the built environment designs and solutions.

Finally, we believe that this issue of Planning Malaysia, can become the platform for experts and researchers to discuss on how sustainable well-being in the built environment can be realized. It is also hoped that the articles in this issue would be useful references for future studies related to the built environment and sustainable well-being.

Assoc. Prof. Dr. Mariana Mohammed Osman
&
Asst. Prof. Dr. Muhammad Faris Abdullah
Guest Editors

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PLANNING MALAYSIA:
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SUSTAINABILITY CONCEPTS IN MALAY AND ACEH TRADITIONAL HOUSES

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Abstract

The migration of people between Acheh and Malaysia can be seen in sporadic settlements in the northern regions. Both communities share Islam as a religion and might have similarities in culture, ethics and the environment. Due to the Islamic influences in both Malay and Aceh community, it is predicted that the traditional houses in both locations are manifestations of the sustainable concept of *hablumminallah, hablumminannas* and *hablumminal'alam*. This concept can be analysed in terms of the Islamic implementations of *hablumminallah*, social beliefs, and activities in the relationship between man and man (*hablumminannas*) and climatic influences in the relationship between man and environment (*hablumminal'alam*). Hence, this paper intends to investigate the implementation of the three concepts in the Malay and Aceh houses. The research methodologies employed are observation (through site visits), pictorial analysis and detail evaluations on the components of the houses. Analysis conducted on Rumah Kutai (RK), Perak and Rumoh Aceh (RA) suggest the realization of the three mentioned sustainable concepts in the houses. In conclusion, the overall findings confirmed the sustainability concepts adopted in the RK and RA through adhering to Islamic guidelines, socio-cultural and climatic aspects.

Keywords: traditional house, sustainable concept, social beliefs and climate

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INTRODUCTION

"And (remember) when your Lord said to the angels: "Verily, I am going to place (of mankind) a khalifah (caliph) on earth" [Al Baqarah 2:30].

As a caliph, part of man responsibilities as a vicegerent on earth is to manage the world and contribute to the sustainability of the environment. The needs of living drive man to create a shelter to fulfil ever changing and increased necessities. And in turn, the shelter serves the needs of man to perform their duties to the Creator, man, and the environment. The needs, culture, and environment always play a major role in shaping the architecture of a place or vernacular architecture. Vernacular architecture is the most pronounced interpretation of the needs, culture, and environment of the people. It had been widely discussed that the traditional architecture (as a form of vernacular architecture) of each region had been designed responsively to the local climate. (Hutchinson, 2002) asserted that a region could often be clearly recognized by the character of its housing. Hence, houses as a basic shelter reflect critical factors such as climate, materials, economics and cultural background of a given environment.

The cultural values of Malays and Acehnese have always been identified as values associated with Islam that is portrayed in the vernacular architecture of this region; for example, Rumoh Aceh (RA) and traditional Malay house. Since vernacular architecture is a local expression, it is also a sustainable solution for a given environment. VerSus (2006), a European research project, affirmed the tendency of a direct connection between sustainable and vernacular architecture based on the research and reviews. Again, sustainability and architecture are inseparable, and man as the vicegerent on earth has the responsibility to continue holding to the Islamic spirituality. Spahic (2009) discussed the concepts of sustainability in Islamic architecture, deliberating on the significance of the concepts about man and environment. He has come to a conclusion on the coexistence between people and environment; and reckons that sustainability is a part of Islamic Architecture. In reaction to these propagations on the relationship of vernacular architecture, sustainability, and Islamic architecture, this paper will elaborate on concepts of sustainability in the relationship between man and God, between man and man, and also between man and environment which was also known as *hablumminallah, hablumminannas,* and *hablumminal'alam* respectively. The discussion of this paper will discuss these concepts implementations in traditional Malay houses in the form of Rumah Kutai (RK), Perak and traditional Aceh house/Rumoh Aceh (RA).

RESEARCH BACKGROUND

Sustainability in Islam had been observed through having a good relationship which can be referred to as *hablumminallah* (the relationship between man and Allah (God), *hablumminannas* (the relationship between man and man) and

hablumminal'alam (the relationship between man and environment). This triangular concept of relations between God, men, and the environment had been viewed as a profound element in the formation of traditional houses, in particular, the traditional Malay and Aceh houses.

The first concept, *hablumminallah* can be seen based on the implementation of Islamic teachings in all aspects of life. The concept of *hablumminallah* is not only possible to be translated into physical aspect but most importantly to be felt spiritually. The traditional house of Malay and Aceh are expressions of *iman* (belief of God). The traditional houses of the Malays symbolized the Malay culture which is rooted with the Islamic teachings and practices. Whereas, the traditional house of Aceh is also known as a form of architecture that reflect the faith of people in Aceh (Nas & Iwabuchi, 2008).

The terms *hablumminannas* means the relationship between man and man that involves culture and social activities. The house is built not only for the purpose of life, for shelter and to cater the basic needs, but it is also built to strengthen the relationship between the family members and the surrounding neighbourhood. Kamal (2015) states that the traditional Aceh house reflected the cultural and environmental sentiment of a place and community. He added, the society`s or individual`s belief and environmental condition have a significant influence on the architecture of a house, as seen in the architecture of RA.

The concept of *hablumminal'alam* (the relationship between man and environment) in architectural perspective can be witnessed through the site and climatic considerations in the house design. The manifestations of the site and climatic factors are clearly seen in the design of the RK and RA in terms of siting, type of construction, architectural elements and features.

The relationship of Aceh and Malaysia can be traced back to the spread of Islam and Dutch colonialisation. The traces of the migration can be seen in sporadic settlements in the northern regions, with the largest being settlements in Yan, Kedah, and Kampong Acheh in Pulau Pinang and Perak. These three states in the northern part of Peninsular Malaysia are the closest to Aceh by their geographical location. Kamaruzzaman, Ruzman and Mohd Yakub (2012) discuss the influence of Aceh in Penang that started in the 15th century in terms of the Malay identity. History has recorded that in the year 1567 - 1585 M, Sultan Alauddin Mansur Syah I, the son of Sultan Mansur Syah 1 from Aceh was brought to the throne as the second Sultan of Perak State.

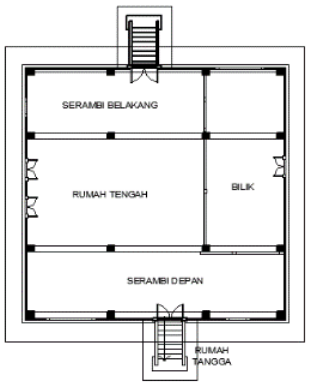
The relationship between Aceh and the mentioned places in Malaysia is part of the historical and social development. Hence, it is hypothesized that the traditional houses of the long roof type for these regions may share the same basic considerations in architectural design. As for RK and RA, both not just represent the architecture features of Malay and Acehnese culture and the traditional living of the people, but at the same time they also have been designed with particular regard to suit to the local tropical climate. The hypothesis forwarded by Seri

Laman (2014) affirmed that the architecture of the RK has a link and resemblance to the houses in Aceh and Makassar. Diaspora of people of the Nusantara region has brought together with them religion, culture and 'reconstruction' of their familiar environment in the new settlement. As a result, there is evidence of amalgamation of social culture that also affects the built environment.

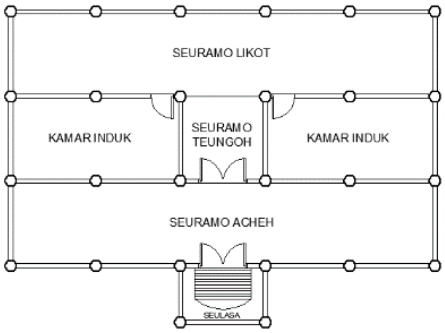
Since Indonesia and Malaysia are within the equatorial climate belt region, there are a few attributes of both RK and RA that have been designed based on respects for the surrounding nature and also responds to the climatic context. For instance, the design for solar control, optimum ventilation and also the control of the thermal accumulation inside the house.

RESEARCH METHODOLOGY

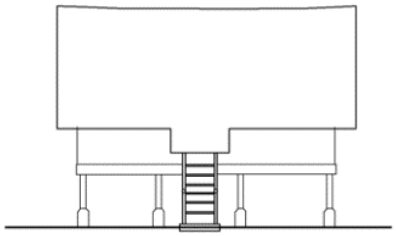
The research methodologies employed are observation (through site visits), pictorial analysis and detail evaluation on the components of the houses. Site visits to several traditional houses in Central Perak and Aceh provided the fundamental data on the typology and layout of the houses. The site visits also provided information on cultural experience, scale, space utilization and feeling of space. On the other hand, pictorial analysis focuses on details and components of both house typologies. The mentioned methodologies in combination are basis for the detail evaluation on the house components; i.e. carvings. Data were collected from purposive sampling for both house types. The samples of RK in Bota, Perak (Figure 1) and RA from Banda Aceh (Figure 2) were chosen for the case study as both represent the traditional Muslim dwelling architecture for both regions. The character and features of both houses had been investigated and analysed according to the implementation of Islamic design, and also the sustainability concept of *hablumminallah*, *hablumminannas* and *hablumminal'alam* that has been discussed earlier.



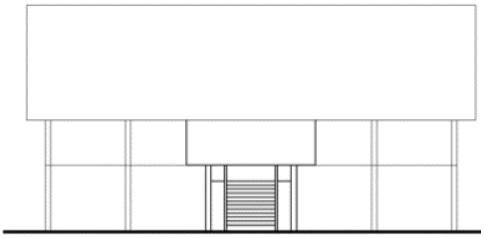
Plan (RK)



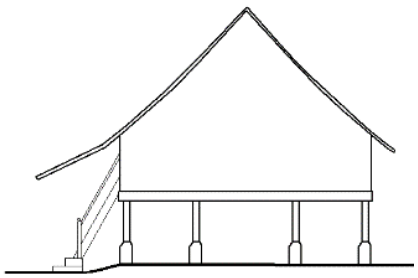
Plan (RA)



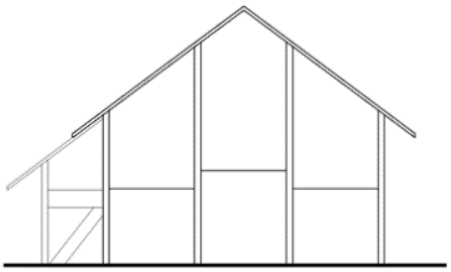
Front Elevation (RK)



Front Elevation (RA)



Side Elevation (RK)



Side Elevation (RA)

Figure 1 Rumah Kutai

Figure 2 Rumoh Aceh

RESEARCH ANALYSIS AND FINDINGS

The research analyses the case study houses in terms of the Islamic implementations (*hablumminallah*), social beliefs and activities (*hablumminannas*), and climatic influences (*hablumminal'alam*).

The traditional houses are fundamentally a reflection of *hablumminallah* or man submission to The Creator (Allah swt). As a vicegerent on earth, Man should take responsibility to fulfil his tasks as a servant; to worship and carry out

duties towards man and environment. By performing these duties, man would have responded to the teachings of Islam. As stated in the Quran:

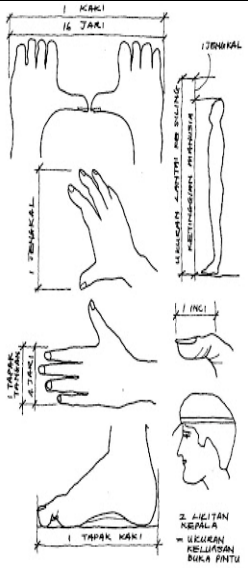
> *And I only created Jinn and men, that they may serve Me. No sustenance do I require of them, nor do I require that they should feed Me. For God is He Who gives (all) sustenance, Lord of Power, steadfast (for ever) [Adh-Dhariyat 51:56-58].*

It is Allah that has created mankind as servants and provides sustenance for a living. Therefore, man should use available means to facilitate their duties as in building a shelter for themselves. Hence, the houses should accommodate the needs of man to carry out the basic requirements, most importantly daily prayers. Both RK and RA are aligned to the *qiblah* with the long sides elongated on the east-west axis (Nas & Iwabuchi, 2008; Lim, 1987). The gables in RA are oriented East-West with the main door coming from North or South. According to Hindu belief, the entrance of the house should avoid facing towards sunset that resembles darkness and death. Due to Islamic influences, the gables were then oriented towards Makkah (Nas & Iwabuchi, 2008). In some instances, there are entrances designed coming from the gable ends, but from the east so as not to disturb the praying direction that is towards the west. The spaces in both RK and RA also offer areas for congregational prayers beside other functions to support health and wellbeing of the occupants as stipulated in Islam.

Hablumminannas (the relationship between man and man) is highly reflected in the design of RK and RA. There are few characteristics of the houses that reflect the implementation of Islamic teachings. The characteristics comprise segregation between genders, female and male domains, and visual privacy.

The houses are inspired from the parts of man body while the measurements used during construction was also based on human anthropometric (Kamal, 2015; Wan Hashimah, 2005; Mohd Yusof, 2012). Table 1 shows the association of the human form to the houses and the body parts used for the measurements. The association to human form expressed the verticality concept. There is a vertical domain expression of the cosmos in the RA, and a horizontal expression of the segregation between male and female. The vertical principle as described by Nas & Iwabuchi (2008) are related to the space underneath the house that is the realm of animals; the raised floor level represents the human life and the upper level with ancestors.

Table 1 Measurement System in Construction of the Houses

RA	RK	Translation	Illustrations
jaroe	*jari*	Width of 1 finger	
paleut	*tapak tangan*	Back of hands	
hah	*hasta*	Elbow to tip of middle finger	
jeungkal	*jengkal*	Spread of thumb and middle finger	
lhuek		Length of the whole area	
deupa	*depa*	Span of spread out arms	

Source: Kamal (2015) & Wan Hashimah (2005)

The lowest area, or the area underneath the house, that is associated with the realm of animals are practically used as a place of living during the daytime. It is also used as:

i. A storage of goods such as agricultural equipment, rice pounding block, rice, firewood.
ii. A place to rear animals. Waste are thrown here to be consumed by the animals or burnt to evade mosquitoes.
iii. A place of play for children or place to conduct work during daytime.
iv. A place for washing.

The vertical usage of RA is similar to most traditional Malay houses and other countries in the Southeast Asian region that are built on stilts. Case study visits to some areas in Perak provided evidence of the same usage of the spaces underneath the houses. The height of this space is between 1700mm to 2500mm. The raised floor level is the living area for man to conduct daily activities and sleeping at nights. Lastly, the upper level that is regarded as sacred space in RA is the place of storage for valuable possessions in RA and RK. The profane spaces of the ground and raised level are the living areas that will be explained as horizontal expressions for both houses.

The horizontal expressions in RA and RK are mainly divided into three

main areas that are illustrated in Table 2.

Table 2 Areas in RA and RK

Parts of the House	RA	RK
Front area	*seuramoe Acheh*	*Serambi depan*
Middle area	*seuramoe teungoh*	*Rumah tengah*
Back area	*seuramoe likot*	*Serambi belakang*

The front areas are also the reception area for guests and geared towards the male gender in both RA and RK. People sit at these place on mats that are laid on the floor. Small feast and other activities are also held in this space. This space is a place for the male children to sleep at night. Male guests are confined to the front area and will not enter the middle area that is of a family and female domain (Lilawati et. al, 2006).

Both RK and RA have rooms in the middle house; in RA there are two rooms namely *rumah inong* (room for the couple of the house or married daughter) and *anjong* (room for unmarried daughters). On the other hand, RK mainly has only one room in the middle section. However, in both houses, the room is always attributed to the couple of the house and female children (married and unmarried). In both RK and RA, the central passage of the middle area is a domain of family members, married couple, treatment of sick family members and for the bathing of the dead (Kamal, 2015; Nur Azfahani, 2009). Similarly, the main house in RA (*seuramoe teungoh*) is a female or family domain where in some instances include rooms for unmarried female children.

The back area of both houses is female domain that has direct access for female guests. The *seuramoe likot* in RA is a sitting room and kitchen. This area has access to the courtyard where the well is situated. The rear access is a door with horizontal shutters for security. RK also has access to the rear area through *serambi belakang*. This access is for the female guests and also the access to the utilities in the house compound.

The architectural elements in RK and RA that are designed to satisfy the *hablumminannas* concept are door and window sizes. In both RA and RK, the door height is lowered 1,200-1,600mm to send a message for the visitors to bow or bend their heads when entering the house. However, once the visitor has entered the house, the ceiling is high and gave a warm and welcome feeling.

It is common for uninvited male guests to be confined to the front steps or invited to the front area of RK and RA. In order to preserve privacy for the female occupants of the house, the houses were designed with small windows that limit the view to the interior of the house. At the same time, the small windows reduce light penetration and result to a darkened interior that supports privacy. Privacy is also achieved due to the darkened interior when male guests enter from the bright outdoors. The guests will take a few seconds to adjust to the

dark interior and will allow the female occupants to retreat to the room or the back area, or to cover their *awrah* (body parts not allowed to be seen by non-*mahram*).

The relationship between man and environment (*hablumminal'alam*) is clearly interpreted in both RK and RA. Both houses respond to the hot and humid climate that are manifested in raised form, elongated building form on the east and west axis, open plans, high ceilings, large roof overhangs and low thermal building materials alongside some other strategies to work with the climate. The basic idea of the traditional houses is to use the climatic factors to advantage and ameliorate harsh effects of the environment for the comfort of man. In agreement with the wisdom principles in traditional architecture, the houses were designed to optimize the given climatic conditions and the surrounding environment. The houses optimize natural ventilation to avoid heat and humidity accumulation; for example, RA and RK have the carved, or split gable ends on the wind path to facilitate cross and roof ventilation (Figure 3 and 4). While RK has a simple pitched roof ranging from 50-60 degrees that provides space for ventilation and cooling that support the thermodynamic process to flow out the heat from the inside to outside. Wall ventilation and raise floor help to avoid the heat accumulation, because of external or internal heat gain through gaps in the floorboards and walls in both RA and RK.

Figure 3: Gable Ends in RK

Figure 4 Carved Gable Ends in RA

The carvings implemented in RK and RA is another evidence of *hablumminal'alam*. Carvings on the houses depicted the entities from the surrounding environment depicting flora and fauna motifs (Figure 5). In older houses, there are carving motifs of fauna figures such as monkey, snake and bird that may have existed during pre-Islamic times in contrast to the floral motifs

from plants that are allowable and in line with the teachings of Islam. Carvings are placed on the walls, doors, ventilation panels, openings, internal partitions and staircases (Sofyan, 2014) (Figure 6). The carvings motifs are mainly symmetrical and repeated pattern in the form of plant shoots, flora and crisscross patterns.

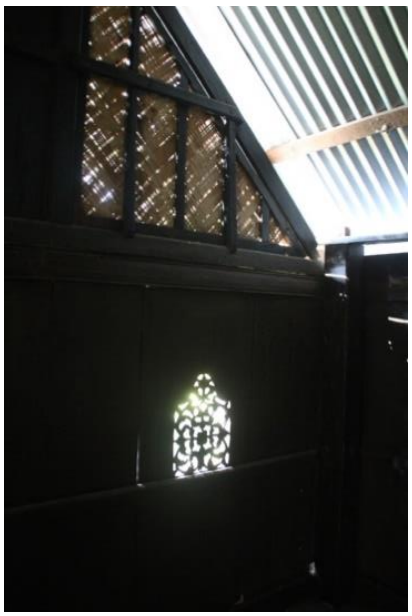


Figure 5 Carvings of Floral Motif at RK

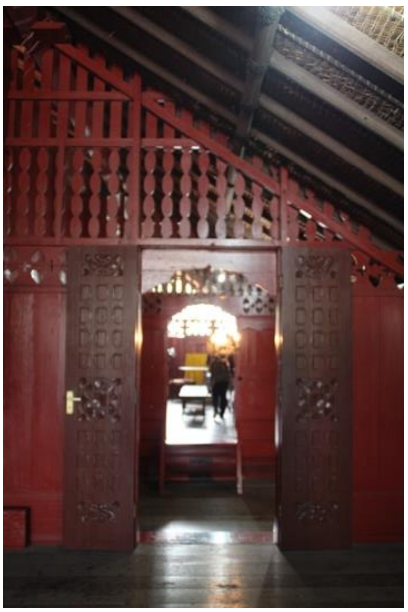


Figure 6 Carvings of Geometrical Motif on an Internal Partition at RA

The carvings are also a reflection of the owner's social status; the richer the carvings, the higher the status of the owner. Floral motifs were inspired from *bunga Melati (Jasminum sambac), daun keor (M. oleifera), sulur pakis (diplazumesculentum), rebung (Dendrocalamus asper), kupula (mimusop elengi), pisang (Ravelana madagascariesis), bunga matahari (Helianthus anuus), rambutan (Nephelium lappacium)* and *pucuk labu (Cucurbita moschata)*. On the other hand, the fauna motifs were inspired from butterfly or *kupu-kupu* (*Danaus sp*.) and grasshopper or *belalang (Oxy asp*.). The application of carvings is a response to social-cultural background, climatic and geographical factor. The higher the status of the owner, the more ornate the carvings of the house. For example, the wall for RK are made of wood panels and carvings for higher ranking people, and weaved bamboo panels for commoners.

CONCLUSIONS

The creative and innovative craftsmanship of these traditional dwellings can be seen through the application of the three concepts; *hablumminallah*, *hablumminannas*, and *hablumminal'alam*. The spatial design, structure and ornamentation aspects which created an identity and technology in these houses are to be appreciated and learned. The findings from the literature reviews and case studies suggest similarities in the realisation of the three mentioned sustainable concepts in RK and RA. On the other hand, the results also indicated differences in the houses due to social beliefs and activities. In conclusion, the overall findings confirmed the sustainability concepts adopted in the traditional Malay and Acehnese houses through adhering to Islamic guidelines, and socio-cultural and climatic aspects.

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CHOOSING AN APPROPRIATE CONTINGENCY SUM ESTIMATING METHODS FOR HIGHWAY CONSTRUCTION PROJECTS IN NIGERIA: A LITERATURE REVIEW

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Abstract

In order to establish a gap to be filled in a particular field, there is a need to gather information that allows the researcher to identify and analyse the current state of researches on the topic. Contingency sum estimation for projects plays an important role for inclusion for risk taken by the contractor on the bid amount. This is good in order to meet project objectives (cost, time, quality, health and safety, and environment). The main function of contingency sum is to cater for variations that arise during the construction phase of projects. The aim of the study is to identifying and examine the various methods for estimating contingency sum for projects with a view to propose an appropriate method which will be suitable for a specific project in order to increase accuracy and reduce cost overrun. A literature review of selected papers (journals, conference proceedings and theses) on contingency estimation was carried out. The major findings from this study is that most studies were carried out on building projects while few were carried out on highway projects. From the analysis carried out, no single method of estimating has been effective for all types of projects. These methods of estimating contingency sums have developed over the years as a result of shortcomings of one method after the other. It is therefore recommended that peculiarity of each project, ease of using each of the methods and accuracy of the estimates needed should be the basis of choosing method of estimating contingency sum.

***Keywords*:** Construction projects, contingency sum, estimating, highway

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INTRODUCTION

Cost performance of construction projects is a critical success criterion always watched out for by project sponsors. El-Sayegh and Mansour (2015) state that several studies establish that highway construction projects have higher risks than other construction projects. This is due to the fact that highway projects are capital intensive, take longer time to complete, spread over a wider geographic area and are threatened by underground conditions. Reeley and Brown (2004) posit that infrastructure and underground projects (of which highway projects) are complex and most of the time, span through several terrains, including sandy and rocky areas. Thomas, Kalindidi and Ganesh (2006) cited in El-Sayegh and Mansour (2015) posits that highway projects involve very high risks due to long project duration, low market value of security packages and complex contract mechanisms and involvement of many participants with diverging interest and challenges. The required huge investment and difficult as well as complicated site conditions, according to Zayed, Amer and Pan (2008), make it imperative to have a robust contingency sum which can take care of this imminent risks inherent in highway projects. Cost contingency is included within a budget estimate so that the budget represents the total financial commitment for the project sponsor (Baccarini, 2006). Therefore, choosing an appropriate method of estimating cost contingency and its ultimate adequacy is of great importance to success of projects.

Definition and Attribute of Contingency

Different researchers such as PMI (2000) have at different times offer varying definitions of contingency. AACE (2010) defines contingency as "an amount added to an estimate to allow for items, conditions, or events for which the state, occurrence, or effects is uncertain and that experience shows will likely result, in aggregate, in additional costs". Bakshi and Touran (2014) offer a definition of cost contingency which is very relevant for this study, as a reserved budget for coping with monetary impacts of risks and uncertainties associated with a project. However, AACE (2010) states that contingency does not cover the following: (i) major scope changes (ii) extraordinary events such as major strike and catastrophes (iii) escalation and currency effect and (iv) management reserves.

Besides, many researchers applied the extension rule to the model counting problem (Touran, 2003), and many amended it so as to apply it into the TP of modal logic19. Still some researchers improved the extension rule, and put forward series of algorithms such as NER, RIER, etc (Yeo, 1990; Zayed, Amer & Pan, 2008).

Extension-rule based TP method has commended considerable respect from many related researchers. For example, Murray (PMI, 2000; Thomas, Kalindidi & Ganesh, 2006) has applied the extension rule into the generation of the target language based on the knowledge compilation, and

achieved good results. Besides, many researchers applied the extension rule to the model counting problem (Touran, 2003), and many amended it so as to apply it into the TP of modal logic (Touran & Liu, 2015). Still some researchers improved the extension rule, and put forward series of algorithms such as NER, RIER, etc (Yeo, 1990; Zayed, Amer & Pan, 2008).

RESEARCH METHODOLOGY

This study is a theoretical research based on review of literature on the methods of estimating cost contingency for construction projects. Academic journals, conference proceedings, textbooks, monograms and other valuable materials that are relevant to the study were selected and referenced. The study carried out a comprehensive survey of literature to highlight the findings of previous researchers with the view to examine the characteristics of different contingency estimation methods, in order to choose an appropriate method when the need arises so as to provide an adequate and reliable contingency sum for construction projects.

CRITICAL ANALYSIS ON VARIOUS METHODS OF ESTIMATING COST CONTINGENCY

S/N	Methods	Researchers	Advantages of the Methods	Disadvantages of the Methods	Projects used for
1.	Traditional method	Ahmed, 1992; Molsehi, 1997; Baccarini, 2004; Mohammed, 2009; Adama & Jimoh, 2014; Amade et al., 2014.	It is easy to use. It does not require long time or budget.	Risk is either ignored or dealt with in arbitrary way. Not suitable for big projects. Fail to take risk drivers in to consideration. No justification for the percentage used.	All form of construction projects. Developing countries still adopt it for highway projects, especially Nigeria.
2.	Individual risk – Expected Value	Mak, Wong & Picken, 2000.	It can model uncertainty as contingencies with specific probabilities which can be analysed for better result.	Identifying fixed and variable factors of the projects is difficult. It still adopts traditional approach.	Construction projects generally.
3.	Method of Moment	Diekmann, 1983; Yeo,	This method is good in situation	Due to its mathematical background, it is	Rarely used in practice.

		1990; Molsehi, 1997.	where simulation is inefficient. No need to invest in any software.	very difficult to use. Not suitable for complex and large infrastructure.	
4.	Monte Carlo Simulation	Lorance & Wendling, 1999; Clark, 2001; Barazza & Bueno, 2007.	It captures outcome of risk identification and impact which can be used to estimate contingency.	The method is hard and cumbersome. It is rarely used in the industry. Only good when there linear relationship between project parameters.	Heavy capital projects
5.	Regression Analysis	Merrow & Yarossi, 1990; Aibinu & Jagboro, 2002; Sonmez, 2004; Thai, Cook & White, 2010; Kim et al., 2004; Bello & Odusami, 2013; Abednego et al. 2014.	It addresses the factors that drive project risk. It is more accurate than traditional method.	It relies on historical cost data which sometimes may not be available. Time consuming to gather historical cost data.	All construction projects, but majorly on building projects.
6	Range Estimating	Curran, 1989.	It takes care of optimistic and pessimistic ends of estimation. It is safer than the traditional method.	It also adopts deterministic approach which makes it less accurate compare to regression models.	Roads in WISDOT
7.	Artificial Neural Networks	Chen & Hartman, 2000; Williams, 2003; Cook, 2006; Polat, 2012.	Prediction accuracy of ANNs gives better results than traditional method	ANN is suitable for non-linear modelling of data.	Roads, Oil and gas projects
8	Factor Rating	Hackney, 1985;	This method can be used	Choosing the four	Capital project in the

	/Estimate Quality	Oberlander & Trost, 2001.	to check the amount of contingency determined by other methods of estimating contingency sum, apart from being a method of estimating contingency.	determinants of the accuracy of the estimate is severely inadequate. It may lead to high contingency if the estimate is inaccurate.	Process industry.
9	Influence Diagram	Diekmann & Featherman, 1998; Park et al., 1998; Oppong, 2013.	It reduces large volumes of data crucial for making decision. Good in sensitivity analysis.	Like other probability models,	Complex construction projects.
10.	Theory of Constraints	Leach, 2003.	It makes use of three point estimates and with the use of probability function makes it more accurate than the traditional method.	This method assumes cost items are independent of each other which is not true in real in real life.	All form of construction projects
11.	Fuzzy Sets	Paek, Lee & Ock, 1993; Shayen, Fayek & Aburizk, 2007; Rezakhani, 2012.	It allows analysis with small samples. It reveals relationship between outcome and explanatory variables.	It is hard to develop a fuzzy model. It requires more fine-tuning which has made it difficult in real practice.	Majorly on building projects but in few occasions for highway projects.
12.	Analytical Hierarchy Process	Dey, Tabucanon & Ogunlana, 1994; El-Touny,	AHP is good in solving complex estimating and decision	It cannot be used to find a true solution to a problem or	Complex construction like civil and heavy

		Ibrahim & Amer, 2014.	making problems which characterizes construction projects.	deriving a final answer.	engineering projects.
13.	Bayesian Belief Network.	Khallafah, Taha & El-Said, 2002.	This method uses probability method which is more accurate than the traditional method.	It is difficult to use by layman	Residential buildings.

Source: Literature review.

With the extant review of literature, the major findings in the analysis of different contingency sum estimation methods are:

1) Traditional percentage method has been widely used across all projects despite criticisms that it is based on intuition and no rationale for arriving at the percentage. Regression and Theory of constraints have also been used in estimating contingency sum for construction projects
2) Monte Carlo Simulation, ANN, Influence Diagram and AHP have been used for complex projects such as heavy engineering, roads, oil and gas. These methods give high degree of accuracy.
3) While Bayesian Belief method has been widely used for residential buildings, method of moment is rarely used in practice.
4) Range estimating has been used in estimating contingency sum in WISDOT.
5) Factor rating/ Estimate quality has been used to estimate contingency sum for capital projects in the process industry.

CONCLUSION

This study reviews the concept of contingency estimation for construction projects with a special emphasis on highway projects. While so many researchers have focused on building projects, little attention has been paid to estimating contingency sum for highway projects which have higher risks than other construction projects. From the analysis carried out, no single method of estimating has been effective for all types of projects. These methods of estimating contingency sums have developed over the years as a result of shortcomings of one method after the other. Also, this study will guide practitioners in the industry on which method to use, having considered the

advantages, disadvantages and type of projects different methods have been used. It is therefore recommended that peculiarity of each project, ease of using each of the methods and accuracy of the estimates needed should be the basis of choosing method of estimating contingency sum

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PLANNING MALAYSIA:
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A THEORETICAL ASSESSMENT ON SUSTAINABLE WELLBEING INDICATORS FOR PEOPLE INTERRELATIONSHIPS

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Abstract

Sustainable well-being is the well-being attained without compromising others' opportunities to pursue their happiness. The concept of well-being is not merely personal, relational, organizational or communal issues, but rather the synergy of all four dimensions. The four dimensions of well-being are distinguishable, but they are inseparable entities. While focusing on subjective measure of well-being some research fail to interrogate the influence of contextual dynamics on respondents who report high levels of well-being despite living in deprived community conditions. This study argues that there could not be well-being without the combination of personal, relational, organizational and communal wellness.

Keywords: sustainable well-being, human interrelationships with other humans.

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INTRODUCTION

This study establishes the theoretical framework of human interrelationships with other humans as an important component of sustainable well-being. Sustainable well-being is the achieved well-being without compromising others' opportunity to pursue their well-being. The study is a part of an ongoing pursuit to discover subjective indicators of sustainable well-being that manifests in (i) human interrelationships with other humans, and (ii) human interrelationships with the environment. This paper focuses on human interrelationships with other humans.

Malaysia Well-Being Report 2013 (MWI, 2013) prepared by Economic Planning Unit (EPU) reported the social progress of Malaysia under eight Social Well-Being components. However, EPU admitted that the reports cannot cover all aspects of wellbeing (MQLR 2004; MQLR 2011). These refer to the non-quantifiable aspects such as the harmony of the country, work ethics, and communal values. On June 2014, EPU inquired researchers to discover what matter most to the citizens.

Many research focusing on subjective well-being measures failed to interrogate the influence of contextual dynamics on respondents who report high levels of well-being despite living in deprived conditions (Prilleltensky & Fox, 2007). There are two interesting and debatable possibilities of the mentioned problem. The first possibility is that the poor people could be genuinely experienced a high level of well-being despite living in underprivileged conditions. The second possibility is that the poor people refused to be portrayed as the object of pity (Haworth & Hart, 2007). Eckersley (2005) claims that sources of bias are countless and social desirability is strong in many self-reports wellbeing studies.

This study assesses recent and relevant studies on human interrelationships with other humans largely conducted in Malaysia. The theoretical findings help in determining the most appropriate dimensions and indicators of human interrelationships with other humans for Malaysia. Selected findings from recent subjective well-being studies from the year 2010 onwards were used to capture the variables involved in human interrelationships with the environment. The purpose of limiting the sources is to establish parameters in determining the patterns of recent findings on subjective well-being studies, particularly in Malaysia. The selection of the papers depends on the relevance of the papers in examining the personal, relational, organizational and communal well-being as well as the addressed dynamics and factors involved in human interrelationships with the environment. The identified issues, dynamics, and factors relate to the discovered potential indicators of human interrelationships with other humans.

SUSTAINABLE WELLBEING

Sustainable well-being entails sustainability towards achieving wellbeing (Dodge, Huyton & Sanders, 2012; O'Riordan, 2014). The approach of sustainable wellbeing is to place maintenance and expansion of wellbeing onto a sustainable basis where it is being provided unsustainably in the present (Holdren, 2007; Dodge et. al, 2012; O'Riordan, 2014). In other words, sustainable wellbeing is achieving wellbeing without compromising others' ability to achieve their wellbeing. 'Others' is about the present society, the future generation, and the surrounding environment. Sustainable well-being offers potential of more comprehensive wellbeing indicators which accounts for a long term use.

Sociality is an important temperament of human existence, a theory acknowledged as far back as Aristotle. Social connectedness is multi-faceted. Well-being studies employing quantitative analysis have been revealing three dimensions where people experience socially connected (Kjell, 2011; Haworth & Hart, 2007). The experience manifests young and middle-age adults and does not differ across ethnicities. The dimensions are intimate connectedness, relational connectedness and collective connectedness. Intimate connectedness reflects the fulfilment of social connection at a personal level and often associates with marital status. Related connectedness indicates fulfilment in the needs of close friendship and often measured by the frequency of contact with friends and family relatives. Collective connectedness recognizes the fulfilment in the sense of belonging to a group and often measured in the number of voluntary memberships. Human has accessed and adapted to a diverse source of relationship opportunities. Satisfaction of one relationship are interconnected with satisfaction with other relationships. Humans seek fulfilments from a wide array of relationships domains. It is within the human nature to want be close and valued unfailingly over time.

HUMAN WELLBEING IN MALAYSIA

Many subjective well-being studies have been centred in the Western individualistic countries. The Eastern people tend to have its place in collectivistic society. Collectivistic values have a significant influence on things that make Eastern people happy (Lu & Shih, 1997). The Western ideal has placed significant emphasis on individualism and liberalism in achieving well-being. The Western ideals greatly differ from collectivistic cultures that highly regard harmonious relations with other members of the society (Lu & Gilmour, 2004; Lu & Shih, 1997). The collectivistic Confucian-based societies particularly Koreans, Chinese and Japanese held moderation as greater esteem than extremism. That is, extreme happiness was not ideal in collectivistic culture (Lu et al., 2001). Nevertheless, while Eastern cultures would provide significant knowledge to well-being studies, a significant majority of the studies focused on Chinese and Japanese. There was a lack of well-being studies on Eastern Muslims

countries such as Malaysia. Table 1, Table 2, Table 3, Table 4 and Table 5 show findings from selected studies in Malaysia. The findings were categorized under Overall Well-Being, Personal Well-Being, Relational Well-Being, Organizational Well-Being and Communal Well-Being.

Table 1 Overall Well-Being

Summary of Findings	Authors
The highest source of happiness for both Malaysian and Indonesian respondents were family. The result demonstrated how Malaysian and Indonesian societies were naturally inclined to collectivistic values that place family and group welfare before personal contentment. Sources of	Jaafara et al., 2012
There were significant inter-correlations between well-being domains: (i) standard of living, (ii) health, (iii) life achievements, (iv) personal relationships, (v) personal safety, (vi) feeling part of the community, (vii) future security, and (viii) life as a whole.	Clark et al., 2014

Table 2 Personal Well-Being

Summary of Findings	Authors
Personality traits influence relationships between work-family conflicts and job satisfaction.	Hashim et al., 2012
There exists a positive and significant correlation between personal well-being and religiosity. The well-being also shows significant positive correlations with (i) beliefs and worship, and (ii) prayer.	Achour et al., 2014
There was a significant relationship between stress and coping, and religion was recognized as most apparent source of coping skills.	Sipon et al., 2014
Holistic model for well-being of Muslim women acknowledged that spiritual well-being as the central of the well-being model that transcends other well-being dimensions.	Hassan, 2015

Table 3 Relational Well-Being

Summary of Findings	Authors
Family well-being were predicted by (i) resiliency, (ii) safety, (iii) savings, (iv) healthy lifestyle, (v) time with family, (vi) work-family balance, (vii) importance of religion, (viii) number of bedrooms at home, (ix) debt, and (x) childcare.	M. Noor et al., 2012
Family life satisfaction was a multidimensional construct consisting (a) family functioning, (b) family resilience, and (c) time with family.	Abu Rahim et al., 2013
Out of 2,640 number of women interviewed, 85% of them stated that they had never experienced violence while 15% indicated they had experienced some types of violence. 5% of them experienced physical violence, 7.8%, emotional violence; and 1.7%, sexual violence. 8% of them experienced violence committed by their living partners.	Shuib et al., 2013
Tangible and emotional support significantly associated with well-being. Social embeddedness significantly mediates the effect of social cohesion upon well-being through tangible support and through	Momtaz et al., 2014

emotional support. Thus suggests that social cohesion leads to increased social embeddedness, which contribute to inducing tangible support and emotional support, thus affect well-being.	

Table 4 Organizational Well-Being

Summary of Findings	Authors
(i) Job satisfaction, (ii) job involvement, and (iii) job security explained 57% variance of Quality of Work (QWL).	Noor and Abdullah, 2011
Two directions of work-family conflicts were work interference with family (WIF), and family interference with work (FIW). Level of WIF is higher than level of FIW.	Panatika et al., 2011
There was (i) a strong positive relationship between self-esteem and satisfaction outcome, (ii) a moderate negative relationship between self-esteem and work-family conflict and (iii) a weak negative relationship between work-family conflict and satisfaction outcome.	Wan Rashida et al., 2012
Gender, marital status, age groups, education levels, monthly income and working experiences were not predictors of financial well-being.	Mokhtar et al., 2014

Table 5 Communal Well-Being

Summary of Findings	Authors
Neighbourhood location and surroundings influenced neighbourhood satisfaction, thus affecting residents QoL.	Sedaghatnia et al., 2013
Social capital had positive consequences on family and societal well-being, strengthen neighbourhood and increase quality of life. The level of social capital was influenced by how long the neighbourhood has been established, the diversity composition of residents, locations and the surrounding developments. Collective actions and cooperation were negatively correlated with sense of cohesion and inclusion High density neighbourhood result in loneliness as residents felt retracted from one another while dealing with 'sensory overload'.	Hamdan et al., 2014
There was a high internal reliability in six components of social capital..	Marzuki et al., 2014

Table 1, Table 2, Table 3, Table 4 and Table 5 summarize the findings and highlight important variables involved from the selected articles of human interrelationships with other human studies. The findings provide understanding on how human-human studies are conducted and the dynamics or relationships between the variables tested in the research. Highlighted key variables from each article can be used to formulate the indicators of human interrelationships with other humans.

DIMENSIONS OF HUMAN-ENVIRONMENT INTERRELATIONSHIPS

Dimensions of human interrelationships with other humans refer to the locations where variables of human interrelationships with other humans manifested. That

is the settings or conditions to which positive interaction between human and other humans occur. There were four dimensions of human interrelationships with other humans recognized based on the explored findings of Malaysia well-being studies. The first dimension is Personal Empowerment which manifests in opportunity to exercise control, voice and choice (Hashim et al., 2012; Jaafara et al., 2012; Achour et al., 2014; Sipon et al., 2014; Clark et al., 2014; Hassan, 2015). The second dimension is Positive Relations which manifests in positive experience of trust, nurturance and affection (Noor et al., 2012; Jaafara et al., 2012; Abu Rahim et al., 2013; Shuib et al., 2013; Momtaz et al., 2014; Clark et al., 2014). The third dimension is Organizational Opportunity manifests in traditions of inclusions, learning and horizontal structures (Noor & Abdullah, 2012; Panatika et al., 2011; Rashida et al., 2012; Jaafara et al., 2012; Mokhtar et al., 2015; Clark et al., 2014). The fourth and final dimension is Community Movement which manifests in maximization of social supports and benefits throughout life cycle (Jaafara et al., 2012; Sedaghatnia et al., 2013; Hamdan et al., 2014; Marzuki et al., 2014; Clark et al., 2014).

Potential Indicators of Human-Environment Interrelationships

Based on the literature reviews and findings from articles gathered from the potential subjective indicators are developed (Table 6) and categorized under the four dimensions of human interrelationships with other humans.

Table 6 Potential Indicators for Human Interrelationships with Other Humans

Dimen-sions	Manifesta-tion	Potential Indicators	Sources
Personal Empowerment	opportunity to exercise control, voice and choice	self-determination, sense of control, self-efficacy, physical health, mental health, optimism, meaning and spirituality	Hashim et al., 2012; Jaafara et al., 2012; Achour et al., 2014; Sipon et al., 2014; Clark et al., 2014; Hassan, 2015
Positive Relations	positive experience of trusts, nurturance and affection	caring/love/affection, respect for diversity, reciprocity, nurturance and affection, emotional support, collaboration, democratic participation in decision-making	Noor et al., 2012; Jaafara et al., 2012; Abu Rahim et al., 2013; Shuib et al., 2013; Momtaz et al., 2014; Clark et al., 2014
Organizational Opportunity	inclusions, learning and horizontal structures	respect for diversity, democratic participation, collaborative relationships, engagement, good communication, clear roles and productivity, learning opportunities	Noor & Abdullah, 2012; Panatika et al., 2011; Rashida et al., 2012; Jaafara et al., 2012; Mokhtar et al., 2015; Clark et al., 2014

Community Movement	maximization of social supports and benefits, and availability of supports throughout life cycle	equitable allocation if bargaining, powers, resources and obligations in society, gender and race equality, universal access to high quality educational, health and recreational facilities, affordable housing, employment opportunities, access to nutritious foods at reasonable prices, public transportation, clean environment, safety and peace	Jaafara et al., 2012; Sedaghatnia et al., 2013; Hamdan et al., 2014; Marzuki et al., 2014; Clark et al., 2014

Table 6 shows the potential indicators of human interrelationships with other humans that are yet to be statistically confirmed. The potential indicators are gathered from the literature reviews and summarized findings of selected subjective well-being studies in Malaysia. The potential indicators are organized under dimensions of the interdependencies between human and other humans. The dimensions are the location where the indicators are found. The manifestation indicates the expression or demonstration of the dimensions. Finally, the indicators proxy the manifestations and dimensions of the interdependencies. In other words, the indicators provide ways for the interdependencies between human and other humans to be gauged.

CONCLUSION

This exploratory review focused on developing potential quantifiable subjective indicators of human interrelationships with other humans at the local scale. The indicators are valuable to measure the readiness of the locals in embracing sustainable well-being in their lifestyle. The indicators are also useful to indicate the extent of current lifestyles that incorporates relations between human and other humans. Other opportunities for use include additional indicators for social well-being components in the national well-being reports. The indicators can serve as helpful data for policy review which before was difficult to evaluate due to lack of unquantifiable data (MWI, 2013; MQLI, 2011; MQLI, 2004; MQLI 2002).

The limitation of this research is the lack of empirical data to prove the dimensions of human interrelationships with other humans. The study will also assess more relevant and reliable published academic sources especially from social indicator researches towards finalizing the subjective indicators of human interrelationships with other humans (Bakar et al., 2015a; 2015b; 2015c). Apart from establishing potential indicators, reviewing selected articles enable the researcher to distinguish the pattern of subjective well-being research particularly in Malaysia. The next challenge of the study is to substitute the potential indicators into questionnaire inquiries in comprehensive yet concise manner,

which are understandable to the targeted respondents. The data obtained and analysed from the questionnaires will determine if the dimensions of human interrelationships do in fact multivariately correlated and contribute to sustainable well-being.

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FIELD, LIGHT AND FOOD: ADAPTING OF THE TOWN SQUARE AS A LEISURE GATHERING SPACE AT NIGHT

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Abstract

A square is an important built open space in cities and towns. In many urban areas throughout the world squares act as essential form of public space, making them a venue where socializing, meeting and event activities take place. Over the years, more squares are emerging as public spaces in Malaysian cities and towns as an alternative to parks. While most people often visit parks in the morning and evening, they still need a public space where they can conduct their leisure activities after working hours and at night. This is particularly relevant for towns and cities located in tropical and humid countries like Malaysia. The rising need to be outdoors in a cooler environment in the evening and at night, as a respite from the daytime heat and work, has attracted people back to the town squares. The sense of openness that a square offers is different from that of a park at night. The attractiveness of a square as a night space relies on how its users relate to the square's physical, social and environmental attributes. Through examining a town square in Malaysia that has transformed into an active public space at night, this article aims to explore the attributes that enabled the square to be adapted into a night space. The findings revealed that there is a strong relationship between the opportunities for various activities and the provision of relevant infrastructure that support the square to serve as a public space for people at night. This is an important tangent in shifting how urban public space in Malaysia might be designed and planned in the future so as to cater for the changing needs of urban dwellers.

Keywords: urban square, town square, public space, urban design

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INTRODUCTION

Square, also referred to as plaza, is an important urban space that has vital roles dated back to the early civilizations until today. Generally, squares function as places for people to gather, whether to socialize or engage in leisure activities (Nur Azlini Abdullah, 2004; Tibbalds, 1992). They are a type of civic places that allows people to socialize and interact with each other in the public (Childs, 2004). Squares with historical and cultural significance often become landmarks for towns and cities (Lynch, 1960, 1981), such as the Tiananmen Square in Beijing, China, the Djemaa El-Fnaa in Marrakech, Morocco and the Trafalgar Square in London, United Kingdom. In Malaysia, the Dataran Merdeka is one of the prominent historic squares that have similarly become an urban and tourism landmark in Kuala Lumpur (Khalilah Zakariya & Nor Zalina Harun, 2013; Nor Zalina Harun & Ismail Said, 2008).

The attractiveness of an urban square is generally contributed by its design, location, surrounding context and facilities that can accommodate people's diverse activities. Its activeness is supported by the availability of other active activities, such as the presence of eateries, food stalls and shops. While these factors may help to sustain the life of a square weekly, the square needs to be managed and planned for events throughout the year in order to attract larger crowds from time to time. As written by Whyte (1980), 'what attracts people most, it would appear, is other people'. These supporting spaces and activities influence the activeness of the plaza, and vice versa because essentially, urban spaces operate as a connected system (Cooper-Marcus & Francis, 1998; Lynch, 1981).

Due to the perceived popularity of squares in major cities, more squares have been designed in other towns and cities in Malaysia. However, not all squares remain active and vibrant as they were initially planned. The roles of squares need to adapt to the process of urbanization and changes in lifestyle of their users. Cooper-Marcus and Francis (1998) suggest that squares in contemporary society are not the same as squares in the older civilizations. Nonetheless, the contextual and functional attributes that make a square successful are still applicable and need to be adaptable to contemporary setting. Consequently, some squares are left underutilized and perceived as a waste of urban open space. This is a critical point where the functions and roles of a square in its very own context need to be well understood. Designing and planning a square is not merely about adopting successful design from elsewhere and hoping that it would function in the same way. Rather, it is vital for us to learn about what makes certain squares active and inactive, and then adapt the lessons to how squares can be designed and managed in the future.

As such, embarking from this position, this article aims to examine factors that contribute to the attractiveness and activeness of a town square through a case study located in Ipoh, Perak in Malaysia. The square, Dataran

Majlis Bandaraya Ipoh (Dataran MBI), acts as a pilot study for the research to explore the physical and functional dimensions that influence the vitality of an urban square as a night public space that builds upon the image of the city. This study is significant in establishing the parameters for the larger body of research on squares and public space in the Malaysian context.

URBAN SQUARE: THEN AND NOW

Historically, public spaces for people to gather have evolved since the early Islamic and Western cities, which initially derived from religious spaces (Kostof, 1992). As an expansion of this public space, cities extended their streets and built open spaces into square or plaza. For instance in the Islamic city, the *maidan* (square) can be found to be located in the middle of residential, commercial and mosque areas (Kostof, 1992). The functions of squares back then are different from present days. As an example, the *maidan* in early Iranian cities are utilized for horse racing sports, polo-field and market area. Early Western cities have also found to have city squares as a public space. Evidence of this can be traced back to the development of Greek cities, where squares functioned as an aesthetic social space for people to interact (Carmona, Heath, Oc, & Tiesdell, 2003).

In the recent years, the European Square Conference (ESC) reported several issues regarding the role of squares in today's cities (International Making Cities Livable, 2002). Some of the challenges for squares in Europe consist:

a) Uncontrolled commercial and suburban development at the city's periphery;
b) Mass tourism that turns the historic square into a tourist attraction;
c) The square's increasing monofunctional character;
d) Promotion of information technology that attempts to replace social life on the square with virtual agora.

The European Square Conference (ESC) further acknowledged that, "in order (for the square) to function, social and economic life had to be organized through negotiation and consensus, by establishing democratic principles in the equitable use of place". According to the ESC, urban squares and plazas are found to be:

a) A representation of the city's unique identity;
b) A potential "market place";
c) Have potential for "mixed use and diversity";
d) Need "appropriate balance between resident and tourist use of the square";
e) A place for "social learning environment".

The concern over the issue of urban squares in Europe is not much different from that in Asia, although research on Malaysia's urban square and its

multifaceted roles as a night public space is still very scarce. An example of this can be seen at the Heritage Bazaar in Dataran Pahlawan Megamall in Banda Hilir, Malacca. Dataran Pahlawan is an urban square that has been renovated to be raised above the ground level to provide shops and food courts underneath it. Recent studies on Dataran Pahlawan revealed the square to be less active than before, other than during events and celebrations held occasionally throughout the year. This had led to the decline of income for some of the small business operators.

METHODOLOGY

This study uses a case study approach in order to examine how an urban square functions as a night space. This case study is part a larger research work that examines other squares in Malaysia. Researchers in the field of built environment often utilize a case study approach to understand and examine conditions and phenomena of spaces (Denscombe, 2007; Francis, 2003; Zeisel, 1984). This approach is adopted for this study to allow the researchers to explore and understand in-depth about the urban square and its users (Yin, 2003; Zaidah Zainal, 2007). Therefore, the pilot study acts as an exploratory case study to guide the preparation of the framework of the larger body of research. This is fundamental in determining the research operations that will be adopted in the next phases.

Two main methods were employed in this study, which are (i) conducting survey questionnaires to visitors, and (ii) conducting observation and site mapping. Survey questionnaires have the advantage to reach a reasonable representative group of people in a short period of time. This data is essential in identifying the types of users, their motivations for coming and their level of experience and satisfaction conducting their activities at the square. The respondents to the survey were people that visited the square during the days of the fieldwork, which covered weekdays and weekends, during the day, evening and at night. This is done to ensure that the collected data will be able to represent the different types of users and their activities at the square. 72 respondents (N=72) were surveyed during the fieldwork.

Observation and site mapping are methods commonly employed in environment-behaviour research. As a method of data collection, observation does not rely on what people say or think they do, but rather on documenting what they actually do by means of observing (Denscombe, 2007; Zeisel, 1984). The observation is documented using photographs and site mapping diagrams to support the quantitative data gained from the survey questionnaire. Mapping allows the researcher to illustrate the connections between the users, the square and the surrounding context. The observations were conducted systematically using fieldwork form that has been prepared prior to the field work. The observations were conducted in four sections during weekdays and weekend:

a) Morning (between 8.00 am to 12.00 noon) – when people visit the square on weekdays and weekends
b) Lunch break (between 12.00 noon to 2.00 pm) – when people pass by the square during their lunch break
c) Late afternoon to evening (between 2.00 pm to 6.00 pm) – when most people start to have their recreational activities after school, after office hours and on weekend evenings
d) Night (6.00 pm to 12 midnight) – night activities and outdoor eating

The selection of mix methodology that combines quantitative and qualitative data in this study helps to achieve the research aim. The cross-examination between quantitative and qualitative data provides a pragmatic way of justifying and explaining the research findings. According to Yin (2003), the generalization from the findings of case study research contributes to expand our understanding of theories through the identification of patterns or repetitive conditions.

The findings from the data collected at the square from both methods are then cross-examined to extract the key findings that inform how the urban square is used as public space and as domestic tourist attraction.

FINDINGS

Dataran Majlis Bandaraya Ipoh as a Town Square

Dataran Majlis Bandaraya Ipoh (Dataran MBI) is located in Greentown, which is part of the new town development in Ipoh (Figure 1 & 2). The square is located in front of Majlis Bandaraya Ipoh, the local authority of Ipoh. Dataran MBI is selected as the case study because of the presence of active temporary food stalls that operate at night along the square, known as the MBI Terrace. This makes the square popular with locals and visitors to Ipoh. Its nightlife represents an emerging trend of informal activities and recreations conducted at night, particularly on weekends and during public holidays.

Figure 1 Location Plan of Dataran MBI

Figure 2 Image of the Square at Night

Dataran MBI is surrounded by a commercial area and two main roads. The square is designed with an open green field in the centre and paved walkway around it. The focal point of the square is the clock tower, which is located on a raised plaza (Figure 3). In the daytime, people who work and visit the area occupy the parking spaces around the square.

Figure 3 Panoramic View of the Square

Visitor's Profile

Based on the survey questionnaire, it was found that the majority of the visitors at Dataran MBI were Malay (93.1%). The majority of the visitors are young adults, aged between 20 and 29 (69.4%), followed by those aged 30 to 39 (12.5%). Children are also present with some of the adults, as they come as a family.

Interestingly, the majority of the visitors came from outside of Ipoh. 20.8% came from other places in Perak, while 40.3% came from other states in Malaysia. The number of out of state visitors signifies that domestic tourists also visit Dataran MBI. Most visitors come with other people to the square, where 43.1% came in a big group, 37.5% came with their friends or partner, and 19.4% came with their families. This clearly demonstrates the role of the square as a social space.

Motivations for Visit

The data presented in Table 1 provides an overview of the visitors' motivations and experiences at Dataran MBI. This includes their main purpose of the visit, frequency of visit and the activities that they do at the square.

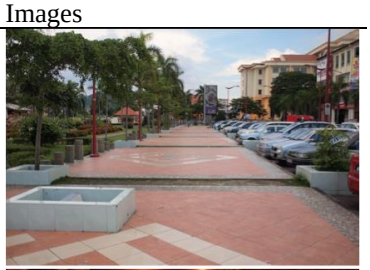
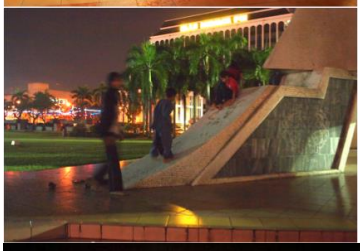
Table 1 Main Purpose of Visit to Dataran MBI

Activities`	Percentage
Eating	31.9%
Recreation	29.2%
Others (meeting people, business, attending events, others)	38.9%

The survey reveals that the main purposes of visiting Dataran MBI are for eating (31.9%), recreation (29.2%), meeting friends and relatives, business and attending events. All of these activities are strongly related to the role of the

square as an urban open space in Ipoh. The most popular activities engaged by visitors are eating (22%) and recreation (21%). The intensity of these activities compared to other activities is relevant to the types of spaces provided at Dataran MBI. The MBI Terrace food stalls offer the visitors an outdoor eating experience at night. Visitors are also able to get a variety of food at affordable prices. On the other hand, the open green field, the walkways and raised plaza enables visitors to conduct recreational and leisure activities, such as strolling, jogging, and sitting, and as a kick-about area (Figure 5-7).

Table 2 Space Utilization at Dataran MBI

Activities	Images
During the day, the square is least active. The perimeter of the square is mostly used for parking. This part of the sidewalk is called MBI Terrace, where food stall vendors operate at night.	
From about 5 pm until midnight, food stall vendors utilize the sidewalks on one side of the square, called the MBI Terrace. Many visitors are seen to visit and dine at the food stalls. All of the vendors are Malay and most of the customers are also Malays.	
Children and families gather, sit and played on the raised platform where the clock tower is located.	
Events are held occasionally at the square, such as the *mawlid* and religious lectures that are open to the public. Public events like these attract huge crowd to the open green field.	

Most of the visitors visit the square at least once a year (23.6%) or once a month (20.8%), while there are those that visit the square occasionally or by chance when they happen to be in town (26.4%) (Table 3). The peak time of the visit at Dataran MBI is at night, from 7 pm until 12 midnight (37.5%). This is followed by late evening, from 5 pm until 7 pm (25%). This finding is closely related to the eating activities at MBI Terrace, where food stall vendors start to operate from about 5 pm until midnight. Interestingly, there are users that occupy the square during the daytime (22.2%). This is contributed by the parking facilities and adjacency of the square to the commercial area that operates actively during the day.

Table 3 Frequency and Time of Visit to Dataran MBI

Activities	Percentage
Occasional or by chance	26.4%
Once a year	23.6%
Once a month	20.8%
7 pm – 12 midnight	37.5%
5 pm – 7 pm	25%
9 am – 12 noon	22.2%

There are several activities that visitors do at the square. Eating and drinking was found to be the main activities (M=4.07), followed by chatting (M=3.72), passing through (M=3.67), watching other people (M=3.65) and meeting someone (M=3.60). Again, eating and drinking activities remain to be the most sought activities due to the presence of food stalls at MBI Terrace.

The distributions of activities in the square during the daytime were observed to be scattered. At night, the patterns of activities are more active at MBI Terrace, which is where the food stalls are (Figure 4). The visual activeness of the crowds is contributed by the presence of the food stalls that add liveliness to the square at night, when there are no events held. Interestingly, young people are seen to park and display their cars as part of an informal social gathering at the road between the square and Majlis Bandaraya Ipoh's building (Figure 5). This reveals another aspect of how existing crowds draw in more crowds to the square.

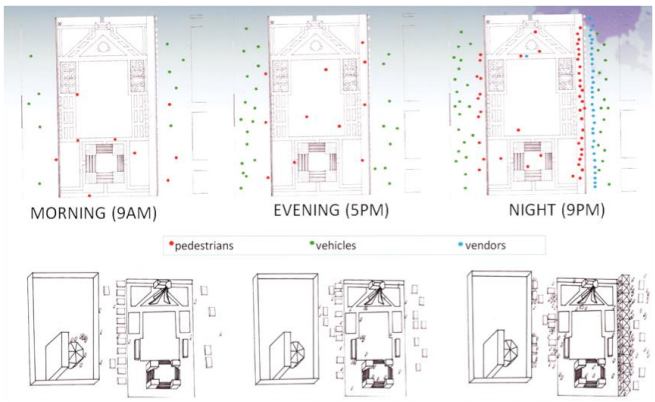


Figure 4 Distribution of Activities at Dataran MBI

Figure 5 Some Visitors Park and 'Display' Their Cars As They Socialize

Attributes of Dataran MBI

The square brings several different meanings to the visitors. The survey indicated that Dataran MBI is most recognized as a place for events (M=4.11) and as a place to socialize (M=4.10). This is closely followed by visitors perceiving the square as a place for recreation (M=3.97) and a landmark for Ipoh (M=3.78). The square is seen less as a place with historical significance or a place for relaxation. A correlation test is conducted to analyse the relationship between the four meanings of the square towards visitors (see Table 4). There are two significant relationships found to be important from this finding. The square is a place to socialize as it is regarded as a place for recreation (r=0.466). It is also a place for events with a landmark to Ipoh (r=0.384). This important relationship indicates that the role of an urban square as a public space is multi-dimensional. To accommodate visitors' socializing activities, the square must be facilitated with

activities for leisure and recreation. Then to draw crowds for events, it must have some cultural significance to the city, such as a landmark that people can easily identify with the place.

Table 4 Correlations on the Meaning of the Square to Visitors

	A landmark in Ipoh	A place for recreation
A place to socialize	.196	**.466****
A place for events	**.384****	**.363****

In terms of accessibility of the square, visitors found the square to be well connected, visible and accessible (Table 5).

Table 5 Accessibility of the Square

Accessibility	Mean
The square is well-connected	3.46
The square is visible from far	3.38
The sidewalk is well-connected	3.25
It is easy to find parking	3.18

The image is considered to be important towards the visitor's perception of the square (Table 6). Visitors at Dataran MBI prefer the green atmosphere of the square, which makes the square attractive. They felt the square reflects a local image. This is contributed by the presence of the clock tower that has been at the square for more than 20 years.

Table 6 Image of the Square

Image	Mean
Looks green	3.58
Attractive	3.28
Reflect local image	3.22
Clean	3.15
Well-designed	3.14

Safety and comfort are other important attributes that influence visitors to come to the square (Table 7). The crowd level at Dataran MBI was found to be tolerable during days without events. The visitors consider the square to be well lit, vibrant with activities and safe. The square is facilitated with a spotlight that lights the open green field, as well as street lighting and decorative lighting around the square (Figure 6).

Table 7 Safety Level of the Square

Safety	Mean
Tolerable crowd	3.46
Well-lit	3.43
Vibrant with activities	3.36
Safe	3.12

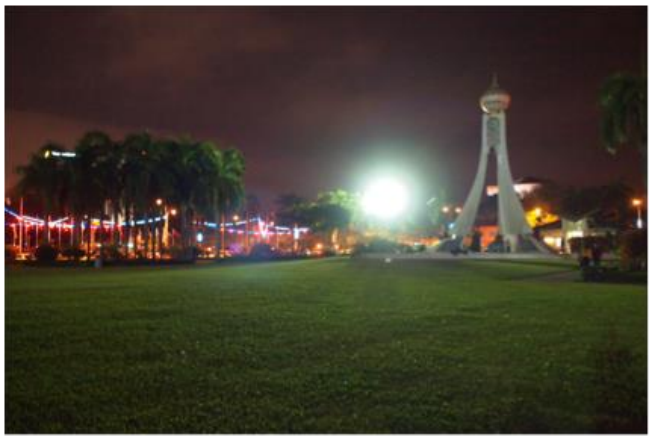


Figure 6 Lighting at the Square

In terms of the provision of facilities at Dataran MBI, visitors prefer that the square offers more retail outlets and food stalls. While they agreed that the square has proper pedestrian walkways, they felt that the square's seating areas, trees and dustbins are less adequate (Table 8). The square green space has the potential to be used for various leisure and recreational activities. However, there are inadequate shady trees and the landscape does not seem to encourage visitors to become attracted to occupy the green space during the day (Figure 7).

Table 8 Satisfaction Level on Facilities at the Square

Facilities	Mean
Retail outlet and food stalls	3.24
Proper pedestrian walkway	3.11
Adequate trees	2.90
Adequate dustbins	2.78
Well-maintained toilets	2.56

Figure 7 Landscape Design of the Square

Visitors' Suggestions

There are several suggestions gathered from the respondents on ways to enhance Dataran MBI. The outdoor facilities at the square need to be improved in order to attract more robust activities during the day and night. Similarly the landscape design should offer more trees in some parts of the square to provide shade. In ensuring safety at the square, they suggest for the local authority to increase the patrolling hours. The square also has potential to become a place for educational purposes, where the authorities can generate more ideas for events.

From the survey and suggestions, it can be construed that Dataran MBI is functioning relatively successfully at its scale as a town square. Although Dataran MBI is not as prominent as other squares in Malaysia, such as Dataran Merdeka and Dataran Pahlawan, it is still able to attract daily visitors to the square. Suggestions for improvement can be expected to boost the square's image and role as a vibrant public space and night space gradually in the future.

DISCUSSION AND CONCLUSION

As revealed in the findings from the questionnaire survey, observation and site mapping, the activeness of Dataran MBI is largely contributed by five key factors:

1. The presence of MBI Terrace food stalls.
2. The events that are held occasionally in the square.
3. The square and the clock tower as landmarks.
4. The location of the square that promotes accessibility (availability of parking, adjacency to a commercial area, surrounded by main roads).
5. The availability of infrastructures (lighting, walkways, open field for activities, areas for vendors, etc.) that attracted people to visit the square in the evening and at night.

The presence of the food stalls allows visitors to come to the square for 'necessity' activities, which is eating and drinking. Eating in public areas is an activity that strongly relates with socializing. By providing eating areas, the visitors indirectly visit the square and consequently attach their eating activities with the square. However, it is critical to note that simply placing food stalls or food kiosks may not guarantee that people will come. The liveliness of the MBI Terrace food stalls is also significantly contributed by its location next to a commercial area and main roads. This makes the food stalls also 'visually' accessible. The visual activeness that comes from the activities, movements, sounds and lighting at the food stall add liveliness the square, which otherwise would remain less active.

Events are another key activities that are able to attract local and out of town visitors. Since the urban square is one of the open public spaces in a city, its spatial characteristics and openness are usually able to accommodate large crowds compared to parks. The success of an event at an urban square is largely contributed by the location of the square, where accessibility and supporting facility play a major role. In addition, the planning and management of the event by the organizer and the local authority also determine the success of the events. Nonetheless, events are one of the ways of how urban squares can be made active and 'marketed' from time to time. This also may build a stronger image of the square over the years.

Accessibility, infrastructure and adjacencies are equally crucial in encouraging the utilization of an urban square by the public. Parking spaces, well-maintained public toilets, well connected walkways, robust spaces and lighting are some of the design requirements that need to meet the varieties of users' activities, from children, youths, families to elderlies. For Dataran MBI, the local authority has demarcated the MBI Terrace for temporary food stall vendors. Although the infrastructure provided might be minimal (marking of stall lots for vendors, improving the drainage, providing water taps and widening the sidewalk), this gesture was able to enliven the square on weekday nights. Again, regular and continuous use of the square will eventually enhance the attachment and relationships that people have with it. This is a vital component in building the place attachment among the locals and visitors to the place.

Another interesting attribute that the square has is people's association with it as a landmark. While the MBI Terrace is relatively new, the clock tower and the open field of Dataran MBI have existed as part of Greentown for over 20 years. This signifies a kind of 'soft' infrastructure where there is already a cultural familiarity between people and the square. Since Dataran MBI has already regarded as a landmark, it is much easier for people to recognize and accept the square as part of a public space in Ipoh.

The adaptation of Dataran MBI into a night public space is important in guiding the design of a good setting for civic and commercial buildings in cities. A place like this is visually, socially and physically accessible as it is believed that its placement, facilities of its surrounding areas also have influenced people's frequent visit. This can simultaneously establish a harmonious relationship amongst the community and visitors. In conclusion, the findings from this pilot study reveals several important key points and attributes that will further be tested at other squares in the country that is currently facing decline in terms of its vibrancy as a public space. Lessons from this study can also help the planning or redevelopment of other town and city squares in Malaysia.

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PLANNING MALAYSIA:
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THE COMPLEXITY OF GOVERNING FISHING VILLAGES IN THE BAGAN AREAS OF SELANGOR, MALAYSIA

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Abstract

This paper examines the current administrative structure that deals with informal fishing villages in Selangor aiming to identify the governance issues of these communities from the local-, district-, state- and federal-level perspectives. Data collection techniques employed were field observations conducted through site visits, in-depth interviews with the state and local planning officials, and focus group discussions involving chairpersons of the Village Development and Security Committees (VDSC). The analysis reveals a sizable number of entities involved in the governance and management of these fishing communities at all levels and accordingly, concludes by outlining a more strategic administrative structure that could effectively govern informal fishing villages that is applicable to Selangor and beyond.

Keywords: Village Development and Security Committees (VDSC), administrative structure, fishing villages

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INTRODUCTION

Many fishing communities in rapidly developing countries are now at a cross-road. Against the backdrop of accelerated urbanization and expanding municipal areas, they are caught between the need to maintain their traditional way of life and embracing development that is increasingly conditioned by sustainable principles leading to uncertainties regarding their future. While the unsustainability of fishing villages has always been attributed to the general lack of infrastructure and public amenities, unplanned settlement and poverty, informal fishing villages are more disadvantaged due to geographical marginalization, basic service deficits, poor governance frameworks, limited access to land and property, precarious livelihoods and, due to their locations in environmentally sensitive areas, high vulnerability to the adverse impacts of poor and exposed environments, climate change and natural disasters. It has indeed been noted that urban sensitive areas in developing countries are currently facing challenges and impacts resulting from processes such as urban sprawl and development, urban agglomeration, tourism development and informal settlements (Trzyna, 2007; Rebelo et al., 2011).

The negative impacts of indiscriminate expansion of informal fishing villages in Malaysia include illegal exploration of land, garbage and sewage problems, socioeconomic problems, lack of road network and improperly installed water and electricity supplies as well as inadequacy of community amenities. Informal fishing villages are more problematic *via* the traditional ones seen from the development planning perspective. Not only are these villages plagued with environmental and socioeconomic issues, formal planning of these settlements is hindered by the status of land being occupied. This is despite the serious efforts by the government to raise the standard of living for fishing communities, while at the same time improve fisheries conservation and management (Tietze et. al. 2006).

The Department of Local Government has identified 19 new villages in Bagan areas in Selangor covering the districts of Sabak Bernam, Kuala Selangor, Klang, Kuala Langat and Sepang (Figure 1) which do not fall under the categories of the new villages (Brigg's Plan) or "kampung tersusun" (resettlement villages). The Malay word "Bagan" refers to jetty which serves to characterize these villages as settlements with jetties. The location of these fishing villages now is amongst the prime area for development where the majority of the villagers are still without land titles which contributes to their informality status. Effective management of these villages depends to a great extent on the governance structures that are present including their administrative roles, financial support and more importantly, a clear goal on future development of the settlements themselves. Given the informal fishing village's history of marginalization and alienation from policy processes, this paper argues for co-management strategy that can better achieve a more sustainable governance outcomes. It examines the

current administrative structure that deals with informal fishing villages in Selangor aiming to identify the governance issues of these communities and concludes by outlining a more strategic administrative structure that could effectively govern informal fishing villages that is applicable to Selangor and elsewhere.

GOOD GOVERNANCE AND CO-MANAGEMENT

Governance in the urban management context refers to all of the laws, regulations, frameworks, systems and processes that shape the way in which the local government operates. It is a complex system whose ultimate definition is not only difficult to be claimed by anyone but also highly contextual where the process and practices vary based on the environment in which they are applied. Based on the definition by UNDP, Bello and Dola (2014) have defined local governance as the exercise of economic, political and administrative authority to manage affairs at local levels. Good urban governance provides the legal, political and networking framework in which good management flourishes. A critical element of effective governance at the local government level is the establishment of an inter-governmental institutional framework that (1) clearly specifies the responsibilities of each level of government; (2) provides the appropriate authority to support the delegated responsibilities; (3) specifies and enforces a code of conduct to underpin administration and (4) encourages private sector and civil actors to participate in development or management. Additionally, good governance requires a sound public-private partnership as well as effective government and citizen interaction.

Increasingly, the potential of co-management is seen to provide a strategic governance alternative for a more democratic and participatory decision-making regarding the sustainability of the informal fishing villages within the context of rapidly urbanizing region. Co-management seeks to bring together resource users in shared stakeholder management regimes (Armitage, Berkes & Doubleday, 2007; Olson, 2009). The premise is that co-management is not just about managing resources but is also fundamentally about managing relationships (Goetze, 2005). By incorporating a diversity of stakeholders, co-management aims to provide opportunity for building trust and linkages among interested parties. Accordingly, the inclusionary practices are purported to increase the legitimacy of decision-making processes and, furthermore, lead to better resource management by incorporating processes of social learning and knowledge integration (Armitage, Berkes & Doubleda, 2007; Berkes, 2009). This "co-benefits" by "co-managing" the development process is to be facilitated by strengthening the local administrative machinery in dealing with the complex socio-environmental issues associated with informal fishing villages. Effective co-management demands the creation of an enabling environment that gives power and authority to both government and resource users at community and

district levels in a broader participatory management process. By-laws at the district authority level should be legally binding and according to which fisheries resources are considered as natural goods for the benefit of the local communities (Njaya, 2007; Olson, 2009).

METHODOLOGY

Data collection techniques employed in this study were field observations conducted through site visits, in-depth interviews with the state and local planning officials and focus group discussions involving chairpersons of the Village Development and Security Committees (Jawatankuasa Keselamatan dan Kemajuan Kampung - VDSC).

Figure 1 Fishing Villages in the Bagan Areas of Selangor

Quantitative data was collected using questionnaire survey and administered on village residents through purposive and snowball sampling. The survey instrument was distributed among the VDSC committee members who

then recruit other respondents from among their acquaintances. This strategy produced a sample of 1,500 head of households; 739 from the villages in the district of Sabak Bernam, 423 from the district of Klang and 328 from the district of Kuala Selangor (from the total of 1,162; 2,240 and 1,194 households in the villages which represent 49.3%, 21.9% and 28.9% of the total sample respectively. This corresponds to the 5% sampling error (significance level (α) - .05) and 95% level of confidence. The instrument was designed to solicit the general household characteristics, livelihood means and participation in village-based organisations as communicative channels for community issues at the villagers' level and at the *ketua kampung* (village heads) level, the 19 *Tok Sidang* were involved in both FGD sessions and individual semi structured interviews to gather information regarding the flow of information bottom-up and vice versa with higher authorities.

HOUSEHOLD CHARACTERISTICS AND MEMBERSHIP IN VILLAGE-BASED ORGANISATIONS

The majority (87.5%) of the respondents surveyed are married and has only primary level education (72.7%). Although most (67.9%) head of households reported self-employment there is also a relatively large proportion (19.5%) of the surveyed respondents who are either unemployed (due to old age) or retired indicating to the increasing number of aging fishers in the villages. 85.8% of the households reported having between 1-4 members being involved in the local economy which revolves around the fishing sector. The 14.2% of the households which did not have any members in the local economic sector shows the trend of increasing disassociation between the fishing villages and the sea as the main source of livelihoods among their current residents.

Almost all (98.3%) head of households studied said that they own the houses in which they live in. Almost all (90.3%) head of households rated their housing conditions to be fair. Despite the informality of the fishing villages, the majority of houses were supplied with electricity and water from official utility providers (97.5% and 97.3% respectively). However, only 41.6% of the houses in these villages have modern toilet while the rest drained their domestic sewage directly into the rivers. The study also found that 98.4% of the head of households surveyed admitted to having stayed in the villages for more than 20 years; 83% said to have lived there for more than 30 years.

A chi-square test was performed to determine whether the three most common village-based organisations were equally subscribed to by the villagers. The result shows that subscription to the organisations was not equally distributed in the population, χ^2 (4, N = 1500) = 212.4, $p < .05$. Table 1 shows that the villager's resident association was not the preferred organisations compared to the fishermen's cooperation. A large proportion of the respondents also reported non-membership to any organisation in the villages as in the case of the villagers

in the district of Klang (82.7%). This however, does not imply community disintegration as communication regarding any issues occurs informally among the villagers given the close-knit structure. The local VDSC which is a small administrative unit that coordinate local level development, nonetheless, still provide the official platform and liaison between the villagers and the government officials on matters pertaining to the villages.

Table 1 Membership in Village-Based Organisations

	Membership in Village-based Organisations			
Districts	Fishermen Association/ Cooperation	Villagers Association	Non Member	Total
Sabak Bernam	265	122	352	739
	35.9%	16.5%	47.6%	100.0%
Klang	53	22	358	433
	12.2%	5.1%	82.7%	100.0%
Kuala Selangor	171	21	136	328
	52.1%	6.4%	41.5%	100.0%
Total	489	165	846	1500
	32.6%	11.0%	56.4%	100.0%

GOVERNANCE OF BAGAN FISHING VILLAGES IN SELANGOR

In the context of the state of Selangor, a number of entities play an important role in the management, development and the future growth of the Bagan fishing villages. On a micro-scale, two entities which are the Villages Associations and Fishermen Association/Cooperation are key players in the governance process at the village level (Table 2). While these organizations are non-governmental based organizations, another entity, the Village Development and Security Committee (VDSC) is considered to be an important local government machinery in the governance of a village including that of Bagan fishing villages.

As shown in Figure 2, these VDSCs are under the jurisdiction of respective *mukim* heads and district offices. In this case study, three district offices play a crucial role in the development of these villages namely the District Offices of Sabak Bernam, Kluang and Klang (Table 2). Matters pertaining to land administration and rural developments are under the ambit of these district offices. By the virtue that all areas under the respective districts are also the gazetted areas of local governments, local authorities do play significant roles in the welfare of these fishing communities in terms of urban services delivery such as garbage collection and disposal as well as provision of other public amenities.

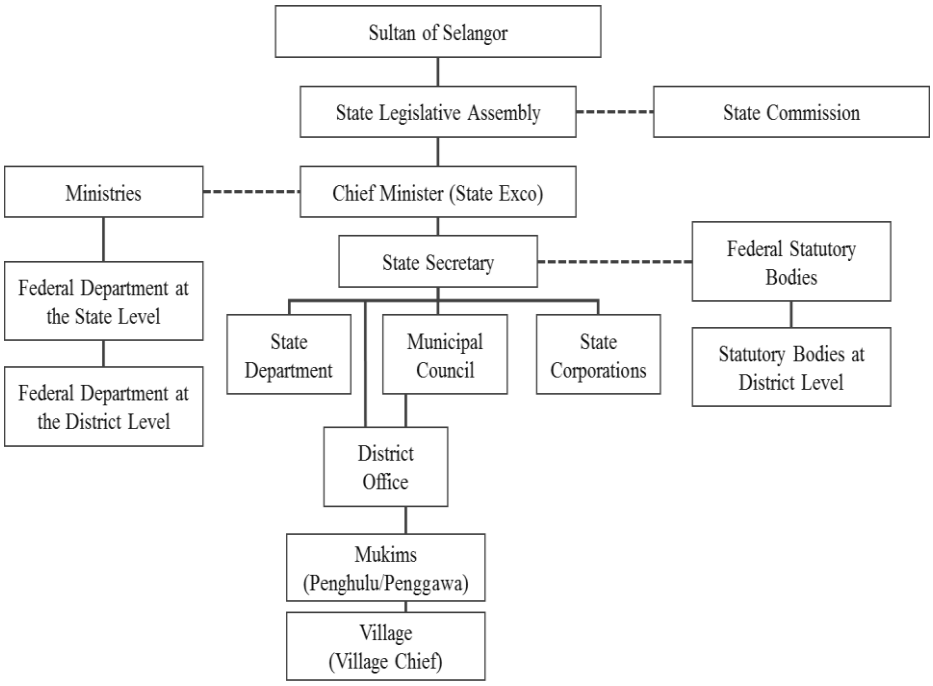

Figure 2 Administrative Structure of the State of Selangor
Source: *Official Portal of Selangor State Government (www.selangor.gov.my)*

Further up the state administrative structure, other government entities also pay important contributions in terms of its public policy decision and implementation of development programmes. The State Economic Planning Unit (SEPU) for example, is responsible for the planning and future development of these villages whilst the State Town and Country Planning Department (STCPD) involves in the physical planning of these villages. Another state entity, the State Land and Mines Department (SLMD) is responsible for land matters of the fishing communities. However, in the state structure the ultimate decision with regards to the development of these fishing villages and their future direction of growth lies with the State Executive Committee (EXCO) or sometimes referred to as the State Cabinet which is chaired by the Chief Minister of Selangor. Under this EXCO system, there are a number of committees established of which a committee called Committee of Investment, Industries, Commerce, New Villages and Illegal Factories chaired by a state assemblyman is responsible for matters in relation to Bagan fishing villages in Selangor.

Based on the FGD among selected villages and VDSC members in the three districts, a number of observations/findings can be made related to the issues of governance in these fishing villages of which two concerns are most prominent as follows:

i. One of the important governance issues gravitated around the status of the land of the village the fishers are residing which is on 'temporary occupation license (TOL)' status. The majority of the residents prefer to continue staying in these villages to earn their livelihood that they have sustained for at least two generations. Their economic livelihood centres on the need to improve their economic status particularly those related to fishing activities.
ii. Given the uncertainty with the status of ownership, it remains one of the challenges of VDSC to find a solution to this issue. It is felt that the award of permanent titles to the land will provide them with the confidence to make investments such as upgrading their place of residence, participation in tourism projects and fishing sector.

Given the rapidly urbanizing scenario in Selangor, it is a matter of time that these fishing villages will be engulfed by the wind of urban change. This brings into question the survival and sustainability of theses villages. One of the strategic approach in adapting these fishing communities would be through a system of co-management that encourages local public participation, inclusionary practices as well as strengthening local machinery to address various governance issues for the betterment and welfare of the fishing communities (Armitage, Berkes & Doubleday, 2007; Olson, 2009).

In the case of Bagan fishing villages, the first strategic step would be to strengthen the VDSC by beefing up its capacity and capability through enhancement of expertise, skill and knowledge in order to provide a good service to its communities. In such a case, the role of the District Offices of Sabak Bernam, Kuala Selangor and Klang together with the local authorities of Sabak Bernam District Council, Kuala Selangor District Council and Klang Municipal Council are to assume a leadership role in enhancing the effectiveness of the local machinery (VDSC). On a slightly broader scale of governance, the state and local agencies that have bearing on the development of fishing villages and communities either in the form of policy formulation, coordination of development programmes, project implementation, enforcement of regulations or monitoring of projects are provided in Table 2.

Table 2 Federal and State Agencies Involved in the Management and Implementation of Development Projects at Fishing Village Level

Agencies	Formulation	Coordination	Implementation	Enforcement	Monitoring
STCP	√	√	√		√
SEPU	√	√	√		√
DID	√	√	√		√
PWD	√	√	√		√
JPNS	√		√	√	√

DWNP	√	√	√	√	√
CDD	√		√		
JKOA	√		√		√
BOMBA	√		√		√
POLICE	√		√		√
JKKS	√		√		√
DOE	√		√	√	√
SWMA	√		√	√	√
LKIM	√		√		√
TSB	√		√		√
LA	√	√	√	√	√
LDO	√	√	√	√	√

IMPLICATIONS OF THE STUDY

The study on the fishing communities in the three districts of Selangor, namely, the District of Sabak Bernam, Klang and Kuala Selangor unravels the complexity of local governance against the backdrop of the rapidly urbanizing state of Selangor. The future or survival of these 19 villages or communities hinges, to a larger extent, on how these entities adjust and adapt to the ever-changing socio-economic and political environment in order to stay functional and relevant. Failure to strategize will lead these villages to lose their traditional way of living and hence its heritage importance. To survive, it entails a skilful and strategic governance approach to navigate among the diversity of stakeholders, optimizing the availability of human as well as financial resources and in line with the developmental objectives and need of a developed state like Selangor (Goetze, 2005). This study underlines the need to have a strong and effective local administrative structure in the form of the Village Development and Security Committee established within the state administrative machinery to play the role of promoter and facilitator of socio-economic development at the village level. To this, it calls for VDSC to adopt a co-management strategy, not only to manage resources but also managing relationships among the stakeholders to ensure the orderly growth of these fishing villages into modern entities and yet retaining their traditional characters and become important heritage of Selangor. The study also underpins the importance of building capacity and capability of these VDSC to meet the challenges of local governance in an urban setting.

CONCLUSION

This paper clearly shows the complexity of governance of Bagan fishing villages in the State of Selangor as shown by the presence of many stakeholders at the state and local levels. The analysis reveals that the administrative structure at the district level is most effective in managing development issues of informal fishing villages in Selangor. The VDSC together with the Office of Village

Communication Officer at the District Land Office, however, need to be strengthened as they are important entities that effectively bridge the gap between local and state level development planning. This complexity of governance underpins the importance of adopting co-management strategy as a strategic governance alternative to ensure the survival of these fishing villages in the Bagan areas within the context of rapidly urbanizing State of Selangor.

ABBREVIATION

VDSC	Village Development & Security Committee	CDD	Selangor Community Development Department
ECXO	State Executive Committee	JAKOA	Department of Orang Asli Development
STCPD	State Town & Country Planning Department	BOMBA	Selangor Fire & Rescue Department of Malaysia
SLMD	State Land & Mines Department	POLICE	Selangor Royal Malaysia Police
SEPU	State Economic Planning Unit	JKKS	Selangor Department of Health
DID	Department of Irrigation & Drainage	DOE	Department of Environment
PWD	Public Works Department	SWMA	Selangor Waters Management Authority
LDO	Land District Office	LKIM	Fisheries Development Authority of Malaysia
JPNS	Selangor Education Department	TSB	Tourism Selangor Berhad
DWNP	Department of Wildlife & National Parks	LA	Local Authority

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RENEWABLE ENERGY AND TRADE DISPUTES: IMPLICATIONS ON SOLAR PHOTOVOLTAIC MANUFACTURING IN MALAYSIA

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Abstract

Malaysia has realised the importance of renewable energy (RE) in the energy mix and continuously reviewing its energy policy to ensure sustainable energy supply. The use of RE is among the options although the RE capacity is still under-utilized. Malaysia achieves 5.5% share of RE in the energy mix by 2015, and the RE sector is expected to double by 2020 with strong growth in the solar photovoltaic (PV), biomass and biogas markets. Beyond 2020, it is predicted that solar energy will surpass all other forms of RE for Malaysia and other countries, and the solar power will be the long term source of energy supply. After an investigation on the RE policy, the domestic solar PV manufacturing scenario is elaborated in this paper. This includes the solar PV manufacturing, issues and trade disputes, and the way forward. Among the key findings from this paper include: the foreign direct investment (FDI) related to RE sector especially from the US and lately China, have increased rapidly, and more 'green' jobs in the solar PV manufacturing and installation sectors have been created. With the existence of trade disputes between the United States and the European Union with China, Malaysia has the potential to reap benefits with the inflow of direct investments from China. Nevertheless, the future incidence of RE trade disputes is still uncertain.

Keywords: Feed-in-tariff, green technology, renewable energy, solar photovoltaic, trade disputes

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INTRODUCTION

As the level of carbon dioxide keeps increasing and causing global warming, countries need to introduce the generation of electricity with an energy mix that is sustainable. Data from United Nations indicate that Malaysia recorded 187 million tons of carbon emission or 7.2 tons per capita in 2006. During the United Nations Climate Change Conference 2009 (COP 15) in Copenhagen, Denmark, the Malaysian Prime Minister declared that the country has agreed by 2020 to reduce its carbon dioxide emissions to Gross Domestic Products (GDP) intensity by 40 percent compared to 2005 levels (BERNAMA, 2009). The Malaysian Government promotes renewable energy by enacting the Renewable Energy Act 2011, the introduction of Feed-in-Tariff (FiT), the establishment of Sustainable Energy Development Authority (SEDA) and the formulation of the green technology policy (KeTTHA, 2012). Currently, about 90% of electricity in Malaysia is mainly produced using liquid natural gas (LNG) and coal (Economic Planning Unit, 2006). Table 1 illustrates that electricity generation in Malaysia heavily relies on fossil fuels.

Table 1 Fuel Mix for Electricity Generation in Malaysia, 2000-2010.

YEAR	GAS (%)	COAL (%)	OTHERS (%)	TOTAL (GWh)
20005000-02	77	9	14	69,280
2005805	70	22	8	94,299
2010069	56	36	8	137,909

Source: EPU (2006)

This paper presents some of the key issues of the development of RE for a green economy in Malaysia, and makes reference to the solar panel global trade dispute that is building up and to solar industries that are under protectionist policies.

RE SCENARIO IN MALAYSIA

RE mix for Malaysia in 2012 was made up of 58MW (41%) from biomass, 47MW (35%) from solar and 32MW (24%) from other RE sources including biogas, solid waste and small hydro, contributing a total of 137MW of RE electricity to the power grid (SEDA, 2012). The Renewable Energy Roadmap provides long-term goals and a holistic approach that encourages various types of renewable resources in the energy mix (Table 2).

Table 2 Renewable Energy Quota

Source	2011/2012 (Mw)	2013	2014	Total
Biogas	30	30	20	80
Biomass	75	70	60	205
Hydro	30	30	95	155
Solar	54	52	52	158
TOTAL	**189**	**182**	**227**	**598**

Source: SEDA

According to SEDA, after the launch of Feed-in-Tariff (FiT) in 2011, 400 MW (40 percent target) were connected to the power grid by 2015 (BERNAMA, 2015a). The FiT scheme has a key objective to provide financial support to residential, industrial and commercial consumers with 21 years payback period and 8% per annum degression rate (The Star Online, 2013). Furthermore, Malaysia targets to generate 2,000 megawatts (MW) of electricity from RE sources by 2020 (Table 3). Two new mechanisms were introduced as part of the efforts to achieve the target, which are net-metering and utility-scale solar (USS). The National Renewable Energy Policy and Action Plan formulated by the Ministry of Energy, Green Technology and Water aims to increase generation of RE power capacity in Malaysia to 4,000 MW by 2030. This increase will be supported by strong growth in the solar PV, biomass and biogas markets.

Table 3 Malaysian National RE Targets

Year	Cum. RE `Capacity	RE Power Mix (vs. Peak DD.)	Cumulative CO^2 Avoided
2010	73 MW	0.50%	0.3 M.T.
2015	985 MW	5.5%	11.1 M.T.
2020	2,080 MW	11%	42.2 M.T.
2030	4,000 MW	17%	145.1 M.T.

Source: KeTTHA, (2008)

Globally, by 2050, it is expected that RE sources will play generate a cumulative capacity of 11.5 GW, out of which 9GW from solar PV, as illustrated in Figure 1. Solar power will be the long-term global source of energy supply. Solar power generation possesses advantages of low greenhouse gasses (GHG) emission, low maintenance cost and low operation noise, and therefore it is

considered the best choice for future electricity generation (Hosseini & Wahid, 2014).

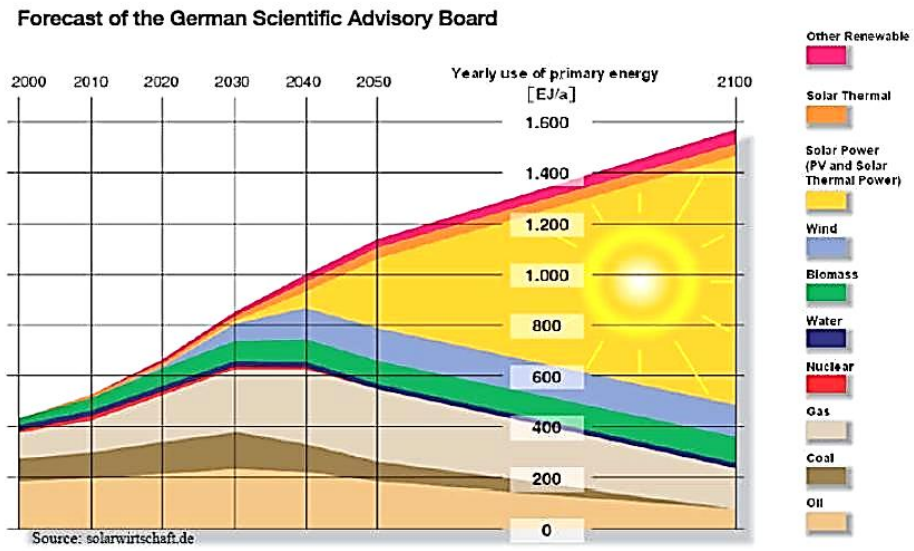

Figure 1 Long-Term Global Energy Supply

After the launch of the FiT scheme, the number of solar PV installations in Malaysia has been increasing. FiT has been successful in promoting RE at the small scale generation level. Additionally, as shown in Table 4, 10,852 jobs were created after 13 months of the e-FiT system launched. The two highest job contributions were from the biomass and the solar PV sectors, which were 4,389 and 4,224 jobs respectively (SEDA, 2012).

Table 4 Statistics of Green Job Creation in Malaysia.

RE Technology	**No. of Job Created**
Biogas (Palm Oil Waste, Agro-Based, Farming)	513
Biomass (Palm Oil Waste, Agro-Based)	4,389
Small Hydro	1,726
Solar PV	4,224
Total	**10,852**

Source: SEDA (2012)

SOLAR PV MANUFACTURING

China is the world's top solar PV manufacturer. Goodrich et al. (2014) found that China's price advantage is driven by scale and supply chain development. China

is successful in attracting Incoming Foreign Direct Investments (FDIs), mainly through the establishment of joint ventures with western partners, which at the same time are potential channels for accelerating technology transfers into China (DeLaTour, Glachant & Meniere, 2011).

PV imports in the US have been rising for reasons including increasing solar module production in places like Malaysia; Malaysia is now a large PV module supplier to the US, as Malaysia is the production base for First Solar Malaysia and AUO SunPower, and the German producer, Q-Cells (now Hanwha Q-Cells owned by Korean) (Platzer, 2012). Since the establishment of First Solar Malaysia in 2008, Malaysia has become the home to top manufacturers of solar PV around the globe. According to Sawhney and Kahn (2011), Malaysia's share in the US import of the core high-tech solar modules was zero in 1989 versus six percent in 2010 (and the fifth largest source after China, Mexico, Japan and Taiwan).

The solar PV industry is one of the growth sectors for electrical and electronics (E&E) in Malaysia. The growth was incentivised by the award off pioneer status, favourable investment tax allowance and the Green Technology Financing Scheme (MIDA, 2015; Green Tech Malaysia, n.d.). Platzer (2012) suggests that low labor cost environment of countries such as China and Malaysia has also contributed in making them solar PV production hubs. Malaysian Government also provides additional bonus FiT rate based on bonus criteria of locally manufactured PV modules. As a result, solar PV manufacturing has grown especially in Penang, Kedah, and Sarawak (Table 5).

Table 5 Major Solar PV Industrial Players in Malaysia

No.	State	Location	Company
1	Johor	Iskandar Malaysia	Xinyi Solar
		Port of Tanjung Pelepas	Flextronics (for Sun Edison)
2	Kedah	Kulim Hi-Tech Park	First Solar, Panasonic Energy
3	Melaka	Rembia	AU Optronics – SunPower
4	Penang	Prai	Jinko Solar
		Bayan Lepas	JA Solar
		Penang Science Park	TS Solar
5	Perak	Kanthan Industrial Area, Ipoh	Solar Twin Creeks / TCTI
6	Sarawak	Sama Jaya, Kuching	Comtec Solar, Sun Edison
		Bintulu	Tokuyama
7	Selangor	Sepang, Selangor Science Park 2	Hanwha Q-Cells

Source: NewsBase (2015).

The main Malaysian PV manufacturing are First Solar and Panasonic Energy in Kulim Hi-Tech Park, JA Solar, Jinko Solar and TS Solar in Penang Science Park, Solar Twin Creeks in Ipoh, Hanwha Q-Cells in Selangor Science Park 2, AUO-SunPower in Rembia, Xinyi Solar in Iskandar Malaysia, Flextronics produces solar PV panels for Sun Edison in Port of Tanjung Pelepas, Comtec Solar and Sun Edison in Kuching, and Tokuyama in Bintulu. In 2015, Malaysia has turned into a major destination for Chinese solar companies seeking to circumvent the high taxes imposed by US and Europe since 2012 (The Edge Market, 2015).

Malaysia offers an advantageous location evidenced by the announcement of global solar PV manufacturers, JA Solar, to build a 400MW solar cell plant at RM300 million (Osborne, 2015) and Jinko Solar's inauguration of its 500MW solar cell and 450MW solar module fab in Penang (Jinko Solar, 2015). These facilities seemed to be established as a solution to the US's anti-dumping duties that are imposed on certain China-made PV products (Energy Trend, 2015).

The Malaysian industrial eco-system, especially intellectual property (IP) protection and well-established semiconductor and supporting industries, has help to attract world major solar PV producers to set up their overseas production facilities in Malaysia. JASolar, for instance, was pleased to be able to support Malaysia's objectives of growing the renewable energy industry (BERNAMA, 2015b). It invested in Penang because of the strategic location, good infrastructure, highly skilled workforce and the support from state and federal authorities (Mok, 2015). Furthermore, locating in Malaysia is part of its long-term strategy of moving some of its manufacturing sites to outside China in order to reduce geographical risk, and to be able to adjust to politics and policies around the world (The Edge Market, 2015). As for JinkoSolar, Malaysia was chosen due to its offering of a pool of highly educated workers, advanced industry infrastructure, a receptive business investment climate and cost-competitive environment, and also to avoid single production base risks (Jinko Solar, 2015).

ISSUES ON RENEWABLE ENERGY AND TRADE DISPUTES

It was reported that the challenges faced by the Malaysian solar industry include limited local market size, human capital development, the need for more investments from public and private entities as well as the increasing global market competition (BERNAMA, 2014). In addition, the solar PV panels manufacturing involves high energy consumption and the use of chemicals which are harmful to the environment (Ismail, 2015). Environmental Impact Assessment Report 2013 on First Solar's maintenance activity of the semiconductor deposition equipment in Kulim facility has recorded cadmium (Cd) in excess of the 5 μg/m3 limit.

Globally, the emergence of more solar panel production countries has resulted in an increasingly globalized supply chain and higher frequency of RE trade disputes (Lewis, 2014). In 2012, the U.S. implemented anti-dumping duties which was applicable to Chinese solar cells used for panel manufacturing. However, many Chinese solar manufacturers produce panels from cells produced out of China especially Taiwan, while components of ingots and wafers are manufactured in China. The U.S. ruled in January 2015 that solar PV imports from China and Taiwan harmed American manufacturers, and imposed the anti-dumping duties on China PV modules, and Taiwan-made solar cells as well. In December 2015, the European Commission announced preliminary measures of anti-circumvention duties and anti-subsidy duties on Chinese solar PV panels and cells shipped from Taiwan and Malaysia to the European Union from 30 May 2016 onwards.

THE WAY FORWARD

Ahmad and Tahar (2014) suggest that availability of renewable resource and feed-in tariff rate are the most important sub-criteria from economical aspect while from technical aspect are the efficiency and maturity of technology. There are vast investment opportunities in the green technology industry. As of June 2011, the total investment in Malaysia solar energy industry has hit RM15.8 billion and generated some 14,300 jobs (Kaur, 2011). Among these investments were by Comtec Solar, JA Solar, Jinko Solar and Xinyi Solar, all from China. This is timely and in line with the aim of Malaysia to become number two in the global solar PV manufacturing by 2020, second only to China. With its existing supporting industries and the complementary development, this solar project will contribute to the overall ecosystem for the PV industry and further enhance Malaysia competitiveness as the next major player in the PV industry. Nevertheless, new investments, such as Jinko Solar must produce solar cells in the facility in Malaysia without sourcing its primary input from China/Taiwan at subsidized prices. Malaysia does not want to be used as a transhipment point for China and Taiwan solar cells and panels to enter major markets such as the United States and the European Union.

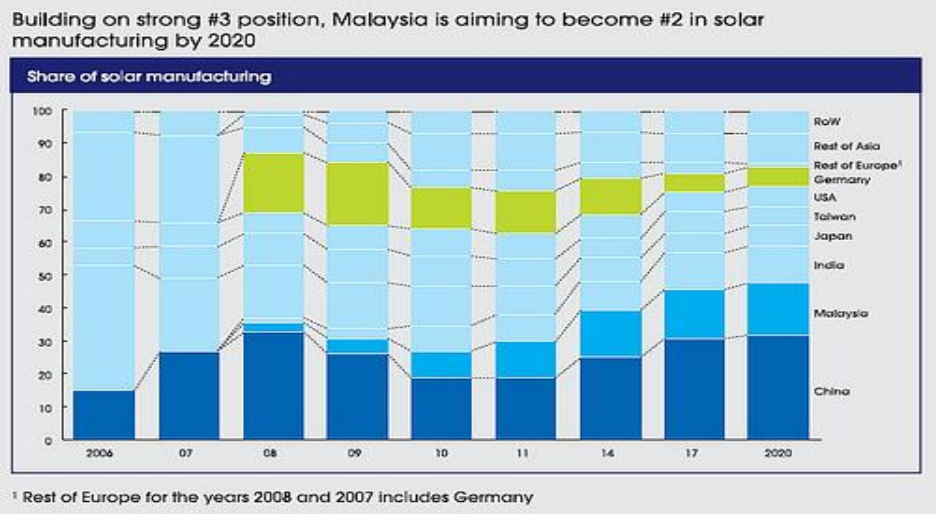

Figure 2 Aiming to Become No. 2 in Solar Manufacturing by 2020
Source: The Green Mechanics

CONCLUSION

It is unfortunate that the future RE trade disputes is unknown. As countries develop RE support programs, questions remain on industrial policies that possibly constitute a conflict with trade rules. When RE is subsidized, there are inherent conflicts with international trade rules. As a result, the utilization of RE technologies as an important part of climate change solution, and increasing trade tensions, will add to both the economic and political costs of deployment. Thus far, Malaysia has successfully maintained as international and reputed solar manufacturers. The country has benefited from the US-China trade disputes which have caused China and Taiwan solar producers transferring their manufacturing outside China (and to Malaysia) to avoid the anti-dumping measures imposed by the US. Additionally, the inking of the Trans-Pacific Partnership Agreement (TPPA) and negotiation of Regional Comprehensive Economic Partnership (RCEP), Malaysia could be a beneficiary of the complex interaction of global trade rules, economic competitiveness and environmental policies in the production of solar PV, where tariffs have the most immediate effect. Malaysia, with its proactive government policies, control, price regulation and right manufacturing ecosystem, is all set to become the second-largest solar manufacturer in the world.

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FEEDER MODE CHOICE SELECTION BEHAVIOURAL MODELLING: THE CASE OF KTM KOMUTER, KUALA LUMPUR

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Abstract

Transit oriented development propagates the use of feeder services such as buses, taxis and paratransit to support the main rail trunks (Taylor, 1982; Limtanakool et.al, 2006; Alshalalfah & Shalaby, 2007). This paper attempts at explaining the preferences of passengers of a Malaysian rail service towards feeder buses, factors influencing their choices and recommendations to encourage the KTM Komuter passengers to switch mode to feeder services instead of driving their private vehicles to and from stations. Using on-board intercept survey method, some results of 200 samples were analysed for the research. Findings showed that 76% of the passengers did not prefer to use the feeder. As such, the chi-square analysis did not find any socio-demographic factors such as gender, income, level of study, employment types, to be significant in explaining this mode switching behaviour. Some trip characteristics such as vehicle ownership, frequency and length of using the KTM Komuter service also did not significantly influence the passengers' preference in using the feeder bus service. Other factors were then examined, including stations' characteristics, users' access and egress behaviours, travel time and distance. Therefore, in order to encourage the KTM Komuter users in using the feeder bus service, several recommendations such as providing an efficient, reliable frequency and catchment areas of feeder bus services were made.

Keywords: Feeder bus, KTM Komuter, public transportation, multimodal transportation system, integrated public transportation.

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INTRODUCTION

This paper revolves around the assessment of preference for bus feeder services. Feeder service is important for any public transport system to work effectively because integration between several different modes of transportation can contribute to a more efficient and highly patronage public transport services. For instance, feeder bus services can pick passengers up in certain areas to transfer points where passengers make an onward journey through other public transport services such as other public buses, trains, trams, rapid transit or even paratransit such as taxis or walking. Feeder buses usually acts as a connector within a locality or regional area. Therefore, its importance as a networking link in promoting the integration of public transportation is crucial. In addition, it promotes a better development that encourages sustainable development such as the transit-oriented development.

Prior to National Key Results Area initiatives (NKRAs) development programme in the year 2013, Malaysian urban rail networks have limited support facilities including park and ride systems as well as feeder services (PEMANDU, 2011). KTM Komuter is a provider of services in the Klang Valley and its surrounding city region hinterlands. The hinterlands spread as far as Seremban district in Negeri Sembilan, a state located southern of Kuala Lumpur; as well as Tanjung Malim in southern Perak district, a state northern of Kuala Lumpur. By 2013, the heavy rail system started to receive a huge investment injection from the government so as to increase the patronage in view of achieiving a more favourable modal split of 40:60. However, until 2013, only seventeen of KTM Komuter's 53 stations were offering the feeder bus services.

Hence, the feeder bus was still not commonly used as a mode of transport to KTM Komuter stations, neither as access nor egress vehicle. Amongst the problems faced by the KTM Komuter passengers regarding the use of feeder bus service were the unreliability of the service especially in terms of frequency and routes, the lack of provision of feeder bus service at KTM Komuter stations and the lack of partnership between the KTM Komuter authority with feeder bus service providers. Therefore, finding and developing a simplistic model to provide behavioural variations in feeder bus selection as an access and egress mode is the aim of this research paper. The two objectives are then formulated to be: i) to assess the parameters that significantly explain the mode choice selection among rail users and ii) to recommend areas in which feeder services can be improved from the rail passengers' perspectives.

LITERATURE REVIEW

The Significance and Function of Feeder Bus in the Bus Service Industry

The function of feeder bus in the bus industry is more focused on door to door connection for instance using a feeder bus from the origin such as residential area to the transit point such as the rail-transit network (Chien & Schonfeld, 1998). In addition, Ceder and Yim (2003) stated that, "Advanced and attractive feeder/shuttle transit system that operates reliably and relatively rapidly, part of the passenger door-to door chain with smooth and synchronized transfers." Which means, a feeder bus services provide the users the ability to move from door to door which can be interpreted as from the door of one mode of transport to another mode of transport easily without the need to walk for because the transports are efficiently connected.

Moreover, the use of private vehicles such as motorcycles and cars which causes problems such as congestion or environmental pollution can be reduced, and at the same time does not require the people to exert extra energy to walk far as there is feeder bus service they can use to bring them to their nearest transit points (Kuah & Perl, 1988). However, the feeder bus system too has its own disadvantages such as in terms of feeder bus planning, if there is insufficient analysis on the feeder bus users or a particular planning for feeder bus system is not being carried out, the success of an efficient and reliable feeder bus system cannot be implemented.

The KTM Komuter Feeder Bus Service

The KTM Komuter is a rail service provider under the subsidiary of the Keretapi Tanah Melayu Berhad (KTMB), the oldest rail service provider in Malaysia. KTM Komuter was the first electric train introduced in Malaysia which started its services in 1995 (KTM Komuter, 2010).

Only some KTM Komuter stations have bus services offered as part of the supporting facilities namely;

- Bandar Tasik Selatan
- Batu Caves
- Batu Kentomen
- Kg Batu
- Klang
- KL Sentral
- Kuala Lumpur
- Labu
- Nilai
- Padang Jawa
- UKM
- Sungai Gadut
- Taman Wahyu
- Shah Alam
- Subang Jaya
- Seremban
- Serdang

Source: Keretapi Tanah Melayu Berhad (2013)

FACTORS INFLUENCING THE USE OF FEEDER BUS

Literature review has identified various factors influencing the use of feeder buses. The bulk of literature has focused on users' socio-demographic characteristics as determinants of mode choice behaviours. Conclusive research on public transport facilities provision and trip characteristics (access or egress behavior) that might influence passengers' choices has been however, lacking. Table 1 outlines the contemporary literature that have been conclusively modelled the behavioural choices of feeder bus services as an alternative access and egress mode to and from the stations.

Table 1 A Summary of Literature Review of Factors Influencing the Use of Feeder Bus

Variables	Authors	Contents
Gender	Zahabi, Miranda-Morena, Patterson & Barla (2012); Xie (2012); Besser & Denneberg (2005)	Agreed that gender as a part of socio-economic characteristics has its share in influencing the preferences of people to use the bus
Origin and destination	Public-Private Infrastructure Advisory Facility [PPIF], The World Bank (2013)	Have stated several reasons why the origin and destination of people that use the transit affect the use of feeder bus.
Distance	Martin & Shaheen (2011); Elhabiby, Fikry, Mahdi, Kandi (2013); Lomax & Schrank (2010); Bachok et. al. (2012)	Have agreed that the travel time from people's origins and destinations do have an influence on people's preferences in choosing public bus as mode of transport.
Vehicle ownership	Bar-Yosef, Martens & Benenson (2013)	The captive riders - students, low income people, disabled people - are neither capable of using their own private vehicles or could not afford to own their own vehicles depends on buses to travel to the point of not caring if the waiting time for the buses is long.
Education	Bouf (2007); Glaeser, Kahn, Rappaport (2008); Soltani & Ivaki (2011)	Level of education does influence preference of using bus service.

Occupation	Taylor et al. (2009); Chow et al, (2002); Gomez-Ibanez (1996); McLeod et al (1991); Kain (1964); Black (1995) Giuliano (2005).	Per capita income and employment levels are the leading economic characteristics related to ridership
Trip characteristics and origin/destination waiting facilities	Taylor (1982); Limtanakool et. al. (2006); Alshalalfah & Shalaby (2007)	Travel time, access distance to transit station, trip characteristics and purposes influenced the mode choices.

STUDY METHODOLOGY

Data Collection

The primary data used for this research are based on the on-board intercept surveys, observation and interviews while the secondary data are obtained from the websites of the KTM Komuter authority itself. For the on-board survey, a sample of 400 respondents had been approached from the total population of approximately 95,000 people which was the average number of people using the KTM Komuter service daily (KTM Komuter, 2010). However, after data input and cleaning, only 200 samples were deemed useful for analysis purpose.

Statistical Analysis

Both descriptive and inferential analyses have been carried out. Inferential analysis has been limited to cross-tabulation and chi-square test, prior to the attempt at developing a simplified model using linear regression analysis. Dependent variable (FEEDER PREFERENCE) has been tested against various (independent) socio-demographic factors, trip characteristics and rail stations' support facilities.

ANALYSIS AND FINDINGS

Descriptive Analysis (n = 200)

The survey of n = 200 samples consisted of 52.5% female (105) and 47.5% male (95). Most respondents have access to a vehicle, either a car or a motorcycle (Figure 1).

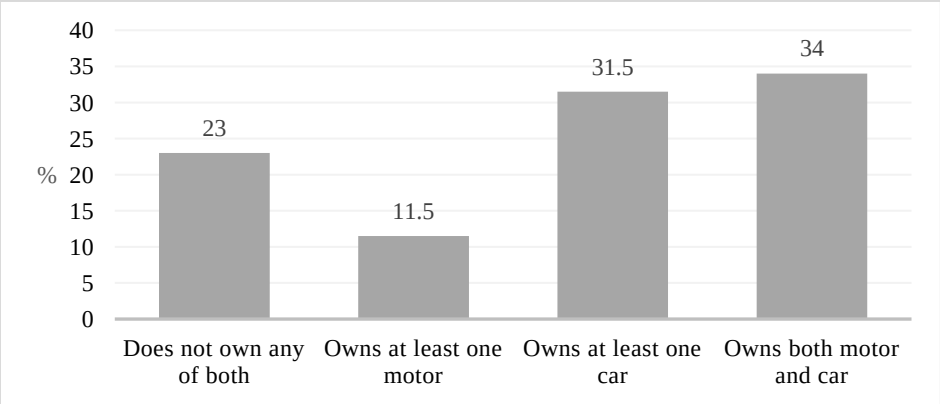

Figure 1 Respondents' Vehicle Ownership

Monthly income has been categorised to reflect the domestic definitions of income levels. Low income reflected those earning less than RM2,000, medium being between RM2,000 and RM4,000. Finally, high income represented those earning more than RM4,000. The lower income dominated the respondent income group at 82% (Figure 2).

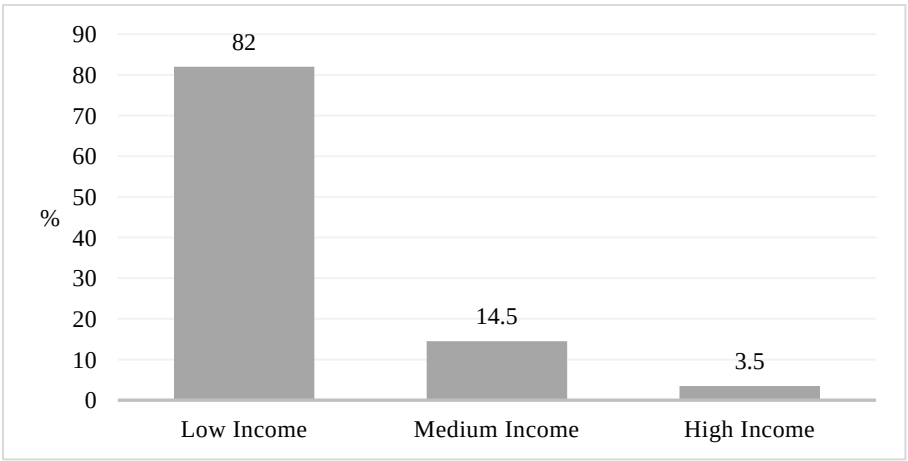

Figure 2 Respondents' Income Distribution

The majority (39.5%) of the respondents were College Diploma holders (Figure 3).

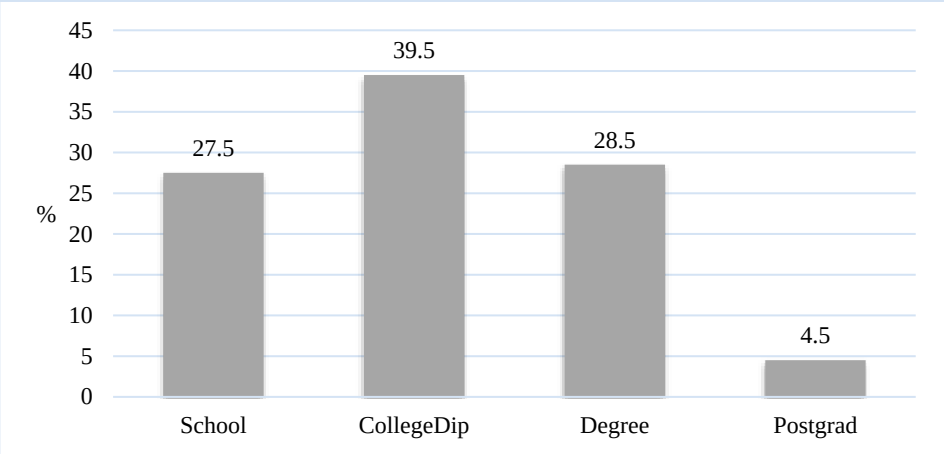

Figure 3 Respondents' Level of Education

Meanwhile, student community formed highest percentage (26%), providing a popular employment type. The routes that KTM Komuter ply through have been the educational and institutional catchment areas.

Trip characteristics of respondents are presented in the following figures. The highest percentage (49%) of the regularity of using the KTM Komuter service was less than 10 times a month (Figure 4). Meanwhile, most of the respondents (63%) had only used the KTM Komuter service between one to five years (Figure 5).

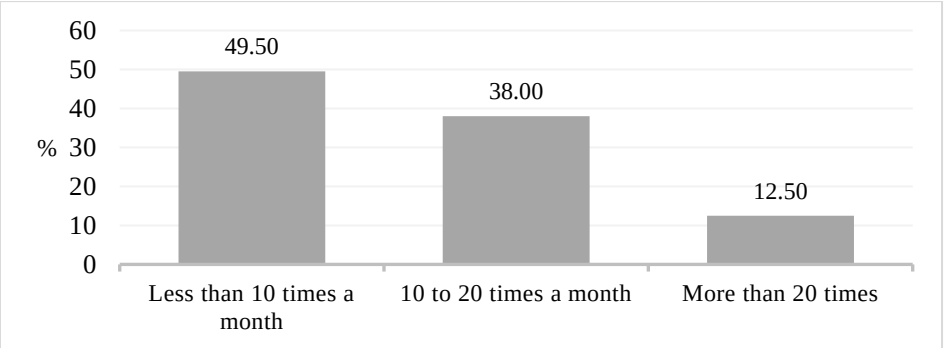

Figure 4 Annual Rail Trip Frequency

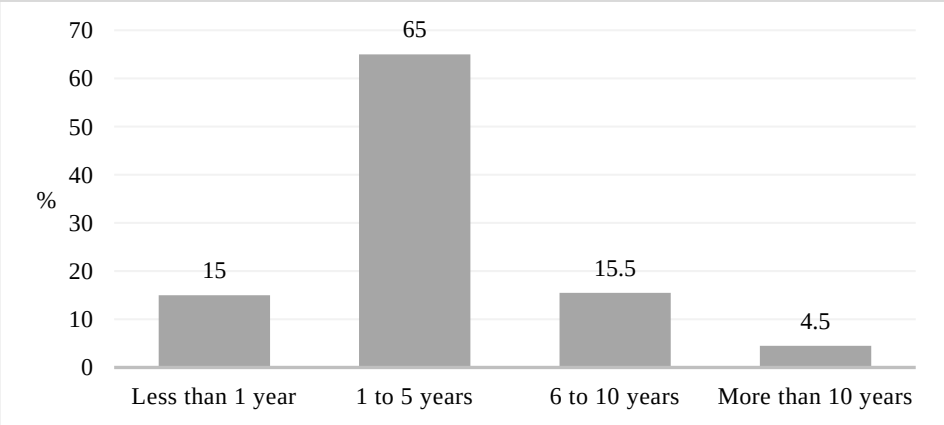

Figure 5 Length of Rail Usage

Origin station with the highest number of people coming from was KL Sentral at 12%. Similarly, people heading to KL Sentral as destination was also the highest (11.5%). Meanwhile, Klang (6.5%) was the second most popular destination.

The highest proportion (27%) of respondents has at least 10 minutes of rail travel time. Frequency of people travelling a shorter travel time was much higher than people travelling longer time. Stated preference revealed that feeder buses were not preferred as an access and egress mode (76% of respondents, Table 3).

Table 3 Feeder Service Preference by Respondents (N = 200)

	Frequency	Percent
No	152	76.5
Yes	48	23.5
Total	200	100.0

STATISTICAL ANALYSIS

Socio-demographic characteristics have been tested using chi-square test. These factors were gender, monthly household income, level of education and type of employment. Rail services usage variables such as frequency/regularity and familiarity were also tested. Neither the preference was determined by the frequency of usage in year nor was it influenced by the usage duration based on the year of the first ride. None of these factors were found significant in influencing feeder services selection.

Table 4 Chi-Square Test and Results for Selected Socio-Demographic and Trip Characteristics

Parameter	Pearson Chi-square Value	df	Asymptotic Significance (2-sided)	Significant at * 95%, **99% levels # insignificant
Gender	.196	1	.658	#
Monthly income	4.797	2	.091	#
Level of education	2.842	3	.417	#
Type of employment	.861	2	.650	#
Vehicle ownership	.509	3	.917	#
Usage frequency	2.452	2	.293	#
Usage familiarity	5.496	3	.139	#

One possible explanation could be the small sample size (n = 200), to be dispersed across multiple categories (column) of independent variables. Feeder preference was quite low (24%), due to various reasons which could only be explained by a more qualitative research, which is not within the ambit of this paper.

An alternative to such analysis, is to combine or collapse the independent variable categories into smaller number, hence reducing the degree of freedom.

The Tables below, provide the cross tabulation of feeder services by the other variables to be analysed using chi-square test. Factors or parameters tested included categories of access and egress modes to and from station, distance (number) of station between origin and destination, availability of parking and feeder services at either origin or destination stations respectively, and whether respondents have driven and parked at the stations of origin or destination, respectively as well as collapsed travel time categories.

Table 5 Feeder Service Preference by Categories of Access Mode to Station

	Categories of access mode to stations		Total
Feeder preference	Private mode	Public mode	
No	74	78	152
Yes	4	44	48
Total	78	122	200

Table 6 Feeder Service Preference by Categories of Egress Mode from the Station

	Categories of access mode to stations		Total
Feeder preference	Private mode	Public mode	
No	72	80	152
Yes	9	39	48
Total	81	119	200

Table 7 Feeder Service Preference by Categories of Station Numbers between Origin and Destination Stations

	Station Distance		Total
Feeder preference	Below 10 stations	10 stations and above	
No	84	68	152
Yes	17	31	48
Total	101	99	200

Table 8 Feeder Service Preference by Origin Stations with Feeder Service

	Feeder Available		
Feeder preference	No	Yes	Total
No	106	46	152
Yes	32	16	48
Total	138	62	200

Table 9 Feeder Service Preference by Destination Stations with Feeder Service

	Feeder Available		
Feeder preference	No	Yes	Total
No	109	43	152
Yes	33	15	48
Total	142	58	200

Table 10 Feeder Service Preference by Origin Stations with Parking Facilities

	Parking Available		
Feeder preference	No	Yes	Total
No	20	132	152
Yes	5	43	48
Total	25	175	200

Table 11 Feeder Service Preference by Destination Stations with Parking Facilities

	Parking Available		
Feeder preference	No	Yes	Total
No	17	135	152
Yes	5	43	48
Total	22	178	200

Table 12 Feeder Service Preference by Having Driven to Origin or from Destination Stations

	Drove to or from stations		
Feeder preference	No	Yes	Total
No	117	35	152
Yes	41	7	48
Total	158	42	200

Table 13 Feeder Service Preference by Having Parked at Origin or Destination Stations

	Parked at either stations		
Feeder preference	No	Yes	Total
No	108	44	152
Yes	43	5	48
Total	151	49	200

Table 14 Feeder Service Preference by Travel Time Ranges

	Travel time categories		
Feeder preference	Below One Hour	One Hour or More	Total
No	142	10	152
Yes	42	6	48
Total	184	16	200

Tests have shown (Table 15) that feeder services preference was dependent on various factors including the type of mode used for access and egress to the stations of origin and destination respectively (significant at 99% C.L.).

Moreover, feeder preference was influenced by distance or number of stations between the origin and destination stations and whether respondents have parked their access or egress mode at either the origin or destination stations (significant at 95% C.L.).

However, feeder preference has also been influenced by availability of parking facilities and feeder services at either origin and destination stations or driven to and from stations of origin and destination, respectively. Similarly, feeder preference was not determined by travel time, or the duration of travelling exclusively by rail.

Table 15 Chi-Square Tests Analysis and Results for Selected Parameters

Parameter	Pearson Chi-square Value	df	Asymptotic Significance (2-sided)	Symmetric measures (Phi, Cramer's V, contingency efficient)	Approximate Significance	Significant at * 95%, **99% levels # insignificant
Type of access modes	24.967	1	.000	.353, .353, .333	.000	**
Type of egress modes	12.399	1	.000	.249, .249, .242	.000	**
Distance between Origin and Destination Stations	5.748	1	.017	.170, .170, .167	.017	*
Available parking at origin (O) station	.251	1	.617	.035, .035, .035	.617	#
Available feeder bus at origin (O) station	.161	1	.688	.028, .028, .028	.688	#
Available parking at destination (D) station	.022	1	.882	.010, .010, .010	.882	#
Available feeder bus at destination (D) station	.155	1	.694	.028, .028, .028	.694	#
Drove to or from OD stations	1.567	1	.211	-.089, .089, .088	.211	#
Parked at either OD stations	6.772	1	.009	-.184, .184, .181	.009	**
Travel time ranges	1.738	1	.187	.093, .093, .093	.187	#

Non-significant testing was validated with a regression analysis, to develop a simple model of feeder preferences.

Table 16 Regression Model for Feeder Preference by Distance (Number of Stations) Between Origin and Destination

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.041[a]	.002	-.003	.429

a. Predictors: (Constant), DISTANCEOD

Table 17 Regression Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.208	.064		18.956	.000
	DISTANCEOD	.003	.006	.041	.579	.563

a. Dependent Variable: FEE

Selection for regression analysis was based on the significant results for chi-square analysis. However, parameters of ratio data such as travel distance (p-value 0.563) and trip frequency (p-value 0.980) made by rail were not found to be significantly contributing to the development of models for feeder preferences.

Table 18 Regression Model for Feeder Preference by Trip Frequency

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.002[a]	.000	-.005	.429

a. Predictors: (Constant), REG2

Table 19 Regression Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.241	.048		26.036	.000
	REG2	-7.574E-5	.003	-.002	-.025	.980

FINDINGS

The empirical analysis indicates that not many passengers (23%) were using the feeder bus services. This was probably because most of the respondents were not regular commuters as most of them were only using the KTM Komuter services not more than 10 times annually. Moreover, more than half of the respondents were using the KTM Komuter service either for the first time and/or less than five years.

The statistical analysis has shown that out of seventeen independent variables tested, only four parameters were found by chi-square test to be significantly influencing mode choice behaviours, namely feeder bus as an access or egress mode for trunk rail service. Nevertheless, the chi-square results corresponded with some of the conclusion made by selected studies researched (Martin & Shaheen, 2011; Taylor, 1982; Limtanakool et. al, 2006; Alshalalfah & Shalaby, 2007). These results therefore can be interpreted in both ways: i) that feeder was not an attractive mode and ii) that returning to bus system was seen as inferior to the current rail system that passengers were enjoying. It can be said that lower demands for feeder bus service was due to the lower number of stations providing this service (seventeen out of 53 stations only). Hence, other variables needed to be examined so as to model the passengers' modal choices.

Regression analysis failed to confirm the strength of the two ratio parameters (number of stations between origin and destination, and travel frequency) in developing a model for mode choice behaviour in this research paper. As such, extended research should be focused on attaining more accurate and precise ratio data for tests including travel time (minutes) and travel distance (kilometre). Access and egress modes to stations, at this juncture were the two variables, worth investigating as the ultimate determinant for mode choice behavioural model for feeder services supporting trunk rail routes.

RECOMMENDATIONS

Based on the findings that there was a low demand, recommendations are focused on improving the availability and quality of feeder bus services. Thus, these recommendations have been forwarded to the KTM Komuter management team so as to increase passengers' patronage of feeder buses to their rail stations. They are:

i. KTM Komuter should provide feeder bus services at all KTM Komuter stations instead of providing the service at only the selected stations.
ii. KTM Komuter should establish partnership with feeder bus service providers such as RapidKL (now Prasarana) or Metrobus with the supervision of the Land Public Transport Commission (SPAD) and to provide suitable routes at places with large catchment areas such as residential and institution areas.

iii. KTM Komuter should also provide suitable supporting facilities for the feeder bus service such as comfortable and convenient waiting facilities, proper bus stops, route maps, integrated scheduling and ticketing between rail and feeder services.

iv. The Land Public Transport Commission (SPAD) should start providing special lanes for buses only so that the bus services are the prioritised traffic, since buses are usually stigmatised to be congested and unattractive relative to other road vehicles.

CONCLUSION

In brief, this empirical study has proven that buses received less proportionate demand as feeder vehicles. The lower demand could be attributable to buses being inferior to rail and that only seventeen out of 53 rail stations of KTM Komuter have been providing the feeder service. It was confirmed that access and egress modes to stations determined the mode choice. Additionally, the number of stations in between origin and destination as well as whether users' had parked at either origin or destination stations were significant in explaining this behaviour. Therefore, KTM Komuter and related agencies may adopt the recommendations made in this paper to encourage more people to use the feeder bus service. The paper's suggestion for feeder services improvements can also benefit other researchers, academicians, transport planners, public transport service providers of city region with characteristics similar to those of Klang Valley, Malaysia.

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PLANNING MALAYSIA:
Journal of the Malaysian Institute of Planners
VOLUME 15 ISSUE 1 (2017), Page 81 - 88

REVITALIZATION OF CHINATOWN AREA AS SUSTAINABLE URBAN HERITAGE IN THE CITY OF MANADO

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Abstract

China Village or Town is an urban region with Chinese as majority of the community. The China Town is located at the old part of the city of Manado and is well known as one of the oldest trade centres in Manado. As one of the urban heritage in the city of Manado, the Chinatown has unique landmarks with temples that are religious buildings for the Chinese community. With time, the quality of the environment has degraded and the image of the Chinatown has become vague. This paper investigates the existing condition of the town through site observation. It then proposes several suggestions with regard to the revitalisation of the Chinatown without discarding its existing function as a one of the trade centres in Manado. It is hoped that the revitalisation of the town would improve the quality of its urban environment that at the end would positively impact the quality of life of its dwellers, and construct the image of the city as a whole.

Keywords: Revitalization, Chinatown, urban heritage, sustainable

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INTRODUCTION

The development of a city cannot be separated from the presence of the old town area. Old town within a city may be a positive asset to the city and acts as a reference point Nur, 2010). One form of heritage which is also a tourism asset of Manado City is the Chinatown (Pecinan, Kampung Cina or Chinese Village). The Chinatown is located in the old city centre of Manado. It was one of the oldest trading centres in the city, and today has become one of the tourist destinations in Manado City. It is known by the name of Kampung Cina, because almost all building owners here are of Chinese ethnicity. Bustling with activity and very crowded every day, Kampung Cina still keeps a number of relatively old buildings, and some of them are very old. The buildings are generally a legacy of the Dutch colonial era and were used as shops (Silomba, 2013).

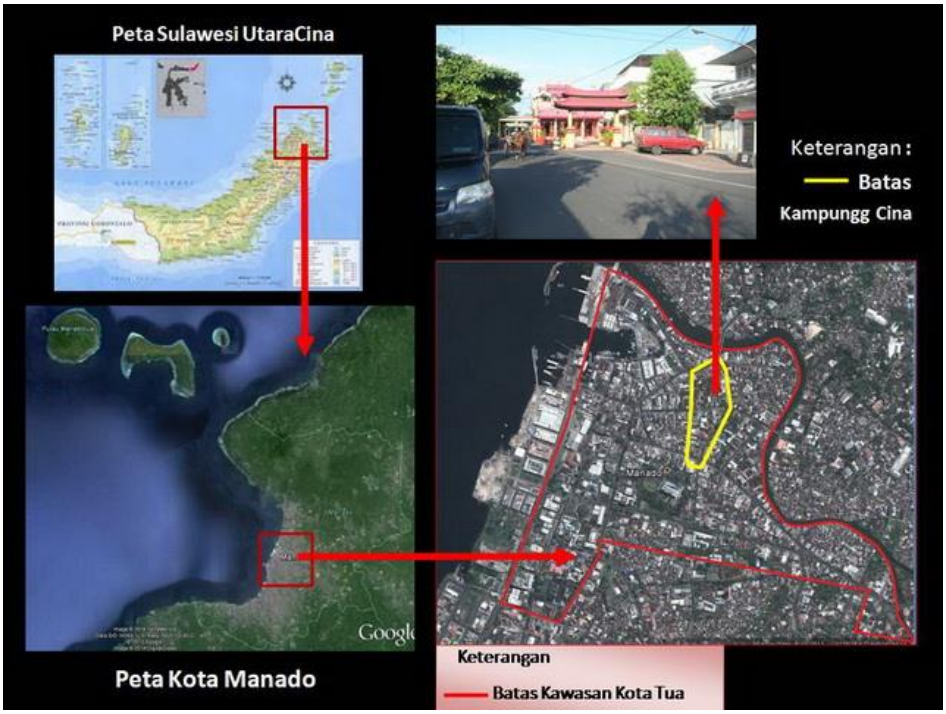

Figure 1 The City of Manado and the Old Town Area
Source: Site observation.

Manado City with traces of its history has the potential to be developed as an urban heritage tourism. It has many attractions, both natural and artificial, which are important assets of the city. This area is the centre of activity from the very beginning that initiated the formation of the city. The appeal of the area continues as the centre of trade and services has led it to become a melting pot of business and trade people from various background and social status. However,

in the course of time, the city experiences a decline in both its environment and its image or identity. On the other hand, to become a tourism destination, a region which has tourism potential must be equipped with a system of infrastructure and with socio-economic nature that are suitable to meet the needs of residents and tourists (Tondobala, 2013).

Figure 2 Area of Kampung Cina (Chinatown)
Source: Site observation.

Manado City Government has the vision of Manado as a World Tourism City, particularly the old city area which has the potential to become a tourism destination. Tourism destination should have the elements of the environment that can lift the image of the region as well as having an adequate standard of life (Tondobala, 2013). However, the potential of the natural environment condition, social, culture and history in the city centre have not been able to improve the image of the old town area. The pressure and the dominance of commercial activities have led to the neglect of supporting facilities development the muddling of the elements that form the character of the area. Thus, the expectation for the city centre to become on of the main tourism destinations has not been fully achieved. Thus, this study looks at ways to revitalize the Chinatown into a main tourism destination without forgoing its existing functions as a trade centre.

LITERATURE REVIEW

The heritage or cultural heritage in the broad sense implies a legacy or historical inheritance of cultural heritage objects. The word itself is often associated with a legacy of something (value) that is derived or inherited (generation to generation) and are transferred from one generation to the next. Given its role as a carrier of past historical value, then the heritage is seen as an important part of the cultural tradition of a society. One way of managing urban heritage in a professional and sustainable is by undertaking revitalization.

Revitalization is an effort to restore the dynamics and to revive the assisted environment, which is affected by various factors, such as social, cultural, economic and political policies. Jefrizon and Rimadewi (2012) provide an understanding of the revitalization as an attempt to revitalize an area or a part of town that was once vital and alive, but then suffered a setback or degradation. According to the Ministry of Public Works, revitalization is an attempt to revive a dead region by redeveloping the area to rediscover their potential. Revitalization is also expected to provide improved quality of the urban environment, which in turn, improve the quality of life of its inhabitants (Jefrizon & Rimadewi, 2012).

RESEARCH METHODOLOGY

This study began with the identification of the context of the problem and goal setting. Based on the objectives, methods were selected for data collection and data analysis. Primary data were obtained through site observation while secondary data were gathered from secondary sources including research articles, maps, statistics and planning standards. Data were analysed in order to establish the history of the area and to make comparisons.

DISCUSSION

The city, as a complex assisted environment, is always changing, and the changes are believed to be somewhat normal and natural. The changes could be positive towards the improvement of the quality of an environment, or it could be otherwise. If a city is changing towards the decline, then it may not be feasible to accommodate new activities or functions.

The existence of historical buildings, sites or monuments is the potential for the development of cultural heritage tourism as an alternative to urban tourism development (Hayati, 2014). The development of cultural heritage tourism in urban area is ideal to be implemented because a city will not lose its local identity, as well as providing an understanding and a sense of pride in the town's history and culture of the local community.

Revitalization is an attempt to revive an area to its former glory but under the present atmosphere, requirements or needs. The revitalization of an area is based on the principles that empower or improve the vitality of the region that was declining or degraded over time. In relation to the Chinatown (Kampung

Cina) in Manado City Centre, elements that have the potential to be revitalized are both the non-physical and the physical elements of the area. Dependencies between elements are very important. Physical elements would be valuable if it can provide added value to the economic and socio-cultural activities of the area. In other words, if the physical elements are well contained by non-physical element, they can provide attraction for visitors. A physical element will deteriorate if it is not used by the presence of non-physical elements. Non-physical element will be lost if its meaning is not understood by the public (Tondobala, 2013).

Revitalization of Physical Building and Environment

Based on the comparison between the building and the street (streetscape), the streets in Chinatown were lined with shops of varied conditions. The present layout of the shops does not provide adequate space for greenscapes and parking space for vehicles. Lack of parking space has resulted in the streets being congested most of the time. In terms of the buildings, in overall the buildings are still in good condition structurally, but they look 'old' and only minimum maintenance was conducted by the owners. The position of the buildings which are on lower platform level as compared to the streets' has resulted in the buildings being often submerged in water during the rainy season. Some of the gutters are damaged and sidewalks are often used by street vendors to peddle their merchandise. These make the area look disorganized and shabby.

Figure 3 Physical Condition of Building and Environment at Kampung Cina
Source: Site observation.

Some of the buildings in Chinatown, including the temples, portray Chinese architectural style. However, the buildings are in need of repairs and the area is in need of upgrades. Improvement and upgrades are required in terms of the building condition, green spaces, road connection system, signs and billboards, and open space. Besides the Chinese-style building, the area also has several buildings with colonial architecture. This is not inseparable from the Dutch colonial rule that at the time makes the Old Town Centre as the centre of residency government administration (Wulur, Kumurur & Kaunang, 2013). Buildings of colonial-style architecture in the Chinatown area help shaped values of locality in architectural form for the city of Manado. However, these buildings are slowly began to disappear. Thus, revitalization of the area need to include a clear benefit and contribution for the establishment of the community; not only for the present but also for the future.

Economic Revitalization

The Chinatown was the embryo of the economy of Manado City in colonial times. The ethnic Chinese were involved in mediating trade negotiations between the Dutch government and the natives. Although no longer an economic hotspot presently, the Chinatown has the potential as a tourism destination for the region because it has a distinctive tradition of good food and celebrations. The revitalization process of the area should begin with the rejuvenation of urban artefacts, which in turn would support the process of rehabilitation of economic activity. Chinatown short term physical improvements are expected to accommodate formal and informal economic activities, so as to provide added value to the city area. In the context of the revitalization is necessary to develop a mix of functions that can encourage economic activities in the region.

Social Revitalization

In the old days, there was a harmonious relationship in the Chinatown between the society and the surrounding environment, and life was calm and peaceful. However, in the present day, life in the Chinatown is hectic because everybody is busy involving themselves in the economic activities. The increase in population of the area has made the area crowded. Focussing too much on the economic activities has also made the people to ignore and forget local cultural values and wisdoms. Thus, revitalisation of the Chinatown must also give emphasis on the social aspect of the area. Culture and society can become invaluable tourism assets for the area.

CONCLUSION

Despite the fact the Chinatown has the assets to become a tourist destination for the region, these has not being fully exploited. The historical buildings are decaying, and the environment is congested and without adequate infrastructure and greens. Thus, this paper proposes the area to be revitalized, not only in terms of the physical aspect, but also the economic and social aspects. The revitalization programme can be implemented as a cooperation between the Government and the private sector to create job, encourage home industry, increase levy and increase revenue from the region investors. Communities must also be involved in the programme. For instance, religious organizations (since there are several temples in the area) can play a role as a mediator or liaison between the communities and the Government so that community participation can accelerate the revitalization of the Kampung Cina in Manado. The revitalization of the area into a cultural heritage in urban tourism is ideal because it will not lose its local identity, as well as providing an understanding and a sense of pride in the town's history and culture of the local community.

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PLANNING MALAYSIA:
Journal of the Malaysian Institute of Planners
VOLUME 15 ISSUE 1 (2017), Page 89 - 108

COMMUNITY-BASED TOURISM IN MELAKA UNESCO WORLD HERITAGE AREA: A SUCCESS IN FOOD AND BEVERAGE SECTOR?

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Abstract

Community-based Tourism (CBT) is a tool for local economic development due to its capability and strength to provide economic sources to the resident destination. Given its focus on benefiting the local community, CBT has attracted a significant degree of academic attention. However, to date, there has been little discussion and evidence based on comprehensive studies on local economic benefits with regards to tourism activities in Malaysia as compared to other regions. This study examined tourists' expenditure on food and beverage, and its contribution to the local economic in Melaka UNESCO World Heritage area. A total of 1,000 diary record survey were collected. Chi-square Automatic Interaction Detection (CHAID) was used to model interaction of domestic and international tourists. The results revealed 22.1% of the tourists spent between RM16.00-RM147.50 per trip for breakfast, lunch and dinner. However, only 9% (breakfast), 34% (lunch) and 43% (dinner) were channelled to local economy.

Keywords: Tourists expenditure, food and beverage, Melaka UNESCO World Heritage area

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INTRODUCTION

Malaysia has been practising the community-based tourism (CBT) approach in tourism development since the year 2000 until the present. The community-beneficial policies and strategies were introduced in the Eighth Malaysia Plan for the period of 2001-2005. The aspiration for community benefits was continued in the Ninth Malaysia Plan (2006-2010) and Tenth Malaysia Plan (2011-2015). The government has allocated around RM19 million to help generate income among the local community members involved in the tourism industry (Ministry of Tourism and Culture Malaysia, 2015). Community-based tourism programs that were considered successful in generating an influx of tourists were homestay programs in Kampung Bukit Bangkong, Kampung Hulu Chucoh and Kampung Hulu Teris in Banghuris, Selangor (Fauziah Che Leh & Mohd Rezuan Hamzah, 2012). Many researchers have conducted studies on local participation in tourism activities such as Zaaijer and Sara (1993), Brandon (1996), Wells, (1996), Aas, Ladkin and Fletcher (2005), Jones (2005), Lepp (2007), and Lee (2012). However, to date, limited study has been done to assess and validate the economic benefits received by the local economy from the various tourism activities in an area and therefore, this research is timely. Melaka UNESCO World Heritage area was chosen as the study area as it has recorded the highest number of domestic and international tourist visits in addition to being inscribed by United Nations Educational, Scientific, and Cultural Organization (UNESCO) as a 'World Heritage Site'.

Tourism is an expenditure-driven economic activity (Mihalic, 2002), that often a significant source of income in many countries (Mok & Iverson, 2000; Li, Song & Witt, 2005; Song & Li, 2008). Tourists purchasing pattern is likely to vary in several tourism activities namely in accommodation, entertainment, shopping, food and beverage as well as transportation (Wang, Rompf, Severt & Peerapatdit, 2006). Moreover, tourist expenditure in those tourism activities is considered as one of the potential tools to improve the economy of local communities (Beeton, 2006; Trejos & Chiang, 2009; Sutawa, 2012). Therefore, tourism is believed to be able to generate income and enhance the economic opportunities of the local community. However, more recently, literatures have emerged that offer different findings, where benefits from tourism activities are low to local economy (Crompton, Lee & Shuster, 2001; Tyrrell & Johnston, 2001; Kasimati, 2003; Daniels, Norman & Henry, 2004). Therefore, community-based tourism should be encouraged to improve the economic benefits received by the local community in expanding their economic opportunities in the tourism industry.

The aim of this paper is to examine the local economic benefits from the food and beverage sector in Melaka UNESCO World Heritage area.

LITERATURE REVIEW

Community-based Tourism

Community-based tourism (CBT) is a type of sustainable tourism where 'people' or 'community' is the focus of tourism development in a particular host destination. Pearce and Moscardo (1999) believe that CBT can produce successful practice and implementation process in developing and less developed countries. This is supported by McCool, Moisey and Nickerson (2001), Davis and Morais (2004), Roe, Ashley, Page and Meyer, (2004) where their studies have observed the CBT in countries like Gambia, Uganda, Cambodia and Laos. McMillan and Chavis (1986) define the term 'community' into three categories (i) Ecological approach: the community living together and adapting to the setting, a process that produces distinctive community characteristics. (ii) Social approach: the roles and institutions that govern society, social relations and the primacy of group membership. (iii) Interactive approach: social interactions of individuals, people, organization occupying a restricted geographic area. As a result, these categories portray multiple descriptions and classifications of the term.

Kling and Posner (1990) have added the 'community' in ecological approach, as a group of people that share a similar geographical area, for instance, the community in a residential area or a village. Madrigal (1995) argues that a community living in the same geographical area can be categorized into smaller communities, such as the youth community, elderly community and housewife community that share common characteristics within the area.

Hollinshead (2004) divides the community into three groups, which are based on solidarity, geographic area and socio-geographic structure. Other scholars define 'community' as a group of people living and staying in the same locality, as well a group of people that share similar ideas, purposes and basic values (Davis, 1991: Mayer et al., 2000; Williams & Lawson, 2001).

The clarification of 'community' is crucial for the study in order to justify the direction of community-based tourism. The definitions discussed mainly refer to spatial and interaction factors. This shows that communities are varied in nature. A community consists of various characteristics and attributes in the radius of large land uses and town centres along with types of tourism activity areas that consists of different community organizations, structures, relations and roles.

Local Economic

According to authors such as Bellamy, Meppem, Gorddard and Dawson (2003), Koo (2005), Shaffer, Deller and Marcouiller (2006), and Gunder (2009), there is no clear and hierarchal sequence of local economic theories in describing details of local economic development and benefits due to the complexity, flexibility and

multiple perspectives influenced by mixed concepts (Rowe, 2009; 2012), practices (Valler & Wood, 2010) and rhetoric (Scott, 2006). In addition, Gunder (2004) clarifies that the built environment field, especially in town and regional spatial planning, often face inconsistent and conflicting theoretical bases when dealing with local economic development. Most of the CBT describe high economic impacts and benefits of tourism activities which must be channelled to the host destination residents (Amat Ramsa Yaman & Abdullah Mohd, 2004; Jones, 2005).

Local economic development in CBT perspective is defined as a process in which the local residents design, develop and implement the tourism development strategies by using local resources, with the aim to improve the quality of life and economic opportunity of the local community (Potter et al., 1999; Pike, Rodriguez & Tomaney, 2006). Within the framework of local economic benefits and impacts, the benefits can be divided into direct effects and indirect effects. Direct effects towards the local economy are the effects, benefits, and consequences from the tourism activities themselves (Bowitz & Ibenholt, 2009). These effects are generated through two main channels, which are earnings and revenues to the local community especially local-based businesses (Nel, 2001) as well as employment opportunities (Ashley, 2000; Wearver & Lawton, 2007). According to UNWTO (2005), there are six ways in which the CBT may generate earnings and revenue for a particular local community: (1) the foreign exchange earnings, (2) direct and indirect employment and income, (3) ownership and management of tourism establishment (e.g. hotel, restaurants, café and private taxi), (4) direct sales of tourism goods and services to tourists, (5) investment in tourism infrastructure, and (6) development of cultural values.

CBT can boost the living standard of households with casual earnings and its propensity to generate equitable distribution of revenue (Ashley, 2000; Wearver & Lawton (2007). Although the earnings are observed to be natural in most of the studies, it can be improved by diversifying the sources of earnings in the tourism sector. Recently, the numbers of small and medium enterprises (SMEs) in the tourism industry have increased due to the active involvement of the local communities in tourist destinations (Weaver & Lawton, 2007). CBT provides direct employment to travel agents, hotel receptionists and food hawkers. Whereas, CBT indirect employment refers to employment in related sectors that do not serve the tourists directly but generates income from the expenditure in tourism linkages; for instance, the employees working in the construction industry building hotels (Ashley, 2000; Beeton, 2006; Tosun, 2006). Sebele (2010) describes that CBT can provide various sources of employment for the local communities as alternative means of survival (Nel, 2001).

Various sectors are connected to the tourism industry, such as accommodation, food and beverage, transportation, management, and health. The increase of goods and services demand from the tourists generates more

employment in handicraft making, agriculture, manufacturing and other related sectors. This is supported by Holloway (2000), who validated that tourism is a labour intensive industry generating many direct and indirect employment opportunities compared to other sectors.

From the previous broad discussions, CBT can be acknowledged as the community's long term tool for sustainability that preserves local resources and cultures, maintains the participation and support from community, and provides benefits to the local economy in terms of income, profits, jobs, and quality of life. However, one major drawback of the CBT concept is that detail study on economic impact and benefit of the community is still lacking as compared to studies on community participation in tourism development.

Food and Beverage

Cohen and Avieli (2004) believe that the food and beverage sector had been neglected in hospitality and tourism studies. This is due to the conventional view which stated that eating while traveling is a secondary tourists experience and routine (Godfrey & Clarke, 2000; Quan & Wang, 2004). However this finding is contradicted with published researches on food in relation to the tourism sector such as food experience in tourism (Kivela & Crotts, 2006; Chang, Kivela & Mak, 2011), local food consumption and spending (Torres, 2002; Kim et al., 2009), food service (Sheldon & Fox, 1988; Nield, Kozak & KeGrys, 2000), food as a form of special interest tourism (Hall et al., 2003; Long, 2004), as well as food preferences and choices among tourists (Torres, 2002; Chang, Kivela & Mak, 2010).

On top of the aforementioned research, the tourist preference in food consumption has been discussed along with numerous factors, namely personality traits (Cohen & Avieli, 2004; Quan & Wang, 2004; Kim, Eves & Scarles, 2009; Chang et al., 2011), exposure and past experience (Richards, 2002; Cohen & Avieli, 2004; Ryu & Jang, 2006) as well as physiology and motivation (Long, 2004; Kivela & Crotts, 2006; Kim et al., 2009). In fact, studies have also confirmed that a number of socio-demographic factors have significantly influenced tourist expenditure, which among others are nationality and cultural influence. Tourists from Japan (Sheldon & Fox, 1988), France, Italy (Pizam & Sussman, 1995), South Korea, Taiwan and Thailand (March, 1997) have strong preferences for their own cuisine, while American and Canadian tourists prefer local food in the host destination (Torres, 2002). Cohen and Avieli (2004) confirm that Asian inbound tourists prefer their own national cuisine as compared to westerners who are less particular. In terms of age, it has been observed that younger tourists enjoy different tastes and range of foods compared to older tourists (Khan, 1981; Tse & Crotts, 2005; Kim et al., 2009); whereas for gender, it has been observed that women are more interested in local cuisine compared to men (Kim et al., 2009). On the other hand, based on education level, it is found

that tourists with higher education levels are more interested in experiencing foreign cultures by consuming the local cuisine (Khan, 1981; Kim et al., 2009).

METHODOLOGY

The diary record survey was implemented to record the expenses of domestic and international tourists that visited the study area with cluster sampling approach. This study employed the cluster sampling approach in the scope of probabilistic sampling method to collect the data. It has evenly distributed a total of 1,500 diary record survey booklets in selected hotels based on star-rating in Melaka. The hotels were divided into 3 main clusters. The first cluster consisted of 5 and 4 star hotels, the second cluster consisted of 3, 2 and 1 star hotels, and third cluster consisted of budget hotels (3, 2 and 1 orchard). Thus, each of the cluster was distributed with 500 diary records survey booklets, 250 booklets of which were distributed to domestic tourists while 250 booklets were distributed to inbound tourists. The survey was administered in two months (March and April) that included six weekdays and six weekends. The determination of survey period was based on the results of the two pilot studies; these two months recorded the highest tourists' peak in Melaka, for domestic and also inbound tourists. This was because the period being the peak of Malaysia's holiday season due to school-break and spring holiday. Since the survey was a self-administered questionnaire, these booklets were distributed to the respondents during their hotel check-in at 2.00pm. After completing the booklets, they returned them to the receptionist during check out at 12.00pm. They reported their expenditure depending on the number of days spent in Melaka. For this study, Chi-square Automatic Interaction Detection (CHAID) analysis method was used to identify the linkages of tourist expenditure in several tourism sectors especially food and beverage. This method was established to involve continuous and categorical data that consists of ordinal and nominal types of variables. Hence, it is flexible in operate a mixture of data types. CHAID method have been successfully applied in many tourism and travel researches (Van Middlekoop, Borgers & Timmermams, 2003; Assaker & Hallak, 2012).

RESULTS AND FINDINGS

Profile of Respondents

1,500 sample were distributed for survey, but only 1,000 survey were collected. The survey collected 525 domestic respondents and 475 international respondents. From the initial cohort of domestic respondents, 39.0% were male and 13.5% were female, while from the total international respondents, 29.3% were male and 18.2% were female. Thus, the male respondents contributed towards 68.3% of the total responses and the female 31.7%. Moreover, 21-30 years age group was recorded as the highest percentage (26.6%) of domestic

respondents participating in the survey, followed by 31-40 years age group (18.3%), 11-20 years age group (3.4%), 41-50 years age group (2.9%), 51-60 years age group (10%) and 61-70 years age group (3%). Similarly, the 21-30 years age group was also recorded as the highest percentage (17.4%) for international respondents, followed by 31-40 years age group (17.2%), 41-50 years age group (6.4%), 51-60 years age group (5.4%) and 61-70 years age group (6%). Respondents with single status was recorded as the highest percentage among domestic respondents, which was 28.8%, followed by married (23.3%), divorced/separated (0.3%) and widowed (0.1%); while married status was recorded as the highest percentage among international respondents, which was 23%, followed by single (22.6%), divorced/separated (1.4%), and widowed (0.5%).

Almost half (47.4%) of those surveyed worked in the private sector with 19.4% were domestic respondents and 28% were international respondents. This followed by 22.4% that were government servants; 14% of which were among domestic respondents, and 8.4% were international respondents; 13.6% were self-employed which comprised 9% domestic respondents and 4.6% international respondents; 12.3% were students comprising 9.5% domestic respondents and 2.8% international tourists; 3.9% were pensioners, which comprised 0.6% domestic tourists and 3.3% international respondents. 0.4% unemployed were recorded among international respondents. For education level, bachelor's degree was recorded as the highest percentage among domestic respondents (24%), followed by diploma (12.7%), master's degree (5.6%), SPM/O-level (5.4%), certificate (4.1%), PhD (0.4%) and STPM/Matriculation/A-Level (0.3%). Similarly, bachelor's degree was recorded as the highest percentage among international respondents at 31.4%, followed by master's degree (7.1%), diploma (3.9%), certificate (2.1%), PhD (1.7%), SPM/O-level (0.8) and STPM/Matriculation/A-Level (0.4%).

Of the initial cohort of 1,000 respondents, 83.5% visited Melaka for holiday purposes, where 45.5% of those were domestic respondents and 38% were international respondents. This was followed by business purposes (6.5%), visiting family (2.7%), education trip (2.5%), shopping (1.9%), conference/seminar (1.6%) and health treatment purposes (1.3%). Moreover, 36.9% of the international respondents visited Melaka for the first time compared to domestic respondents of only 8.1%, while 44.4% of the domestic respondents had visited Melaka several times compared to only 10.6% international respondents. Next, in response to the number of visiting adults and children, 46% of the respondents were traveling single, while 85.2% travelled to Melaka without children.

Results of Tourists' Expenditure

Figure 1 CHAID 1-Tourist Expenditure Linkage Generated by CHAID
Source: Primary data: Diary record survey, March-April 2014

The tourists' expenditure linkage as illustrated in Figure 1 above was generated by Chi-Square Automatic Interaction Detection (CHAID) analysis for five tourism sectors. In order to identify tourist expenditure in the sectors, there was a need to observe the complete linkages that involve all terminal nodes (five tourism sectors) that created by CHAID analysis model. Secondly, each linkage was compared in terms of the number of tourists spending on each of the nodes (tourism sector) (Gacto, Alcala & Herrera, 2010). Consequently, this will lead to the determination of the most effective linkage. Therefore, among the 29 linkages that created by CHAID analysis model, 'CHAID 1' as illustrated in figure above was recorded as the linkage with the highest number of respondents spending in the each tourism sectors as specified in the CHAID tree pattern. As a result, 'CHAID 1' was chosen as the main linkage to be evaluated in the second stage of the research process, which was to identify the local economic benefits. The decision was based on Janakow (1996) and Juang & Chang (2010) that claim the linkage had the best performance and was the most prominent variable values in the CHAID tree pattern in which the linkage recorded with the highest number of respondents spending in the sectors. Therefore, 22.1% of the total respondents spent high percentage of expenses in the range of RM16-RM147.50 in food and beverage sector. This is parallel with the findings by Hall et al. (2003) that stated the food covers approximately one-third of all expenditure.

Results of Local Economic Benefit

Hajah Ruhana Restaurant, Hajah Mona Restaurant, Newton Food Court, Nyonya Resturant, San Shu Gong Restaurant, Famosa Chicken Rice Ball, Asam Pedas Selera Kampung, Asam Pedas Zahra Restaurant, Nasi Ayam Hoe Kee Restaurant, Jonker Street restaurants and cafés and Medan Selera in Medan Samudera were categorized as "local community'. On the other hand, Restaurants in Mahkota Parade, McDonalds, Hard Rock Café Melaka and Restaurants in Pahlawan Mall were categorized as 'non-local community'. Additionally, tourists that did not indicate any spending for meal was categorized as 'non-local community', as this category indicated less economic benefits for the local community. Tourists that

had meal outside the study area boundary, or had meal in relative's house or attended wedding were categorized as 'other'. This is because they were spending outside the boundary of the study area.

The validation and estimation of local involvement and ownership in the food and beverage sector was verified by the officer from Business Premises Management and Customer Service Department, Melaka Historic City Council.

Breakfast

Table 1 below illustrates the cross-tabulation result between 221 respondents and the food and beverage venues in which they have dined and spent between RM 16.00-RM 147.50 for breakfast. McDonald Café was recorded as the most popular dining venue among the respondents (14.5%). It was followed by 12 respondents (5.4%) spending at Restaurants in Mahkota Parade such as Nando's, The Chicken Rice Shop, Secret Recipe, Starbucks, Station Kopitiam, OldTown White Coffee, Kentucky Fried Chicken (KFC) and McDonalds. Only one respondent (0.5%) each spending at Hajjah Ruhana Restaurant and Asam Pedas Zahra Restaurant at Plaza Mahkota. 155 respondents (70.1%) provided 'no answer' for their breakfast record and thus was assumed that they did not have anything for breakfast.

Table 1 Summary of Cross-tabulation Result for Food and Beverage (Breakfast)

Food and Beverage Venues	**Percentage (%)**	**Frequency (Person)**
Hotel	0.9	2
Jonker Street Cafes	5.0	11
McDonald Café	14.5	32
Mahkota Parade (Restaurants)	5.4	12
Hajjah Ruhana Restaurant	0.5	1
Asam Pedas Zahra Restaurant	0.5	1
Restaurant Melaka Raya (Mamak)	1.8	4
Kedai Kopi Chung Wah Jonker Street	1.4	3
'No answer'	70.1	155
Total	**100**	**221**

Source: Primary data: Diary record survey

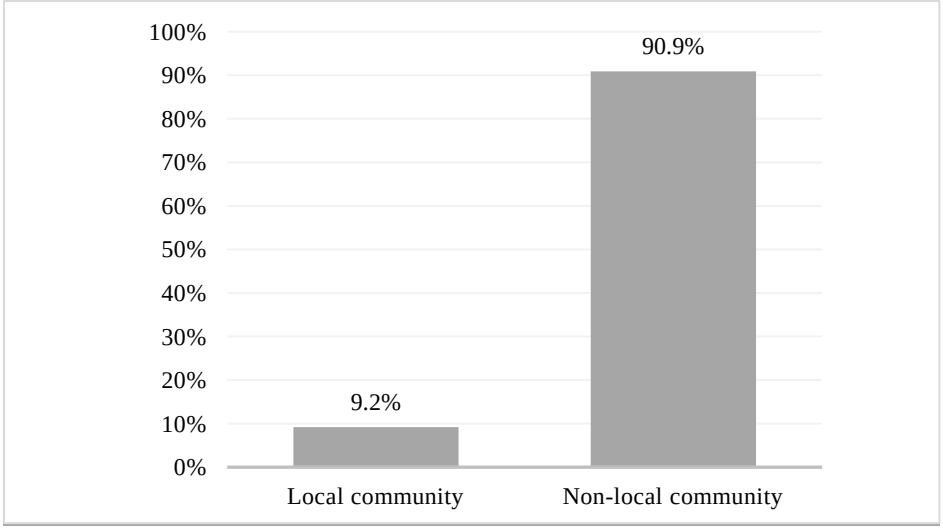

Figure 2 Distribution of Local Economic Benefits (Food and Beverage: Breakfast)
Source: Primary data: Diary record survey, March-April 2015

Figure 2 above reveals the distribution of local economic benefits from the tourists' expenditure for breakfast in the food and beverage sector. Based on Figure 2 above, only 9.1% of the local community gained benefits from the food and beverage sector during breakfast in the study area, hence revealed the weak linkage between the food and beverage sector and the local community in the area. Moreover, the proportion for 'non-local community' was 90.9% during breakfast, which serves as an indication of the leakages occurring along the tourism value chain in the area.

Lunch

Table 2 and Figure 3 illustrate the cross-tabulation result between 221 respondents and the food and beverage venues in which they have spent between RM 16.00-RM 147.50 for lunch. Restaurants in Pahlawan Mall were recorded as the most popular dining place among tourists for lunch, as indicated by 43 respondents (19.5%). It was followed by 36 respondents (16.3%) spending at restaurants in Mahkota Parade. Asam Pedas Zahra Restaurant in Plaza Mahkota remains the least popular with only one respondent (0.5%) had lunch there. One respondent (0.5%) attending a wedding. 14 respondents (6.3%) provided 'no answer' for their lunch expenditure and it was most probably that they skipped lunch.

Table 2 Summary of Cross-Tabulation Result for Food and Beverage (Lunch)

	Percentage (%)	**Frequency (person)**
Hajjah Ruhana Restaurant (PM)	2.3	5
Asam Pedas Zahra Restaurant (PM)	0.5	1
San Shu Gong Restaurant (JS)	2.7	6
Nasi Ayam HoeKee (JS)	1.4	3
Famosa Chicken Rice Ball (JS)	5.0	11
Medan Selera Medan Samudera	2.7	6
Asam Pedas Selera Kampung	0.9	2
McDonald Cafe	7.7	17
Mahkota Parade (Restaurants)	16.3	36
Pahlawan Mall (Restaurants)	19.5	43
Jonker Street Restaurants and Cafes	8.1	18
Hard Rock Café Melaka	9.5	21
Wedding	0.5	1
Relatives house	1.4	3
Bukit Katil	0.9	2
Bukit Cina	1.4	3
Ayer Keroh	8.1	18
Jusco Aeon Peringgit	5.0	11
No answer	6.3	14
Total	**100**	**221**

Source: Primary data: Diary record survey

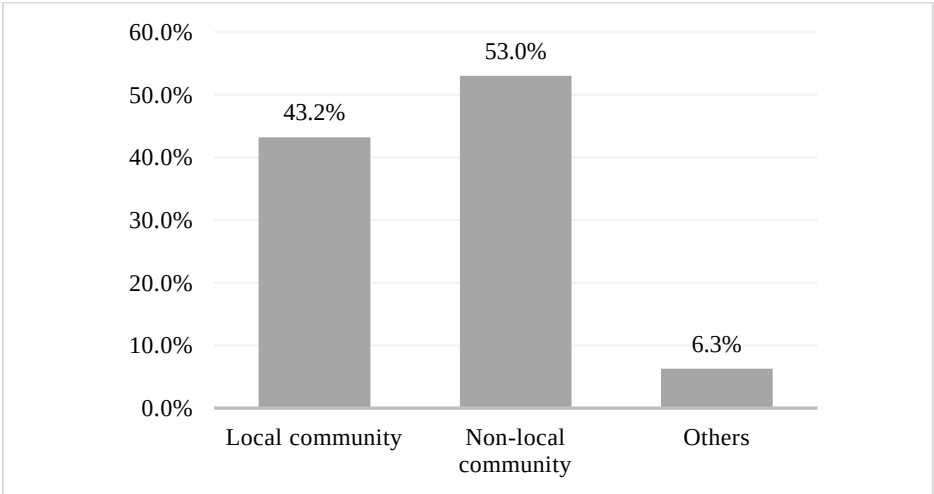

Figure 3 Distribution of Local Economic Benefits (Food and Beverage: Lunch)
Source: Primary data: Diary record survey, March-April 2015

Figure 3 presents the distribution of local economic benefits from the tourists' expenditure for lunch in the food and beverage sector. As can be seen, only 42% of the local community gained benefits from the food and beverage sector in the study area, hence revealed the weak linkage between the food and beverage sector and the local community in the area. Moreover, the proportion of economic gain for 'non-local community' was 58%, which indicates where the leakages occur along the tourism value chain in the area.

Dinner

Table 3 and Figure 4 illustrate the cross-tabulation result between 221 respondents and food and beverage venues in which they have spent between RM16.00-RM147.50 for dinner. Hard Rock Café was recorded as the most popular dining place among respondents, as indicated by 36 respondents (16.3%). It was followed by 32 respondents (14.5%) spending at Hajah Mona Restaurant in Kota Laksamana and 30 respondents (13.6%) spending at Banda Hilir McDonald Restaurant. The lowest response were two respondents (0.9%) spending at Nyonya Restaurant and one respondent (0.5%) spending at the hotel. 19 respondents (8.6%) provided 'no answers' for their dining venue.

Table 3 Summary of Cross-tabulation Result for Food and Beverage (Dinner)

Food and Beverage Venues	**Percentage (%)**	**Frequency (Person)**
Hard Rock Café Melaka	18.6	41
McDonald Café	16.3	36
Hajah Mona Asam Pedas	8.1	18
Jonker Street Restaurants and Cafes	11.3	25
Newton Food Court	6.8	15
Ikan Bakar Umbai	10.0	22
Mahkota Parade (Restaurants)	10.4	23
Pahlawan Mall (Restaurants)	13.6	30
Nyonya Restaurant Plaza Mahkota	0.9	2
Hotel	0.5	1
No answer	3.6	8
Total	**100**	**221**

Source: Primary data, Diary record survey

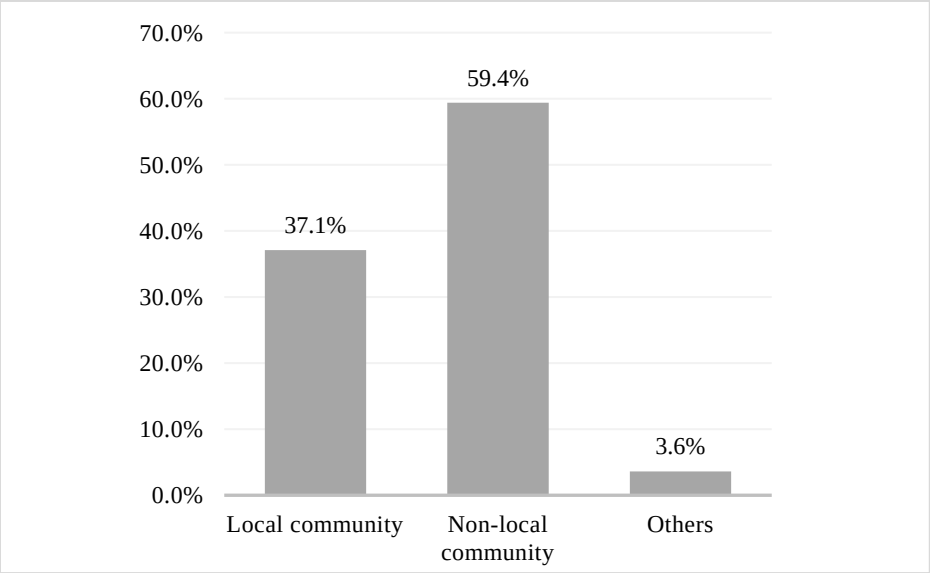

Figure 4 Distribution of Local Economic Benefits (Food and Beverage: Dinner)
Source: Primary data: Diary record survey, March-April 2015

Figure 4 above reveals the distribution of local economic benefits from the tourists' expenditure for dinner in the food and beverage sector. Based on Figure 4, only 37.1% of the local community gained benefits from the food and beverage sector in the study area, hence revealed the weak linkage between the food and beverage sector and the local community in the area. The proportion of 'non-local community' benefits was 59.4%, indicating where the leakages occur along the tourism value chain in the area.

DISCUSSION

According to the Value Chain Model developed, the food and beverage sector recorded high spending among domestic and inbound tourists, but provided low economic benefits to the local community in the Melaka UNESCO World Heritage area. As illustrated in CHAID linkage, 45% of the tourists spent in the range of RM16.00-RM147.50; and only 9.1% from the tourists' expenditure was channelled to the local community during breakfast, 43.2% during lunch and 37.1% during dinner.

The high expenditure but low benefits to the local economy in terms of food and beverage in the study area could be attributed to a few factors. Firstly, the variety of unique local food in the study area attracts tourists due to the six major races with different religions found in the study area namely Malay, Chinese, Indian, Baba Nyonya (Chinese Peranakan), Chitty (Indian Peranakan), and Portuguese Serani, with their uniqueness and diversity of food. The authentic

food in Melaka is associated with its historical roots, colonial influence, religion and local folk culture. By experiencing the local cuisines, the tourists are experiencing new cultures (Baker & Crosbie, 1993). People nowadays have increased their experience to a variety of ethnic food and products during travel (Torres, 2002; Boxkir & Sezer, 2011). Hence, this may encourage a greater demand for local cuisine. Food in the study area can be sampled everywhere and walking distance away (Nurbaidura Salim, Abdul Ghapar Othman, Badaruddin Mohamed & Hairul Nizam Ismail, 2012), from luxury restaurants to local street stalls. Malay cuisines can be found in most places in the study area, which among others are Restoran Hajjah Mona Asam Pedas in Kota Laksamana and Asam Pedas Selera Kampung Restaurant in Plaza Mahkota, while Chinese cuisine is featured at the famous Hoe Kee Chicken Rice in Jonker Street. In addition, Baba Nyonya cuisine can be found at Bibik Neo Restaurant in Plaza Mahkota. In fact, most of the hotels in the study area actively advertise local traditional cuisine especially during the festive season. This gives them extra promotion to increase their occupancy.

Secondly, the experience of trying local food has encouraged the tourists to ignore the prices in order to enjoy the experience. In tourism, food consumption and expenditure are not referred to repetitive daily eating habits and routines. They are considered a request for various foods to engage in experiences. Quan & Wang (2004) categorize two types of seeking behaviors in food consumption during holidays. First is routine rotation of various foods across time. This type of routine is known as "routine variety-seeking' behavior. Second is "novelty-seeking," or the act of eating foods that the tourists have never tried before. This refers to the tourists' behavior of requesting for food experiences that are beyond the borders of their routine. Sims (2009) categorises food experience as firstly, the ingredients of foods are unique and enjoyable; and secondly, the way the food is made, delivered and consumed is unique. This is described by the Hoe Kee Chicken Rice Restaurant, which is a famous Chinese restaurant among locals and tourists especially from Singapore and China. The restaurants situated in one of the small colonial shop lots located on Jalan Hang Jebat (Jonker Street). The crowd is apparent during the weekends. The signature dish, which is chicken rice that shaped like ping pong balls rather than served as a bowl of rice. This has created a new experience for tourists visiting Melaka, tasting the special chicken rice in a small local Chinese restaurant atmosphere. Food consumption during holidays might become part of the peak touristic experience (Quan & Wang, 2004). Thus, these two factors have led to the increase in food consumption among tourists in Melaka, hence increasing the expenditure in the food and beverage sector.

In the context of the local economic benefits, the locally owned food outlets and restaurants have less demand from the tourists as compared to multinational operators. The spread of multinational operators in the food industry has given intense competition to the local food outlets. The food offered, including hamburgers, pizza, fried chicken, pastries, coffee, and ice-cream, attracts the young generation and children. Among the leading multinational operators and international companies are McDonalds, Hard Rock Café, KFC, Burger King, Baskin-Robbins, Domino's Pizza, Seoul Garden and Dunkin Donuts (Khan, 1981). These outlets can be found in the study area. On the other hand, locally owned food outlets encourage participation of the local community to produce, distribute and promote local products.

The local food operators do not have the ability and knowledge to promote their food as a tourism product. Many local restaurants and cafés in the study area are mostly small and medium-scaled. Most of the cafés on Jonker Street are family operated and only open at night or during weekends. Furthermore, they only provide a few tables and a small counter in front of the shop lot, with their homes at the back part of the shop. Hence, the desire to carry out promotion and awareness does not exist due to financial barriers, style of business and knowledge. In comparison, multinational companies and fast food enterprises such as McDonald and Hard Rock Café feature a distinct type of menu and target population. Therefore, Stout and Rust (1993), and Hyun, Kim and Lee (2011) believe that such big enterprises are controlling the specific segment of consumer market because of their promotion. Besides the strong promotion, they have strong world-recognized branding. The restaurant brand and labels affected the tourists' purchasing intentions (Albright & Flora, 1990; McCall & Lynn, 2008; Eibel et al., 2009). Therefore, the restaurants that have strong and well-known label would dominate the local food options.

CONCLUSION

This paper has identified the local economic benefits from the tourists' expenses in food beverage sector. This study suggests strong partnerships or clustering among the tourism stakeholders, especially the suppliers in Melaka UNESCO World Heritage area. A cluster can be formed between similar tourism service suppliers and also between the suppliers that offer different kinds of tourism services to ensure that all the tourism products, services as well as facilities offered can be accessed by all kinds of tourists that visit the study area. For instance, the budget hotels in Jonker Street are encouraged to carry out a joint venture with the local restaurants nearby to provide breakfast to their overnight clients and deal with local traditional Malay massage parlours for discounts on their services. This is regularly applied in most tourism destinations such as Bali, Indonesia and Bangkok, Thailand. This partnership idea extremely promotes and supports local businesses, resulting in a stronger community because the money

stays within the local area, hence promote the community-based tourism in Melaka. Moreover, the unique relationship among the local businesses may provide the community of the study area with a distinctive character and values that are currently lacking in the area. A suggestion of future research needs to be carried out to explore the factors affecting the poor and high participation and economic benefits in relation to Melaka UNESCO World Heritage site or other tourism destinations. The factors may include internal and external factors. It is important to note that not all tourism destinations operate and are impacted in the same way and to the same economic extent towards the local community. Some destinations may contribute more effectively towards the local economies.

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PLANNING MALAYSIA:
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FENG SHUI: THE SHAPE OF FIVE ELEMENTS OF LOW TI KOK MANSION

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Abstract

Feng shui is one of the most outstanding subjects and popular life principles in the world and is also one of the oldest traditional Chinese philosophies. *Feng shui* is seen as wisdom that has been accumulating for more than three thousand years of history and experience in architectural theory. The application of *feng shui* is not only a unique knowledge but is also a complex way to comprehend natural phenomena. The aim of *feng shui* in architecture is to enhance the quality of life for humans, building, and nature. It is related to the built environment theory. *Feng shui* had indeed been incorporated into the construction of Chinese mansions in Peninsula Malaysia despite having only a few people who are aware of them. Since *feng shui* is a complex subject, this paper focuses on one of the *feng shui* principles: the Five Elements. The Five Elements and their respective shapes are Water, wavy-shaped; Wood, angular-shaped; Fire, triangle; Earth, square; and Metal, circle. These elements are discussed in their association with the case study of Low Ti Kok Mansion. The Low Ti Kok Mansion, which is located in Kajang, Selangor, has no recorded documentation on *feng shui* as opposed to the Cheong Fatt Tze Mansion in Penang, which is known for being influenced by *feng shui*. In this paper, the researcher attempts to investigate and document the case study based on *feng shui* influences. The objectives of this paper are twofold and they are (1) to understand the *feng shui* and (2) to examine the Five Elements concept on the Low Ti Kok Mansion. The research approach in this paper is qualitative in nature. Document reviewing and observation have been employed and interpreted in this paper to analyse the case study, which is based on the Five Elements concept. It is found that the Five Elements shapes are clearly shown on the floor plan of Low Ti Kok Mansion.

Keywords: Five Elements, *feng shui*, Low Ti Kok Mansion

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INTRODUCTION

Feng shui is an ancient practice that has accumulated more than three thousand years of history, knowledge and experience. It has also been incorporated into architectural theory, especially with regards to position and design. *Feng shui* is a part of an ancient Chinese philosophy of nature and is considered a cultural heritage in China (Erdogan & Erdogan, 2014). Since *feng shui* is considered a traditional Chinese philosophy and not a religion and belief, *feng shui* practice is popular among people. It has flourished worldwide when the literature about it in English was introduced (Erdogan & Erdogan, 2014; Lip, 2010).

The practice of *feng shui* has also continued uninterrupted in fate and business among Chinese communities in Hong Kong, Taiwan, Malaysia, and Singapore (Lip, 1979). This basic purpose of *feng shui* is to enhance the quality of harmonious life between humans, buildings, and nature (Erdogan & Erdogan, 2014).

The *feng shui* philosophy is a wide and complex subject in architecture theory. Unity of Heaven, Earth, and Human, *qi*, *yin* and *yang* principle, and the Five Elements are principles used in *feng shui*. These principles incorporate divination, medicine, and astrology. *Feng shui* also incorporates certain fields of science, especially climatology, geology, topography, ecology and landscaping. The architectural theory of *feng shui* can be divided into two main schools of thought: the Form School and Compass School (Yap, 2007). The Form School emphasises the consideration of earth surface where the *qi*, the energy, is affected while the Compass School focuses on the cosmic pattern, magnetic field, and sensitive direction based on the Chinese compass. The Form School has been widely accepted by international researchers in the analysis of built environment (Yap, 2007).

During the late nineteenth century, the Chinese migrants brought their culture including *feng shui* and architecture into Malaysia. Chinese builders incorporated *feng shui* into Chinese houses, especially shophouses and mansions. The Cheong Fatt Tze Mansion is an excellent example of a mansion in which *feng shui* has been strictly incorporated. The architectural aspect of *feng shui* had been used and it flourished in Chinese houses until the late 1930s.

Since *feng shui* is a complex subject, this paper focuses on one of its aspects, which is the Five Elements. This paper investigates the incorporation of the Five Elements into the construction of the Low Ti Kok Mansion in Kajang, which has no recorded documentation to date.

LITERATURE REVIEW

Feng Shui

The term of *feng shui* is extremely difficult to translate (Yap, 2007). *Feng shui* is a tool in designing and orientating the site to balance between human and nature.

It is a need to understand the relationship between the conditions of surrounding and humans. *Feng shui* might be called environmentology and is not related to Chinese geomancy. In definition, *feng shui* is the art of placing a building on a site so that it is in harmony with other man-made structures and in balance with nature (Erdogan & Erdogan, 2014). Yap (2007) states that *feng shui* is a skill of studying the flow of invisible energy in the environment, planetary influences, and contours of the land, and river and mountain formations in relation to a property.

Feng shui is so deeply rooted in Chinese architecture that since historic times, it had been incorporated into architecture, environmental science, conceptual design, cultural heritage and interior decoration (Erdogan & Erdogan, 2014). The art of *feng shui* has been accepted into architectural design principles in order to create sustainable buildings and environments (Mak & So, 2015). It reflects nature and buildings. This concept of *feng shui* has been widely used in modern buildings in Hong Kong especially the Bank of China and Shanghai Bank. The concept of *feng shui* in buildings is to obtain the balance between nature and human behavioural impacts.

Five Elements

The Five Elements comprises the five basic groups of substances in the world. There are the elements of Wood, Fire, Earth, Metal, and Water. This theory of Five Elements represents the initiation, progress, development, fatigue, and cessation processes of events (Mak & So, 2015). The Five Elements can be determined by the element of a people to obtain the suitable element after organising the interior space. Every space has its element of the Five Elements such as bathroom represents Water.

The Five Elements present their characteristics in seasons, times, directions, conditions, colours, forms, and numbers. The Five Elements have its cycle between two elements. For example, Water is related to the colour black while Fire is related to red. These elements are destroyed where Water will extinguish Fire according to a specific order. The cycles of the Five Elements are the productive cycle, controlling cycle, and weakening cycle (Lip, 2010). The productive cycle creates positive energy and produces the element. In other words, Fire produces Earth; Earth produces Metal; Metal produces Water; Water produces Wood; and finally Wood produces Fire. The controlling cycle creates negative energy and destroys the opposite element: Fire destroys Metal; Metal destroys Wood; Wood destroys Earth, Earth destroys Water; and Water destroys Fire. The weakening cycle creates the natural cycle between elements. The productive and controlling cycles are commonly used in the Five Elements. These cycles assist in creating the movement of energy in nature according to the laws of nature and heaven (Erdogan & Erdogan, 2014). Figure 1 shows the three cycles of the Five Elements

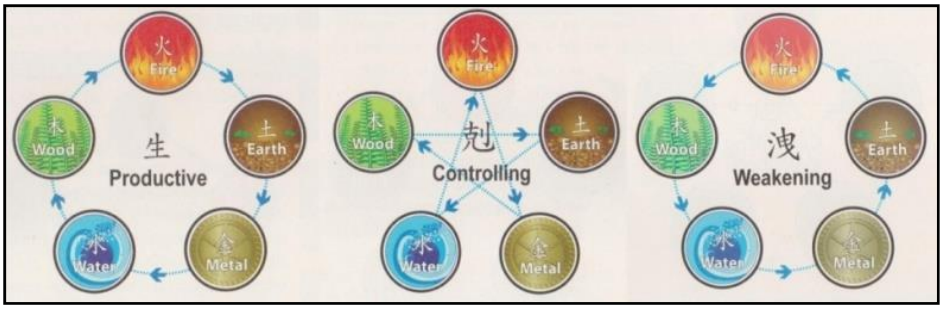

Figure 1 The Cycles of the Five Elements
Source: Lip, 2010.

The shape of the Five Elements can be seen on the gable end wall of the Chinese shophouse. The pointed shape represents Fire, the square or flat shape, Earth, the round shape, metal, the wavy-shaped, Water, and angular-shaped is Wood. Figure 2 shows the shape of the Five Elements on the gable end wall.

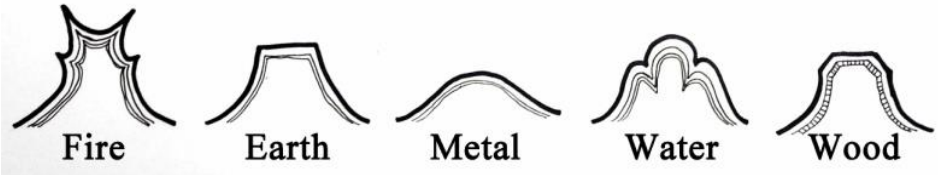

Figure 2 The Five Elements on the Gable End Wall.
Source: Drawn by author from Tan.

METHODOLOGY

To investigate the Five Elements on the case study, the qualitative research approach is employed through observation. The primary sources such as visual data and the secondary sources are gathered. All information are then presented and interpreted in the findings of this paper.

CASE STUDY

The Low Ti Kok Mansion is located in the north of Kajang Town in Hulu Langat District. Historically, this mansion was built in 1932 and was owned by Towkay Low Ti Kok (1877-1943). This mansion was sold to the Hulu Langat Hokkien Association (HLHA) in 1985 and is known as HLHA building today. Today, it still stands as an old Chinese mansion that escaped the bombing during World War II in Kajang. Figure 3 shows the floor plan surveyed by researcher during fieldwork.

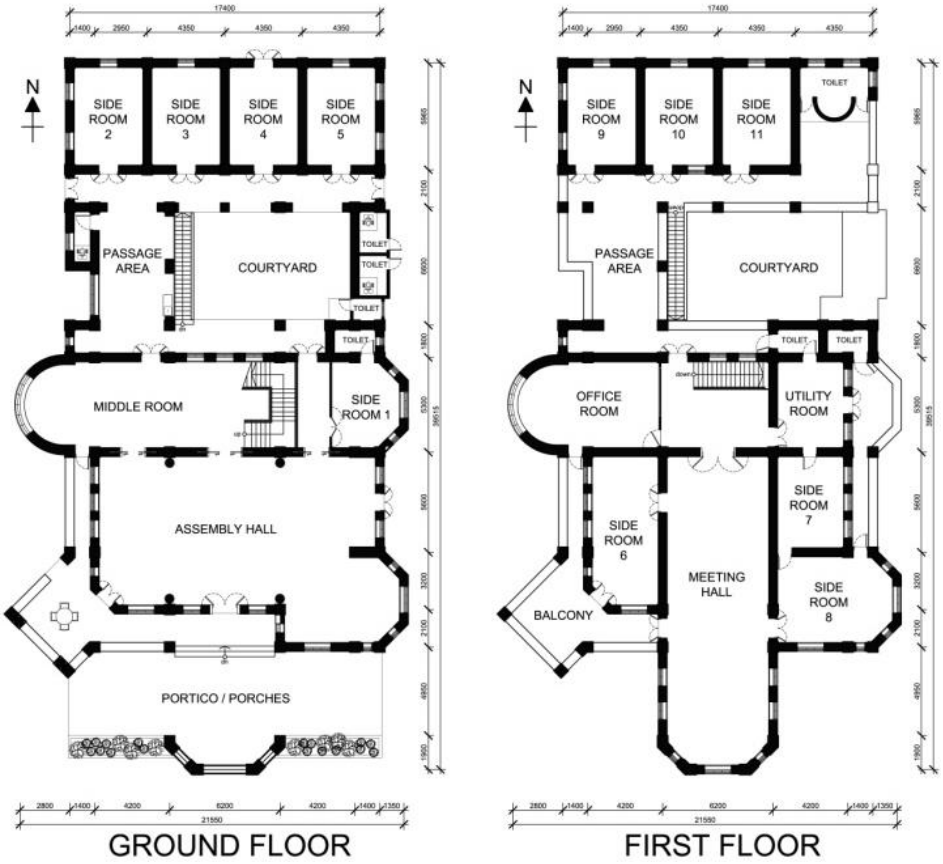

Figure 3 Floor Plan of Low Ti Kok Mansion
Source: Adapted and surveyed by author

The Low Ti Kok Mansion is facing directly south. In Figure 3, it can be seen that there are different shapes such as semi-circle, angular-shape, and square, on the outline of the floor plan of the Low Ti Kok Mansion. The semi-circle and square can be seen on the right side of the mansion while angular-shaped can be seen at the front and the left side of the mansion. These shapes will be discussed in the findings of this paper to reveal the shape related to the Five Elements.

FINDINGS

This section discusses the findings of the Low Ti Kok Mansion based on the Five Elements. According to the Four Emblems, there is a Black Tortoise at the back; Green Dragon on the left; Red Bird in the front; and White Tiger on the right of the site. These Four Emblems are related to the Five Elements and the symbolism of the shapes. They are Black Tortoise represents Water and is wavy-shaped; The

Green Dragon is Wood and rectangular or angular-shaped; the Red Bird is Fire and triangular; and White Tiger is Metal and circular.

Besides that, according to the Nine Chambers of the Magic Square, the Five Elements are also related to direction. North is Water; Northeast and Southwest is Earth; East and Southeast is Wood; South is Fire; and Southwest and West is Metal. These elements are also represented by the shape.

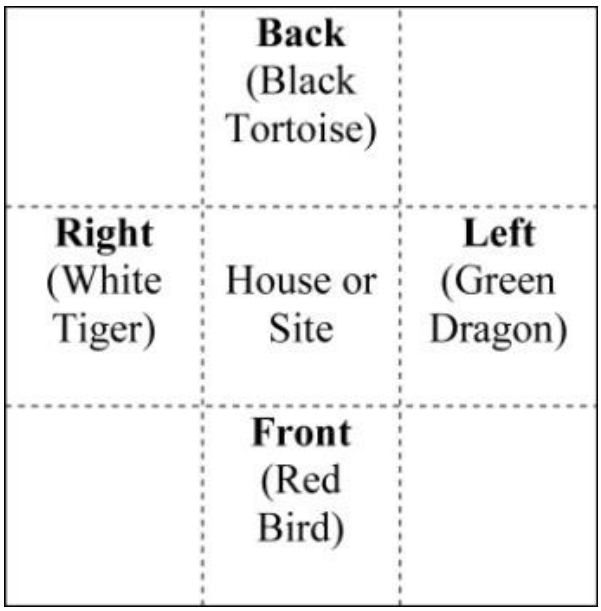

Figure 4 Four Emblems
Source: Modified by author

From the findings, it is found that the semi-circle at the right side of the Low Ti Kok Mansion has a similar concept to the Metal in the Five Elements of the Nine Chambers. The angular shape on the left side represents Wood while the square at the southwest is related to Earth. Besides that, the front of the mansion is angular-shaped which represents the Wood Element and it faces South, the Fire Element. According to the productive cycle of the Five Elements, this is preferable as Wood produces Fire.

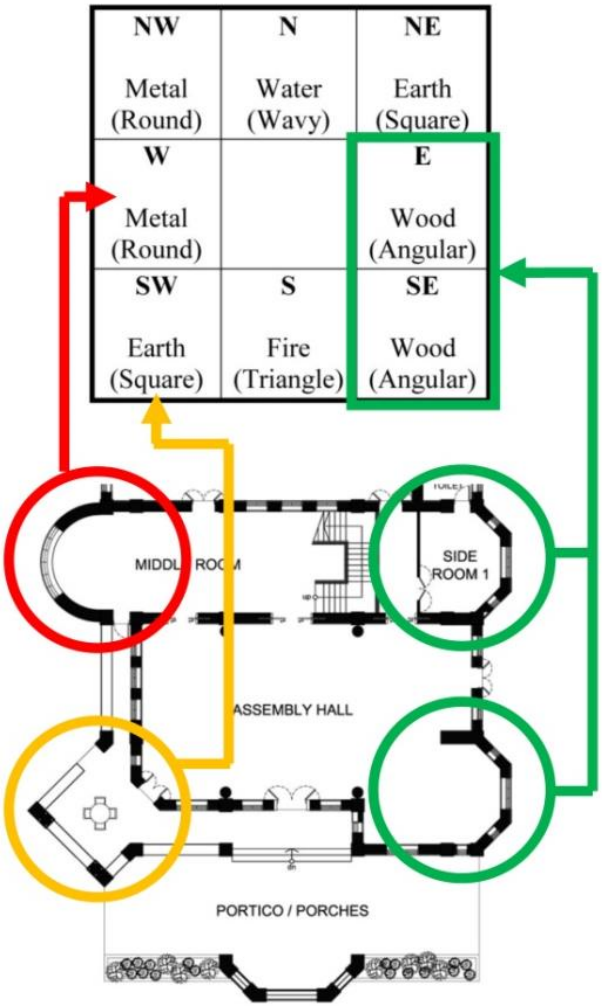

Figure 5 Findings on the Floor Plan
Source: Modified by author

CONCLUSION

This study is not only crucial but is also enlightening for the understanding of the design of *feng shui* in architectural theory. Shapes are used by humans to design buildings. The shaping of the buildings has an impact on the building and surrounding nature. The main idea of this study is the application of the shapes of the Five Elements to reflect the design principles, especially of harmony and of balance. This can be used as a guide for designers in the *feng shui* concept. It assists in enhancing the concept of sustainability in nature and future architectural space.

ACKNOWLEDGEMENT
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PLANNING MALAYSIA:
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APPRECIATION OF VERTICAL GREENERY IN A CITY AS PUBLIC ART

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Abstract

Vertical greenery (VG) is greenery where plants can be grown on, up, or against internal or external walls of buildings or as freestanding structures. Whereas, public art (PA) is a structure or form that contains an artistic expression. It is placed in public spaces. VG has gained tremendous popularity in recent years, and this offers an opportunity to integrate it as a part of public art in cities. A place with a combination of art and aesthetics with environmental principles would become a new urban art that will help extend VG's survivability and human security in the future. Most research in VG focuses on an environmental and technical aspect that consider its benefits, technical issues, feasibility, acoustic impact, sustainability, system and maintenance. On the other hand, creative methods to approach VG are seldom researched upon especially in Malaysia. Hence, this study explores this possibility from the public's perspectives. The objectives were to identify public's familiarity and values of VG as PA, and VG attributes to be as a PA. An online survey was used to obtain public's perspectives on the integration of VG as PA. The target respondents were the public, whereby the link to the survey was sent out to 400 potential respondents. The survey obtained 117 responses, and they were gathered automatically in an Excel spreadsheet. The data were converted into the themes to generate results. Findings yield positive outcomes in terms of the public's familiarity of the terminologies (i.e. VG and PA), people's awareness of VG in an urban environment, and the possibilities and potentials of VG to become a PA in Malaysian cities. It means that VG has extended beyond the environmental benefits to also become an art form for people in a city.

Keywords: Vertical greenery, public art, integration, sustainability

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INTRODUCTION

This research focuses on the potential of vertical greenery (VG) to be appreciated as public art (PA) in a city. VG is greenery where plants can be grown on, up, or against internal or external walls of buildings or acts as freestanding structures. PA is a structure or form that contains an artistic expression. It is placed in a freely accessible public space for people to view. In the 80's, there was a growing interest in environmental issues. The scenario has triggered a vision of bringing nature into cities, environmentally and aesthetically. VG is suitable in urban places, as there is insufficient urban green spaces. VG is increasingly being implemented in the city's public spaces and buildings to improve the urban life quality and ecosystems, as well as to upgrade urban realm. VG can modify temperature, improves air quality and increases biodiversity. Contact with greenery in city is also said to improve people's physiology and mental health. Hence, VG has gained tremendous popularity in recent years to be erected in public spaces. This popularity offers a great opportunity for it to be appreciated as a part of public art in city spaces. It is implied that a place with a combination of art, aesthetics and environmental principles would become a new urban art that helps to extend the survivability of VG. The interest will not be just a passing trend for one time only (Séguin, 2012).

Furthermore, most researches on VG were centred on the environmental and technical aspects, such as on the benefits, technical issues, feasibility, acoustic, sustainability, system and maintenance of VG (Peck et al., 1999; Watts, 2009). However, the creative methods to approach VG were seldom researched upon especially in Malaysia. Hence, this paper explores the views and acceptance of city residents on the creative methods to appreciate VG in public spaces. Recent increase in the popularity of VG has created the possibility to incorporate VG as 'green public art' into city spaces. The aim is to identify the possible ways VG can be appreciated as public art (PA).

LITERATURE REVIEW

There is a growing trend of using the VG system to green urban public spaces. There is also a definite need to improve the selection and appearance of PA in Malaysia (Shunmugam, 2006; Mohd Fabian et al., 2012). PA in Malaysia is claimed only typically to decorate and fill empty spaces of a public area. It lacks art quality, unable to command people's attention or evoke deeper feelings to the public. Hence, VG is seen as a new way to creatively attract the public to appreciate PA.

The utilization of VG for its beauty and functions can be traced back to as early as the 500 BC. For instance, the Hanging Gardens of Babylon applied terrace structure over arch stone beams, and were waterproofed with thick layers of reeds and tar. More recently, the garden city movement jump-started the concern and care for the environment in urban spaces in the 1920's. During the

garden city movement, Stanley Hart White, a professor in Landscape Architecture field had patented a vertical greenery system for environmental benefits, known as Vegetation-Bearing Architectonic Structure and System (Hindle, 2012). However, due to the public's concern about the strength of the structure, the concept was not popular at the time.

To understand VG's association with PA, a history of PA also needs to be considered. The term 'public art' was first coined in 1959 when the first Percent-for-Public Art ordinance in the United States was adopted by the city of Philadelphia, Pennsylvania (Cartiere & Willis, 2008). However, PA was only used for its aesthetic value during the time. In 1967, PA started to be used for environmental, aesthetic and social values. Concurrently, from the 1960's to 1980's, PA started to be adopted in Malaysia. Nonetheless, most of the artworks at this time were influenced by the post-formalist approach. However, in the late 70's, as Islamic consciousness increased, more artists began to align themselves with abstract-expressionist style, as well as Islamic centred art (Sarena, 2011). PA during this time was designed for its social, environmental and aesthetic benefits. The awareness of Land Art has also started to emerge parallel to this event as artists becoming more concern about environmental issues (Irons, 2012). This led to more interest in environmental issues, resulting in the vision of bringing nature into cities was conceived in the 80's. At the same time in Malaysia the artworks were began to be influenced by environmental awareness, social democracy and human rights (Sarena, 2011) and they began to use recycled materials in their artworks and diverse art techniques.

Figure 1 Three Types of Public Art (PA)

In 1988, Patrick Blanc's re-introduced the concept of modern VG to the world that was already initiated by Professor White in 1938. One of the most prominent examples of VG in Blanc's works was a palette of foliage that creates a subtle mixture of effects, forms and shades over the surface of walls. It has put

the VG system into the limelight whereby it was appreciated for its environmental and aesthetical utilisation.

Over the years, both VG and PA have gone through many stages of development. What can be determined from this is that the integration of both produces many benefits to city spaces. Their application and usage could be explored in many other creative ways. The sustainability of urban landscape can be generated when the site, art and people are integrated. Buildings around the world have embraced VG for its environmental, aesthetic and economic values. The application of green concepts for urban design cityscapes is made obligatory in some parts of the world. These have popularised the installation of vegetation on external street walls. For instance, a piece of garden wall art can enhance the experiential quality of the adjacent space by providing an aesthetically pleasing, calming and the environment that is closer to nature (Chin, 2010). VG as PA is an urban greening project, which creates an environment for people to be comfortable shopping, working or living, and their community's character is expressed (Watts, 2009). Hence, successful urban greening projects will be worthwhile and rewarding in the long term for the community. Currently, VG has often showcased beautiful patterns and becoming a new urban art in a city (Séguin, 2012).

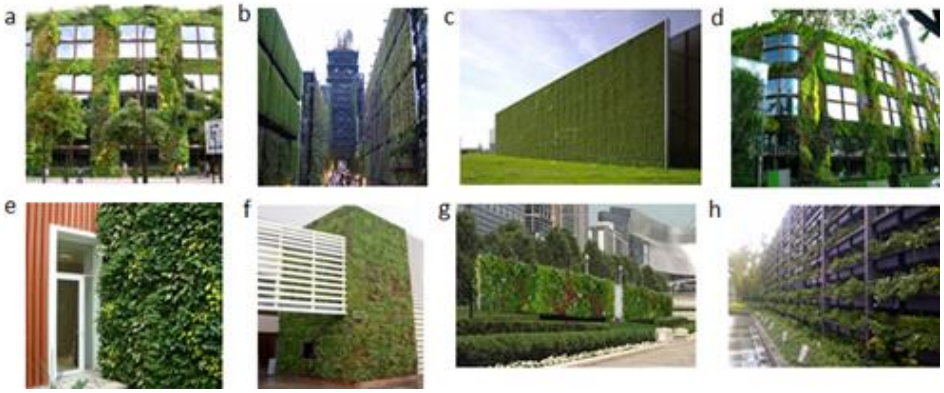

Figure 2 (a) vertical garden (VGr); (b) bio façade wall (BW); (c) green wall (GW); (d) green façade (GF); (e) vertical greenery system (VGS); (f) green scaffolding (SG); (g) green space wall (GSW); (h) living wall (LW)

Several types of VG have the potential to become PA in urban public space (Figure 2). Vertical garden (VGr) is all forms of plant surface of the wall. It allows the growing of plants, up, or on the façade of buildings (Baskaran, 2003; Green Public Art, 2010). Bio facade wall (BW) is vegetation that is guided to climb through the structure like wires or cables. Green wall (GW) is all forms of vegetation surface, while green facade (GF) is climbing plants or cascading

groundcovers trained to cover designed supporting structures (Badrulzaman, 2011). Vertical greenery system (VGS) is a way in which plants can be grown on, up, or against a façade of a building or feature walls (Wong et al., 2010). Green scaffolding (GS) applies mainly to eco-retrofitting, essentially wraps a lightweight structure around the exterior of existing buildings. Green space wall (GSW) is an eco-sphere that doubles as an exterior wall or mixed interior/exterior spaces in new development (Birkeland, 2008). Living wall (LW) consists of pre-vegetated panels, vertical modules or planted blankets that are fixed vertically to a structural wall or structure (Chin, 2010).

METHODOLOGY

An online survey was used to identify public's familiarity and responses on the integration of VG as PA. Electronic survey is becoming increasingly common because it provides strong advantages such as speedy distribution and response cycles, the ability to conduct large-scale distribution of a questionnaire to prospective respondents, and cost less compared to postal mail survey (Yun & Trumbo, 2000; Lazar & Preece, 1999). The questionnaire consisted of three sections. The first section recorded the respondent's background. The second section dealt with familiarity with the terms VG and PA. The third section explored public's views on the integration between VG and PA. The survey questions consisted of mainly closed-ended question, supported by pictorial questions and open-ended questions.

A link to the survey was sent online to potential respondents, where the respondents were automatically directed to the Google Form survey. The survey was pre-tested and fine-tuned before being distributed to the respondents. The target respondents were the Malaysian public, and the link to the survey was sent out to almost 400 potential respondents. The survey was opened for two months to allow potential respondents ample time to answer. All in all, the survey managed to gather 117 responses.

Several steps were used to analyse the online responses. The responses were automatically recorded in Excel spreadsheet and later sorted into respective themes to generate frequency distributions. The analysis process began with familiarizing the data. This phase involved reading and re-reading the responses to become familiar with its content. Important dimensions from the responses were selected using categorical analysis. Descriptive analyses were used to analyse the closed-ended questions using percentage from frequency distributions derived from the Excel spreadsheet. For the open-ended questions, category headings were used to theme the results about the objectives of the study. In this case, categorising the responses that the respondents replied and suggested based on the parameters.

FINDINGS

Respondents' Profile

The minimum age of the respondents was limited to 18 years or older to ensure that the respondents were adults. 64% of the respondents are within the age of 18-30 years old. 24% are within the age of 31-40 years old, 8% within 41-50 years old, and 4% within 51-60 years old. More than half of the respondents were female (62%). Almost half of the respondents are professionals (43%). 21% of them are academicians, 19% students and the rest (17%) consisted of various groups of professions. Regarding the place of residence, 50% of the respondents reside in Selangor, 21% in Kuala Lumpur and the others (28%) live in other states in Malaysia. 57% of the respondents have degree qualification and 32% have postgraduate qualification. 8% of the respondents are diploma holder and 3% only have secondary school education.

Familiarity with Vertical Greenery and Public Art

Concerning familiarity, less than half of the respondents (48%) are familiar with the term vertical greenery (VG). It is because VG is a new term among Malaysians, and it is associated with terms that are closer to it such as *vertical wall* and *green wall*. The public might have encountered it before, but unsure of the terms used to describe it.

Eight types of VG, as in described in Figure 2, were shown to the respondents using images in pictorial questions. As shown in Table 1, most of the respondents are familiar with the VGS (71%), followed by GF (69%), LW (67%) and BW (56%). Less than half of the respondents are familiar with the GW (48%), VGr (45%), GS (39%) and the GSW (34%). 56% of the respondents have seen the VGS in the public spaces. The results suggest that even though the respondents are not very familiar with the term VG, they do recognised the types of VG images that were shown in the survey. Some have also seen it personally. Overall, the results suggest that even though VG is a new term of landscape approach in Malaysia, the public is quite familiar with it.

Table 1 Familiarity with Types of VG

Variables		VGr	BW	GW	GF	VGS	GS	GSW	LW
Familiarity on types of VG (%)		45	56	48	69	71	39	34	67
The types of VG that respondents have seen in a public area (%)		26	40	22	49	56	26	21	48
Location of VG being displayed	Selangor	3	13	11	16	8	10	3	12
	Kuala Lumpur	9	3	6	9	18	7	12	24
	Others	7	4	3	4	4	4	6	15

Note. Highlighted figures are the highest frequency (%)

In terms of familiarity with the PA term, majority (78%) of the respondents is familiar with the term. Three types of PA, namely the integrated art (integrated walls-IW, integrated fence-IF), environmental art (EA) and stand-alone art (SAA) were shown to the respondents to identify their familiarity and preference of PA in the urban public space. The finding is necessary to understand the public's knowledge about PA. Results on the familiarity of different types of PA are shown in Table 2.

Table 2 Familiarity with Types of PA and the Preferred PA

Variables	IA		EA	SAA
	IW	IF		
Familiarity with types of PA (%)	93	79	73	92
Preferred PA (%)	20		46	34

Note. Highlighted figures are the highest frequency (%)

The respondents are most familiar with IW (93%) followed by stand-alone art SAA (92%), IF (79%) and EA (73%). The result shows that the Malaysian public is more familiar with the term PA as compared to the term VG. Regarding preference in types of PA, the result shows that the respondents preferred EA out of all types of PA (46%). It is followed by SAA (34%) and IA (20%). The result suggests that even though the respondents are more familiar with IW (integrated wall), they prefer EA (environmental art) and would like to see more EA being implemented in the urban spaces. Also, these findings reveal that the public is aware of the importance of having more environmental-friendly PA in urban public spaces.

Integration of Vertical Greenery as Public Art

To assess respondents' familiarity and views whether VG can be appreciated as PA, they were asked to identify four types of VG that can act also as a PA. These are VG as IW, VG as IF, VG as EA and VG as SAA. To assist the respondents, pictorial questions with the image of the abovementioned VG were provided in the survey. Results are shown in Table 3.

The results show that the public in Malaysia is not yet very familiar with the integration between VG and PA. About half of the respondents (43%) pointed out that they are familiar with VG as EA. Nonetheless, 85% of the respondents stated that they have seen VG as SAA in urban public spaces in Malaysia. The results show that the public is familiar with the VG as PA in Malaysia even though they seldom encounter the artwork personally in urban public space, but have seen the artwork being displayed in Malaysia in the media. It shows that although VG was still not widely implemented as PA as compared to other countries, the implementation has already started in Malaysia. Thus, it would not be a hindrance for it to be widely implemented in Malaysia.

Table 3 Familiarity of VG as PA

Variables	Detail	VG as IW	VG as IF	VG as EA	VG as SAA
Familiarity with VG as PA (%)	Yes	42	23	43	23
	No	57	76	54	72
Familiarity of VG as PA being displayed in urban public space in Malaysia (%)	Yes	80	84	74	85
	No	16	15	23	10
Location of VG as PA (%)	Selangor	3	3	10	1
	Kuala Lumpur	6	12	-	1
	Other states	1	4	4	4

Note. Highlighted figures are the highest frequency (%)

On the idea to integrate VG as PA, 92% of the respondents agreed with the idea to integrate VG as PA. It shows that the public is very interested in the idea to implement VG as PA. An analysis of the survey data found seven dimensions or reasons for their agreement for the appreciation of VG as PA (Table 4).

Table 4 Integration of VG as PA

Reasons to integrate VG as PA	Frequency (no)
1. Aesthetic: aesthetic value, attractive	9
2. Environment	36
Mitigate greenhouse effect; pollution	8
Nature; balance development; scenery	12
Environmentally friendly	11
Native plant species	2
Health benefits	1
Minimum land usage	2
3. Awareness	11
Promote message to public	2
Greener Malaysia; appreciate green art	9
4. Economic	7
Attract tourism; economic benefit	5
Enhance space value	2
5. Design	9
Possible trend	3
Unique; creative; Providing varieties	6
6. Development of VG - improve	1

7. Development of PA	6
Promote green art; awareness on PA	3
Quality PA; artistic; diversity of PA	3
Support social needs	1

The most cited reason by respondents is that VG is good to be appreciated as PA for the care of the environment (36 times). The respondents suggest that it can mitigate the greenhouse effect, bring nature in cities, environmentally friendly, improve the scenery, produce environmental benefits, utilise many plant species in Malaysia, mitigate pollution problems, balance between development and nature, health benefits, and minimum land usage. Among the respondents' insights on this is *"...The development always concerns on the buildings and the facilities. Everything is made up of concrete and metal. It is a good idea to implement the greenery in the area for the aesthetic value of the area, landmarks, and most importantly the environment, such as cooling down the area, cleans the air, etc..'.* The response shows that the idea to integrate VG as PA is well accepted by the public and the idea would have a bright future to be realised.

The Attributes of Vertical Greenery as Public Art

Questions on the attributes of VG as PA preferred for city spaces in Malaysia were also included in the survey. Table 5 shows the respondents' answers, where 59% - 78% of the respondents preferred all types of VG to be moderate in size. In terms of colour, 56% - 67% preferred it to be a combination of warm and cool colour. 56% - 67% agreed for the VG to be located outdoor rather than indoor. For the design attribute, 84% - 92% favoured the VG to be a combination of natural and formal design. Finally, 45% - 56% prefer the material to be a combination of natural, recycled and new materials. These responses would help designers to have ideas on the attributes that should be taken into consideration when designing VG as PA.

Table 5 Preferred Attributes of the Implementation of VG as PA

Attributes	Dimension	Vertical Greenery as Public Art (%)				Remarks
		VG as IW	VG as IF	VG as EA	VG as SAA	
1. Size	Small	0	9	1	10	
	Moderate	62	78	59	61	Size: Moderate Range: 50%-80%
	Large	38	14	37	26	
2. Colour	Warm	4	5	11	10	
	Cool	29	32	28	24	
	Combination	67	61	56	61	Colour: Combination Range: 50%-70%
3. Location	Indoor	5	7	3	9	
	Outdoor	92	91	91	84	Location: Outdoor Range: 80%-92%

4. Design	Natural	27	27	29	22	
	Formal	5	10	8	10	
	Combination	66	57	57	62	Design: Combination Range: 50%-70%
5. Materials	Natural	23	24	25	23	
	Recycle	18	17	15	15	
	New	3	5	9	8	
	Combination	56	45	45	50	Material: Combination Range: 40%-60%

Note. Highlighted figures are the highest percentage (%)

Most importantly, the open-ended question on the preference of attributes also produced many valuable suggestions. 27 responses were obtained from the respondents, which can be categorised into 14 dimensions as shown in Table 6. The highest frequency of the attribute is in the choice of plants. The public suggests the consideration of Malaysian native plants, the plants' habitat, aromatic plants and medicinal plants. The result implies that the public can accept the idea to integrate VG as PA and is very keen on it.

Table 6 Additional Attributes Derived from Respondents' Responses

Attributes	Frequency (nos.)
1. Maintenance - proper and easy maintenance; low	5
2. Function – shade; health benefits; good for LA Profession	3
3. Education - appreciate nature	1
4. Islamic Values	1
5. Location	1
6. Public acceptance	1
7. Types of plants – species; native plants; habitat; aromatic; medicinal	6
8. Supporting elements – recreational element	1
9. Irrigation system	1
10. Locality - cultural heritage elements; building facade's character	1
11. Awareness - message	1
12. Safety – no vandalism; safe	2
13. Design - retaining wall along the highways; green standing structures	2
14. Cost - management	1

Recommendation for Vertical Greenery to Be Integrated As Public Art

In terms of recommendations, 46 respondents provided ideas which were classified into seven categories (Table 7). Education and promotion (15 times) are the utmost importance to improve the integration. It is vital to educate the public to care for effort in the maintenance of the VG and to educate public to realize the idea. Awareness, strong promotion through mass media, promotion through expo and exhibits, 'bring back nature campaign', no vandalism

awareness, education using new technology and to educate the developers on the benefits of VG are among the suggestions.

Table 7 Recommendations to improve VG as PA in Malaysia

Potential Improvement	Frequency (nos.)
1. Government Initiatives	11
Government's Act; green living enforcement	4
Additional budget	2
Competition	1
Specific allocation of space	1
High score in GBI	1
Incentives/subsidy to developers/consultants; Cooperate with private companies	2
2. Function – benefits; multi-purpose	3
3. Education and Promotion	15
Educate public to maintain, realize the idea; awareness; no vandalism awareness	8
Strong promotion through mass media; exhibition; campaign on nature	5
Education with new technology	1
Educate the developers	1
4. Location – strategic place; legible	2
5. Maintenance - low	2
6. Design	12
Implement at early stage of design; compulsory in contract; better design	6
Include in LA scope of work	2
Approach companies	1
Integrate VG with well-known Malaysian landmark	1
Use climbing plants	1

CONCLUSION

VG can contribute to the quality of life as it serves numerous advantages towards a city. In ensuring the survivability of VG and sustainability of the urban environment, a creative way to implement green in urban public spaces must be explored. VG and PA complement each other in aesthetic, environment and economy. The integration of both will create not only public art that is high in aesthetic quality but also environmentally sound. The findings of this study suggest that the public is very keen to see more implementation of VG as PA in Malaysia. Hence, more emphasis should be given to developing a creative, innovative and quality environment that will later encourage further research on integrating VG as PA in the urban landscape. The public insights regarding this matter are very crucial for designers to come out with a sound recommendation

of VG as PA. This exploratory study provides the stimulus for designers to rethink approaches to the functions, content and strategies for VG as PA.

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DESIGN PROBLEM-SOLVING: UNDERSTANDING THE SIGNIFICANCE OF ITERATIVE-BEHAVIOUR IN DESIGN

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Abstract

Different concepts and definitions associate iterative-behaviour with repetition. This study consider iterative-behaviour simply means as the act that involve repetition of activities to improve the evolving design. The research further investigate the significance of designer iterative behaviour in design using sketching as the media for design interaction. The retrospective protocol analysis of the video data have identified and measure designer iterative behaviour in design, through a sketching and scoring sessions by five (5) final year undergraduate students and five (5) design tutors, all from the Department of Architecture, University of Technology Malaysia. The design and score were qualitatively and quantitatively compared using close group discussion and the Pearson correlation coefficient analysis. The result shows that in design problem-solving, designer iterative-behaviours were not statistically significant in determining the quality of design.

Keywords: Iterative-behaviour, modification, revisit, fixation, representation

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INTRODUCTION

Iterative-behaviour simply means involving repetition of activities to improve an evolving design (Eppinger, Nukala & Whitney, 1997). Different concepts and definitions associate iterative-behaviour with repetition. Among research specifically conducted to measure iterated-behaviour uses straight observation, interviews, questionnaires, and protocol analysis with records of verbal and actions of real design activity (Stauffer & Ullman, 1991; Ericsson & Simon, 1980) To date, there has been little research specifically addressing issues of designer iterative-behaviour in design (Jin & Chusilp, 2006). Literature indicated repetitive actions such as physical actions, sign language, and eye movement, and sketching activities such as regroup, interpret, reorganize, generate, revise, refine and consolidate are all form of iterative-behaviour developing a design idea (Robbins, 1994; Gero, Tversky & Purcell, 2001; Suwa & Tversky, 1997; Schön, 1983; Goldschmidt & Smolkov, 2006; Safoutin, 2003). However, studies on the relationship of iterative-behaviour and sketch quality was slightly under researched. To this end, this study had successfully observed, identified and analysed some of the above classification of iterative-behaviour in design problem-solving that uses sketching as the design tool (Furlinger & Moore, 2008; Aguero et al., 2010).

THEORETICAL FRAMEWORK

In recent times information and communication have become key features in any technological advance. The use of sketch as a medium for communication that has begun in early civilization and has continued up to the present digital era for design ideation. This study adopted a method use to study designer behaviour by Adams and Atman (1999) using fresh and senior students in their engineering design coursework. The focus of their work was to identify designers' behaviours, such as the monitor, search, verify, plan, redefine and capture, and further related to design competency. The research method used was verbal protocol. Alternatively, this study used sketching and pin-up design assessment as design media and scoring tool. Coding categories were equally used to describe and measure the specified required behaviour. Although the result of their study suggest designer behaviour is a significant component of design activity, whereas this study suggests otherwise. Their result indicates measures of designer activities correlate positively with design success, and senior students tend to have more efficient behaviour than freshman students (Adams & Atman, 1999).

The architects are trained professionals charged with the responsibilities of solving design problems and managing the building processes. The behaviour of these professionals could provide insight into their problem-solving processes; therefore lacking in this knowledge constitutes a significant research gap in the study of Architectural design process. Iterative-behaviour is the act of repetitive behaviour, usually with the aim of achieving the desired goal, yet the occurrence

of iterative-behaviour in architectural design is under-researched. In addition, since sketch is a common visual thinking tool for design, the study of designer behaviour with regards to it potentially forms an important issue of research in the architectural design process. Findings and results of this kind of study can assist stakeholders in design domains to improve on existing manual and traditional methods of design problem solving. The main objectives of the study are to identify and investigate the role of designer iterative-behaviour in sketching using final year undergraduate architecture students and design tutors.

ITERATIVE-BEHAVIOUR

According to Wynn, Claudia and John (2007), iterative-behaviour has five (5) attributes namely repetition, revisit, rework, modification and fixation. Repetition means the repetition of a process such as do it again, reworks, copy, delineation and revisit activities until you are satisfied with the outcome of your design. Copy activity means the act of duplication or reproduction direct or indirect transfer of drawings from the same sheet or between two sheets. Another aspect of repetition considered is delineation as the process of outlining or defining an object for further clarification by tracing, shading or colouring. According to Wynn, Claudia and John (2007), modification is the refinement of primary characteristics of secondary characteristics by enhancing and integrating of shapes, lines or texture together with maintaining the originality of the design. Also, by combining and amalgamating different parameters of various shapes to converge as well-defined design (Wynn, Claudia & John, 2007).

Visual or Haptic visitation using eye movement or haptic hand contact during sketching are other forms of iterative-behaviour found in this study. Visual visitation refers to designers' act of visit and revisits with eye movements between drawing sheets at a distinctive time interval during the sketching session, while Haptic visitation means designers transformation moves between drawing sheets using physical hand movement during sketching. Also Haptic and Visual visitation are also found to transfer or communicate information ideas or to draw during design. Further research can prove the need to develop a computerized designer haptic sketching tool for effective sketching activity. Figure 1 illustrates visual and haptic visitations in the sketching session. According to Bilda, Gero, & Purcell (2006), designers' undergo some premature difficult caused by cognitive and behavioural activities such as brainstorming and handling tools during sketching. A moment where innovation is blocked (Figure 2). The fixedness occurs as a result of identifying and finding solutions to the problem using knowledge, skills, experience, measure, construct, observe, tasks and information or handling sketch working tools such as pencil, pen, and drawing sheet. Designers' communicate their ideas using methods such as visual information transfer either manually or computerized. According to Fish and Scrivener (1990) designers communicate abstract and concrete ideas using

imagery and sketches (Abstract), schematic drawings and 3D modelling (Concrete). This study used the same concept to categorized designers embodiment design as Concretization while Abstraction represents the method of preliminary designs presentation. This study used the 5 classifications of iterative-behaviour illustrated by Wynn, Claudia and John (2007) and in Table 1 as the variables that will represent iterative-behaviour in the research.

Figure 1 Designer Visual and Haptic Visitations during Sketching Activity

Figure 2 Designer Cognitive Fixation in Design

METHODOLOGY

Among methods of studying design activities are protocol studies, observation, interviews, content analysis, close group discussion and linkography. Eastman conducted the first protocol study in 1968 in which experienced architectural designers were asked to redesign the interior of a residential bathroom (Akin & Lin, 1995).

Protocol studies is classified into content oriented and process oriented studies (Gero, Tversky & Purcell, 2001) where the content-oriented approach is centred on the study of the drawings produced, such as sketch, CAD drawings, and models while, the process-oriented approach is the study of the process of production such as behaviours, verbal use, and gestures. Most recently an empirical protocol analysis was used to compare two design working environments, which were manual pencil and paper and the monitor, keyboard, mouse working environments, using FBS, Chi-square Test, and Paired-T test (Tang, Lee & Gero, 2010).

This study select protocol study as research methodology because of the ability to study procedures based on behaviour, verbalization, and gestures found in architecture, industrial design, mechanical engineering, electronic engineering, and software design conducted in an observed experiment involving a drawing or sketching process (Cross & Anita, 1996).

The aim of this research is to identify and investigate the significance of designer iterative-behaviour in design problem-solving. The research method and design include stages of experimental design, subject recruitment, conducting experiments, transcribing protocols, coding schemes, quantitative and qualitative comparisons using close group discussions with a supervisor and members of the research group, literature review and non-probabilistic experiment that established findings and possible options for future research.

EXPERIMENTAL DESIGN

The experimental design consists of planning, positioning, and distribution of experimental components such as designers, instruments with appropriate distribution of methods, processes, time, position of the instrument, space allocation and other facilities required for the study. The design consists of the designers positioning, design task and arrangement of supporting instruments. The designers are five highest grade score final year students of architecture selected based on their sketching ability, design grade and willingness to participate in the exercise. The selected subjects worked independently for a period between 45 to 60 minutes.

The design problem requires the design of an internet café for the international student of UTM. The café should have a range of shopping and commercial shops, along with some public, cultural and social space within the same site. It will also have some courts. There shall be adequate parking facilities and landscaping to provide the student with a sense of identity. Pedestrian paths and sidewalks shall ensure safety for the student from vehicular movement. The proposed design shall aim to evolve a more humane internet café through sustainable strategy, appropriate construction and technology, innovative planning, creative architecture, and sustainable environmental design. These shall be the main criteria for the evaluation of the project.

Experimental procedure akin to this research experiment was conducted using two high-level video cameras in the corners of the room20. One of the cameras points to the designer behaviour while the other to the sketching activity (Dorst & Cross, 2001). This study also used three video cameras, one digital photo camera, film editing computer system, stopwatch, bell, voice recorder, loudspeakers, drawing sheets and instruments, table and chair.

These instruments are technically arranged in an Audio/Visual Lab as illustrated in Figure 3.

Figure 3 Experimental Set-up

DESIGN ASSESSMENT

In a similar context, a research study conducted an experiment that uses design tutors assessments as a method of obtaining the overall 'quality of a design using five independent, skilled design teachers from the TU Delft Faculty of Industrial Design Engineering, all of whom are also practicing designers to assess the designs (Dorst & Cross, 2001). Below is the procedures of the design quality measurement set-up:

First, the assignment was read, and some of the relevant information were shown to the judges. The judges could ask questions for further clarification. Slides of all the concepts were shown in random order for 15 seconds, accompanied by a one-sentence summary to explain the way each of them works.

The scoring categories together with the design concepts are presented to the judges for scoring. The scoring categories are creativity, aesthetics, technical aspects and ergonomics, and business aspects. In the last run-through, the judges were asked to give total judgments of the concepts. Thus, the 'total' judgments is not a mean of the other scores, but a separate, 'overall impression' score (Dorst & Cross, 2001).

In this research, the assessment was done by experienced architectural design academicians from the architecture department at the Faculty of the Built Environment, Universiti Teknologi Malaysia. The drawings produced by the students was collected immediately after every experimental session and immediately presented to the assessors for scoring.

The scoring process was the same as the normal "pin-up" studio design assessment. Four different criteria were used to judge a design where each criterion have a maximum of 25% marks which in sum gives a total of 100% marks. The first criterion is designer ideation (Aesthetics order) which is the role of achieving a sense of unity or synthesis through the characteristics of shapes,

patterns, or detailed that constitute the design (Laseau, 2001). The second criterion is designer skills (Proficiency in communication) which represent the designer ability to communicate explicitly design ideas (Laseau, 2001). The third criterion is the progression (transformation) in design, which is the transformation of concept and detailed design (Laseau, 2001). The final criterion is the clarity of the information contained in the drawing (Laseau, 2001).

RESEARCH DATA

The process of data collection is classified into phases of different protocols starting with an introductory warm-up exercise before proceeding with both sessions (design and scores). The first category of data is the drawing while the second category is the information derived from video record based on the five variables that represent iterative-behaviour, i.e. repetition, modification, revisit, representation, and fixation. Then the third and final category which is the result of the design quality measurements carried out by the design tutors (Data on Design Quality Measurements).

Table 1 Proposed Coding Categories for the Study of Iterative Behaviour

ACTIVITIES	CODE	ACTION	DESCRIPTION
Repetition	C1 D1	Copy Delineation	The act of duplicating and defining objects in sketching
Modification	E1 N1	Enhancement Integration	Adding of lines, colour, texture, magnitude as well as connecting shapes in sketching
Revisit	V1 H1	Visual Haptic	Designer eye and hand contacts during sketching activity
Fixation	C2 B1	Cognitive Behavioural	Designer fixedness during caused by Brainstorming or physical actions
Representation	C3 A1	Concretization Abstraction	Detailed and conceptual design

The authors further divided the five variables into ten sub-variables of copy, delineation, enhancement, integration, visual, haptic, cognition, behavioural, concretization and abstraction. These ten sub-variables are the designer behaviour that represents iterative-behaviour in the design session. The second category is the score that is produced by the four judges. The scoring variables include ideation, clarity, skills, and progression which collectively give the actual measurement of the sketch. Each variable is assigned with 25% weight, and the sum of the four variables makes the actual measure of the design. The approach used in extract the data from the data involves the use of various tables and codes for data categorization and collection.

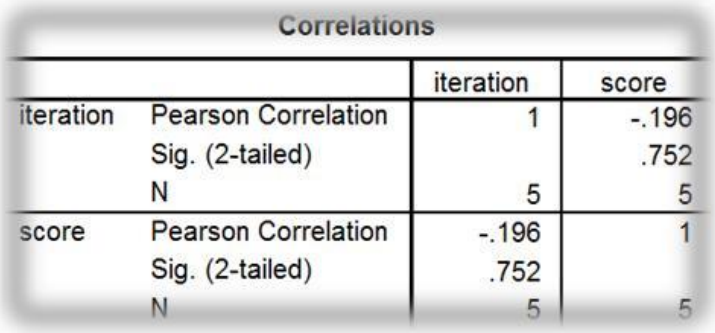
ANALYSIS AND RESULT

Processing and summing designers' iterative-behaviour and judges score has established the figures that has been used for qualitative and quantitative data analysis. The two different analysing factors are judges' score and iterative-behaviour. Table 2 illustrate the sum of individual designer iterative-behaviour and score.

Table 2 Data on Designers Iterative-Behaviour and Score

Designers	Iterative-behaviour	Score
D1	166	74
D2	204	79
D3	122	79
D4	161	62
D5	242	69

Based on the result of the observed designer iterative-behaviour as presented in Table 3, Figure 4 indicated that the relationship between the sum of iterative-behaviour and score (column 2 and 3 in table 2) was negative and weak. Moreover, the influence of the measured iterative-behaviour seems to be very low or even close to zero when compared with the score implying that iterative-behaviour has a negative and weak relationship with the score.



Correlations

		iteration	score
iteration	Pearson Correlation	1	-.196
	Sig. (2-tailed)		.752
	N	5	5
score	Pearson Correlation	-.196	1
	Sig. (2-tailed)	.752	
	N	5	5

Figure 4 Correlation score between Iterative-Behaviour and Design quality (Score**)**

Table 3 Research Data for Iterative-Behaviour

Subjects	ITERATIVE-BEHAVIOR									Sum
	D1	E1	N1	V1	H1	C2	B1	C3	A1	
D1	44	6	6	21	21	0	0	38	9	166
D2	59	4	4	33	33	0	0	48	2	204
D3	18	3	3	30	30	0	0	10	9	122
D4	43	5	5	36	34	0	0	16	1	161
D5	48	5	5	53	49	0	0	32	4	242

However, the findings have shown some positive relationship between skills and score together with ideation and progression. There are nearly no correlations between Iterative-Behaviour and score but some findings between other scoring criteria have a strong and positive relationship with iterative-behaviours. The result further expressed that getting higher scores in architectural design sketch is not related to designer iterative-behaviours as presented in Table 4.

Table 4 The Correlation between Iterative-Behaviour and Scores

	Correlation coefficient
Iterative-Behaviour and Score	-0.196

CONCLUSION

This study examines the role of iterative-behaviour in architectural design sketching where the empirical comparison is used to compare iterative-behaviour and sketching through protocol analysis and Pearson correlation coefficient analysis. The results show that the relationship between iterative-behaviour and score was negative and weak. Moreover, the influence of iterative-behaviour seems to be very low or even close to zero when compared with the score implying that iterative-behaviour has a negative and weak relationship with the score of architectural design sketch. However, the findings have shown some positive relationship between skills and score together with ideation and progression. The results of Pearson correlation (Table 3 and Figure 4) show that there was no significant relationship between iterative-behaviour and a total score of architectural sketching processes. In other words, too much of iterative-behaviour does not have either positive or negative impact on the outcome of the overall score of an architectural sketch. Maybe the reason for the negative and weak correlation result could be due to the conventional sketching method used in this research. Maybe a computerized sketching tool could proof a strong and positive relationship between iterative-behaviour and score.

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PLANNING MALAYSIA:
Journal of the Malaysian Institute of Planners
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ARCHITECTURAL HERITAGE RESTORATION OF RUMAH DATUK SETIA VIA MOBILE AUGMENTED REALITY RESTORATION

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Abstract

This paper focuses on Mobile Augmented Reality (MAR) for architectural heritage restoration as an alternative technique to visually restore the ruined rear house of Rumah Datuk Setia, Kuala Kangsar, Perak. The research consists of the development of Virtual Heritage (VH) based on the architectural heritage information of the ruined rear house, such as spatial organization, construction, ornamentation, materials; as well as "Augmented Reality" (AR) for architectural heritage restoration via mobile devices, such as smartphone and tablet. The objective is to develop Mobile Augmented Reality Restoration (MARR) of Rumah Datuk Setia, as a showcase of architectural conservation technique, for future restoration. The study reveals the process by integrating layers of architectural heritage information – VH, MAR and other enabling technologies as primary mediums for architectural heritage restoration. The research manifestation introduces a new technique of architectural heritage building restoration through MARR. It highlights necessary elements needed to be considered, and challenges, in developing the MARR, which can be applied for future architectural restorations.

Keywords: Virtual heritage, mobile augmented reality, architectural heritage restoration

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INTRODUCTION

Architectural heritage restoration normally comes in physical forms, which requires commitments in terms of time, cost, and energy. Physical restoration of a building of authentic values entails careful handling so as not to damage the original building elements. Thus, to restore architectural heritage virtually is perceived as significant to "preserve, protect and interpret" cultural and building heritage (Noh, Sunar & Pan, 2009). This research proposes an alternative restoration technique to visualize architectural heritage information at the historical site by employing MARR application and integrating it with other potential enabling technologies.

In doing so, the research intends to develop MARR of the ruined rear house of Rumah Datuk Setia (Datuk Setia House), as a showcase of MARR at the heritage site. "MARR" is a term to describe the utilization of mobile devices, such as smartphone and tablet, to visualize architectural heritage information, which has been virtually restored in the database. Development of MARR involves a thorough study of the original run-down building representation, as many similarities as possible.

Since physical architectural heritage restoration is scarcely affordable, this alternative restoration technique would be established even though the original architectural heritage on the site is in ruin. It offers an extraordinaire experience showcasing the legacy of the priceless Malay – Colonial architectural heritage in its glory days.

RUMAH DATUK SETIA

Rumah Datuk Setia is distinctive among other colonial bungalows due to its hybrid architecture. Colonial influences' immersion into the local building tradition with prominent Islamic principles became the primary ideology underlying its design approach. The development in Perak and the British intervention in the local scene have brought new materials and architectural style to the design of local dwellings. The 86-years-old mansion sits within a sixteen acres land, in Kampung Enggor, Karai, Kuala Kangsar, Perak.

Historical Architectural Components

Built approximately in the 1930s, the house was believed to be purposely designed by a British architect for the village chief, Penghulu Endut. Rumah Datuk Setia is divided into two main buildings: front and rear.

The front facade accentuates the house's characters - carefully adapted in response to his personality. As one approaches towards the mansion, one would notice this symmetrically designed building embraces a hybrid of Colonial and Traditional Malay architecture, embellished with decorative motifs, which portrays the owner's stature. The bungalow's grandeur scale is inspired by neo-classical public buildings and palace designs in Malaysia during the period.

The most prominent feature is the entrance porch (porte cochére), with Greek-style Corinthian capital using Setawar leaf motifs and cornice detailing on the entablature, on top of paired masonry columns. Its colonial architecture is indicated by the plastered brick masonry external walls and columns, originally in peach colour; and symmetrically protruding polygonal verandas (*anjung*) on both sides with the same column design. Floral motifs of Lotus flower and Setawar leaf symmetrically and repetitively enhance the arches.

Decorative floral ornaments at the fascia board and above the window lintels enhance the elegance of the building's appearance. Another interesting architectural feature is the trefoil arches discernible throughout the ground floor above the windows, which are uniformly glazed with small panes, and regularly spaced with arched mouldings at the top. The space planning demonstrates colonial characters through the formal and symmetrical layout. The front house layout is designed mainly for administration, whilst the upper floor and rear house are the family's dwelling areas.

In contrast, the rear building is instilled with traditional Malay architecture with square and cylindrical masonry columns at the ground level and common timber post-and-beam frameworks on the upper floor, with bigger and higher scale to adapt with the proportion of the colonial domain. Rafter boards (*papan sisek*), wooden lattice walls, lattice above openings and Malay floral motifs were carved onto the fascia boards. The open-plan space planning on the upper level depicts the traditional space division of a typical Malay house, with the *selang* (hallway) as a transitional space between the front and rear house; and the kitchen at the back. This space also includes a set of staircases at the back entrance, and another ladder on the east side, which leads straight into the kitchen.

RUMAH DATUK SETIA RESTORATION

The focus of the MARR is at the rear house, which is in a dilapidated state. Due to the lack of maintenance by the owner(s), major defects are apparent on floors, walls, roof structure, as well as finishes. The timber lattice walls at the ground floor are missing, leaving only traces of low-height brick masonry walls of about 580mm. Square brick masonry and round Doric style columns on the ground support the timber beams and floor joists on the upper floor. Also, there is evident of classical ornament below the timber beams acting as light holder below the upper floor joists. There was turquoise painted horizontal timber strip walls and panelled ceilings at the top floor interior. The walls, including openings, have been destroyed by termites. The roof systems are severely damaged, and cracks are visible on the leftover roof tiles.

Figure 1 The Rear House of Rumah Datuk Setia

METHODOLOGY

The research is based on action research where the researchers are directly involved in the process of establishing the MARR of Rumah Datuk Setia. There are three stages; data gathering, action planning and measuring. These processes guide the researcher to unfold the relations between architectural heritage information and virtual heritage (VH) reconstruction by categorizing the architectural building components. The researchers also adapt mobile augmented reality (AR) and other enabling technologies to assist MARR for on-site tour. While exploring the MARR on-site, the researchers synthesize the findings based on the technical issues, challenges and limitations.

VIRTUAL HERITAGE (VH) AND AUGMENTED REALITY TECHNOLOGY

The AR technologies can be considered as a practical and successful approach of combining the Virtual Reality (VR) into the real environment. It inspires "Architecture, Engineering and Construction" (AEC) (Wang, 2009) as well as "Architectural Reconstruction and Restoration" (ARR) to look into the new possibility of combining the VH setting with the physical characteristics and tools through the AR technologies. The aim is to offer "Experiencing Architecture" (Raynsford, 2016) by overlaying the VH with the "Real Environment" (RE).

The early AR reconstruction and restoration such as "Geist" (Kretschmer et al., 2001) and "Archeoguide" (Vlahakis et al., 2002) promised a new way of reconstructing and restoring the architectural heritage, which allows the visitors to experience the Heidelberg Castle while walking, guided by the electronic guide at the archaeological site of Olympia. The VH also plays an active role in reconstructing the monument and verifying fragments of the Parthenon (Papaioannou, Karabassi & Theoharis, 2001) and restoring some buried artefacts

at the Museum of Terra Cotta Warriors and Horse (Zheng & Zhang, 1999). Regarding touring on the historical site, iTacitus established the MAR guide for a historical sight, which applied historical media as augmentation layers (Zoellner et al., 2007). The aim is to use 2D feature-tracking method for exterior exploration.

Thus, the research fully utilizes the role of VH with architectural heritage information contents and overlays them with the historic site. This alternative technique promises a new way of architectural heritage documentation, history and culture resources; while giving the opportunity to simultaneously visualizing and reconstructing the lost architectural heritage, and also experiencing the architectural heritage without risk of damage as well as enhancing the virtual tourism (El-Hakim et al., 2004).

AR and Other Enabling Technologies

The development of AR technologies is mostly related to other enabling technologies. The research attempts to unfold these techniques, which could assist MARR regarding localization, User Interface (UI) design, online environment and mobile device technologies.

In term of localization, the usage of GPS, RFID, UWB, SF, SLAM (Hammad, Wang & Mudur, 2009; Razavi & Haas, 2011a; 2011b; Shahi et al., 2012; Castle, Klein & Murray, 2008) and Barcoding in AR application have improved the tracking, especially on site location. The AR application is also integrated with Natural User Interface (NUI), which fully utilizes the human movement and gesture as a medium of interaction such as kinaesthetic control, SixthSense, iHelmet, ARCADE and KinÊtre (White, Lister & Feiner, 2007; Tonn, Petzold & Donath, 2008; Mistry & Maes, 2009; Yeh, Tsai & Kang, 2012; Stein, 2012; Chen, Izadi & Fitzgibbon, 2012). In accessing the information, AR application integrates with Cloud Computing environment such as CloudBIM and SOA4BIM that can be accessed at anytime and anywhere (Redmond et al., 2012; Møller & Schwartzbach, 2006). Regarding devices, there are many AR research application, which use smart phones, tablets, HMD or Glasses (Papagiannakis & Magnenat-Thalmann, 2007; Jang, 2009; Goldman, 2012). These mobile devices are smaller, affordable and powerful, and offer high-resolution display, which can be utilised at the on-site tour.

Thus, these enabling technologies provide an insight to the research proposal for the architectural restoration method using computer generated visual algorithms and its deployment to the AR application for the mobile device such as smartphone and tablet. This AR application is supported by cloud computing and geo-location where all VH information is stored in database and GPS to track the information about location and position of the real object and overlaid onto the VH.

MARR AND ITS REQUIREMENTS

MARR is a term used to describe the application of mobile devices, such as smartphone and tablet, to visualize Augmented Reality (AR) model, which has been virtually restored. VH is established concerning the original run-down building, representing as much similarity as possible. Since physical architectural heritage restoration could be highly expensive and resource consuming, this alternative technique may serve building archaeologists, as well as tourists in restoring or experiencing the precious architectural heritage. In developing the MARR, the research highlights components such as architectural heritage information, AR application, MAR, Cloud Computing (CC) and Internet connection as the design ingredients for a design decision.

AR Application

In developing the VH, the research uses SketchUp Pro 2013 as a tool to reconstruct and restore the ruined rear house of Rumah Datuk Setia. The software is integrated with AR-media Plugin, which allows VH to be visualized out of Virtual Environment (VE) by connecting the webcam and printed markers or GPS. The VH can be visualized through a personal computer or mobile devices such as smartphone or tablet.

MAR Devices and NUI

The MARR file is a stand-alone and compatible for all common mobile platforms such as IOS and Android. The AR-media Player can be downloaded from App Store or Play Store by using mobile devices such as smartphone and tablet and stored into AR-media Player library. The user can interact using NUI to navigate or touring on the historical site at Karai, Kuala Kangsar since AR-media Player supports geo-location to visualize the VH without printed marker.

Architectural Heritage Information

The MARR emphasizes on the accuracy and photorealism 3D Virtual Heritage. In measuring and restoring the rear house of Rumah Datuk Setia, the research applied contact method (Remondino & El-Hakim, 2006) involving measuring, tracing, scrubbing and moulding. For the photorealistic AR, the MARR models use existing UV mapping for adding details of the VH.

Online Database

The online database is the supporting unit of MAR Restoration model, which is accessible by the user and system administrator. The MARR files can be downloaded from the online database. The files can be categorized into the spatial organization, building components, construction, ornamentation and decoration. All MARR files are assigned with metadata descriptions. The idea is to facilitate

MARR, especially on-site tour in searching the architectural heritage information.

Table 1 The Layer of Architectural Heritage Information

No	Architectural Characteristics	Restoration
1	Spatial Organization	Hallway (*Selang*) Kitchen (*Dapur*) Dining Space
2	Building Components	Wall, Partition, Floor, Ceiling Door, Window, Top Hung Staircase, Railing
3	Construction	Footing, Foundation Column, Beam Roofing
4	Ornamentation/Decoration	Wall, Partition, Floor, Ceiling Staircase, Railing Column, Beam
5	Material/Specification	Wood Masonry etc.

Internet Connection

The wireless connection is imperative to link the database and the mobile devices. The aim is the real-time transfer of MARR files during the site tour and personalized the information based on the user interest.

MARR STRUCTURE AND FLOW

The MARR technical structure and flow can be categorized into five (5) stages as follows (Figure 2).

Stage 1 refers to physical documentation process where it involves architectural heritage information through contact method, literature reviews and interviews. The UV mapping technique of original material and texture for VH.

Stage 2 refers to the development of MARR via the VH reconstruction by considering the layer of architectural heritage information. The VH is designed to be deployed on the mobile device with geo-location features.

Stage 3 refers to the development of website design supported by cloud database to provide a real-time transfer of MARR. All MARR files are stored in cloud database and are easily accessed during the on-site touring.

Stage 4 refers to MARR model generated by the MAR engine. This MAR engine tracks and recognizes the geo-location on the historical site then loads the MARR model on the mobile display.

Stage 5 refers to the on-site tour of the historical site by navigating the MARR model on the display screen by NUI design while touring the historic site.

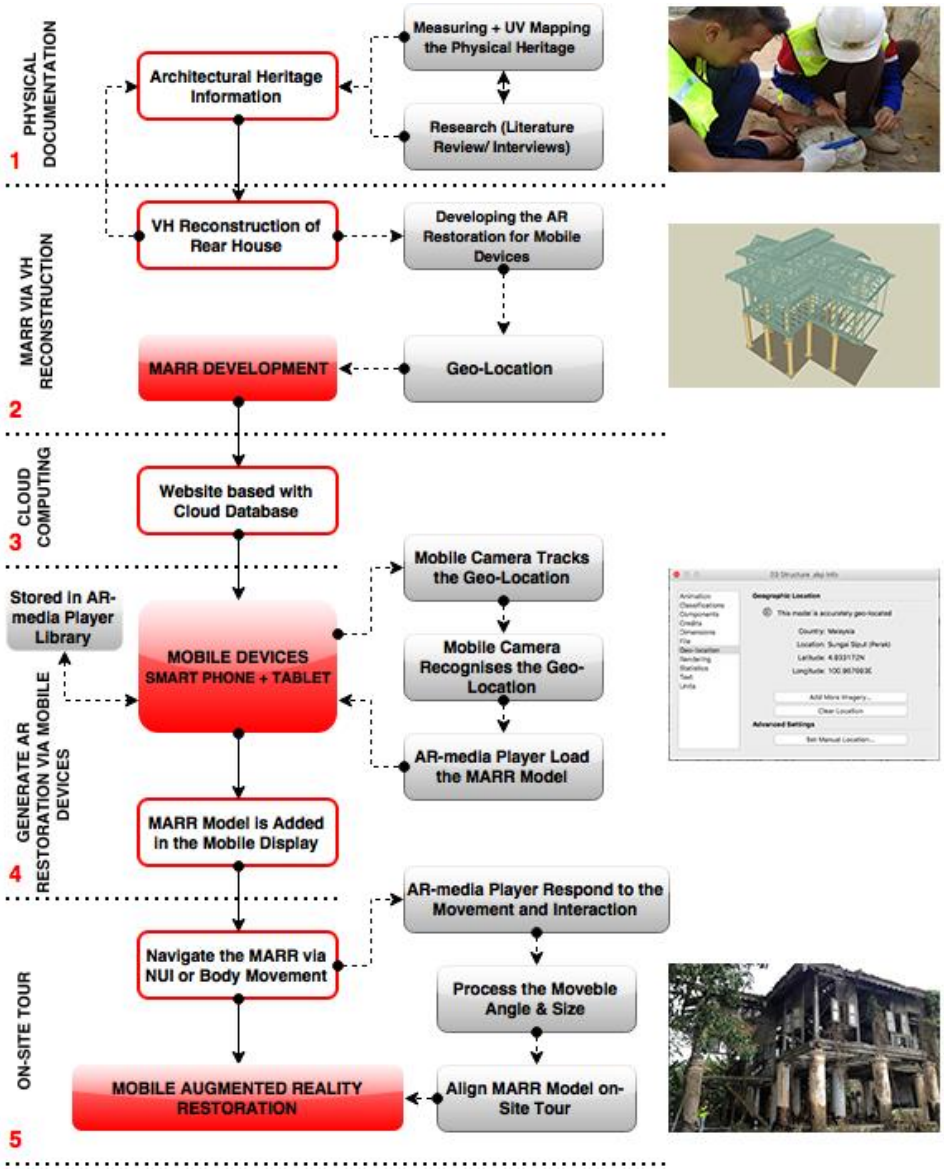

Figure 2 MARR Technical Structure and Flow

DISCUSSION AND SUGGESTIONS

In developing the MARR model, accuracy of geo-location is the most important factor to determine the alignment between VH and RE. However, mobile tracking technologies using GPS have difficulty to identify the geo-location on the large environment, and consequently effecting the precise position and orientation of

the MARR model as well as Rumah Datuk Setia. As an alternative, the research suggests using AR-media SDK application to track the 3D object in the RE (Battini & Landi, 2015). The aim is to improve mobile tracking by establishing the connection between the architectural heritage images and VH geometric features.

Regarding visualization, MARR suffers from poor visualization quality and is too detail to operate with the complex layer of architectural heritage information. Consequently, it affects the navigation performance of MARR such as lagging during the on-site touring. The research suggests that VH reconstruction should adopt Building Information Modelling (BIM) as a tool to manage the complex architectural heritage information (Fai et al., 2011). The aim is to categorize and minimize the complexity of object entities without losing any architectural heritage information.

CONCLUSION

The research presents architectural heritage restoration by employing MAR with other enabling technologies to assist the architectural archaeologists and tourists. MAR provides the alternative technique for architectural heritage restoration of the ruined rear house of Rumah Datuk Setia. The research also highlights the technical structure and the flow that need to be considered in producing the MARR as well as the challenges and limitations of the technology faced throughout the research. The MARR offers new hope for architectural heritage restoration since physical restoration can be highly expensive. It promises an enriched experience and features the legacy of the Malay – Colonial Architecture even though the original architectural heritage on the site is in ruined.

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PLANNING MALAYSIA:
Journal of the Malaysian Institute of Planners
VOLUME 15 ISSUE 1 (2017), Page 151 - 162

ARCHITECTURAL INFLUENCES OF ISTANA LAMA SERI MENANTI, NEGERI SEMBILAN

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Abstract

Traditional Malay Royal Palaces in Malaysia are monumental buildings representing the rich architecture, heritage, traditions and expertise of the Malays. The architecture of these palaces differs from one another to demonstrate the identities of the vernacular architecture as timber palaces were representations of Traditional Malay Houses on an exaggerated scale. One example of this is Istana Lama Seri Menanti in Kuala Pilah which is a four-storey timber palace built in the 20th century by Malay carving experts. Another factor to consider is the rich cultural acceptance of the Minangkabau as they have been around in Negeri Sembilan since the 15th Century. Hence, this paper aims to determine the architectural identity of Istana Lama Seri Menanti through the influences on the palace architecture and the factors affecting these influences. The research methods undertaken include case studies, interviews with experts, and document and historical analysis of subjects about palaces. The findings conclude that the key element of 'atap bergonjong' cannot be found in Istana Lama Seri Menanti which has the more common modest curve of the roof ridges found in houses of Negeri Sembilan. Furthermore, Chinese influences on the woodcarvings of the palace can be seen on the columns and beams of the exterior of the palace. In conclusion, there are many influences on the architectural identity of Istana Lama Seri Menanti such as Chinese influences and British's political influences on the design of the palace.

Keywords: Architecture, heritage, traditional Malay royal palaces

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INTRODUCTION

Palaces belonging to royalties were built as representations of the power, wealth and influence the royal families had over their subjects and ruling states (Abdul Rahman, 1999). Considerable thoughts and ideas were put into the design of a palace. Hence, palaces are architectural identities of the royal families and the culture of the area it is located in (Fuh et al., 1993). Therefore, it can be said that palaces represent the symbol of the Malay rulers because palaces act as buildings of residence, administration and venue of royal functions (Fuh et al., 1993). Traditional Malay royal palaces can be considered as a replica of a traditional Malay house on a larger and grander scale (Gibbs, 1987). Due to the nature of the Malay culture as a very nature-associated society, the architecture of the Royals was also a reflection of the ideologies and beliefs of the traditional Malays (Megat Latif & Abdullah, 2008). Hence, the architectural elements of traditional Malay royal palaces which included design allowance for environmental factors, privacy and safety of residents and also gender segregations of male and female members of the families (Haja Bava Mohidin, Ismail & Megat Abdullah, 2012).

Gender segregation is important in *Adat Perpatih* as it relates back to the Islamic teachings it is rooted in. Therefore, it is an important design element in traditional Malay houses in Negeri Sembilan as many of the houses include gender segregated spaces to allow for female family members to have their areas within the house. This design can be found in the abundant number of houses in Negeri Sembilan which includes attic designs and have houses which are more than one storey high (Haja Bava Mohidin, Mohd Razif & Kadikon, 2012). Figure 1 below illustrates a key design element of Traditional Malay Houses in Negeri Sembilan which includes an attic.

Figure 1 A Traditional Malay House in Rembau, Negeri Sembilan with an Attic Space

It is important to understand the vernacular architecture of Traditional Malay Houses in Negeri Sembilan because the architecture relates back to the palace architecture of Istana Lama Seri Menanti which will be discussed in this paper. The same design element can also be found in the palace which communicates the local building practices and culture of *Adat Perpatih* practised by the locals. As much as *Adat Perpatih* influences the daily activities and customs of Negeri Sembilan residents, it is important to identify the influences on the architecture of Istana Lama Seri Menanti and determine the architecture of the vertically designed timber palace.

RESEARCH METHODOLOGIES

The research methodologies undertaken in this research are case studies and precedent studies of timber palaces in Malaysia and interviews of experts on the knowledge of architectural heritage. Seven case studies were used as subjects for this research about the architecture of Istana Lama Seri Menanti. Table 1 illustrates the case studies used in this research to identify the similarities and differences of timber palaces around the years that Istana Lama Seri Menanti was built.

Table 1 Traditional Malay Royal Palaces in Late 1800s-early 1900s.

NO	PALACE	YEAR	LOCATION
1	Istana Balai Besar 	1842	Kelantan
2	Istana Ampang Tinggi 	1864	Negeri Sembilan

3	Istana Sultan Ismail 	1870	Perak
4	Istana Tengku Nik 	1881	Terengganu
5	Istana Jahar 	1887	Kelantan
6	Istana Lama Seri Menanti 	1908	Negeri Sembilan
7	Istana Sri Terentang 	1908	Pahang

8	Istana Kenangan 	1926	Perak

The case studies were selected based on the construction materials used which were timber and the year they were built in which was during the late 1800s-early 1900s. These factors will adequately determine the factors behind the construction of Istana Lama Seri Menanti and the architecture seen in the palace. However, not all of the palaces can still be found today as the palaces have either been demolished or have deteriorated.

TRADITIONAL MALAY ROYAL PALACES

Timber was commonly used by the traditional Malays for the construction of buildings such as houses, mosques and even palaces (Massart, Meuter & Van Begin, 2008). The availability of timber was a major factor in determining timber as the choice of construction materials. The durability and robustness of timber also made it the prime material for construction. Hence, the expertise of the locals in using timber increased with the construction of bigger buildings such as mosques and palaces. These experts known locally as *Tukang* were not only carpenters but were also woodcarvers. *Tukang* of palaces were appointed by the Sultan or Raja, and in the case of Negeri Sembilan the Yang Dipertuan Besar and were known as *Tukang Raja* (Md. Nazuan, 2005). The *Tukang* also acts as a *Pawang* or Shaman as beliefs in the mistics were still prevalent during the olden days and as a *Pawang*, it is important that the future site of the palace is selected carefully and any negative energy were cast out (Md. Nazuan, 2005).

Palaces in the olden Malay towns were surrounded by villages as the commoners lived surrounding the royal families and influential leaders (Daud, Arbi & Faisal, 2012). Some palaces were located on top of hills for the advantage of the view and safety factors whereas the villages surrounded the lower hillside (Daud, Arbi & Faisal, 2012). Only palaces were allowed to be gated or fenced in as they were considered important buildings of the society (Massart, Meuter & Van Begin, 2008). The most common layout of a traditional Malay town must include a palace, an open field for the community and a market (Noor & Khoo, 2003; Harun & Said, 2009). This layout allowed the state generates income for itself and becomes a self-sustaining city, and the power of the royals will be stable.

Architecturally, traditional Malay royal palaces can be divided into two typologies which are single-type building and multiple-type building (Md. Nazuan, 2005). These typologies mean that palaces can be built as a free-standing building on its own and gated within an area or as a part of a complex of multiple different buildings within an enclosed area. Figure 2 below illustrates an image of Istana Ampang Tinggi as a single-type palace building in Negeri Sembilan. The Palace is a residential building as is a stand-alone building.

Figure 2 Single-type Palace Building of Istana Ampang Tinggi in Negeri Sembilan

A multiple-type building is a complex of buildings which include the main Rumah Ibu, separate halls and bedrooms for the royalties (Md. Nazuan, 2005). For example, Figure 3 below is an example of a multiple-type palace which was once part of a complex of palace buildings in Terengganu. Istana Satu was the Rumah Ibu and acts as the main building within the complex.

Figure 3 Istana Satu was part of a Multiple-Type Palace Complex in Terengganu

Another important element found in the design of traditional Malay royal palaces were the spatial layout of the palace. The most common layout would be

the sporadic design layout where the palace building spread out over a large area of Palace reserves. However, there is the less common spatial design of building vertically with palaces that are more than one storey high (Abdul Aziz, Remaz Ossen & Idid, 2010). These types of spatial layout vary from one state to another, but none has been built more than two storeys high using timber except for Istana Lama Seri Menanti.

ISTANA LAMA SERI MENANTI

In Negeri Sembilan, the earliest known traditional Malay royal palace was Istana Barong-Barong which was located in Ampang Tinggi (Raja Shahminan, 2010). Istana Pulih was then built during the reign of Yamtuan Antah (1875-1888) but was burnt down by British troops during the Bukit Putus War in 1875 (Sheppard, 1969). Istana Baroh was later built to replace the burnt-down palace and was used as a residential palace for the royal family (Raja Shahminan, 2010; Saw & Raja Barizan, 1991). In 1902, Tuanku Muhammad who was the 7th Yang Dipertuan Besar Negeri Sembilan instructed the building of a new palace in Seri Menanti as the new residential palace (Muhammad, 2011).

The construction of Istana Lama Seri Menanti was completed through the expert skills of Tukang Kahar and Tukang Taib who were local carvers in Seri Menanti. Tukang Kahar was appointed the Tukang Raja as he was commissioned to design and construct a timber palace for Tuanku Muhammad. The palace was completed in 1908 with the help of Tham Yoong, who was a Chinese contractor, and the drawings were prepared by Mr Woodford, who was a British Draftsman from the Public Works Department (Muhammad, 2011). As timber palaces were not found to be more than two storeys high in other states in Malaysia, there might be a sharing of skills and technology for Tukang Kahar and Tukang Taib to be able to construct such a vertically planned timber palace. Even so, it is very common to find traditional Malay houses especially that of the aristocrats and wealthy leaders to have houses that were two and even three storeys high. Thus, it is plausible that the technology and skills were available in Negeri Sembilan with the *Tukang* but were further developed with the Chinese influences. The British draftsman was only providing technical drawings expertise, but the British influences could be found in the space allocations within the palace as specifically dedicated spaces were provided such as the dining/reception area and separate bedrooms for family members. Figure 4 below illustrates the image of an abandoned Istana Lama Seri Menanti before being turned into a museum.

Figure 4 Istana Lama Seri Menanti before Being Turned into a Royal Museum

The timber used for the construction of the palace were locally known as Penak or Cengal, and were taken from nearby forests in Negeri Sembilan. A study by Saw & Raja Barizan (1991) plots the Cengal forest distribution in Peninsular Malaysia including Cengal forests in Negeri Sembilan. Figure 5 below illustrates the Cengal forests found in Peninsular Malaysia while specifically highlighting those in Negeri Sembilan.

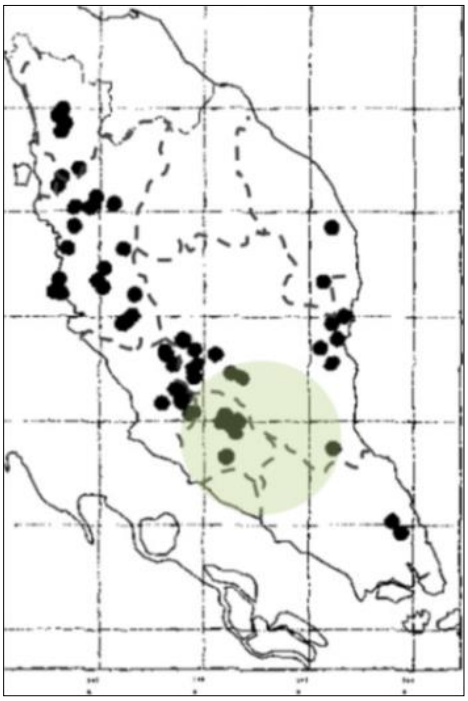

Figure 5 The Distribution of *Neobalanocarpus heimii* (Cengal) in Peninsular Malaysia

The spatial layout of Istana Lama Seri Menanti is vertically planned throughout the four storeys where the spaces are segregated according to functions. The ground floor of the palace is dedicated to the palace staff and is a public domain (Abdul Aziz, Remaz Ossen & Idid, 2010). The first floor of the palace is a semi-public area where royal functions such as *Majlis Menghadap* are held at the *serambi* where a special raised platform is built for the Yamtuan. The first floor is also a place for meeting delegates and making public summonses. The floor also includes four bedrooms and a dining/reception area for the royal families. The second floor of the palace is dedicated to only the royal families as three bedrooms are located on this floor. The third and fourth floor are private spaces for the Yamtuan and hold his room and a storage area on the highest floor for family heirlooms. Figure 6 below illustrates the vertical planning of Istana Lama Seri Menanti.

Figure 6 The Vertical Plan of Istana Lama Seri Menanti

The function of Istana Lama Seri Menanti remained as a residential palace during 1908 until 1931 when a new palace was built nearby. The Istana Besar Seri Menanti was a masonry construction of double storey high and became the new palace the royal families resided in. After the Yamtuan had moved into the new palace, Istana Lama Seri Menanti became a place of residence for other royalties of visiting families of the Royals. In 1959-1964 however, the palace was used by the local state as a religious school for the local children. It was during this time that the ground floor and first floor of the palace became a place for religious classes and helped spread the knowledge of Islam. Later in the years, the palace was restored and converted into a Royal Museum in 1992. Figure 7 below illustrates the palace photo taken in 2015 during which further restorations were being undertaken.

Figure 7 Istana Lama Seri Menanti in Negeri Sembilan

FINDINGS

Findings of the research demonstrated that Istana Lama Seri Menanti was built with the skills and expertise of the local *Tukang* as vernacular architecture in Negeri Sembilan were commonly found to be more than one storey high. Hence, the construction of a vertical timber palace was plausible with their expertise and skills in Negeri Sembilan and not found elsewhere in Malaysia. Furthermore, Chinese contractors were hired to help with the construction. Thus some Chinese influences could be found in the design of the palace particularly some of the woodcarvings found on the beams of the palace. Figure 8 below illustrates the images of a mythical creature carved on the beams of the palace's entrance.

Figure 8 Woodcarvings of Mythical Creatures on the Beams of the Palace

The design of the palace which was symmetrical on plan and the elevations could prove the existence of a British influence on the spaces of the palace because, traditionally, Malay vernacular architecture was not symmetrical and did not provide specific spaces for specific activities. Malay vernacular architecture usually provides multi-functional spaces in their buildings which

could be used in different functions and for different purposes according to the needs of the users. Hence, the segregation of spaces and dedicated rooms to specific activities is very Western-like and could prove the existence of British influences on the palace.

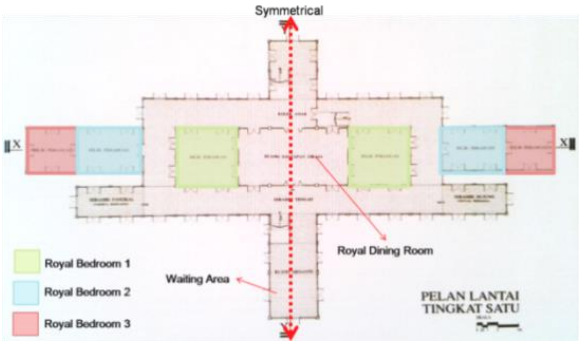

Figure 9 The First-Floor Plan Shows Symmetry and Balance

CONCLUSION

In conclusion, Istana Lama Seri Menanti which was constructed using only timber without the reinforcements of nails is a unique 20th century traditional Malay royal palace. While other timber palaces were built earlier in the 1800s, Istana Lama Seri Menanti was built as a permanent palace of residence for the royalties during which masonry palaces were already being built extensively around Malaysia.

The palace which was designed to be symmetrical throughout is another unique factor which separates it from other timber palaces in Malaysia. The verticality of the palace's image provides a grandeur architecture which can be seen from afar and differentiates itself from any other traditional Malay royal palaces. More information is needed in determining the influences on the architecture of Istana Lama Seri Menanti. This research is still ongoing, and further findings will be developed into more discussions in the future.

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PLANNING MALAYSIA:
Journal of the Malaysian Institute of Planners
VOLUME 15 ISSUE 1 (2017), Page 163 - 168

CHALLENGES TO IMPLEMENT CARRYING CAPACITY FRAMEWORK: A CASE STUDY OF PULAU PERHENTIAN MARINE PARK INSTITUTIONAL FRAMEWORK

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Abstract

The environmental quality at Pulau Perhentian Marine Park is degrading day by day. Many studies have been done in order to support sustaining the tourist sites such as having limits in development and tourist arrival, or better known as carrying capacity. Despite the existence of many agencies whose job scope is related to Pulau Perhentian, poor implementation of the guideline is resulting in degrading environmental quality of the park. This paper looks at the roles and functions of each government agencies related to Pulau Perhentian. The outcome of this paper is the analysis of the current roles and responsibilities of the agencies and where are the gaps that can be filled in order to promote sustainable tourism in Pulau Perhentian.

Keywords: Institutional framework, government agencies, tourism key players, sustainable tourism

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INTRODUCTION

Pulau Perhentian is one of the coral reef islands on the east coast of Peninsular Malaysia. Statistics on tourist arrivals show an increasing arrival trend from 123,159 in 2005 to 244,762 in 2015 (Department of Marine Park, 2016). The increase in tourist arrivals has led to the various infrastructures been developed on the island. As suggested by Nurul (2013) and Rees (1992), development in areas like marine park should be controlled to avoid negative impacts on the environmental quality of the area. However, Pulau Perhentian is under overlapping administration of various agencies, which has created coordination issues.

This paper reviews the existing institutional framework related to the planning, management, implementation and operations of Pulau Perhentian. An examination of the roles and functions of each agency and association involved has been carried out to identify common ground, overlapping jurisdictions and potential conflicts. The federal, state and local agencies involved in the administration of Pulau Perhentian are as shown in Table 1 below.

Table 1 List of Government Agencies Involved in Managing and Developing Pulau Perhentian.

Federal	Ministry of Tourism and Culture, Terengganu Office (MOTAC) Tourism Malaysia Terengganu Terengganu Marine Park Department Terengganu Marine Department
State	Terengganu State Economic Planning Unit (UPEN) Terengganu Town and Country Planning Department (JPBD)
District	Besut District Council Besut District and Land Office

METHODOLOGY

This paper adopted a survey approach to obtain primary data from the stakeholders. In developing tourist sites, a formal institution will normally consist of internal and external parties (Singh, et. al., 2009). Internal parties are usually those who involve directly on-site, such as the local communities, resort and chalet owners, scuba diving operators, and boat service operators. Meanwhile, the external parties are the government agencies who are tasked with monitoring and regulating the sites.

The analysis undertaken in this study was for the external party audit, which sought the views of concerned parties on the island's current and potential tourism image and branding. The audit was done for both Perhentian Kecil and Perhentian Besar islands via interviews with various stakeholders, such as the Ministry of Tourism and Culture Malaysia (MOTAC), Tourism Malaysia, and

Department of Marine Park Malaysia (DMPM). It is also to study the structure and function of each government agencies and what are the contributions to the ecosystem of the island.

ROLES AND RESPONSIBILITIES OF EACH STAKEHOLDER

Ministry of Tourism and Culture, Terengganu Office (MOTAC)

This agency is set up by the Ministry of Tourism and Culture to act on its behalf at the state level and to provide the linkage between Federal & State Government on tourism-related matters. Basically, MOTAC gives advice on tourism policy and implementation. Besides that, it monitors the planning and development of tourism products and infrastructure, as well as tourism services and training.

MOTAC handles licensing applications for travel agents, homestays, tour guides, excursion buses, hire/drive cars, tourism training institutes and tourism accredited shops. They are to liaise with Tourism Malaysia in promoting tourism in Terengganu.

Tourism Malaysia Terengganu/ Terengganu State Economic Planning Unit (UPEN)

Tourism Malaysia Terengganu is responsible for the overall planning and development of tourism in Terengganu, in addition to acting as the link between the State & Federal Government. The agency is also responsible for assessing state resources, identifying development projects and their feasibility and/or implementation, and providing general advice on planning and economic matters, including advice on alternative proposals for consideration.

Terengganu Marine Park Department

Terengganu Marine Park Department have the authority on the protection of aquatic flora and fauna, and on the protection, preservation and management of the natural breeding grounds and habitat for aquatic life with particular regard to species that are rare or endangered.

The department is also in charge of promoting the natural regeneration of aquatic life whenever such life has been depleted. Therefore, one of their job scopes is to promote scientific study and research that will preserve and enhance the pristine state and productivity of such areas. Recreational and other activities are to be regulated too to avoid more damage to the environment of the area.

Additionally, boatmen training courses for island villagers are also held by the department in order to train them in handling tourists. The department also organises awareness programmes relating to marine parks for the island local community and tourists such as beach/coral clean up and ‘coral camp’. It is also in charge of collecting conservation charges which are imposed on all tourists visiting the marine parks.

Terengganu Marine Department
This agency is responsible for ensuring the safety of users navigating in the waters of Terengganu. Unlike the Marine Park Department, it specializes in the registration of ships and licensing of boats, enforcing and regulating shipping laws, and conducting ship inspections and surveys.

The Marine Department is also in charge of Kuala Besut jetty in terms of providing the facilities, managing passengers and controlling ferries/boats coming in and going out at the jetty. However, the officers interviewed mentioned that currently, the department is facing shortage of workforce to carry out monitoring and enforcement programmes, therefore leading to lack of monitoring of tourist behaviour and activities on site.

Terengganu Town and Country Planning Department (JPBD)
JPBD is responsible as an advisor to the State Government on matters relating to land use and development and maintenance in Pulau Perhentian. The department is also accountable for the planning of projects and development of land, besides providing planning advice to the public. The department also oversees the preparation and implementation of statutory development plans for the area such as Special Area Plan, District Local Plan and State Structure Plan.

Besut District Council
Besut District Council is responsible to plan and control development in the Besut District. Among its other roles are to provide environmental cleanliness services, plan, implement, maintain and encourage landscape beautification and social facilities structure programme in Besut District. It also responsible in the preparation, implementation and monitoring of the Special Area Plan and District Local Plan of the area.

Besut District and Land Office
This agency is responsible to plan, coordinate and implement physical development projects and community development in the Besut District. It also processes land subdivision applications, change of land category and other land matters in Besut District. Nevertheless, the capacity and budget allocation is the main problem here because more manpower is needed in managing Pulau Perhentian.

FINDINGS
This study has found that there are some overlapping jurisdictions between the agencies. If the agencies can clarify further their job scopes and make effective collaboration and coordination model among themselves, this could help to alleviate problems associated with insufficient workforce to monitor and

administer Pulau Perhentian. Coccossis and Mexa (2004) suggest that with effective coordination, they can also improve the existing management plans, master plan and also the policy implementation.

Table 2 Classification of Roles and Responsibilities of Perhentian Island External Stakeholder

No	Agencies	Roles and functions										Current issues
		Policy maker	Planning	Management	Implementation & enforcement	Monitoring	Marketing & promotion	Training	Advisory	Research & development	Safety	
	Federal Level											
1	MOTAC	/			/		/		/			
2	Tourism Malaysia Terengganu				/		/					Insufficient manpower. At tourism information centre Kuala Besut only 1 employee on duty.
3	Terengganu Marine Park Department	/		/	/	/		/		/		Insufficient manpower and onsite enforcement in regulating tourist and community activities in marine park areas.
4	Terengganu Marine Department	/		/	/	/					/	Insufficient manpower to carry out monitoring and enforcement.
	State Level											
5	Terengganu State UPEN	/	/	/	/	/	/		/			
6	Terengganu JPBD	/	/			/			/			
	District Level											
7	Besut District Council	/	/		/	/			/			Insufficient manpower in terms of management (planning, implementing, maintaining, and controlling development) in Pulau Perhentian. Insufficient budget allocation for additional staff.
8	Besut District and Land Office			/	/	/						Insufficient manpower.

CONCLUSIONS

This study is significantly valuable for the tourism key players to identify and recognize their main roles, and then improve their service delivery, for instance, to include the local participation in the management of coastal marine resources. Studies by Cinner (2005), Kaza (1988), Kenchington (1988) and White (1986) support the findings that both state and federal agencies should be more effective in delivering their roles, aside from giving priority to the community involvement, as it is the main factor in the success of marine protection area.

This study is done due to the concern of the environmental issues that are occurring nowadays at Pulau Perhentian Marine Park. Even though many studies have provided solutions such as low impact visitation and eco-friendly tourism activities, but without effective implementation and management, the environmental degradation of the park will continue.

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PLANNING MALAYSIA:
Journal of the Malaysian Institute of Planners
VOLUME 15 ISSUE 1 (2017), Page 169 - 178

A REVIEW INTO THE "ISLAMIC" TRADITION IN THE MUGHAL GARDEN: (RE)SHAPING OUR STAND ON ISLAMIC ART AND DESIGN

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Abstract

In the field of garden history, Mughal gardens represent a prominent chapter of what is often called the Islamic garden tradition. Most previous studies have discussed on its theories and principles. However, it is essential to establish the physical characteristics of the Mughal garden as representing Islamic garden tradition. The method of content analysis has been applied in this study. The study found that Mughal garden design is much influenced by the Persian's Chāhār Bāgh, Hindu mythology and Quranic paradise imagery. To conclude, Mughal garden design needs to be assimilated into the current culture of local people within the established principles of environment in Islam.

Keywords: Mughal garden, contemporary garden, Islamic garden, culture, Islamic principles

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INTRODUCTION

The origin of Mughal gardens can be traced to central Asia, while the climax was reached in India over a long period of time (Koch, 1997a). Mughal gardens were influenced by gardens of other regions and times such as regional influences from central Asia, Kashmir, western Punjab, Persia and Delhi sultanate (Wescoat, 1996). Mughal gardens had always had a powerful impact on architectural history and design as one of the pre-eminent expression of Islamic art, culture, and values. It represents the extraordinary synthesis of human concerns. It integrates the finest features of natural and built environments with the finest traditions of local and regional landscape design. They draw together human aspirations for worldly spiritual order by merging the Paradise imageries with real garden design on earth (Wescoat, 1996).

OBJECTIVE OF THE STUDY

The main objective of the study is to dispute the assignment of the Mughal garden as representing the Islamic garden.

METHODOLOGY OF THE STUDY

The methodology followed in this study is mainly content analysis and library search that emphasized on the theories and principles of the Mughal garden.

THEORIES AND PRINCIPLES OF THE MUGHAL GARDEN

Mughal gardens are primarily situated along the plains of India and Kashmir. The climate of the area is tropical and winds are warm and dry (Lehrman, 1980). The most important aspect of Mughal gardens is that the built environment remained very closely wedded with the natural ingredients such as plants, lights of the sunshine and the moon, the songs of the birds and movements of the air saturate with the garden environment (Koch, 1997b). Man-made structures were organized in such a way that one felt to be in an idealized natural environment. The built environment captured the harmony which existed within nature. Similarly, man-made elements such as aiwans, streams, fountains, walkways and lamps coexisted simultaneously with natural elements. The individual elements formed a whole, and the whole was always subordinate to nature. Therefore, gardens were actually used as places of enlightenment, meditation and revelation (Ashtiani & Sadat, 2015; Asher, 2003).

The Mughals were Persianised Turks originated from Central Asia and brings Persian culture to India (Dickie, 1985). Babur (1526-1530), the first Mughal Emperor (Lehrman, 1980; Koch, 1997b) was directly descended from Genghis Khan and Tamerlane (Koch, 2008). The sensational conquests of his great ancestor over a century before had brought together Central Asia, North

India, Persia, Mesopotamia, Syria, and Asia Minor in a single empire with its capital at Samarkand, and subsequently Herat (Dickie, 1985). This is evidenced in the remarkable similarity of garden layout and planning over a vast geographical territory and time period, despite wide variations in local culture and technological contexts (Blair & Bloom, 2003). The Mongols had no real culture or well-defined religion of their own and they readily adopted those of the country they conquered. To embellish his capital of Samarkand, Babur imported garden designers from Central Asia, as one of his initiatives to develop a garden (Jaffar, 1936).

India was first ruled by Babur (1526-1530) followed by Humayun (1530-1556), Akbar (1556-1605), Jahangir (1605-1627) and ended by Shah Jahan (1627-1657). Of these five emperors, Babur, and his great-grandson, Jahangir was the most passionate nature lovers and the most renowned garden builders (Moynihan, 1980). Gardens were the new centres of royal power (Petruccioli, 1997) during their time. Therefore, the tradition of formal gardens in the Indian subcontinent started with the arrival of the Mughals.

The Mughals were justifiably known as some of the history's greatest patrons of gardens. Before the establishment of Mughal rule, the sites for recreation and pleasure activities were mostly informal and situated in the suburbs of residential settlements or near water sources. Planned landscape features existed in and around shrines, temples and water bodies. The objectives of such formal and informal spaces were to bring the human mind and soul closer to nature. The Mughals gave a new image of the landscape to areas occupied by them. Gardens were built within towns, in suburbs, and along major highways (Mubin, Gilani & Hasan, 2013).

One of the significant features of Mughal gardens is that they are mostly used during the evenings rather than day time. This is exhibited in the extensive use of lamps and moonlight in the gardens. The sensory qualities of landscape elements in the Mughal gardens made up its ambience (Petruccioli, 1998; Wescoat, 2011).

The earliest Mughal garden was of Babur's, located in Agra; was laid out in an urban context in a deliberate opposition to the citadel-palaces or forts, built by pre-Mughal rulers (Asher, 2003; Md Jani et al., 2015; Wescoat, 2011). The Ram Bagh of Agra came into the picture when Babur visited Timurid and Uzbek gardens in Samarkand, Kabul and Herat before coming to Hindustan. He was amused by Samarkand's fascinating gardens that stimulated him in developing his own garden (Titley, 1979). Babur was interested in the garden as an object of beauty and a means of delight, rather than as a man-made reflection of the Quranic image of paradise. The open layout and greater architectural character have eventually been so typical of the Indian garden (Ansari, 2011; Ashtiani & Sadat, 2015; Asif et al., 2015; Esmaili, 2014).

Most of Babur's gardens were in the hilly country, with abundant streams which then Babur ordered to be diverted into straight watercourses and rectangular basins. It was this concept of orderliness and symmetry which he carried with him to India (Dale, 2004; Gilliat-ray & Bryant, 2010; Mirza, 2015). However, Babur's craftsmen from Persia and Central Asia brought the Islamic garden tradition of order, geometry, symmetry, straight channels and rectilinear pools but also absorbed local custom. On the other hand, Hindu craftsmen introduced an organic quality (Dickie, 1985; Rehman, 2013; Rehman & Akhtar, 2012). The basic plan and other elements of the Mughal garden are influenced from the earlier gardens in Turkestan and Persia, especially the Chāhār Bāgh or fourfold garden layout (Gilliat-ray & Bryant, 2010; Brooks, 1988; Stronach, 1994).

Mughal gardens took a great advantage of the natural feature in the landscape by erecting gardens of three types; first, gardens within the palace courts; second, gardens that surrounded tombs and third are the gardens of large charbaghs or paradise gardens (Moynihan, 1980). Tomb gardens recalled an earlier Persian garden design with no terraces, only a slight slope and shallow changes in the level for the gravity-fed water system. Its layout was a square with multiple divisions of plots in the four quarters. While, the layout of paradise garden is a parallelogram with four-square gardens on each terrace (Dickie, 1985; Wescoat, 2011; Moynihan, 1980; Mughal, 2011).

Water dominated all Mughal gardens. The heart of their charbaghs was the central watercourse. The early gardens depended on upon wells, later in canals, as a more dependable water supply followed by widening of the watercourses studded with fountains. These charming water gardens in a waterless landscape provided the user with a scene of sensational and poetic (Moynihan, 1980; Rehman, 2013).

Relating to the concept of Quranic paradise imagery in Mughal garden, Mr. Sajjad Kausar in his publication on Shalamar garden made this comparison by stating that, "The Islamic garden tradition…can be traced in all Mughal gardens…that often represent those of the Quranic gardens of paradise" (Moynihan, 1980).

> *"Mughals gardens were full of symbolism delineate the culture of the local people. For example, the terraces in the gardens represented those of the Quranic garden of paradise. Superstitious, but religious at the same time, some of the emperors sought guidance from the stars and occasionally built their charbaghs to conform to the number of planets and signs of the zodiac. The number nine and eight have a special meaning to the Mughals which always be crystallized onto gardens spatial element designs."*
>
> *Moynihan (1980*)

In contrast, Brookes (1988) opposes to that by stating that, "Islamic art (in India) was the very antithesis of Hindu art; for Hindu adornment was individualistic, irregular and symbiotic, while Islamic decoration was mathematical, continuous and abstract" (Moynihan, 1980). The early Mughal gardens had more vitality and a stronger character than the later, more voluptuous gardens (Moynihan, 1980; Ross, 1931). It is evident in the reflection of wealth and security in Mughal buildings. Also, the structures of gardens became more palatial, light silken awnings and other features emulating an increase in extravagance. These mutual influences of garden and palace culminated in Shah Jahan's palace in the Red Fort of Shahjahanabad in Delhi, which was not a palace at all but a terrace of luminous marble pavilions linked by gardens and watercourses (Stuart, 1913).

The Mughal garden was developed for two purposes; to serve as a mausoleum and those developed for pleasure. The Mughal mausoleum set in its garden was not derived from Iranian precedents; it is more likely to have evolved from Mongol tradition or even from Hindu mythology. A garden would be developed during the owner's lifetime when the building at its centre was possibly used for receptions and banquets, and then converted into a mausoleum upon his death. The second purpose is to suit the Islamic style of gardening to create pleasure gardens in a summer resort with fertile plains, green hills and springs outpouring, where it is described by Jones Lehrman "as a natural paradise on earth" (Baarah, 2010).

The courtyards were also largely for pleasure when they were designed as small enclosed gardens with water, grass and shade. Courtyards in the mosque were still well designed and executed, paved and contained an ablution basin in the centre (Lehrman, 1980). A Mughal garden is always rectangular in shape, accessible (Dickie, 1985), terraced and had pavilions and avenues lined with trees and fountain and bore Iranian names. The focus of the design of the pleasure garden was a pavilion that was inspired from the Chahār-Bāgh layout in Chihil Sutun. Therefore, the Chahar Bagh layout was used only to refer to Timurid gardens or to those of Babur's (Jaffar, 1936; Rehman, 1997).

Meanwhile, gardens in the plains were more related to the traditional formal paradise layout and were primarily the setting for magnificent buildings. The development of the pleasure garden, on the other hand, largely reflected the regard felt by the Mughal Emperors for Kashmir, where many such gardens were established. The rulers of the Mughal Empire built grand palaces and gardens which were usually adaptations of the Mughal style after the empire weakened resulting in the decline of its architecture. These palace gardens were built without the application of strong axial symmetry and the use of water in them diminished or in other words, Chahār-Bāghs were no more plays the role of the

garden's prototype. The great Mughal period ended after the death of Shah Jahan (Moynihan, 1980; Stuart, 1913).

The Islamic characteristics in the Mughal garden are, in fact the influence of Timurid gardens. This tradition was brought to the south to produce the Persian garden and to east to produce the Mughal garden, which are mostly located in palaces (Moynihan, 1980; Stronach, 1994; Stuart, 1913; Wescoat, 2011). As a consequence, the introduction of lush gardens of Central Asia into the dusty plains of India produced a mixture of garden (Dickie, 1985; Hamed, 1994). Babur ruled Afghanistan for 22 years (Titley, 1979). His first garden there was inspired by a Timurid model. It was built more as a residential environment that consists a sitting place, enjoyment hall, horse stables, camping place, a splendid gateway and an abundance of cherry trees, orange trees, sugar cane and pomegranates in a Chāhār Bāgh layout (Rehman, 1997; Rehman & Akhtar, 2012).

Meanwhile, Babur's first garden in India, the Ram Bagh was designed by himself in an orderly and symmetrical way (MacDougall & Ettinghausen, 1976) with a square pool often placed at the junction of two waterways (Rehman & Akhtar, 2012) as well as a pleasure house in the centre. There was a stone platform for sitting, shaded by a canopy. The platform is placed in front of the first pavilion, and close to a pool. Steep terracing became characteristic of his design, and he apparently never built a garden without water (Moynihan, 1980). The attractive border area contained plantings. The other pavilion is slightly larger and is most likely of a type which backs onto the garden wall and has a small rectangular room in the rear. Monumental gates were essential components (Rehman, 1997).

Columns and flowers were carved. There were also two pavilions along the waters' edge and a few courtyards. There were trees and flowers, two fountains and square stone tanks with coloured tiles and fountains (Moynihan, 1980; Titley, 1979). There were constant movement and sparkle of water (the hilly landscape encouraged the introduction of waterfalls), cascades, stone-lined water channels, water chutes, mausoleum or kiosk, cisterns, and wells. There was also a geometrical pattern of raised walks and platforms. The walks are some ten feet above ground level and about eight feet wide, with narrow irrigation channels down the centre to water the trees planted at intervals along the walks. At the corner of the pavements are stone platforms surrounded by narrow watercourses which can be found in almost all Mughal gardens.

Mughal gardens are always in a series of ascending terraces, and this concept was followed in many later gardens. The first level was open to the public, the second was the emperor's private garden, and the third was the zenana garden for the harem. A Mughal garden could have eight terraces, which followed the Islamic concept of paradise in eight divisions. Among the examples of

Mughal gardens are Bagh i-Wafa (garden of fidelity), Nimla, Kashmir Shalimar Bagh, Nishat Bagh, Lotus Garden, Sheikhpura (today Pakistan) which is similar to pairidaeza of the Sassanian kings of Persia[26] and others. Alternatively, a garden could have seven divisions which then reflected the seven planets. There was little consistency; Nishat Bagh in Kashmir was given twelve divisions one for each sign of zodiac (Ruggles, 2008).

The manipulation of water through channels was sometimes laid at right-angles to the main water course and conformed to the traditional fourfold division. These channels were paralleled by straight paths (MacDougall & Ettinghausen, 1976; Mirza, 2015), grassed area, edged with narrow flower beds shaded by straight rows of imposing trees. The garden was enclosed by massive walls, which gave a sense of privacy and peace. The walls were a shield against the hot winds of summer and the brown land. There were lofty gateways centred on the wall, contained huge wooden doors, studded with heavy iron bosses, nails and spikes. Regular avenues led from the gateway or flanking pavilion to a central structure in front of which were rectangular water tanks. Water flowed through carved inclined planes or chutes (chadar) from one terrace level to the next. The channels of the early Mughal gardens were narrow and shallow, with broad areas of paving on each side. The secondary channels led from the main ones. As Mughal garden design evolved, the channels became wider. The base of the channels was sometimes inlaid with zig-zag stripes of dark marble to symbolize the movement of the waves as the water flowed through (Ansari, 2011; Ashtiani & Sadat, 2015; Asher, 2003).

The Mughal gardens were also planted with imported trees such as poplar, oriental plane or chenar, dark cypress, willow and the massive chenar. Roses and narcissus were also planted. Locally grown fruit trees are also planted such as apples, oranges, figs, mangoes, coconuts, bananas, mulberries, lime, quince, apricot, cherry, plum, peach, guava, pear, pomegranate, and tamarind. Flowers that were cultivated were roses, violets, sunflowers, jasmine, marigolds, poppies, carnations, hollyhocks, wallflowers, delphiniums, hibiscus, hyacinths, jasmine, lilies, narcissus, lotus, lilacs and tulips, which were all watered by hand during the extensive dry season. Iris has been the substitute of myrtle; frequently present in Mughal iconography. For irrigation purposes, artificial lakes, canals and wells with raised water by an arrangement of wheels and levers was used for many years before Mughal (Lehrman, 1980).

Mughal garden is usually in a square or rectangular shape with rows of trees and flowerbeds, centrally placed canals, waterfalls and running fountains (Mughal, 2011). The gardens had Chāhār Bāgh layout (Wescoat, 2011) which was originally inspired from Iran, and brick-lined walkways and causeways. A high wall, adorned with serrated battlements and pierced by a lofty entrance gateway, encircles the garden. In larger gardens there are always four main gateways or buildings. The water runs into a trim stone or brick-edged canal down

the whole length of the enclosure, falling in cascades, or rushing over carved water-chutes (cedars) then ended up in a larger or smaller tank, usually studded with numerous small fountains (Ali, 2003).

The principal pavilion was often placed in the centre of the largest of these sheets of water. There are also side-canals, leading out from the principal into the wall, raised platforms (Rehman & Akhtar, 2012) and gateways. From these stone-bordered canals and tanks, the water required for irrigating the soil is conducted by pipes. Avenues of plane and cypress trees were planted in the square plots intersected by watercourses which were filled with fruit trees and parterres of flowers. There were shady walks, pergolas of vines and flowers; turfed open squares shaded by large trees planted at the corners, or having one central chenar or mango tree surrounded by a raised platform of masonry or grass, terraces, fountains, and narrow watercourses, with their tiny, carved water-chutes, and the old well from which the garden was supplied with water from the Jumna (Dale, 2004).

Water chutes are used in a series of high terraces (Dale, 2004; Wescoat, 2011). But in small gardens, or in the plains, even the slightest slope was made into little waterfalls. A small pavilion built on the terrace at the far side of the garden. There are two large sunk plots on the garden's site. This enclosure, square plots, narrow watercourses, raised paths, sunken flower beds, continuous parterres, lowered square garden, flower beds that contain rose bushes, fruit trees, and tall-growing flowers and herbs. The large fountain basins and tanks were designed in the same fashion, their corners and sides being ornamented with scrolls of sculptured stone or marble, wide terraces with lines of little fountains and broad pathways (Mirza, 2015; Nath, 1982; Petruccioli, 1998).

The early Mughal gardens in India followed closely on their Persian origin. It is essentially a terraced garden. Water was manipulated beautifully in canals, jets of water, waterfalls, cascades, ponds and lakes (Nath, 1982). "The central artificial pool was highly appreciated as a place of relaxation and as a setting for court ceremonials" (Ross, 1931). Here the paved walkways are raised some ten feet above the level of the beds. The height above the flowerbeds varied according to what was intended to be planted in the garden: thus, some gardens were quite shallow while others were very deep. Thus, the Indo-Islamic garden operated simultaneously on two levels: visually, on the upper level, as a living carpet; and, sensually, on a lower plane, as a place of shade and intimacy and cool repose. It could only operate visually as a floral carpet or actually as a refuge from the scorching heat provided the planting was dense (Rehman, 1997).

CONCLUSION

Mughal garden is one of the great gardens in the Muslim world, which was largely constructed to serve the emperors or sultans. The garden was generally built in a

palatial environment, influenced by the ancient culture and traditions of the Persians as well as local cultures of Hinduism. Though the Quranic concept can be traced in all parts of the garden, the garden does not stand on glorifying the Quranic imageries alone, but mixed with local culture, which is obviously beyond Islamic doctrine. It is essential to note that, nothing on earth is equivalent to the paradise promised to the believers by the Almighty Allah (SWT), what more to equalize a man-made (restructured) environment to a paradise, which appearance is undoubtedly incomprehensible by a normal person's mind. Indeed, as indicated in the article; Mughal garden apparently has gone through a series of transformation from a nature-appreciation landscape, during the reign of the first emperor, Babur, to a voluptuous garden in the reign of the last emperor of Mughal, Shah Jahan. Secondly, the implication of culture in the garden is discernible throughout its construction and design. The construction and arrangement of the built structures, vegetation, water elements, location, materials used, pre-determined layout and other physical features in the garden should be assimilated into contemporary garden design according to local context, preferences, religious affiliation as well as the underlying environmental principles in Islam, such as unity (*tawhid*); creation (*fitra*); balance (*mizan*); and responsibility (*khalifa*) (Khalid, 2010; Abdul Latiff & Mohd Yunus, 2016).

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CONTENT ANALYSIS OF THE EXISTENCE OF BIOMIMICRY LIFE'S PRINCIPLES IN GREEN BUILDING INDEX MALAYSIA

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Abstract

Concerns about climate change and global warming have led many countries to initiate energy rating systems in the planning and development of the built environment. Although useful and novel, this paper contends that these ratings are only remedying and alleviating whatever negative impacts that development creates. Energy ratings are seemingly lacking in attempts to integrate and enhance the physical development of the natural environment. Instead, biomimicry is a discipline that explores nature and tries to understand its bio-integration for the establishment of sustainable products, processes and systems. This paper postulates that with the integration of Biomimicry – Life's Principles (BLP) into the Green Building Index (GBI) Malaysia, a higher level of environmental sustainability could be achieved. This paper attempted to explore the presence and the extent of the presence of BLP in the existing GBI utilizing the content analysis method. This article concludes that although the presence of BLP in the GBI is high, the extent of the presence is low. The paper also recommends the areas of concern that could be improved within the GBI for a more effective rating system.

Keywords: Green Building Index (GBI); Biomimicry - Life's Principles (BLP); content analysis; presence; extent of presence

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INTRODUCTION

The primary aim of this paper is to explore the existence of BLP within the GBI Malaysia. Thus, the study was conceptualised based on three objectives: The first is to explore the meaning and concept of biomimicry in the development of the built environment. Secondly, is to analyse the presence of biomimicry principles in the current energy rating tools and finally, is to analyse the extent of that presence or usage of BLP in the GBI system.

What is Biomimicry?

The term biomimicry comes from the Greek words bios, meaning life, and mimesis, which mean to imitate (Baumeister, 2012). This concept emerged in 1982 and was made famous by Janine Benyus in her book 'Biomimicry: Innovation Inspired by Nature' in 1997. Benyus (1997) defines biomimicry as the "new science that studies nature's models and then imitates or takes inspiration from these designs and processes to solve human problems". Biomimicry is a scientific approach that examines nature's lessons and methods, which are applied to the processes and designs to solve human problems. It seeks sustainable solutions by imitating nature's patterns and strategies (Zanowick, 2011). According to Gamage & Hyde (2012), biomimicry could be called 'strong ecological design' because it advocates using the same materials and processes applied by nature closely. Reap (2009) used three verbs to define biomimicry: 'study, imitate and solve'. Reap (2009) studies the living systems with the intent of imitating it to solve technical problems. Additionally, a final evaluation was required to ensure that the product or design commensurate with the natural principles.

Biomimicry has achieved some innovative and efficient technologies in materials and product, and has resulted in numerous innovations in fields such as transportation, material science and medicine. It is also gaining recognition in the design professions such as architecture (Gamage & Hyde, 2012). Designers and architects are becoming more interested and aware of how much nature can offer to improve the way the systems function. El Ahmar et. al., (2013) among others, contended that biomimicry is a growing area of research in the field of architecture and engineering. However, it is still unrealized, largely in architecture as demonstrated by the small number of built case studies (El-Zeiny, 2012; Klein, 2009; McGovern, 2009). The paper suggests that biomimicry should be considered as an approach to increase the sustainability of a building project. The mimicking of general ecosystem principles should be integrated into the design at the earliest stage and utilised as an evaluative tool all over the design process (Zari, 2015).

Biomimicry Design Lens

The 'Biomimicry Design Lens' (Figure 1) is a guide that helps in understanding how biomimicry can be applied to any discipline or design scale. The Lens includes the Biomimicry – Life's Principles (BLP), and Biomimicry Thinking

(Biomimicry 3.8, 2013). The Biomimicry – Life's Principles (BLP) represents 'Nature's strategy for sustainability' and they provide a lens to observe design strategies (Zanowick, 2011). According to Biomimicry 3.8 (2013), these principles also signify the central patterns found among the species living on Earth. The Design Lens or framework demonstrated six (6) main principles and twenty (20) sub-principles. The principles are all equally weighted, and they are (in no particular order): Adapt to Changing Conditions; Be Locally Attuned & Responsive; Use Life-Friendly Chemistry; Be Resource Efficient; Integrate Development with Growth and Evolve to Survive. The BLP design lens was used as a guide in assessing the primary aim in this paper (Figure 1).

Figure 1 The Biomimicry Design Lens
Source: http://biomimicry.net/

Green Building and Green Building Rating Systems

The main motivation behind the green building movement is the sustainable development paradigm (Kibert, 2012). Green building is an outcome of applying sustainable construction approaches to provide a responsible built environment. The term 'green building' refers to the actual structures' quality and characteristics that are provided using sustainable construction principles and methodologies (Kibert, 2012). At present, Green building movement grows rapidly and it is supported by many government and non-government organisations. This movement becomes popular among professionals and authorities to create a balance between the building and its surrounding environment. The goals are to lower the buildings' adverse impacts on the environment during the life cycle of the building, which can be achieved through better design, siting, construction, operation, maintenance and demolition. A building is defined as green when it has undergone an evaluation process. The evaluations are to verify that a building follows the strict requirements of the green building rating systems to provide detailed assessments (Kibert, 2012). As a result, these systems can be called assessment building systems, or building rating tools or systems such as the Leadership in Energy and Environmental Design (LEED) (US, 1998) and Green Building Index (GBI) (Malaysia, 2009).

GBI Malaysia is made up of six Parts: Energy Efficiency, Indoor Air Quality, Sustainable Site Planning and Management, Materials and Resources, Water Efficiency and Innovation. Under each of these Parts, there are several criteria according to which the building will be evaluated. In the beginning, two GBI rating tools were developed: the Non-Residential and the Residential rating tools. After that, several more tools were developed. Recently, there are around 11 GBI rating tools. Each of these rating tools has its own point allocation, where each tool places its emphasis on GBI criteria that are different from other tools. One of these tools is the Non-Residential New Construction (NRNC), which is the focus of this research.

Green Building and Nature

As stated before, the natural systems have many solutions for the current problems that people are facing nowadays. Most of green building's definition states that ecology and ecological principles are important for the designing of green buildings. However, some critics claim that ecological or natural-based principles do not exist in a coherent manner in the green buildings (Gamage & Hyde, 2012). Some other critics suggest that most green building designs operate as a collection of eco-technologies such as photovoltaic panels and eco materials (Yeang, 2006). This illustrates a lack of knowledge in understanding the significance of holistic integration (Gamage & Hyde, 2012). According to Kibert (2012), the progress of high-performance green building requires the ability of the design team to understand and apply ecology and its principles. In other words, buildings should have 'a synergistic relationship' with the natural

environment surrounding it (Kibert, 2012). Kibert (2012) claims that green building with higher economic and aesthetic value can be produced when there is a use of design approach that is based on the understanding of natural systems and ecosystems' behaviour. In short, green buildings need to go beyond the points and certifications, and they are required to integrate and blend with nature and this cannot be achieved with a simple checklist as used by most rating tools.

METHODOLOGY

This paper is the beginning of a deeper study and is more exploratory in nature. In order to achieve the stated aim and the subsequent questions, the principle methodology used in this study is utilizing the content analysis method. Analyses were done on the GBI documents to investigate on the presence and on the extent of the application of the biomimicry principles in the existing ratings. The content analysis used not only the exact words but also the meaning or concepts of the BLP that are deemed relevant in the GBI. The findings of the analysis would from a basis for the recommendation of improving the present GBI document wherever relevant.

Content Analysis

Content analysis is a method of analysing documents, and it helps in testing theoretical issues to improve the understanding of the data (Elo & Kynga, 2007). There are different levels of content. There is the primary content that is represented by themes and main ideas of the text, and there is a latent content that is represented by the context information. The purpose of content analysis method is to provide new insights, knowledge, a representation of facts and a practical guide to action and also to get a shortened or broad explanation of the phenomenon (Elo & Kynga, 2007). The processes of content analysis involves coding of raw data, such as visual images, textual material, and illustrations, in accordance with a classification scheme. The coding is a process for organizing content in a way that helps in easily identifying, indexing, or retrieval of the content that is relevant to the research questions. The components of the content could be words, phrases, topics, theories, concepts or other features.

Content analysis method is used with either qualitative or quantitative data by either deductive or inductive processes and consists of three phases of work: preparation, organizing and reporting. The preparation phase includes deciding on sampling, selecting the unit of analysis and making sense of data. After that, a decision will be made whether to use deductive or inductive approach. If the deductive approach is chosen, a categorization or conceptual matrix will be developed (Elo & Kynga, 2007). The data are coded for correspondence with the identified categories or concepts. For each deductive category, clear definitions, examples, and coding rules must be provided and arranged in a coding agenda. There are several computer programs that are widely used for content analysis, and one of them is ATLAS.ti. This program works as an assistant in working through the material, writing marginal notes, defining

category and codes, underlining, writing comments and others. Also, it is a very helpful tool for handling the text.

The deductive approach was used because the BLP was developed by the Biomimicry Institute (Biomimicry 3.8, 2013). It is divided into six main categories and twenty sub-categories. BLP were coded as the codes/categories and the GBI document was coded for correspondence with the identified codes/categories. The codes definition of BLP document (Biomimicry 3.8, 2013) is shown in Table 1.

Table 1 The Code Definition for BLP

Document	Main Principles	Code	Sub-principles
BLP - Biomimicry Life's Principles	Evolve to Survive	C1	3
	Be Resource (Material & Energy) Efficient	C2	4
	Adapt to Changing Conditions	C3	3
	Integrate Development with Growth	C4	3
	Be Locally Attuned and Responsive	C5	4
	Use Life- Friendly Chemistry	C6	3
		Total	20

The codes definition of GBI document (Non-Residential New Construction (NRNC), 2015) is shown in Table 2.

Table 2: The Code Definition for GBI

Document	Parts	Code	Criteria
GBI, Green Building Index	Energy Efficiency	EE	9
	Indoor Environmental Quality	EQ	15
	Sustainable Site Planning & Management	SM	13
	Materials & Resources	MR	7
	Water Efficiency	WE	5
	Innovation	INV	2
		Total	51

Stages for Conducting Content Analysis

Stage 1 is the Preparation stage where both documents were analysed and the coding was specified and assigned. The researcher decided to code for sets of words, phrases or themes, which were relevant or related to the specified codes/concepts (pre-defined set of categories). **Stage 2** is the Organization stage where the software Atlas.ti was actively used in the coding process. Atlas.ti was helpful in working through the text, underlying, writing comments and applying codes to a highlighted or selected text. These actions were to look for the existence of assigned words and concepts according to the codes specified in the

GBI document. The codes were then organised into categories, using the Biomimicry Lens as a guide. The outcome of this is shown in **Stage 3,** the Reporting stage. This stage is the most crucial stage where the results found from Stage 2 were presented in tables and charts for clarity of reporting. In this stage, the BLP Lens was used to illustrate the presence of these principles in the GBI terms.

ANALYSIS & RESULTS

Most of the analyses were done in Stage 2: the coding process. Coding of the text was conducted by reading through the documents and manually writing down the occurrences of concepts identified, using Atlas.ti. The GBI rating tool was considered as the document or data analysed according to the existence of the codes (as concepts and not as exact words). The text was coded using ATLAS. Ti (attaching the code to a text that used the principle) and the results were arranged in a matrix and finally reported in the forms of bar chart and as a summary, the radar chart. The results were reported in terms of the presence and the extent of this presence. Table 3 shows an example of the coding process undertaken.

Table 3 Example of the Coding Process of the Occurrences of the Concepts in the GBI similar to BLP

BLP: C 1-1: Replicate Strategies that Work	
GBI Criteria	**Quotation**
EE1: Minimum EE Performance	"Promote the use of MS 1525."
EQ6: Thermal Comfort: Design & Controllability of Systems	"Design to ASHRAE 55 standards in conjunction with the relevant localised parameters as listed in MS 1525:2007."
EQ10: Electric Lighting Levels	"The ambient lighting level should be designed in accordance with the illuminance level recommended in MS1525:2007."
SM13: Building User Manual	"To document Green building design features and strategies for user information and guide to sustain performance during occupation."

The coding process was where the texts within the GBI were coded for the presence of the Biomimicry life's principles (BLP) as obtained from Atlas.ti. In addition, the extent of existence was also provided in the form of the percentages of the presence of each main principle in GBI. It is important to note that the coding was for the presence of the concept/principles and not how it was applied. The aim was to find out whether these concept or principles were embodied or employed in the GBI criteria or not.

The next step was to categorise or arrange the quotations from the GBI text (coded text as shown above) into a matrix to look for the presence of the BLP in the GBI. An example of the categorization matrix of the presence of BLP in the Energy Efficiency Part from the GBI is shown in Table 4.

Table 4: Example of the Categorization Matrix in the Energy Efficiency Part

GREEN BUILDING INDEX (GBI)		BIOMIMICRY LIFE'S PRINCIPLES (BLP)																			Results	
		C1: Evolve to Survive			C2: Be Resource Efficient				C3: Adapt to Changing Conditions			C4: Integrate Development with Growth			C5: Be Locally Attuned and Responsive				C6: Use Life-Friendly Chemistry				
		C1-1	C1-2	C1-3	C2-1	C2-2	C2-3	C2-4	C3-1	C3-2	C3-3	C4-1	C4-2	C4-3	C5-1	C5-2	C5-3	C5-4	C6-1	C6-2	C6-3	Total	%
ENERGY EFFICIENCY	EE1	√			√	√								√								4	20
	EE2					√																1	5
	EE3													√				√				2	10
	EE4														√							1	5
	EE5				√	√			√													3	15
	EE6																					0	0
	EE7																					0	0
	EE8																	√				1	5
	EE9																					0	0

The categorization matrix was conducted for all 6 Parts of the GBI document (refer to Table 2). These were further analysed to present the investigation of the BLP codes in the GBI documents.

The presence of the BLP was reported at two levels: in GBI as a whole and then in each part of the GBI. On the other hand, the extent of the presence has two dimensions: the extent of the fulfilment of BLP itself and their extent of

the presence in GBI. This study takes the stand that all principles must be fulfilled to create conditions conducive to live as seen in the Biomimicry Life's Principles framework or lens. The summary of the findings is reported next.

The Presence of BLP in GBI

When looking at the GBI as a whole, the level of presence of the BLP is a likely 65%. This result means that much of the contents of the GBI include the themes and concepts as coded and categorised from the BLP. The total number of presences equate to the number of sub-principles found in the whole GBI document. Further analyses showed that 13 BLP sub-principles out of a total of 20 were present but in the different Parts of the GBI. The radar chart in Figure 2 illustrates the summary of the results of the three levels of analyses on the presence of the BLP in the GBI.

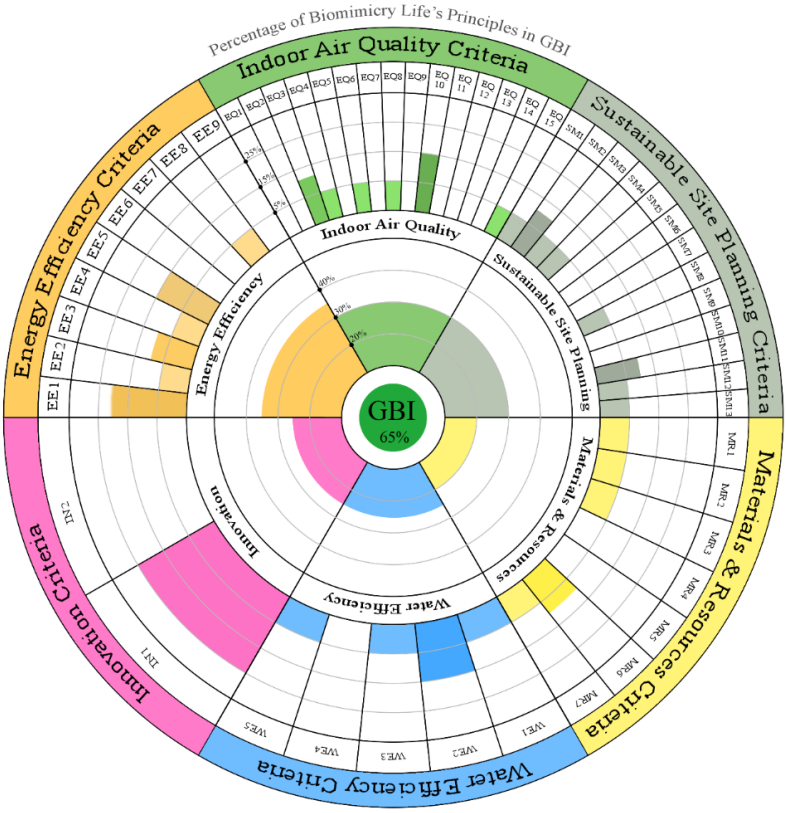

Figure 2 Summary of the Presence of Biomimicry Life Principles in GBI

The most outer ring presents the 6 Parts of the GBI (see Table 2). The second ring shows the criteria of each Parts and the third ring shows the levels of

occurrence/presence of BLP in each criteria of the GBI. Going inwards, the fourth ring shows the levels of fulfilment or the extent of the presence of the BLP in the GBI. The innermost or smallest ring shows the total and percentage of the presence of BLP in the GBI.

All Parts of the GBI were represented, but not all criteria have the presence of the BLP. For example, in the Innovation (IN) Part, which consisted of only two criteria (IN1 & IN2), BLP is only found in one criterion. However, the level of the fulfilment of BLP is the highest (25%) amongst all criteria. Another example is the Indoor Air Quality (IAQ) Part, where nine criteria out of fifteen do not have any BLP presence in them. When going deeper into the inner ring, the result illustrates the magnitude of the presence of BLP in each GBI Part on the whole. Energy Efficiency (EE) Part obtained the highest presence of BLP with 35%. On the other hand, Materials and Resources (M&R) Part has seven criteria but the lowest number of BLP with only 20% presence.

The Extent of the Presence of BLP in Parts of GBI

The definition of the extent of presence here means the level of frequency of the presences of the BLP in the GBI. The frequency was obtained through a categorization matrix where the presence of the BLP sub-principles was ticked against the criteria in the GBI when found. These occurrences may appear several times in some criteria/sub-principle matrix. While in another matrix, it may not appear at all. The results are shown in Figure 3.

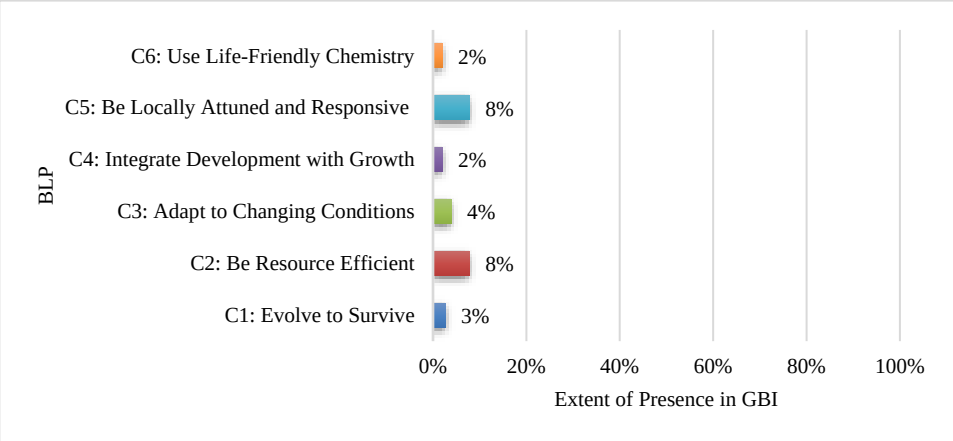

Figure 3 The Extent of Presence of BLP in GBI

The results show the percentage of the extent of the presence of each main principle of BLP in the GBI. Although many of the BLP existed in GBI as a whole (65%), the extent (or level of frequency) of the presence is low. The highest numbers of the frequency of presence (8%) in GBI are evident in two principles. They are "Be Locally Attuned and Responsive" and "Be Resource

Efficient (Materials and Energy)". The lowest extent of presence is by the "Use Life–Friendly Chemistry" and "Integrate Development with Growth" principle, where the extent is only 2% in the GBI criteria.

This result would infer that more efforts are required to increase and enhance these principles in the GBI. On average, the total of the extent of the presence of BLP was calculated as 4.7% in the whole GBI. This finding indicated poor bio-integration of ecological principles into the existing green building-rating tool.

CONCLUSION

Green building design and biomimicry are two different evolving approaches to sustainability in the built environment. Green building design aims to achieve the sustainable development goals and principles. On the other hand, biomimicry seeks to study nature's models to solve all problems that humans face nowadays. In other words, biomimicry is based on the natural model while the green building relies on the man-made model. As demonstrated, nature is considered as a perfect paradigm of sustainability and, therefore, using the biomimicry life's principles in green building design could be very beneficial. The synergy between biomimicry and green building design can help in improving and further develop the green building rating tools that are widely used by building's professionals to help them define and produce a sustainable building.

This research uses the Biomimicry Life's Principles (BLP) framework or lens to analyse the GBI Malaysia rating tool. The whole GBI document was examined against the existence of Biomimicry principles in it. This study helped in highlighting the natural principles that exist in GBI and also indicating those that do not exist. Once the missing attributes were found, efforts can be made to enhance the content of the GBI document to achieve a higher level of sustainability. The study explicated the extent of the presence of BLP in GBI, which, in general, is low. The findings inferred a need for more integration of the BLP in the next generation of the GBI rating tool. Future study would be to find out how the missing principles may be included in the existing GBI and how the other existing principles may be enhanced. An improved framework can be developed in which all the criteria are designed based on the natural principles where all criteria are working together to help professionals in producing the building that "create conditions conducive to life".

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REVISITING ANDALUSIAN GARDEN: VISIONS FOR CONTEMPORARY ISLAMIC GARDEN DESIGN

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Abstract

Andalusian garden is one of the historical gardens in the Muslim world. It appears that the garden designers at the time managed to emulate the spiritual and sacred essence of the paradisiacal environment on earth. The method of content analysis and library search was applied in this study. The findings of this study reveal that the Andalusian garden has been built in accordance with Islamic principles of environment and has crystallized the Quranic paradise description in reality. To conclude, the physical attributes of the Andalusian garden made an essential reference for a contemporary Islamic garden design.

Keywords: Andalusian garden, Islamic garden, contemporary garden, environmental principles

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INTRODUCTION

Historically, Muslim has ruled Spain from early 8th century until 1492 (Abdu-Noor, 2005). Al-Andalus, the Muslim political sovereignty in Spain was governed by the Umayyad caliphs in Damascus until 750 when the Abbasid dynasty came to power in the East. Abd al-Rahman ibn Mu'awiyah ibn Hisyam ibn Abd al-Malik ibn Marwan or Abd ar-Rahman I (756-788 A.H. 139-172), the last surviving member of the Umayyad dynasty, escaped from Damascus and fled to Spain. He established an independent Umayyad state (Dodds, 1992) in Cordoba, thus became the founder of Umayyad dynasty there. He built the first garden called Al-Rusafa (Ruggles, 2008; Almagro & Ruggles, 2007; Dodds, 1992) in the city of Al-Rusafa, Cordoba based on what he saw at Damascus, Syria (Abdine, 1986; Lehrman, 1980) that had influences from the Umayyad dynasty during the caliph Hisham's reign from 724-743 (Ruggles, 2008), and if the dating is correct, this garden was the earliest Islamic garden exemplar (Almagro & Ruggles, 2007; Grabar, 1980). This was also the moment when a number of small Muslim dynasties bloom.

Al Rusafa garden is a large garden enclosed by mud-brick walls. In the centre, an elevated square pavilion of stone with four sides' access is located (Almagro & Ruggles, 2007). Elevating a building on an intersection allows elevated views and vistas of the surrounding garden as well as an expression of sovereign power. This garden did not follow the four-part layout that became ubiquitous in most of the Islamic gardens Dodds, 1992; Ruggles, 2008). Its orchards were watered by a pipe which ended in a pool, over which there was a lion covered in pure gold. The water entered through its hindquarters and poured out through its mouth (Al-Makkari, 1840).

Another type of Andalusian garden is the open courts and gardens (Abdine, 1986), which are found throughout the south of Spain including Cordoba, Seville and Málaga. Madinat al-Zahra is one of the examples of an open court garden built by the first Spanish Umayyad caliph, Abd al-Rahman III (North African reverts to Islam) located in the royal city of Madinat al Zahra' (Doak, 2009). This luxurious palace garden of Madinat al-Zahra is built in the agricultural zone (Ruggles, 2008) on three stepped terraces on the sloping skirt of a mountain (Ruggles, 1992) in the royal city, using materials that reflected the king's wealth such as marble, bronze, silver, and gold (Foret, 2009). The garden consists of several palaces and planted with palms, olives, oranges, jasmine, yellow roses and pomegranate (Abdine, 1986; Almagro & Ramón-Laca, 2007; Lehrman, 1980). "Madinat al-Zahra' resembles that of Abbasid cities like Samarra which tended in their maze-like form. The planning shows the impact of Abbasids, decorated from an indigenous Spanish Islamic tradition" (Dodds, 1992).

Accordingly, it became the model of subsequent palace estates built in Cordoba. It had influences from Iran and Mesopotamia gardens. The renowned

term Mesopotamia was first used by the Greek to refer to the area between the Tigris and Euphrates rivers (Phillips, 2010). Madìnat al Zahrā' had enclosed courtyard complete with essential elements in an Andalusian Islamic garden such as pavilions, sculptures, arcades and terraces lined with trees and flowers, watered from rivers and hillside streams (Abdine, 1986; Lehrman, 1980).

OBJECTIVE & METHODOLOGY OF THE STUDY

The main objective of the study is to determine the physical characters of the Andalusian garden to be emulated into contemporary Islamic garden design. The methodology adopted is mainly content analysis and library search that emphasised on the theories and principles of the Andalusian garden, as well as reference to the Quran, Hadiths and related literature written by Islamic scholars.

THE PARADISIACAL CONCEPT IN THE ANDALUSIAN GARDEN

Andalusian garden has a paradisiacal concept in the sense that it is filled with scented flowers, singing birds and water-wheels with entertaining sound (Al-Makkari, 1840). There are three types of Andalusian garden (Harvey, 1974); first, walled courtyard or patio, domestic and inward looking (Court of the Myrtles (1334-1354). Second, the large gardens (Jennat al-Arif) or the Generalife or 'The paradise of the Architect' (Fromherz, 2010). The third, the ordinary garden (Harvey, 1974). It is also called Royal Garden, referring to its construction of high ranking courts and splendid royal palaces, the Morphological Garden, referring to the aroma, color and aesthetic hedonistic ends and multiple uses of plants; used for medicine, decoration, food, agriculture, dyes, perfumes, and cosmetics (Ruggles, 2008). Essential elements in the garden are water, plants, trees, sculptures and pavilions while figural sculpture is very rare in Islam (Harvey, 1974).

Andalusian garden also exhibits the sense of intimacy and privacy; remote from the outside world; delicacy and subtle use of water as the major conceptual focus of a paradisiacal garden world; astounding variety of low, musical sounds created by many tiny splashing jets and the last is the intensity created by contrasts between large and very tight spaces, and the contrast between deep shade and bright light (Nevins, 1988). Lastly, the garden is always around pools or water features (Almagro & Ramón-Laca, 2007).

The Alhambra is a majestic complex of administration with several courtyard gardens in different sizes. It is the Islamic palatial and residential architecture (Rabbat, 1985) where a great emphasis is given to the inward orientation (Attia, 2006) around the court which appears as the typical Islamic inclination (Omer, 2009). The Alhambra is no more than a palace in the same sense as Versailles and Buckingham Palace. The palace was more like a synthesis of early Islamic palaces and a fortified town which comes from both Roman and 2ndcentury central Asian traditions. The palace is saturated with divine codes.

There is no division between the sacred and secular life of the code, even the earthly power of the sultan is subordinate to that of god. "God alone is the Victor", the motto of the Nasrid is present on the walls of the Alhambra (Dickie, 1992).

The Court of the Lions has always been praised for the balanced composition or architecture, vegetation and water (Rabbat, 1985). The longer east-west axis in the court is defined by projecting pavilions sheltering fountains whose overflow draining through channels to the centre, forms two of the rivers of paradise. A central pond in the middle of the Court of the Lions and the Court of Myrtles symbolizes soul purification, reflection, contemplation, continuity, nucleus, animation, delicacy, infinity and symmetries. Bowls in the courts let water flows continuously in carved channels made of stone before spilling into rectangular pond (Attia, 2006). Meanwhile, in the large garden of the Generalife, the water channels are diagonal that run across the steep hillside to fall into patio gardens (Attia, 2006). There are also three layers of water stairway that provide dramatic views over the landscape, juxtaposed with the visual play of water and stone. The dynamism of water management in the Court of the Lions is accounted as purifying the soul, contemplating God's creation of the universe (Lehrman, 1980) and to give life to the inanimate. The dynamism of water management is put into the physical form of water fountains, channels, an underground cistern to catch rainwater, small jets, underground reservoirs, small canals and tanks.

The availability of water in abundance was also intelligently used as a cooling agent within an enclosed space such as in the Patio de la Acequia. Stagnant water feature in the patio is essential as reflecting agent; reflecting the sky, surrounding architecture and plants. She mentioned that, in order to ensure the movement of water in the small-area garden in the Court of the Lions, pumps and hydraulics are used showing the flexibility and the sense of regionalism or space. Rainwater is captured by gables on the roof to each tree with minimal evaporation and water loss (Carroll, 2003). The Court of the Lions is a water clock-fountain, regarded as a rejuvenating agent that adheres strictly to the management of water, use water only when people actually use the space. The lion statues were designed in such a way that it will shoot water both ways when the shadow casts on them to remind the Muslim of *zuhur* prayer time, and the water that circulates is clean enough for ablution.

The principal of spirituality was well displayed by the repetitive inscriptions of geometric and calligraphic decorations on the walls of the Court of the Lions as an Islamic iconography (Foret, 2009; Mirza, 2014; Rabbat, 1985). It is important to note that, Kufic is used for calligraphies from the Qur'an, which tend to be high up on the walls nearer to the heaven, while the poetry is further from heaven nearer the ground. These repetitions of inscriptions on the walls of the Alhambra symbolize the instability of the political environment of the Nasrids due to an endless war with other Muslim dynasties and non-Muslim dynasties, the Castilla and Aragon (Ahmad, 2004). Built primarily by Muhammad V, the

Court of the Lions reflected cultural syncretism (Ahmad, 2004). Today, the routes are no more the same, windows have been converted into doors, beds into passageways and the two palaces of Alhambra and Generalife are now connected (Dickie, 1992). The whole palace complex was the setting of the mysterious real and imaginary worlds of splendour, intrigue and romance.

For most scholars, the Court of the Lions was seen as having the paradisiacal image of four gardens (Ali, 2000). Such interpretation also can be found in Persian gardens however; the court was not conceived in the image of Paradise (Rabbat, 1985). It was an earthly garden for earthly pleasure imitating the tradition of the Roman of *villa rustica*. The purpose of the court was not to glorify materials or feats of engineering, or even to impress the subjects of the King but to provide its inhabitants with an intimate, entertaining living space (Grabar, 1990). It displays profoundly the traditional architecture not technology (Ahmad, 2004) which was already found during Achaemenid.

There is no evidence in the first four centuries of Islam that gardens were consciously designed with four quadrants and four water channels in order to imitate the paradise. Most gardens belonged to palaces where the environment was decidedly impious, characterized by the political display and other immoral acts that are forbidden to be practiced by Muslims (Ruggles, 2008). Even the 12 lion statues in the centre of the Court of the Lion was built by the Jews. This is supported by the facts that the Jews who used to live within Muslims for hundred years, had used to the culture of Moorish Spain and considered it something they shared with Spanish Muslims. It is a symbol of so-called harmony coexistence of Christians, Muslims and Jews; three faiths lived together in peace and harmony. Courtyards are private and secured gardens constructed to optimize a small space located on a small scale of area normally in a building fully occupied by rich spatial elements derived from the description of paradise from the Qur'an. Strict geometric patterns (Lehrman, 1980; Ruggles, 2000) also promote a sense of belonging (Lehrman, 1980).

This principle of balance and harmony are aligned between vegetation and architecture in the sense that they did not conflict with each other (Lehrman, 1980). For example, in the Court of Myrtles, aromatic bushes are planted in parallel to the walkways (Attia, 2006) and sometimes in geometrical and maze layout (Lehrman, 1980), orange trees are planted in four corners of four axial canals. Consequently, the truth becomes the hidden *baraqah* for the old building which survives till today from the 14th century, when without the Muslim, the building also acted as a reminder of the Oneness as angels still conduct *dzikr* from the walls decorations. Theoretically this is known as 'spirit of a place' alive for centuries. It was not realized by the Christian's Spaniard of Ferdinand and Isabelle due to their culture of siesta which destroyed them till today. It is interesting to find that these inscriptions show exactly the intention of its builders (Hoag, 1977).

The Alhambra was developed by the Moors in 1238-1492 (Lehrman, 1980). It has the influences from Europe, the Almohads, the Fatimids and the Eastern Islamic world (Ahmad, 2004). The layout of the magnificent Alhambra conceitedly organised around an inner courtyard. It presents to the outside world high windowless walls interrupted only by a single low entrance that emphasised its perspective and ensemble the successful integration of water and built environment (Attia, 2006). It promotes passive ventilation system; capture the wind and reduce heat where the designer can manipulate the site and create a variety for water, vegetation and pavement composition (Attia, 2006). For example, in the Court of Myrtles, built by Muhammad V, there is a rectangular courtyard with a rectangular pool in the middle (Attia, 2006) with a dodecagonal basin is located at the bottom of the twelve stone lions (Attia, 2006; Hoag, 1977).

The settings and arrangement of the animate and inanimate in this small area garden of Court of Myrtles (Harvey, 1974) are done in a balanced composition that occupies the small space of the garden to the maximum. In order to optimize the space usage, the layouts and settings of the area are always done in such a way to reach as many geometric patterns as possible by employing quadripartite lines (Attia, 2006), squares, perpendiculars, dodecagonal, axial, parallel, axes; longitudinal, transversal and symmetries.

The lavish decorations by the mean of geometric designs and *muqarnas* vaulting in the garden represent the infinite and the divine (Foret, 2009). The decorations of the chambers enhanced the idea of abundance (Abdine, 1986; Foret, 2009). These abstract patterns were seen as agents of the spiritual world. The decorations are lively and set in a space allocated for contemplation as one of the ultimate forms of pleasure that were attained through God and seen through the abstract patterns of the geometric decoration and *muqarnas* vaulting (Grabar, 1990). The *muqarnas* are a representation of the rotating dome of heaven, which in turn represents the mastery of time. The inscriptions on the walls directly suggest the illusion of heaven.

King Muhammad V has magnificently designed the Alhambra with the profuse usage of water, rectangular pools with water reflecting the sky and the abundance of water in the garden itself. The value of proportion, spiritual refreshment, paradisiacal, luxury, spaciousness, luminosity and relaxation that mirror the ideal human condition that deeply concerned with inner soul development is established. The court consists of four principle-surrounding chambers of the Hall of the *Muqarnas*, the Hall of Justice, the Hall of *Abencerajes* and the Hall of the Two Sisters (Hoag, 1977).

Besides, the court and all the spaces in it are built in such a way for people to sit on or near to the floor (Hoag, 1977). “This explains why...all the other fountain basins...are flush with the marble floors...reflections on the water are also best observed while seated beside them...hence the verses around the central fountain basin” (Hoag, 1977). Plantings of flowers, bushes and small trees were

also once being nearer to the eye level of persons seated in the porticoes but the view to the court are not concealed. However, there are no trees planted in the court (Attia, 2006).

Domestic courtyards (Lehrman, 1980; Omer, 2009) in the Andalusian garden emulate as much the characteristics of paradise as mentioned in the Qur'an in terms of its layout, settings and arrangements of its spatial elements. The stone paving, white stuccoed walls, bright and dark colored tiles (Lehrman, 1980), potted plants for the minimal use of water (Lehrman, 1980), white marbles and trees of cypress, orange and palm that were planted in rows to show infinite rhythmic at each side of a small pool with trickling fountain is a reminder of the paradise of Muslim. There is also a channel that flows into a basin with a pavilion in the centre of the courtyard (Lehrman, 1980). In order to remind one of the paradise, a small bower is placed at the junction of paths that were formed from the cypress trees. The enhancement of privacy and shade is successfully reached in this generous garden courtyard. The courtyard garden is a cool and shady as the trees and plants were so dense that they do not allow the sunrays to reach the ground thus providing a gentle wind all day (Attia, 2006).

The Generalife is a city within a city, was built in the time of the King of Granada, Muhammad II (1273–1302), and later enlarged by Kings Muhammad III (1302–1309) and Isma'il I (1313–1325). Besides featuring Granada's Muslim legacy, it was also a city of scholars[32] such as al-Mazini, ibn Tufayl, ibn Rushd, ibn Zuhr, ibn Khaldun, ibn Batuta and ibn al-Khatib to name a few. Its setting on the elevated spot with good fertile red soil displays its majestic political and religious complex. The Generalife is a series of gardens and pavilions; known as the summer retreat of the Sultan or the court of irrigation (Attia, 2006).

The quadripartite design is mentioned more than one time in the Qur'an hence become a common design for Islamic gardens from Spain to Mughal India (Carroll, 2003; Lehrman, 1980). In order to resemble paradise, evergreen, shady, colourful and lavish plants and vegetation are planted such as artichokes, myrtle and cyprus. These plants provide structure and lushness year-round such as in the Court of the Alcazar, Seville (Carroll, 2003). The combination of natural and built environment elements of the garden is shown when climbing vines (Foret, 2009) are sometimes let to cover the wall as a finishing element to make it look like high evergreen hedges to maintain coolness such as in the modern design of urban plazas (Nevins, 1988). Aromatic plants are also planted to form Arabic calligraphy in the garden, besides being used for culinary purposes (Lehrman, 1980).

Ground covers are normally planted under the tall trees (Ruggles, 2000). These ground covers, sunken beds or living carpet design make use of both lush and dry landscape (Ruggles, 2000). It is designed and arranged in such a way that the plants are planted with the same level with the adjacent water feature thus water that was captured from the adjacent water feature can be used minimally

(Hoag, 1977). Therefore, an Islamic garden should be harmless for people or visitors to sit on the ground while enjoying the variety, beauty and aromatic smell (Ali, 2000) of the garden as picking fruits that hang low within the reach of hands (Ali, 2000). Fruit trees are arranged in lines of garden walks and parapets (Lehrman, 1980). Plantation lent additional colour and fragrance that use any water runoff to irrigate the garden (Lehrman, 1980).

Among the accessories in the Andalusian garden are solid benches that stand on their own and sometimes are attached to a wall. There are also pots of terracotta, flower beds (Lehrman, 1980), vases of coloured glaze, unglazed tiles that were formed and paved and capped walls. The walkways are faced with tiles, bricks, earth-coloured and smooth pebbles laid in a geometric pattern. There are also fountains and paths and edged steps (Lehrman, 1980). Courtyards in the Andalusian garden has a minimal use of plants and water in the most purposeful ways. The focus is given more on living spaces while leaving the native landscape dry. Andalusian garden offers shade and flexibility within a built environment. The lushness is created without a great deal of water thus highlighting the uniqueness of the space and makes the urban fabric feel grounded in place. Gardens on the hilly area are terraced with an orchard to mitigate erosion and surface runoff. It also produces the maximum effect by using minimum expenditure of water (Harvey, 1974). The Generalife is exhibited as planted with trees and shrubs and brightly colourful flowers with penetrating perfumes. Cypress trees are used as its principle tree that lived for 600 years (Harvey, 1974).

The Alhambra is known for its sustainable water management planning in the city. The Andalusian garden is full of water. Water is the binding thread that ties everything together. Fountains in the centres of the Hall of the *Abencerajes* and of the Two Sisters drain again into the centre, symbolizing the other two rivers of the paradise. The uses of water in the palaces fountains and watercourses are dynamic in terms of its design, which are rightly to the long-evolving tradition of ornamental and palatial water usage in the Mediterranean and Persia, both in the pre-Islamic and Islamic periods (Grabar, 1980).

Having a royal city in a large urban complex can also be seen in the other parts of the world such as Rome, Byzantine, Constantinople, Samarra and monastery garden. Six features of the Domus Aureus from the mediaeval ages had influenced much on the Islamic palaces. They are grand size, different kinds of water (pools, fountains, hot, cold), the luxury of surfaces and artificially composed nature (as in gardens or agriculture). There are three types of decorations namely vegetal, geometric and epigraphic. The Alhambra of today is a modification. This delicate and fragile palace was made essentially for temporal power and worldly pleasure. Its decoration is flawless but not new. It represents the mixture of previous cultures that the Nasrids had to balance politically and culturally. The decline of the dynasty in 1453 had also marked the end of the Muslim empire in Spain and Catholicism was spread to every corner of the world.

CONCLUSION

Andalusian garden is a metaphor of garden which is a reward for those who practice good deeds as a garden on planet earth; it is far from the real paradise gist as described in the Qur'an. The real garden attributes are varying according to the Muslim culture all over the world and is determined by weather and local practices. "Among the examples of Islamic architecture under the sway of light, the Alhambra at Granada sets the first rank. The Court of Lions in particular sets the example of stone transformed into a vibration of light; the lambrequins of the arcades, the friezes in *muqarnas* the delicacy of the columns which seem to defy gravity, the scintillation of the roofs in green tile-work and even the water jets of the fountain, all contribute to this impression. By analogy, one can say of Muslim architecture that it transforms stone into light which, in its turn, is transformed into crystals" (Nasr, 1987). Andalusian garden shows an attempt of spiritual and sacred essence of paradisiacal environment emulation by its designers at the time. However, to truly adhere to Islamic principles is not enough by integrating the paradise description on garden's design alone, however, it must instil the senses of *tawhid*, *mizan*, *fitrah* and *khalifah (*Abdul Latiff & Mohd Yunus, 2016). Into it as everyone are answerable to His Creator for how he has used the countless blessing rewarded upon him. Not to mention that, Islam forbids any unlawful act or elements in any circumstances including in designing a garden that disgrace Islam and create misinterpretations about the religion.

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PERCEPTION OF PARENTS AND GUARDIANS ON SAFE DISTANCE FOR CHILDREN TO TRAVEL TO PUBLIC AREAS

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Abstract

Children safety is of utmost important. Children are susceptible to safety risk while traveling to public areas such as schools, parks and bus stops. Perception of parents and guardians on the safety of their children determines their decision whether or not to allow their children to travel to public areas and how. This study looks at the perception of parents and guardians on the safe distance for children to travel to public areas. 4,500 respondents were surveyed. It was found that parents and guardians perception of safe distance is heavily influenced by distance and children's age factors.

Keywords: Safe distance, children, public areas

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INTRODUCTION

Increasing incidence of crime against children has posed a challenge to parents and families in ensuring the safety of their children (Al-Dawamy & Sulaiman, 2010). Parents tend to focus on the welfare and safety of their children and most parents tend to ensure that their children are within their view when at public places. Knowledge of the suitable safe distance is crucial to ensure safety of children, especially when the children are to travel to public areas. Thus, the aim of this research is to study parents and guardians perception on the safe distance for children to travel to public areas such as schools, shopping mall, community facilities, bus stations, parks and others.

Background of the Study

Knowledge on safe distance is crucial to community in order to prevent unwanted incidents involving children from happening due to the negligence of parents in public areas. Public areas are areas that include residential area, schools, parks, shopping malls and other public places. According to Mammen, Buliung & Lay (2012) and Oluyomi et al. (2014), distance is one of the factors that influences the element of safety among children. Their studies found that the closer the distance between school and home, the higher the perception of safety among parents. Other factors such as the security system in school, the type of development surrounding the school and the school condition also influence the perceived safety of children among parents (Mammen, Buliung & Lay, 2012; Oluyomi et al., 2014). McDonald (2008) suggests that a typical walking rate for school-aged children is about 2.7 miles per hour (or 1.35 miles per 30 minute-period). Therefore, most children will probably not walk farther than 1.35 to/from school.

Crime against children is a widely discussed issue among the public. This is not unwarranted since researchers have found that crime against children are increasing yearly (Al-Dawamy & Sulaiman, 2010). This, to an extent has affected parents in determining where their children can go and how to go there. In the United States, according to Evers et al. (2014), walking rates to school among children remain low because parents are concerned for their children safety. Safety in this case is not limited to only crime, but also road safety (Fatimah & Osman, 1997).

In Malaysia, Child Act 2001 (Act 611) was enacted with the aim to preserve and protect the social and physical rights of children. Act 611 highlights the responsibility of parents or guardians to protect the well-being of children. Parents or guardians are considered guilty and subjected to criminal offence if these responsibilities are ignored (Act 611; Mohd Yussof & Tahir, 2005).

METHODOLOGY

This study adopted questionnaire survey method for primary data collection. The questionnaire survey form was made up of two sections to obtain information regarding respondents' profile and their perception of safe distance. Using the from, enumerators surveyed 4,500 respondents in the Klang Valley region. The areas selected fall within the administrative boundary of Kuala Lumpur City Hall (1,000 respondents), Shah Alam City Council (1,000 respondents) Petaling Jaya City Council (500 respondents), Subang Jaya Municipal Council (500 respondents), Ampang Jaya Municipal Council (500 respondents), Klang Municipal Council (500 respondents) and Selayang Municipal Council (500 respondents). The targeted respondents were those aged at least 18 years old and have at least a child or a relative who are still schooling either at preschool, primary school or secondary school level. Data obtained through the survey was keyed in into SPSS software and analysed using both descriptive and inferential analyses.

ANALYSIS AND FINDINGS

Respondents' Profile

Table 1 below shows the profile of the respondents. The majority of the respondents (63%) were those aged between 18 to 39 years old. In terms of race, 74% of the respondents were Malay. The majority of the respondents attained diploma level in education and over 85% were in employment. The average household size was 4.

Table 1 Respondents' Profile

Respondents' profile	Category		Frequency	Percentage (%)
Age	Youth	: 18 – 39 years old	2,839	63.1
	Adult	: 40 – 60 years old	1,628	36.2
	Retired	: 60 years old	33	0.7
Sex	Male		2,044	45.4
	Female		2,456	54.6
Race	Malay		3,344	74.3
	Chinese		699	15.5
	Indian		430	9.6
	Others		27	0.6
Education Level	Primary	: Primary School	88	2.0
	Middle	: Secondary School	899	20.0
	Higher	: Certificate	458	10.2
		: Diploma	995	22.1
		: Degree	1,750	38.9
		: Master	272	6.0
		: PhD	38	0.8

Marital status	Single		265	5.9
	Married		4,119	91.5
	Divorced		116	2.6
Occupation	Employed	: Executive, Professional	1,553	34.5
			1,777	39.5
		: Admin, Management	465	10.3
	Unemployed		181	4.0
		: Business	477	10.6
		: Full-time Student	47	1.0
		: Housewives		
		: Retired		
Household income	RM 1,000 – RM 1,999		264	5.9
	RM 2,000 – RM 2,999		609	13.5
	RM 3,000 – RM 3,999		1,042	23.2
	RM 4,000 – RM 4,999		844	18.8
	RM 5,000 – RM 5,999		670	14.9
	RM 6,000 – RM 6,999		374	8.3
	> RM 7,000		697	15.5
Household size	< 3		1,340	29.8
	4 – 6		2,767	61.5
	7 – 9		352	7.8
	> 10		41	0.9

Source: Questionnaire Survey, 2015

Table 2 below shows the number of children or relatives of respondents by gender. The highest number of respondents (61%) has at least one male child or relative who are attending school. Meanwhile, 51% of the respondents have at least one female child or relative who are still schooling.

Table 2 Number of Children/Relatives Still Schooling by Gender

Gender		Female child/relative (nos)							Total	%
		0	1	2	3	4	5	6		
Male child/ relative (nos)	0	0	896	165	69	10	4	10	1,154	25.6
	1	1,343	1,229	126	26	13	4	1	2,742	60.9
	2	186	126	97	18	7	1	1	436	9.7
	3	52	28	28	8	3	1	0	120	2.7
	4	19	6	5	2	2	0	0	34	0.8
	5	9	0	0	0	0	0	0	9	0.2
	6	0	2	2	1	0	0	0	5	0.1
Total		1,609	2,287	423	124	35	10	12	4,500	100.0
%		35.8	50.8	9.4	2.8	0.8	0.2	0.3	100.0	

Children Mode of Transportation to Public Area

Table 3 shows the children mode of transportation in going to public area. Over 80% of respondents stated that their children or relatives travel to public area in motorised transport. Of this, 67% travel using private transportation and 14% travel using public transportation. Only 11% walk, and 9% cycle, to public area.

Table 3 Children Mode of Transportation to Public Area

Vehicle type	Transportation mode	Frequency	%
Motorised	Private	3,002	66.7
	Public	621	13.8
Sub-total		3,623	80.5
Non-motorised	Walking	476	10.6
	Cycling	401	8.9
Sub-total		877	19.5
Total		**4,500**	**100.0**

Respondent Perception of Safe Distance

Respondents were asked on the distance they perceived as safe for their children to travel to public area. 49% of the respondents felt that it was safe for children to walk within 100 metres to public area (Table 4). Meanwhile, 31% perceived 400 metres as the safe distance for children to walk to public area and 20% felt that it was still safe for children to walk 1 kilometre to public area. This indicates that the farther the children have to travel to public area, the less safe it was perceived by the respondents.

Table 4 Perceived safe distance

Statement	Frequency	Percentage (%)
Safe distance is to walk within 100 meters to the public area	2,193	48.7
Safe distance is to walk within 400 meters to the public area	1,397	31.0
Safe distance is to walk within about 1 km to the public area	910	20.2
Total	**4,500**	**100.0**

Source: Questionnaire Survey, 2015

A cross-tabulation between results from Table 4 and Table 5 shows that despite perceiving that 100 metres is a safe distance for children to travel to public areas, many of the respondents still transport their children to those areas in private vehicle (Table 5). In fact, for each category of safe distance (i.e. 100m, 400m and 1 km), private vehicle was the highest mode of transportation chose by the respondents. This reflects that respondents perceived traveling by private vehicles as safer than other modes of transportation.

Table 5 Respondent Perception on Safe Distance for Children and Mode of Transportation

Mode of transportation	Perception of respondents on safe distance			Total
	100m walking to public area	400m walking to public area	1 km walking to public area	
Walking	203	156	117	**476**
	(4.5%)	(3.5%)	(2.6%)	**(10.6%)**
Riding bicycle	140	154	107	**401**
	(3.1%)	(3.4%)	(2.4%)	**(8.9%)**
Private vehicle	1,604	864	534	**3,002**
	(35.6%)	(19.2%)	(11.9%)	**(66.7%)**
Public transport	246	223	152	**621**
	(5.5%)	(5.0%)	(3.4%)	**(13.8%)**
Total	**2,193**	**1,397**	**910**	**4,500**
	(48.7%)	**(31%)**	**(20.2%)**	**(100.0%)**

Source: Questionnaire Survey, 2015

Chi-square analysis (Table 6) shows that there is a significant relationship between the respondents' perceptions of the safe distance for children to travel to public area with the mode of transportation they travelled in. Respondents tend to perceived that using private vehicle would be safer as compared to using public transport, cycling or walking.

Table 6 Chi-Square Analysis on Respondent Perception on Safety Distance with Mode of Transportation

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	87.774[a]	6	.000
Likelihood Ratio	88.350	6	.000
Linear-by-Linear Association	5.590	1	.018
N of Valid Cases	4500		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 81.09.

Determinants of Safe Distance

A review of the literatures has identified six factors that commonly influence parents and guardians in determining the safe distance their children are allowed to travel to. These factors are age of the child, gender of the child, distance to the destination (whether near or far), the company of the child (whether the child travels alone or with company), time (whether day or night) and familiarity of the destination. In this study, respondents were asked to rank these factors in order to determine which factors influenced them most in deciding how far is safe for their children to travel to public areas.

Table 7 Respondents' perception on factors determining the safe distance

Factors	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Rank 6	Mean score	Priority order
Age	1,391 (30.9%)	1,252 (27.8%)	608 (13.5%)	418 (9.3%)	383 (8.5%)	448 (10%)	2.67	1
Sex (Male/ Female)	1,039 (23.1%)	1,062 (23.6%)	754 (16.8%)	545 (12.1%)	577 (12.8%)	523 (11.6%)	3.03	2
Distance (Near/Far)	585 (13%)	703 (15.6%)	1,037 (23%)	1,020 (22.7%)	810 (18%)	345 (7.7%)	3.40	3
Chile condition (Alone/ With Company)	865 (19.2%)	687 (15.3%)	802 (17.8%)	740 (16.4%)	626 (13.9%)	780 (17.3%)	3.43	4
Time (Night/Day)	366 (8.1%)	542 (12%)	882 (9.6%)	1,139 (25.3%)	1,146 (25.5%)	425 (9.4%)	3.76	5
Destination (Familiar/Unfamiliar)	249 (5.5%)	259 (5.8%)	418 (9.3%)	647 (14.4%)	958 (21.3%)	1,969 (43.8%)	4.71	6
Total	**4,500 (100)**	**4,500 (100)**	**4,500 (100)**	**4,500 (100)**	**4,500 (100)**	**4,500 (100)**		

Source: Questionnaire Survey, 2015

Based on the results shown in Table 7, the most important factors perceived by the respondents in determining the safe distance for children to travel to public areas was age of the child. Over 30% of the respondents ranked age as the most important factor (i.e. Rank 1). Meanwhile, familiarity with the destination was perceived as the least important factor with only 6% of the respondents ranked this factor as the most important. Mean score analysis also portrays the same result. Age of the child was the highest priority factor, with a mean score of 2.67. Familiarity with destination was the lowest priority factor with a mean score of 4.71.

Public perception on the importance of safe distance

Respondents were also asked to rank the importance of safe distance for children to travel to public areas. Based on ranking, ensuring safety of children in public places was the most important reason to the respondents. It received Rank 1 from over 40% of the respondents (Table 8). Similarly, based on mean score analysis, ensuring safety of children in public places was also the highest priority, with a mean score of 2.06. This is followed by, in order of importance, reducing crime rate, ensuring access to public places, reducing road accidents and contributing towards safe city.

Table 8 Public Perception on the Importance of Safe Distance

Statements	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Average score	Priority order
Ensuring the safety of children in public places.	1,956 (43.5%)	1,254 (27.9%)	657 (14.6%)	316 (7%)	317 (7%)	2.06	1
Reducing crime rate.	1,143 (25.4%)	1,295 (28.8%)	1,188 (26.4%)	538 (12%)	336 (7.5%)	2.47	2
Ensuring accessibility to public facilities.	905 (20.1%)	963 (21.4%)	896 (19.9%)	895 (19.9%)	841 (18.7%)	2.96	3
Reducing road accidents.	222 (4.9%)	568 (12.6%)	1,132 (25.2%)	1,637 (36.4%)	941 (20.9%)	3.56	4
Assisting in creating a safe city.	274 (6.1%)	420 (9.3%)	627 (13.9%)	1,114 (24.8%)	2,065 (45.9%)	3.95	5
Total	**4,500 (100%)**	**4,500 (100%)**	**4,500 (100%)**	**4,500 (100%)**	**4,500 (100%)**		

Source: Questionnaire Survey, 2015

CONCLUSION

This study was successful in identifying the perception of parents and guardians on safe distance for their children to travel to public areas. It was found that majority of the respondents perceived that it was safest for children to walk 100 metres to public areas. However, this is heavily influenced by the age of the children. Respondents also perceived that safe distance is important in order to ensure safety of children in public areas.

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DAYLIGHT CHARACTERISATION OF CLASSROOMS IN HERITAGE SCHOOL BUILDINGS

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Abstract

This paper studies the daylight characteristics in selected high schools that are located in heritage-listed buildings. Heritage buildings were selected in this research due the problematic condition regarding the indoor illumination level after being adaptively reused. Based on the previous research, lighting in educational institution is a critical factor because poor lighting not only is detrimental to the occupants' visual comfort but also might lead to visual fatigue. To achieve the objectives of this paper, daylight level measurements and observation were conducted. The results show that the daylight that penetrates into the classrooms were below the standard due to many obstructions founded in both schools. Artificial lightings were used as a supplementary during the whole school hours since the daylight was not uniformly distributed. Thus it can be concluded that the inappropriate adaptive reusing heritage building indoor is significantly affecting the indoor light level and might lead to visual discomfort issues for students. The research findings as well as the suggestions have been delivered to the school management to overcome the issues founded.

Keywords: Daylight performance, visual comfort, heritage building, adaptive reuse, high schools

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INTRODUCTION

The issue regarding the effect of the indoor light level to the visual comfort has been highlighted since the last few years. This is also related with the green building trend where building occupants need to be comforted when they are indoor, be it is in an office, school, store or even at their own residence. Nowadays, green building rating tools have included the assessment on the Indoor Environmental Quality (IEQ) in order to obtain a healthy occupants and one of the assessments is to focus in on the visual comfort.

Based on the previous research, the indoor light level has a detrimental effect on the building occupants, including students. Indoor lighting is widely known to give a significant role in satisfying visual comfort as it is highly affecting students' satisfaction and their academic performance. Moreover, several studies have been conducted to highlight the lighting performance in learning environment (Yang, Becerik-Gerber & Mino, 2013; Samani & Samani, 2012; Axarli & Tsikaloudaki, 2007; Benya, 2001).

To achieve good indoor lighting quality, it needs an appropriate planning. The lighting must accommodate the occupants' activity. However, there were some buildings were not meant to be built as its main purpose. Adaptively reused buildings are prone to cause discomfort to the occupants (Prihatmanti & Bahauddin, 2011) and this is commonly found in heritage buildings which being reused into a different purpose or can no longer functioned with its original purpose. Therefore this research aims to study the lighting performance in high schools that is located in heritage-listed buildings.

LITERATURE REVIEW

Heritage building is an evidence of history. By conserving those buildings, it helps to understand the past and to contribute for the future generations. It can give the sense of continuity and belonging to the place where people live. One method for conserving heritage building is by adaptive reusing it. As stated in the Burra Charter (Australia ICOMOS, 1999), adaptive reuse is rehabilitating or renovating heritage buildings or structures for any uses other than the present uses. It involves no change to the culturally significant fabric, changes that are significantly reversible, or changes with minimal impact. Meanwhile, according to Bullen, adaptive reuse is known as one of the effective strategies to improve the sustainability of the existing building by lowering material, transport and energy consumption, as well as helps to reduce the pollution level (Bullen, 2007).

The changes of building function has made the building's IEQ level degrade, including the indoor lighting performance. It could be in the form of obstructing the windows, doors or any other openings in order to create more indoor spaces by applying full height partition. In order to maintain the IEQ level, there is a need to study the performance of the indoor light level based on the daylight that penetrates in the designated buildings.

The lighting performance is generally measured by the illuminance level (E), daylight factor (DF), and also the uniformity ratio. E or illuminance is a measure of the illumination of a surface (Szokolay, 2004). The illuminance level may vary for each room with different function. Illuminance level was produced by an overcast sky, and it strongly depends on the solar altitude angle behind the clouds. The overcast sky illuminance may vary in wide range limits. As the outdoor lighting conditions are highly variable, design can only be based on the worst conditions. However, the ratio between illuminance on a certain point indoors to the outdoors remains constant (Szokolay, 2004).

$$DF = \frac{E_i}{E_o} \times 100\ (\%).$$

Where,
Ei = indoor illuminance
Eo = outdoor illuminance (vary from 20klx-130klx)
DF = Daylight Factor

The indoor illuminance for DF is measured in two measurement points. They are Main Measurement Moint (MMP) and Side Measurement Point (SMP) (Badan Standardidasi Nasional, n.d). MMP is observed in the middle of side walls, with the distance of 1/3 from effective daylight aperture; while SMP is taken in the distance of 0.5m from the side wall, in line with the MMP. Both of measurement points must be taken on the workplane height (0.75m).

Uniformity ratio is used to study daylight distribution. Higher uniformity ratio means better daylight distribution. It is measured as the ratio of minimum workplane illuminance to average workplane illuminance. The maximum number for uniformity ratio is one (Yang, Becerik-Gerber & Mino, 2013). Good daylighting for tropical climate is indicated by several parameters. As for classroom, the illumance level standard in tropical climate is approximately 200 lx (Rea, 2000). The standard for DF value on MMP point is 0.35d (d=room depth) and on the SMP point is 0.2d (Badan Standardidasi Nasional, n.d).

In order to supply maximum daylight into any room, uninterrupted visual line between the room inside and sky dome should be provided. In the past, buildings were designed to be adaptive with the local climate. The features of adaptive strategies in those buildings were purposely constructed to create users' thermal comfort. However, inappropriate design of the features could interrupt the visual line and reduce the daylight penetration into the room (Heerwagen, 2004).

METHODOLOGY

Selection of the Research Objects

In Surabaya, there are number of heritage buildings that have been adaptively reused as schools that is located in heritage buildings. The research objects were selected based on the heritage significances. There were 2 schools selected in this study; all of them are the prominent private schools in Surabaya. Those are Santa Maria Senior High School and St. Louis Senior High School. These schools are listed as the national heritage building by the Surabaya City government regulation No. 5/2005. Since most of the heritage schools are expanding due to the increased numbers of students enrolled every year, this research was conducted in the classroom that is located only in the heritage building. However, due to the permission given by the schools, the survey was conducted during the last subject that is between 1 to 2 p.m. The typical classrooms from both schools can be seen in Figure 3 and 4.

Research Objects Description

A. Santa Maria Senior High School

This school is located in Raya Darmo Street Surabaya. This building is divided into the main and annexe building. The main building is considered heritage building since it was built in the 1920s. In this study, the studied class is located on the second floor, in the heritage wing, which is facing to the south. The east and west side of this building are facing open space, the north side is facing the Rever Academy building, and the south is where the annexe building located. The site illustration is shown in Figure 1.

Figure 1 The Santa Maria School

The studied classroom is equipped with wooden desks and chairs. The floor is covered by grey-coloured terrazzo. The classroom is surrounded by brick walls, painted in matte white, with light green ceramics on the bottom-half of the wall. The ceiling height is approximately 3.5m and painted in white. Based on the observation, there are no high reflectance materials in this classroom. The openings (1.8x1.0m in size) are located on 1.8m above the ground, on the north and south wall. The high ceiling and openings are the common characteristics of climate adaptation for buildings in the tropical climate. The obstructions for the openings come from the surrounding buildings, that is the annexe building (2-storey high) and the Rever academy (single storey).

B. St. Louis Senior High School

This building is located at Polisi Istimewa street Surabaya. The building itself has a U-shape form. Similar with Santa Maria, this school also consist of heritage building and annexe building as the additional one. The building has open spaces on the north side and a courtyard on the south. The studied class is located on the second floor, in front part of this building, facing the north, i.e. the main road and parking spaces.

Figure 2 The St. Louis School

The furniture inside the classroom are made from wood, stained in dark colour. Dark grey terrazzo is used as the flooring material. Brick is used for wall material, and painted with green colour as its finishing. The 5 m ceiling is finished with white paint. Similar with the other building, most of the building fabrics and other materials are less reflectance. High openings are placed in north, east, and south wall. A door as an opening at the south wall is used for circulation access from the corridor to the classroom. The daylight comes mostly from the openings at the north and east side. The external obstruction comes from the vegetation on

the open spaces, while internal obstruction comes from the internal shading as the window treatment.

METHODOLOGY

The objectives of this research is to assess the characteristics of daylight in heritage school buildings. Therefore the studied buildings need to be visually observed on the physical conditions (classroom and its surroundings) and the illuminance level needs to be measured quantitatively. The observations were taken on September 2015, when the sun is on the equinox position and in overcast sky. Surabaya is situated along the Equator (7º15'55'' S and 112º44'33''E), thus the amount of daylight is abundant throughout the year.

First, each classroom was divided into grids with 1.00m to 1.20m distances. The illuminance level for every grid's points were measured in workplane height (0.75m) by using hand held light meter in daylight condition. The illuminance level measured was also for MMP and SMP. The daylight factor assessment was done by measuring indoor illuminance level and outdoor illuminance level at the same time, at the grid point that has been made.

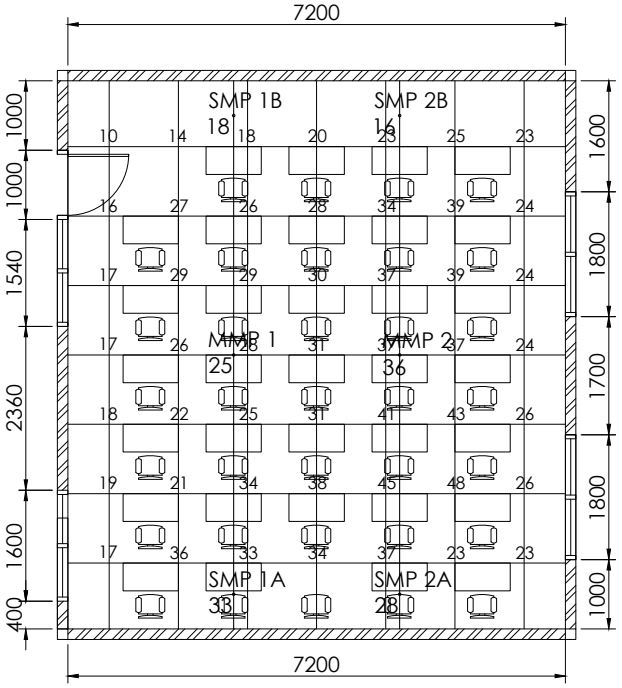

Figure 3 Illuminance Data of a Typical Classroom in Santa Maria

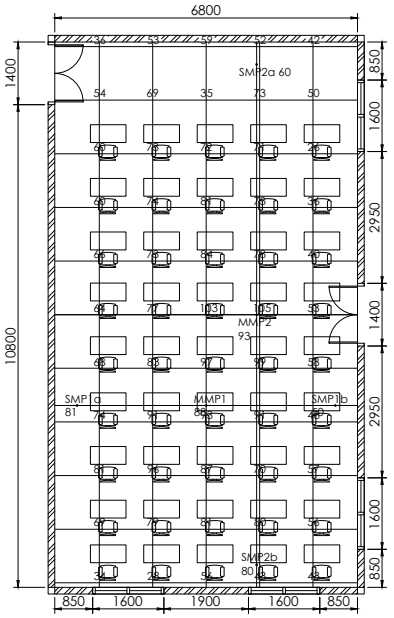

Figure 4 Illuminance Data of a Typical Classroom in St. Louis

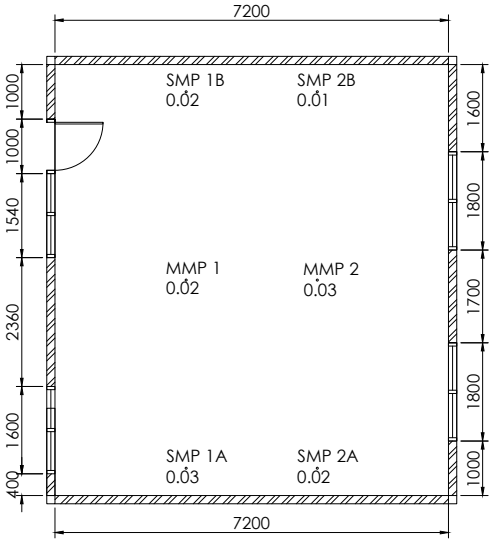

Figure 5 Daylight Factor of a Typical Classroom in Santa Maria

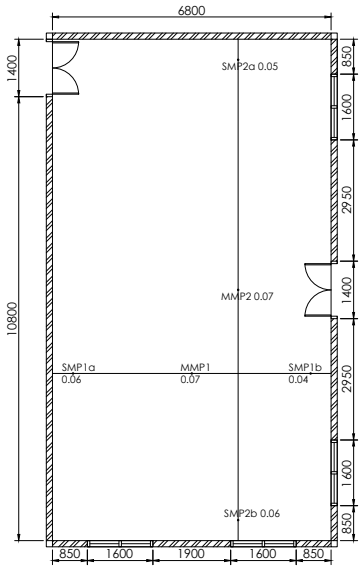

Figure 6 Daylight Factor of a Typical Classroom in St. Louis

Figure 3 and 4 show the illuminance data for each classroom while the DF value for each measurement point can be seen in Figure 5 and 6. Thus, observation on the building and lighting parameters were conducted to answer the objectives of this research. To analyse the data that have been gathered previously, descriptive analysis was carried out as well as comparing with the references related.

DISCUSSION AND CONCLUSION

Illuminance Level

Analysis of illuminance level is started with the isocontour graphics as seen in Figure 7 and 8. Higher illuminance level are shown with orange-red colour, while the blue colour shows the lower one. Both isocontour graphs show that higher illuminance levels are placed around the centre of the room. This result shows that lighting treatments on heritage building (high window, high ceiling, light painted) are successfully to bring the light deeper into the room. However, the numbers of illuminance level are still below the standard. Good illuminance level was analysed based on the IESNA requirements for classroom. The highest internal illuminance from both classrooms is only 105 lx, that is below the standard (200 lx)[9].

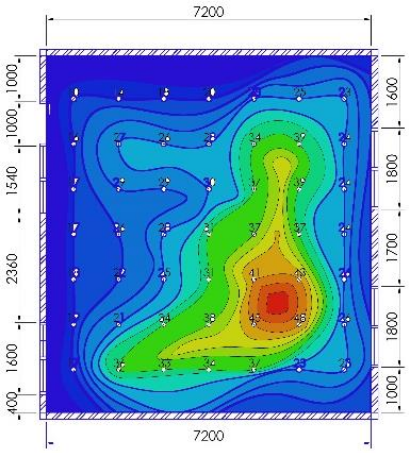

Figure 7 Isocontour of a Typical Classroom in Santa Maria

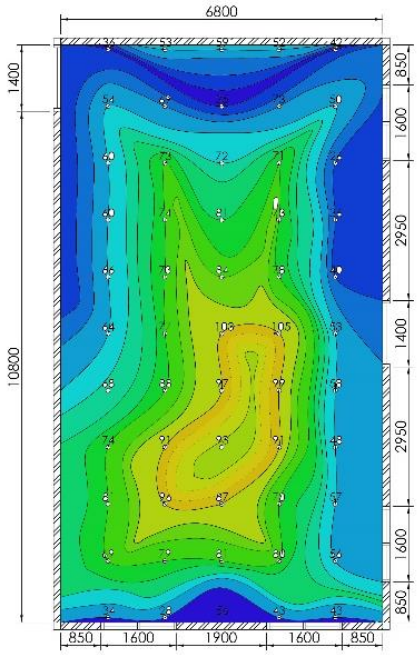

Figure 8 Isocontour of a Typical Classroom in St. Louis

Daylight Factor (DF)

Beside illuminance level, DF was also considered in this research to indicate design effectiveness in bringing daylight into the indoor area. As mentioned previously, DF is the ratio between outdoor illuminance to indoor illuminance in the overcast sky. As seen in Figure 5 and 6, the DF value from both classes is between 0.01-0.07. This results are then compared to the DF value standard, and tabulated in Table 1.

Table 1 Daylight Factor Level

Name	**DF actual**	**d (m)**	**MMP= 0.35d**	**SMP 0.2d**
Santa Maria Senior High School				
MMP 1	0.02	7.2	2.52	
SMP 1A	0.03			1.44
SMP 1B	0.02			
MMP 2	0.03		2.52	
SMP 2A	0.02			1.44
SMP 2B	0.01			
St. Louis Senior High School				
MMP 1	0.03	10.8	3.78	
SMP 1A	0.04			2.16
SMP 1B	0.02			
MMP 2	0.05	6.8	2.38	
SMP 2A	0.04			1.36
SMP 2B	0.03			

Table 1 shows that all classrooms taken for this research have DF value below the standard level. As mentioned previously, uninterrupted visual line between room inside and sky dome should be provided in order to supply maximum daylight into any room. Some heritage features that need to be considered as the obstructions are the corridor, shading device, and surrounding building.

Both classrooms measured in this research are along the corridor. It is widely known that corridor could reduce the daylight penetration into the room. However, the DF value in St. Louis classroom is slightly higher since the classroom has higher ceiling level (6 meters) compare to the Santa Maria (4 meters). Higher ceiling gives chance for higher window level, which lead to higher chance for daylight penetration without any obstruction.

Since this research is conducted in tropical climate, shading device is one of climatic responsive strategies that needs to be considered. Appropriate design of shading device will contribute to better daylight condition. The overhangs could create higher illuminance level and distribution uniformity. However deep corridor make reflected sunlight cannot reach the room inside. Horizontal louvers with reflective metal materials could give more advantages. As shown in Figure

9, horizontal louvers can reflect much more sunlight and contribute in giving higher daylight factor.

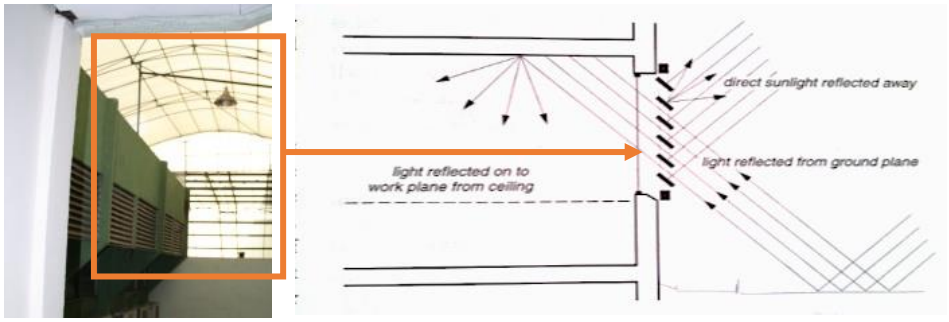

Figure 9 The Horizontal Louvers

Uninterrupted visual line can be provided if there is no obstruction from site contour, vegetation and surrounding building. Classroom observed in St. Louis has no surrounding buildings. However, the visual line of classroom observed in Santa Maria is obstructed by surrounding buildings.

Uniformity Ratio

Uniformity ratio is used to study the daylight distribution. Higher uniformity ratio means better daylight distribution, and the maximum value is one. Uniformity ratio for both classrooms are shown in Table 2.

Table 2 Uniformity Ratio

Name	Minimum WPI	Average WPI	Uniformity Ratio
Santa Maria	10	28	0.36
St. Louis	26	77.84	0.33

Theoretically, high ceiling, high window and appropriate placement of window are good strategies for creating better daylight distribution. But in this research, those strategies failed to create good daylight distribution. This can be seen from low uniformity ratio value. This is mainly due to the appropriate strategies that are not followed by sufficient daylight source. In the St. Louis the daylight source at one side of the rooms is obstructed by the corridor, while in Santa Maria it is obstructed by the corridor and surrounding buildings.

CONCLUSION

The result from the measurements shows that the indoor light levels in both classrooms were below the standard. The daylight was insufficient to provide good illuminance and the lights were not uniformly distributed. Thus it can be concluded that the inappropriate adaptive reusing heritage building indoor is significantly affecting the indoor light level and might lead to visual discomfort issues for the students.

Treatments for improvement are limited to the heritage building conservation rules. Therefore indoor treatments are the most preferred. Treatment in ceiling, wall and floor are suggested. Material with appropriate reflectance number will increase the illuminance level and DF value, while curved ceiling is suggested to obtain higher uniformity ratio.

The research findings as well as the suggestions have been delivered to the school management to overcome the issues discovered. However, there is a need in conducting research regarding the visual satisfaction in adaptively reused buildings, particularly in the school or office.

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PLANNING MALAYSIA:
Journal of the Malaysian Institute of Planners
VOLUME 15 ISSUE 1 (2017), Page 221 - 228

THE BENEFITS OF RIVER INDICATORS TO ASSESS THE ECOLOGICAL STATUS OF IIUM CAMPUS

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Abstract

The concept of sustainable campus has emerged from the social, economic and environmental impacts due to anthropogenic activities around the world. One of the initiatives of sustainable campus is the application of ecological indicators. The indicators provide information about the current condition and early warning on the possible risks of environmental impacts to the campus environment. However, lack of understanding on the values of natural ecosystem in campus and the lack of proper planning has led to the depletion of natural ecosystem. The study seeks to examine river degradation in IIUM campus and to explore the benefits of river indicators towards achieving IIUM as an ecologically sustainable campus. Data were gathered using a qualitative approach involving three methods of data collection namely: (i) document analysis, (ii) semi-structured interview and (iii) site inventory. The finding reveals that the application of river channel morphology indicators is an important basis for physical planning in making a campus ecologically sustainable. Further analysis suggests that the suitable indicators to assess the condition of IIUM River are the river channel morphology indicators such as width, depth, channel pattern and slope ratio. The process of selecting the indicators are carried out based on six criteria of good indicators discussed in this study. The study concluded that the application of river channel morphology indicators is a critical process in physical planning of a sustainable campus as it contributes in preventing the loss of natural ecosystem and it offers a credible basis for creating a conducive place for campus residents.

Keywords: IIUM campus, sustainable, ecological indicator, river

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INTRODUCTION

The concept of sustainable development is an approach of making economic, social and environmental resources available for current and future generations. This concept has been implemented throughout the world as a response to many environmental degradation. Nowadays, the world faces numerous challenges that threaten to undermine the welfare of people all over the world. Issues like urban sprawl, congestion, waste and global warming has alarmed many urban planners and encouraged them to apply evolving notions of sustainability in city planning. As a result, many actions and policies have been developed to cater the issues of social, environmental and economic sustainability, especially in the urban contact.

The concept of sustainable urban development can be applied at any scale of development from a global scale to as small as institutional scale such as a campus of higher learning institution. Accordingly, a campus today is recognised as a vital platform where all new information and efforts to improve quality of life without compromising the needs for future demands can be disseminated (United Nations Environment Program, 2014). Significantly, an ideal campus is supposed to be an entity that can be an inspiration for many organizations in implementing efforts towards achieving sustainable development.

In Malaysia, three campuses have implemented the use of ecological indicator for their sustainable campus development. They are Universiti Kebangsaan Malaysia, Universiti Malaysia Sabah and Universiti Sains Malaysia. Among the three universities, four aspects that are often highlighted in their sustainability efforts are energy, water, transportation, and waste management (Zen et al., 2013; Saadatian et al., 2010).

This study contends that a tool for assessing the current condition of the natural ecosystems could help to predict any changes of the ecosystem state, as it is significant to maintain the natural ecosystem in order to create a conducive environment that supports learning, teaching, innovation and research. However, lack of awareness and consideration in maintaining the health of the river ecosystem in IIUM has led to degradation of the ecosystem, which contributes to many environmental impacts such as flash flood. In this case, the need of a tool to assess the river condition is vital to provide information, in order to avoid severe environmental impact on campus. Initial study revealed that the main trigger of the degradation of the river is because of the physical changes of the river. Therefore, this research was set out to identify the condition and factors of river changes and the framework of selecting ecological indicators for sustainable campus by concentrating on the river channel morphology.

Ecologically Sustainable Campus and Its Environment

Managing campuses by taking into account the environmental aspect is a must today. Ecologically sustainable campus is basically motivated by the idea that the

campus is expected to be a comfortable, clean, sound, beautiful and healthy place for knowledge seekers. By managing campus physical aspect, it will provide a healthy environment that is vital for the wellbeing of the campus residents. As a result, a good environment in campus will foster academic performance, and social and personal development by providing a place for students to get the opportunity to form an identity and sense of community of the institution.

The Concept of Sustainable Development

Sustainability or sustainable development has widely emerged in many areas of human civilization. It has started many years ago and continuously disseminated especially during 1987 when Brundtland Report was presented during the World Commission on Environment and Development Conference (WCED, 1987). The concept of sustainable development is actually emerged from the awareness about the importance of preservation and maintenance of natural resources. Since then, numerous initiatives have been taken at local, national and global levels in an effort to tackle diverse aspects of the environmental disputes (Mebratu, 1998). According to WCED (1987), sustainability can be defined as an approach that serves the needs of the present without neglecting the ability of future generations to fulfil their own needs. Brundtland's definition of sustainability has inspired many policymakers, environmentalists and researchers to further improve the inclusive definition of sustainability, resulting in a wide variety of meanings and interpretations.

Sustainable Campus

The sustainability concept evidently is applicable to any scale of development including institution like university. University is seen to be a key player in the global transition towards sustainable development. With its population and activities held in campus, it is recognized that its decisions and actions have a very significant impact on the environmental, economic and social aspects at present and in the future. University is seen to be accountable to perform as role model for the bigger community. It is because university is an ideal platform to disseminate the idea of sustainability (Howitt, & Rickards, 2013). The future leaders that study in the campus are valuable assets and are hoped to spread the sustainability concept after they graduated especially in their working environment. Therefore, it is recommended that this is accomplished through the education of future generations about sustainability practices into their own university operation.

Campos (2008) who views the work of Le Corbusier in 1936, highlights that the campus is a place which students enjoy the pleasant stage of life in the ambience of a paradise. Here, the term campus is envisioned as a physical boundary used by students for a certain period of study that have a comfortable and conducive learning environment. The visualization of a sustainable campus

must be envisioned by the character of a paradise which highlights the exquisite of its ecological aspect. Therefore, campus should serve as a place with vibrant environment for learning because knowledge seeking should be the most enjoyable juncture in human life that depicts a character of a paradise.

Therefore, an ideal ecologically sustainable campus is a campus that resides picturesque landscape blended with a great diversity of ecosystems. Lush green ecosystems that showcase the flora and fauna available within the campus are properly preserved for general awareness and research that offer excellent opportunities for the study of complex ecosystems. This idea only can be achieved by the awareness of the university management in maintaining the health of the available ecosystem.

Campus Sustainability Assessment

The campus operation must be based on a systematic planning and operation. This will enable university management to take a more structured approach to managing resources and environmental impacts in campus. A good framework of sustainable campus is developed by Cole (2003) namely the campus sustainability assessment framework (CSAF). Cole (2003) proposes an egg of sustainability (Figure 1) that integrates of two systems which are the people and the ecosystem. In her framework, the sustainability of ecosystem covers aspect of land, water, air, materials and energy. Whereby, the sustainability of people system incorporates aspects of knowledge, community, health and wellbeing, governance, economy and wealth. Cole's framework has been adapted by many campuses around the world as it provides comprehensive framework that can be used in implementing sustainability in campus.

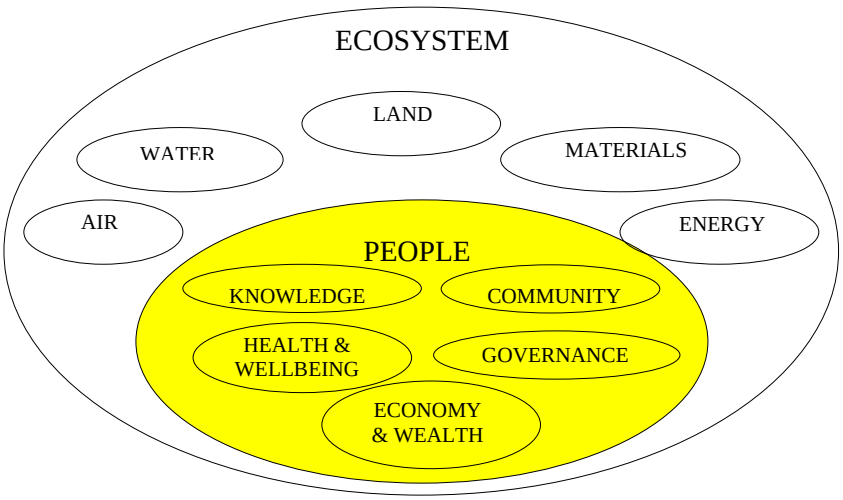

Figure 2 Egg of sustainability
Source: Cole, 2003

RESEARCH METHODOLOGY

The research employed qualitative approach using ecological site inventory, semi-structured interview and document analysis as methods of data collection. Meanwhile, the case study is chosen as the strategy of inquiry. In constructing the method, understanding on the issue of studied area, and types of information need to be collected are considered as significant. The site inventory checklist and interview questions are formulated parallel with the research questions, aim, and research objectives. The site inventory is done to understand real phenomenon of the studied area. Whereby, semi structured interview is done for two group of respondents to investigate the factors of phenomenon and verification process of framework that shows the process of selecting suitable indicators for IIUM river. Next, the data is analysed to identify major factor, critical component to be monitored and the impacts on river ecosystem. Based on the data from interview and site inventory, the process of indicator selection is proposed through thematic analysis from previous framework studied form literature review. The data are themed according to the steps of the selection of indicators. Finally the framework is verified by experts to check the appropriateness of the process and suitability of indicators.

FINDINGS AND DISCUSSIONS

The findings reveal that there are remarkable changes to the physical characteristic of river in IIUM. These have proved that there is alarming issue on the sedimentation that changes the physical character of the river, thus, influence biological and chemical properties of the river. The evidence presented in Table 1 thus far supports the idea that sedimentation resulted from anthropogenic activities has led to many consequences to the overall integrity of the river ecosystem.

Table 1 Factors of River Depletion and Its Impacts on the River Attributes

Factor	Driver	Attributes	Impact
Sedimentation	Sand mining Construction Erosion Clogged-culvert	Physical	Channel width reduction
			Channel depth reduction
			Channel pattern changes
			Increase slope rate that increase erosion rate
			Reduce water retention capacity during heavy rain
			Reduce water clarity
			Land degradation
			Loss of reservoir capacity
			Changes on the soil physical character
			New vegetation increase sedimentation rate

In view of factors and impacts of sedimentation, this has confirmed the significance of the study of river channel morphology in detecting changes on the ecosystem. The study reveals that physical character of the river has the strongest influence on the biological and chemical component of the river and the quality of the river are determined by the measurement of the physical character of the river. The physical form and the shape distribution to forecaster variables are somewhat simple to determine. The changes to the river channel morphology can be caused by two activities. The first factor is from anthropogenic activity modification in and surrounding the river. The second factor is from natural factor over short and long term period.

The process of selecting the suitable river indicators explained in this paper has identified river channel morphology indicator as the most suitable indicator to detect changes on the river morphology as it is the most badly affected component in IIUM.

The ability to assess the condition of the river ecosystem, evaluate sensitivity to modification, and recognize potential changes to the ecosystem resulting from different anthropogenic activities such as development adjacent to the water body is important to notify risk of river degradation for resolution making. A more systematic and sustainable approach to reduce the negative impacts of anthropogenic activities is required in making the campuses more sustainable and liveable. Although many environmental protection methods can be seen at some universities, the natural ecosystem like river is usually left unattended. One way that university management can apply in monitoring the condition of river is through the implementation of river indicators that will characterize the current situation and help determine where to focus efforts in order to make the campus ecologically sustainable.

Figure 2 explains the process of physical planning in campus organization. The monitoring process of any project or development should be implemented using ecological approach to maintain an ecologically sound environment of a campus. Accordingly, ecological approach is vital while planning for campus physical development. By promoting this approach, it will thrive for increasing environmental awareness and help to build consensus around the concept of sustainability and the need for incorporating ecological knowledge into planning. By applying river indicators for campuses that own river ecosystem, it will reduce the potential risk on the river such as river depletion, sedimentation, flood, wildlife extinction and loss of ecosystem that will further disrupt the wellbeing of the residents.

Other perceived benefits of river indicators as one process in the landscape planning process is that they convey useful information about the condition of current ecosystem so that planners can use those beneficial information in planning and maintaining campus physical ground. The integration of ecology and planning is therefore seen as multi-disciplinary

landscape planning, in particular, to assist in helping biodiversity and development planning move away from their predominantly site-based emphasis.

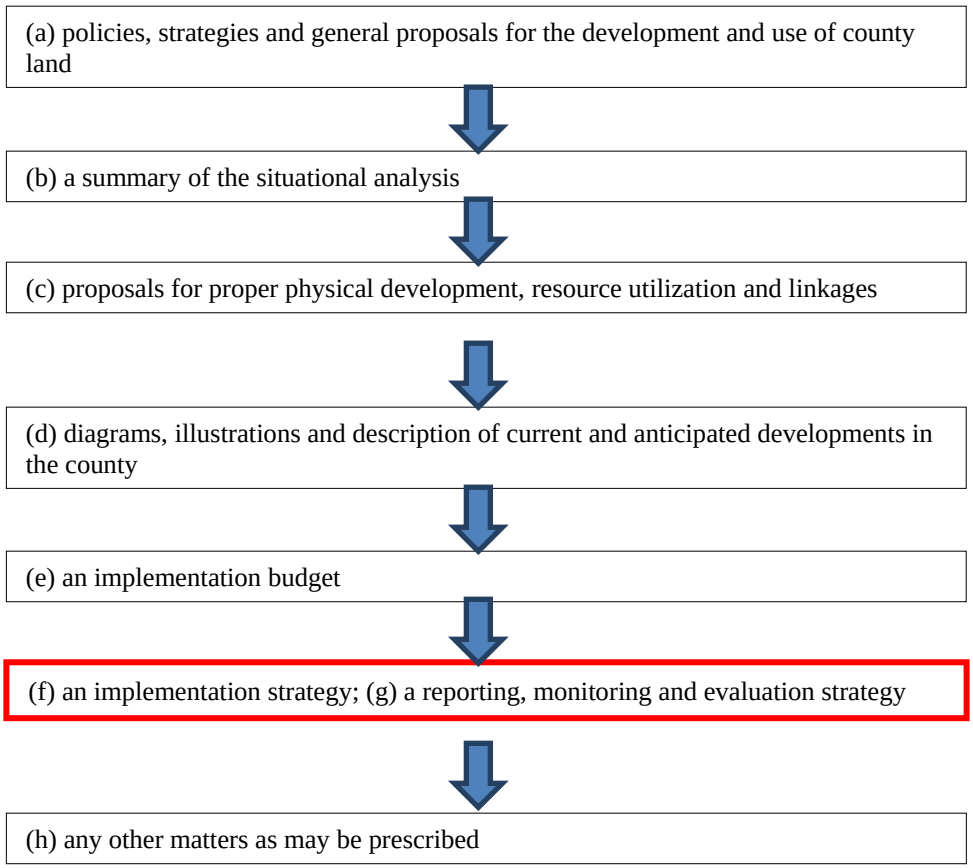

Figure 2 Campus Planning Process

CONCLUSION

The implementation of river indicator framework is emphasized because campus sustainable planning is essential and urgent in order to plan for suitable and enduring ecosystem for campus residents. Therefore, planners and landscape architects need to work harder in promoting effectively the integration of several disciplines, and incorporate ecological theory appropriately so that the campus residents can live harmoniously with nature. The research also revealed sedimentation resulted from sand mining activity, construction, erosion and clogged culvert is known as the salient factor that causes physical destruction of river ecosystem in IIUM. Therefore, maintenance and inspection are essential to

the successful performance of sedimentation control measures. Lack of maintenance on the river ecosystem is the most common cause of failure. Practices should be inspected on a regular basis and after each storm event. If maintenance is required, it should be performed in a timely manner to ensure proper function. Failure of a structure can release large amounts of sediment, severely impacting the river physical characteristic that later will impact the integrity of the biological and chemical attributes.

In conclusion, landscape ecology is clearly recognised as a basis for positive planning, rather than simply controlling land use on a reactive basis. Presently, in many countries in the world, there is a growing interest in integrated approach in making a campus ecologically sustainable. By applying this framework, it offers a credible basis for creating a campus a conducive place for campus residents harmonising with nature, making it sustainable for all living beings.

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PLANNING MALAYSIA:
Journal of the Malaysian Institute of Planners
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PUBLIC BUS LEVEL OF SERVICE PERFORMANCE IN PENINSULAR MALAYSIA: CORRELATION ANALYSES ON LEVEL OF SERVICE (LOS) AND PASSENGERS' SATISFACTION LEVEL

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Abstract

This study explore the stage bus performance of 48 routes within selected urban and regional settlements in Peninsula Malaysia, using a quantitative traffic engineering measure known as Level of Service standards or LOS and validated through the evaluation of passengers' satisfaction level. The findings on the level of service (LOS) highlight the poor performance of the urban and rural bus service with the tolerable threshold below D. There are clear disparities on LOS and passenger satisfaction level between the urban and rural bus operation systems in terms of frequency, operation hour, bus speed, and passengers' load threshold

Keywords: Level of Service (LOS), stage bus, passengers' satisfaction

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INTRODUCTION

Assessing bus service performance is important to improve the quality, reliability, efficiency and effectiveness of the system. Service quality is not only can be measured from the aspect of operation and management but also through the perception and expectation of the passengers. The level of service (LOS) assessment is a tool to measure the quality of service based on specific attributes. The passengers' satisfaction assessment can help to improve the level of service, the quality and performance (Zakaria et al., 2010).

The objective of this paper is to assess bus performance of 48 routes within selected urban and regional settlements in Peninsula Malaysia, using LOS and validated the findings through the evaluation of passengers' satisfaction level.

LITERATURE REVIEW

Passengers' satisfaction survey is a tool to measure the performance and quality of bus service that sequentially useful as a benchmark or indicator to enhance the efficiency and effectiveness of bus service delivery and operations (Dell'Olio, Ibeas & Cecin, 2011; Rojo et al., 2015). It is also defined as a judgment from the passengers that relates to the pleasurable level of consumption (Ismail et al., 2012; Lai & Chen, 2011).

Research on service quality and passengers' satisfaction identified attributes that usually be measured such as waiting time, reliability, service information, comfort, travel time, convenience, safety, security, affordability and frequency of service (Ismail et al., 2012; Nakanishi, 1997). According to Parasuraman, Zeithaml and Berry (1985), service quality lies around the aspect of intangibility, heterogeneity and inseparability, and can be defined as the degree and direction of discrepancy between consumers' perceptions and expectations (Parasuraman, Zeithaml & Berry, 1988). It is the key component in measuring the bus services from the view point of passenger (Transportation Research Board, 2013). Even though there exist no specific standard to measure bus service quality, the attributes in LOS and passengers' satisfaction study are considered as sufficient for service quality assessment (Ismail et al., 2012; Nakanishi, 1997).

METHODOLOGY

This study employed the qualitative measures of LOS for bus quality assessment and validated the analyses through on-board face to face passengers' questionnaire on comfort and convenience of passengers riding the buses. In this study, performance measures for selected attributes qualitative determination of the level of service (LOS) were referred to the standards for Level of Service (LOS) from A to F grade developed by Transportation Research Board (2003) and applied in previous researches.

Sampling Size

Adopting Yamane (1967) algorithm, given the confidence level = 95%, and P = 0.05, with the total population of selected areas were 2,739,544 (Department of Statistic Malaysia, 2014), thus, the sample size was estimated to be a minimum of 400 bus riders living in the selected urban and rural settlements. However, after considering the probability of non-sampling errors in coverage and non-response as well as bias in data (Phung et al., 2015), 1,200 samples were collected for the overall study. Only 1,130 survey forms were analysed for generalisation purposes based on data cleaning process. Some terminals have more than proportionate samples due to the higher number of riders and greater concentration of route coverage. Target respondents were passengers on-board within the range age of 15 to above 55 years old and have commuted routinely using public bus services (Ismail et al., 2012). The distribution of respondent according to an urban-rural centre is shown in Table 1.

Table 1 Distribution of Sampling Unit for On Board Survey

Centre	Terminal	Population 2010	No of Respondent	Percentage (%) over population
Kerian, Perak	Parit Buntar	7,400	100	1.35
Ipoh, Perak	Medan Kidd	46,629	105	0.23
Seberang Prai, Penang	Penang Sentral	815,676	101	0.01
Georgetown, Penang	Jetty Terminal	704,376	100	0.01
Kuantan, Pahang	Hentian Bandar	427,515	130	0.03
Pekan, Pahang	Pekan	103,839	108	0.10
Johor Bahru, Johor	Larkin		60	0.01
	Terminal	424,648		0.05
	J.Bahru Sentral		200	
Batu Pahat, Johor	Batu Pahat	209,461	226	0.11
TOTAL		**2,739,544**	**1130**	**0.04**

Source: Department of Statistic Malaysia (2014) and primary data collection.

FINDINGS AND DISCUSSION

Overall LOS of Stage Bus Services

The study found that LOS varied based on four performance measurements namely fixed route hour, frequency, passenger load and speed. Disparities between urban and rural services were clear because only two of the five measurements in rural areas achieved the minimum tolerable level (Table 2). From the average and disaggregated scoring measurement, it is confirmed that only bus speed in rural areas (LOS C) surpassed LOS D, the threshold. Other

achievements were LOS D, E, E, and F respectively. Passenger loads during the weekend were in the worst condition (LOS F). The crush load situation (Level F, more than 1.5 capacity factors) has created uncomfortable and inconvenient riding experience for the passengers. A very mild gap was also observed in terms of bus service hour, trip frequency, service hours, passengers load and bus speed suggesting that different geographical location does influence the services provided.

Table 2 Summary of Overall Scores for LOS of Selected Urban-Rural Bus Services in Peninsular Malaysia

Measure	Urban		Rural	
Fixed-route hour service	C	Early evening service provided	D	Daytime service provided
Frequency	E	Service available during the hour	E	Service available during the hour
Passengers Load (Weekdays)	E	Maximum schedule load for urban transit	E	Maximum schedule load for urban transit
Passengers Load (Weekend)	E	Maximum schedule load for urban transit	F	Crush load
Bus Speed	C	Small increase in traffic causing substantial increase in approach delay and hence, decrease in arterial speed	C	Small increase in traffic causing substantial increase in approach delay and hence, decrease in arterial speed

Correlating the LOS Bus Services and Passengers' Satisfaction Level

The level of satisfaction survey was carried out to verify the level of service (LOS) identified and to assist in the improvement of the bus services. From the 1,130 respondents surveyed, three in five (60.4%) were dissatisfied with the current public bus service (Table 3). About one in five (18.2%) were satisfied, and the remaining 21.4% were undecided or feel indifferent regarding the performance of the bus service. The mean value for overall passengers' satisfaction level was 1.58, indicating the greater number of the dissatisfied respondents.

Table 3 Passengers' Satisfaction Level Distribution

Satisfaction Level	**Frequency**	**%**	**Mean**
Dissatisfied	682	60.4	1.58
Between Satisfied and Dissatisfied	242	21.4	
Satisfied	206	18.2	
Total	1130	100	

Based on the findings observed in the Table 3, the LOS variables were then tested using Spearman Rho correlations. A Spearman's correlation was employed to determine the relationship between passengers' satisfaction level and the LOS of bus service. The hypotheses developed were:

H_0: There is no relationship between passengers' satisfaction level and the bus service quality.
H_1: There is a significant relationship between passengers' satisfaction level and the bus service quality.

Based on the results in Table 4, since the significant values of LOS measurements such as bus speed and bus condition were lower than the critical value of 0.05 and the r value is less than 0.20, the null hypothesis can therefore be rejected. The results above shows that the significant value of LOS of bus speed was $r < 0.20$, suggesting a very weak, negative correlation; where satisfaction level was increased even the LOS of bus speed was poor. Meanwhile the significant value of LOS of bus condition was $r < 0.20$ indicating a very weak, positive correlation. When the bus condition was better, the level of satisfaction increased. Based on the observed significant value, it can be concluded that the variables of LOS confirm the association between the values of LOS with passengers' satisfaction level. Thus, H_1 can be accepted.

Table 4 Spearman Rho Correlations: Passengers' Satisfaction Level and Bus Service Quality

Bus Service Quality	Correlation Coefficient	Sig. (2-tailed)	N	Relationship (Rule of Thumb by Guilford, (1956)
LOS Service Hour	.048	.349	1,130	Fail to reject Null Hypothesis
LOS Frequency	-.032	.289	1,130	Fail to reject Null Hypothesis
LOS Bus Speed	-.065*	.030	1,130	Very weak negative correlation
LOS Passenger Load (Weekday)	-.052	.079	1,130	Fail to reject Null Hypothesis
Bus Condition	.172**	.000	1,130	Very weak positive correlation

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

CONCLUSION

It can be concluded that the stage bus LOS was associated with passengers' satisfaction level. Hence, the objective of the research is achieved. Even more notable, there are correlation relationships in aspects of bus speed and bus condition. In summary, these findings indicate that, the level of service in stage bus services somewhat has influenced the passengers' satisfaction level. In essence, the attributes in assessing the level of service of public bus system–such as travel time, waiting time, the level of occupancy, regularity of service, or

reliability, comfort, cleanliness, and crew behaviour–were indeed affected by the passengers' satisfactory level. In short, the sustainability of public buses in Malaysia can be achieved first by implementing a comprehensive systems assessment through LOS identification and passengers' satisfaction survey.

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TRANSLATION OF SOCIAL CITIZENSHIP TO ARCHITECTURE & BUILT ENVIRONMENT: A METHODOLOGICAL REVIEW

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Abstract
Social Citizenship is a concept that is used to represent acceptance and identity by the local community. This is a manifestation expressed in the form of space, monument or buildings. Buildings such as mosques and other religious buildings are a form of manifestation to such expression left for other generations to see and study. This manifestation of citizenship through religious buildings can be an expression of struggle, establishment, sense of belonging and local acceptance towards achieving social citizenship. The understanding of this concept implicitly shows that these elements are the driving forces behind the architecture that is erected in order to find approval from the local population. This paper reviews the employed research designs, methods and procedures in the process of understanding the translation of social citizenship to architecture expressed by mosques. The methods adopted were aimed toward obtaining archival/historical evidence that can elicit proof of the concept. The methods also involved the process of inquiry that would be the basis for discussion and to draw a conclusion to the relationship between social citizenship and architecture. This paper also highlights the strengths and limitations of the methodological techniques besides spelling out the variables needed to prove the relationship.

Keywords: Archival/historical inquiry, typo-morphology, social citizenship, sense of belonging, space, architecture

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INTRODUCTION

Social Citizenship is a concept that is represented by displaced people in a foreign country. Displaced people are the minorities of foreign origin that may have come to a place to work and later establish a small community. Social Citizenship is a concept that is used to represent acceptance and identity by the local community. This is a manifestation expressed in the form of space, monument or buildings. This manifestation is crucial to achieving social citizenship because it is a permanent monument is an expression of self-identity, hardship and struggle in order to achieve the acceptance of the local community. According to Proshanky, Fabian and Kaminoff (1983), and Lefebvre (1974), place identity is based on a persons' sense of memories, ideas, feelings, attitudes, values, preferences, meanings and conception of behavior and experiences that is gained every day. Creating a form of architecture is, in fact an expression of the emotions (Proshanky, Fabian & Kaminoff, 1983). This relationship of space and people can be referred as a form of investment and as a self-proclamation of independence in a foreign place. This collective effort in acquiring a space, land or building is a form of establishment, representation and to establish a sense of belonging (Tuan, 1977).

This paper aims to highlight the translation of social citizenship to architecture. This is because civil citizenship is a recognition that is given on paper (Turner, 1993) that is fulfilling emotionally but does not fulfil their way of life and sense of belonging towards their home country. Social citizenship is a medium of expression that is expressed at urban level translating the sense of belonging and individual expressions to the acceptance of the locals (Turner, 1993; Roche, 1987). This research is based on historical implication to the built environment through the understanding about of culture, ethnicity and historical values (Roche, 1987). It will contribute to the understanding of different cultures in different settings and how they integrate and accepted in the country (Pakulski, 2007; Roche, 1987). Accordingly, the focus of the paper is to describe the research designs, methods and procedures employed to understand the translation of social citizenship to architecture and the built environment. It also highlights the strengths and weaknesses of the methodological tools besides spelling out the variables needed to prove the relationship. This paper will explore the idea of social citizenship in the context of Australia in detail, and Perth Mosque and Adelaide Mosque as the case studies.

BACKGROUND: THE CONTEXT

The implication of a mosque to the built environment is wide-ranging. From an urban planning point of view, a mosque is regarded as a built urban form that serves the community similar to the role of a community/civic centre. In relation to community sustainability, a mosque is the right place that can promote social cohesion. The concept of social cohesion is central to social sustainability as it

focuses on to foster civic participation, strengthen community network, promote community tolerance and to support shared sense of social tolerance.

In this context of research, Social Citizenship refers to immigrants from all over the world trying to establish a place in where they reside today (Feldman, 1990). The struggles of the immigrants in establishing a place that represents their culture and society while gaining approval from the locals are well represented in the concept of Social citizenship (Bugg, 2013). The phenomena of Social Citizenship can be viewed in cities with many immigrants such as in Birmingham, New York and Sydney. Immigrants of different backgrounds whether from Indian, Afghan or Arabic descendants have strived in placing their culture and identity in the community and strived in assimilating into the local community while maintaining their uniqueness (Arijit Sen, 2013; Harris, 2013). The translation of Social Citizenship to Architecture is a symbol of their uniqueness represented in solid form for all to see, experience and appreciate (Arijit Sen, 2013).

The translation of citizenship to architecture and the built environment is based on certain elements that are defined by the relationship of human sense of establishment and the sense of belonging (Arijit Sen, 2013). These elements are the driving force behind the architecture that is erected in order to find approval from the local population and acceptance of their existence in the land. Drawing from the idea presented by Phillips (2014), Feldman (1990) and Gale (2004), the authors formulated a concept of social citizenship that impacted the architecture and the built environment (refer Figure 2):

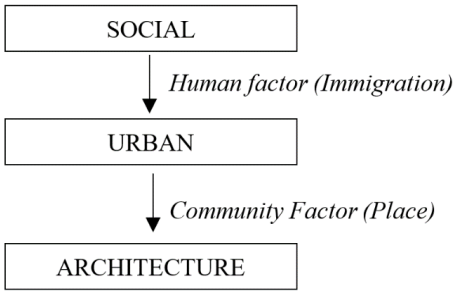

Figure 1 Translation of Social and Cultural Implication to Architecture

The concept of Social Citizenship in Figure 1 and Figure 2 relates to the human need of establishment in terms of social and in the form of architecture. This establishment is the symbol and representation of the struggles that the migrants have done n a country. According to Figure 1, the human factor that is usually resulted to migration to a foreign country.

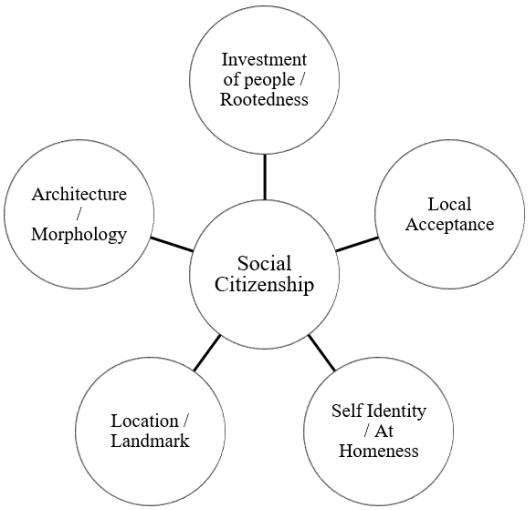

Figure 2 Concept of Social Citizenship
Source: Modified from Phillips (2014), Feldman (1990) & Gale (2004).

In Figure 2, the concept of Social Citizenship is represented by five elements. These elements are what make social citizenship translated to an architectural form in terms of a building, monument or open space (Tuan, 1977). Each of the elements plays a role in expressing the feeling and the struggle of the immigrants as the sense of belonging to their homeland is strong in them (Arijit Sen, 2013). The first generation of immigrants has a stronger sense of belonging and by establishing a building or structure that represents their existence. This is a strategy that translates into a building that would later be appreciated by the next generations and locals as something unique and exotic representing a sub-minority group of locals (Arijit Sen, 2013).

METHODOLOGY

The methodology adopted incorporates the process of gathering the data, processing the data/information and interpreting the data or archival information obtained. In this study, the method of processing and understanding the data in the most crucial step because of its historical value and story that it has behind it. The methods adopted are aimed toward obtaining archival/ historical evidence that can elicit proof of the concept. It also involved the process of inquiry that would be the basis for discussion and to draw a conclusion to the relationship between social citizenship and architecture.

Historical Inquiry (Historiography)

Historical inquiry comprises of historical method of doing research and it is also known as historiography (Berg, 2001). In doing historical research, evidence-

based and primary sources are the basis of analysis (Peters, 2013). Evidence-based research would require evidence from books, archived information, old newspapers and documents. These information gathered from the government or reliable source relating to the topic of the research. In this case of Social Citizenship, information relating to buildings and mosques is very vital (Berg, 2001). The buildings that are constructed, submitted and approved drawings from government agencies and reports relating to the construction of the buildings is an important element required for analysis (Berg, 2001).

Data used for historical research are divided into two sources. Data sources for histiography is different than any other qualitative methods as the histiography approach is through existing and verified data that is currently available. Histiography data can be divided into primary sources and secondary sources (Berg, 2001).

Primary sources include written statements of eyewitnesses, documentation of original articles and narration of experiences by a person directly related to an event (Berg, 2001). These include documents, photographs, recordings, diaries, memoirs, journals, life histories, drawings and other related relics, (Berg, 2001; Salkind, 2000).

Secondary source is based from oral interview from a person who is not present or directly available the event (Berg, 2001). This is a testimony of people in the form of written objects or documents created by others that relate to a specific research question or area of research interest (Berg, 2001).

Historical inquiry methodology is based on criticism from fixed set of questions (Garraghan, 1946). The set of questions is generated based on the topic that is being researched on. In the case of Social Citizenship, questions regarding the background of Social Citizenship and the source of social citizenship comes into place. According to Garraghan (1946), questions are being formulated based on the guidelines below:

i. When was the source, written or unwritten, produced (date)?
ii. Where was it produced (localization)?
iii. By whom was it produced (authorship)?
iv. From what pre-existing material was it produced (analysis)?
v. In what original form was it produced (integrity)?
vi. What is the evidential value of its contents (credibility)?

These questions are used in relation to the main topic where any other information that is found shall be added to suit the context.

Interpretive Approach

Interpretive Approach is another method used in determining the quality of information and exact analysis of the topic. The interpretive method is used in determining account of journeys, case work, case history and anthropological field study (Howell & Prevenier, 2001; Johansson, 2003). The interpretive approach is a good point of determining fragmented history from multiple sources that require detailed analysis and interpretation in order to extract the particular information need in the research (Peters, 2013).

In the case of Social Citizenship, the approach of historical Inquiry and interpretive approach is used in order to structure and arrange the information that came from numerous sources (Howell & Prevenier, 2001). This information may come from newspaper articles, a fraction of an article mentioning related articles or just an advertisement describing the required information (Berg, 2001).

Typo-Morphology

Typo-Morphology is an approach that focuses on the changes in the physical form of a city over time and how different cities compare to each other (Anne Vernez, 1997). Typology refers to categorized form types in architecture and urban design. Architectural typologies refer to the form characteristics of buildings, the study of categorized form types in architecture and urban design. As opposed to building type, which refers to functionality, architectural typologies refer to the form characteristics of buildings (Anne Vernez, 1997).

Meanwhile, morphology refers to a study of larger urban structures, pattern and issues. Morphology is also a study of the form of human settlements and the development of their formation and transformation according to time and era. Generally, the aim of the technique is to capture and examine the spatial structure and character of a space, village or city through studying the patterns of its components, parts and the process of its development and growth according to time (Anne Vernez, 1997).

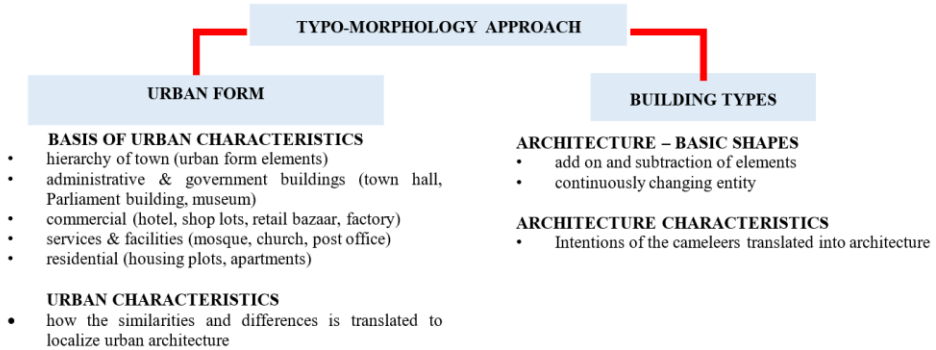

Figure 3 Typo-Morphology Approach
Source: Anne Vernez, M., 1997

To further clarify on the connections of Social Citizenship, typo-morphology approach is used by analysing patterns and structure of the urban landscape against buildings established by the immigrants. The analysis is done in urban settings where immigrants are established. These urban settings represent a variety of settings and different background of urban sceneries and history (Gulgonen, 1998). The similarities between cities and towns are the placement of the immigrants in relation to major elements of the city. Points of analysis that will take into account for all urban elements in this analysis will be:

i. Train station
ii. Major transportation routes into city
iii. Town hall
iv. Hotels
v. Government buildings
vi. Commercial areas
vii. Mosque location
viii. Industrial area

Based on these elements, the positioning of the building is measured against the location of important places in the town or city. This measurement will be based on the distance between the building and the important infrastructure of the city. This is to analyse the importance of the area and also the significance of the mosque based on the location (Anne Vernez, M., 1997; Gulgonen, 1998).

This method analyses the differences between all urban areas where the cameleers have establish themselves and how do these characteristics affect the architectural outlook of the cameleers' mosque. These elements will also affect the mosque architectural outlook relating to social and affordance of the Muslim community and what they represent in the area.

DISCUSSION

The methods adopted in this research would yield historical information relating to the activities of the immigrants, their contributions towards the local society and the level of acceptance that they receive (Pakulski, 2007). Usually, these immigrants are displaced and lurking at the edge of the city far away from local population. This is because of different backgrounds and way of life making them alienated by the society (Bugg, 2013). The scream for acceptance is always represented in the form of a building that is unique to their culture and background but exotic to the locals (Bugg, 2013). This difference in the form of architecture is easily perceived by the locals as it is regarded as a unique trait in the urban settings that invokes curiosity to the locals. This architecture is later easily received and the immigrants are recognized as part of the society (Arijit Sen, 2013).

In reference to Figure 4, the mapping of the major elements against Perth Mosque location shows the significance of the mosque (Bartsch et al., 2015). Based on the historical research, Perth Mosque is located in the main area of Williams Street a major retail street of Perth (Bartsch et al., 2015), Western Australia in the early 1900's. The location of the mosque there shows that the Afghan immigrants strived to establish a building in a major area so that they can be seen and accepted easily.

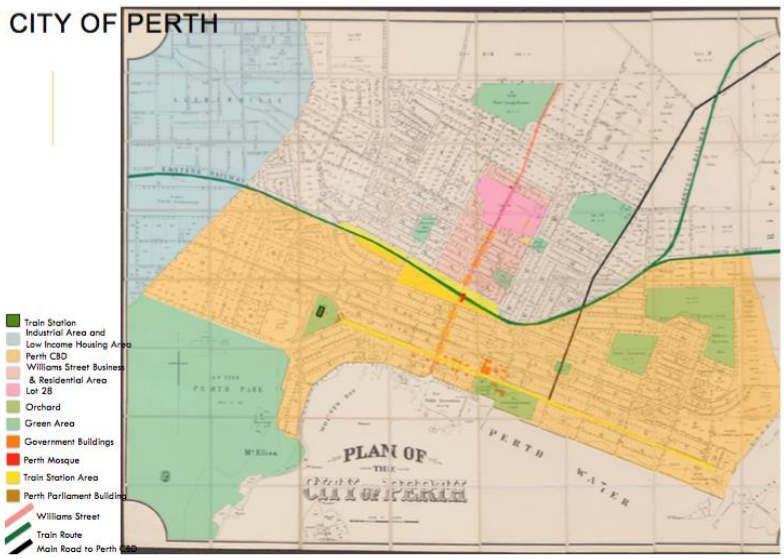

Figure 4 Sample of Morpho-Typology Mapping
Source: Author

The mapping of the location against the major amenities and elements of the city shows that the land that was purchased to build the building is in a significant area where major activities are done. The information historically is further supported by the mapping using typo-morphology method. Certain other cities may not reflect the same situation as in Perth such as the Adelaide mosque where the mosque is built in the fringe area of the city where it is well known to be an immigrant spot (Bartsch, 2015). However, in the long run, the Adelaide mosque today is located in the main area of Adelaide City. The Afghans had established a significant piece of landmark in Adelaide that is well accepted and celebrated by the locals. This is a way of approvement and acceptance of the locals towards the Afghans.

The methodology used in this research is a way of selecting and verifying information based on historical events, archived information and mapping the

information on a plan of the city to view the changes and relationship of the building towards the urban and local society.

By applying this method more information is easily obtained and the relationship between historical information and architecture of the building is seamlessly translated from the mapping from typo-morphology and historical data.

CONCLUSION

The translation of citizenship to architecture and the built environment is based on elements that are defined by the relationship of human sense of establishment and the sense of belonging. The understanding of this concept implicitly shows that these elements are the driving forces behind the architecture that is erected in order to find approval from the local population and acceptance of their existence in the land. The research also signifies the importance of architecture as a classifying device (Thomas & Deborah, 2002) through social citizenship. The strength of the method in this research is in discovering and understanding the history of places especially relating to migrants and migration and the application of religious architecture as a point of establishment. However, it also poses some limitations which mainly involves the data itself; to obtain credible data and information, verification of the sources and the way one understand and interprets the true meaning of the information. Conclusively, this method can be further explored.

ACKNOWLEDGEMENTS

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PLANNING MALAYSIA:
Journal of the Malaysian Institute of Planners
VOLUME 15 ISSUE 1 (2017), Page 245 - 254

THE IMPACT OF INTANGIBLE FACTORS IN SHAPING THE IDENTITY OF ANCIENT CITIES AND ARCHITECTURE OF CHINA

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Abstract

China is an immense nation and highest population on earth with incredible civilization, it kept up its character over millenniums in spite of its different ethnic gatherings and distinctive geographical conditions. The Ancient Chinese architecture and urban planning are fundamental units of the world architecture and well known of their particular character. In addition, they were an extraordinary wellspring of motivation for some neighbouring nations. Several factors were behind the momentous Chinese architecture and urban planning, and among those was the emperor guidance who unified the government and encouraged regularity in many aspect in Chinese architecture including city planning. The aim of this paper is to examine the impact of nonphysical factors such as Chinese culture and beliefs in shaping the distinct identity of ancient Chinese cities. This is done by studying; *feng shui* notion, Yin and Yan forces, the theory of five elements and other Metaphysics philosophies of China. Furthermore, this paper scrutinises a number of Chinese ancient capital cities and temples of heaven in Beijing as case studies to measure to what extent the intangible factors contributed in shaping the identity and layout of Chinese cities and architecture.

Keywords: Traditional houses, vernacular architecture, magic square, five arts of Chinese, sustainable houses, *feng shui* art.

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INTRODUCTION

In order to understand the Chinese architecture, the culture of China must firstly be understood. Chinese believe in many metaphysics theories and one of these is the *feng shui*, which is one of the Five Arts of Chinese. It meant according to English dictionary wind-water. However the notion to Chinese is to harmonise the building and occupants with the surrounding environment or events within the universe. Traditionally, *feng shui* was widely used to orient buildings in certain direction to bring luck, for instance a providential building location should be determined by reference to local great features such as water body, a powerful stars, or a compass. Harley & Woodward (2010) suggest that the better meaning of *feng shui* is the British one, which is positioning or placement than the word geomancy.

Therefore the application of this phrase led into siting the structures as buildings, villages, capital cities even a space within a building in favourable locations to benefit from the *qi* energy generated from nearby water body, mountains or other features of terrain. *Qi* energy has a great influence on denizen mood and health of living occupant or even dead. "*The Chinese art of siting has been applied in and mankind is its guardian a very wide range of spatial dimensions, from smallest of space- say bedroom or even the location of chair to largest, cosmic direction "* (Harley & Woodward, 2010, p.216).

Feng shui philosophy also articulates that *qi* energy exists in living creatures and inanimate objects or natural elements such as trees or hill. Moreover, *qi* is created by two contradictory forces, Yin the female and Yan the male, and these two powers should be kept in balance neither the male dominating the female nor the opposite or else disaster and chaos will occur. These two forces come together to generate everything in our universe and represented by numbers, colours, seasons, direction, temperature, natural feature or other terms of endearment. For instance Yin (female) is even number, weak, earth or valley and refer to north direction and its colour is black or dark representing a poor, old and distraction status. The female force is winter, moon and water whereas the Yan (male) is white, heaven, odd numbers, light, sun, fire and the opposite of all female attributes. The male represents the south direction, rich, young, strong and summer season.

Yin and Yan interact together to create the five elements known as Wood, Metal, Water and fire, and consequently everything including living creatures and lifeless elements in our universe are made of these five components. In Chinese legends the tow forces male and female were born since the beginning of the cosmos establishment and their harmonized interaction took place at the centre of earth and has led to creation of the first human being and various deities. Hence centrality is a fundamental principle in Chinese architecture and it is evident through many case studies in this paper. For instance vital buildings such as emperor palaces or government buildings were commonly located at the core of

the city. According to this philosophy, humankind was in the centre of the universe and the link between earth and heaven. Furthermore, his duty is crucial to protect earth and maintain harmony among Yin and Yan and this notion led to establish the well field diagram. "*The garden was the good Earth, and mankind is its guard for this he had to establish harmony in himself between yan and yin"* (De Sheng, 1991, p.35).

APPLICATION OF FENG-SHUI THEORY IN CITY PLANNING

As mentioned earlier, *feng shui* principle articulates that building or city should have great link with surrounding milieu to benefit from *qi* energy forthcoming from mountain or watercourses. Hence, most of ancient Chinese city were located at the mountain foot and nearby water body or forest. *"Indigenous chicness religious traditions were based on a belief in life after death, ancestors worshiping and reverence for natural features such as trees, rocks and hills, as well as cosmic element such as sky, sun and moon"* (Frenzo, Moffett & Wodehouse, 2013, p.82). This approach underscores the link between architecture and the five element theory. For instance the forest provides the wood and fire whereas the mountain is source of earthy material needed for construction and act as barrier. Moreover, it assists in generating rain. Finally, the water body is for drinking, farming and fire control since wood is the main construction materials. *"Mountains and rivers played an important role in the popular creeds of Chinese form the most remote antiquity they have been objects of worship. Mountains, forests, rivers, valleys, high hills have the power to produce rain, to make rain and wind: of all these things it is said that they are then a sacred powers"* (De Sheng, 1991, p.31)

In fact, the influence of Yin and Yan theory is palpable in building orientation. Dwellings faces south to permit better air circulation, and maximize heat and light acquisition. Moreover, south represents Yan the male who is a symbol of richness youth and luck, and this resulted in grid layout of city to allow south positioning of premises. "T*he philosophy foundation of development of square –shaped cities in ancient china was determined by ancient philosophy such as the philosophy of YING –YANG along with the principle of the five elements of water, fire, earth, wood and metal. The theme of duality, which featured in these philosophy led to an emphasis on forming a central axis in the basic layout of cities in and also promoted symmetry"* (Yanxin, 2010, p. 9).

In China the emperor duty expand beyond governing the nation. He is also in charge of choosing the best locations of his capital and other major cities to ensure good *feng shui* of new established cities. Therefore he sends his trusted officers to collect data concerning water availability and topographical aspects of the site, water quality should also be investigates as it effect farming and mankind health. "*Feng shui is a philosophy with origins in the traditions of ancient Chinese Culture, which held great respect for man's natural environment and*

which had a significant impact on the choice of locations for the ancient cities and their layout" (Yanxin, 2010, p. 9).

The synthesis of *qi* energy with *feng shui* philosophy inspired the Chinese planners to invent the well field diagram or system which combined numbers, shapes and geomancy, the diagram acknowledge the setting of the emperor at the centre between heaven and earth by locating the palaces and governments buildings at the core of the diagram. The well field square comprises 9 squares numbered from 1 to 9. The centre square is numbered by 5 representing the male power and featured the link with five elements which forms everything in the universe. Square 5 named the inner city accommodating royal palaces and other crucial buildings through which emperor governs the nation. Moreover, inner city is surrounded by wall and out of bound to the public. It is only for empower members, upper class citizens and government officers. Other odd numbers 1, 3 and 7 accommodate multipurpose hall, temple of harvest and ancestor's temples and even numbers exist in the corner as female power to balance the male force accommodating residential villages or wards (Figure 1).

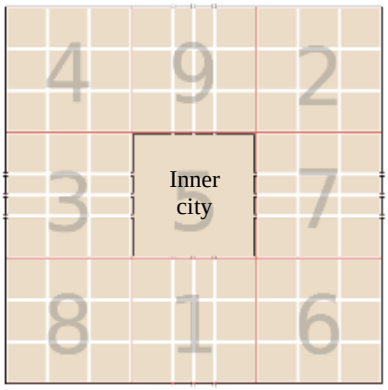

Figure 1 Well Field Square

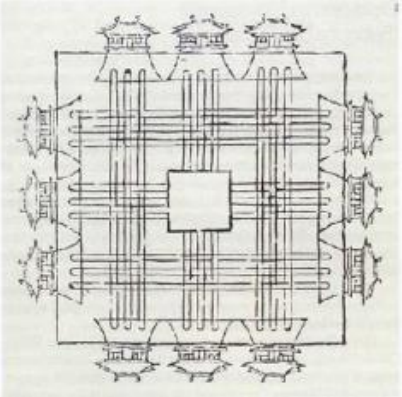

Figure 2 Zhou Dynasty Well field System

Another feature of the well field system is the nine main avenues running from North- South and West –East directions and they end in main gates on each opposite side. The entire city is protected by a second wall and the diagram layout was common during the Zhou Dynasty when the emperor power was dominating the religious authority. The first application of the diagram was adopted firstly in Chengzhou 1036 BC (Figure 2). *"This plan, like its counterparts in several other Eurasian civilization, was designed to illustrate and establish the centrality of the ruler, the son of Heaven who sat at the pivot of the four quarters and meditate between heaven and earth. Hence emperor through Chinese history often concerned themselves with the geometric layout and numerological symbolism of*

the capital and its cultic sites and structure." (Harley & Woodward, 2010, p. 212). The layout of many other ancient cities in China such as Chang'an, Luoyang and Beijing were evidently inspired by the well field system. Usually, the emperor before establishing the well diagram on selected setting, would requested a report regarding the site to ensure it has a good *feng shui* and link with the five elements such mountain or natural terrain.

CASE STUDY - CHANG'AN CITY

Chang'an is primordial capital city for several dynasties in Chinese history was set up around 618AD (at present, the city referred to Xinjiang in Shaanxi). It was a great urban planning model and inspiration for many areas, and influenced the design of bordering nation Japan, in particular Kyoto and Nara cities. The Chang'an city was initiated in light of the well field diagram created during Zhou era and imparted basic components from Chengzhou city with the exception of internal city, the city roads were laid in matrix framework, and both inner and outer cities were fenced by walls. Entry to city is through odd gates. The royal premises or governments buildings occupying central square 5 were shifted northwards in Chang'an prototype to satisfy different traditions or notions (Figure 3).

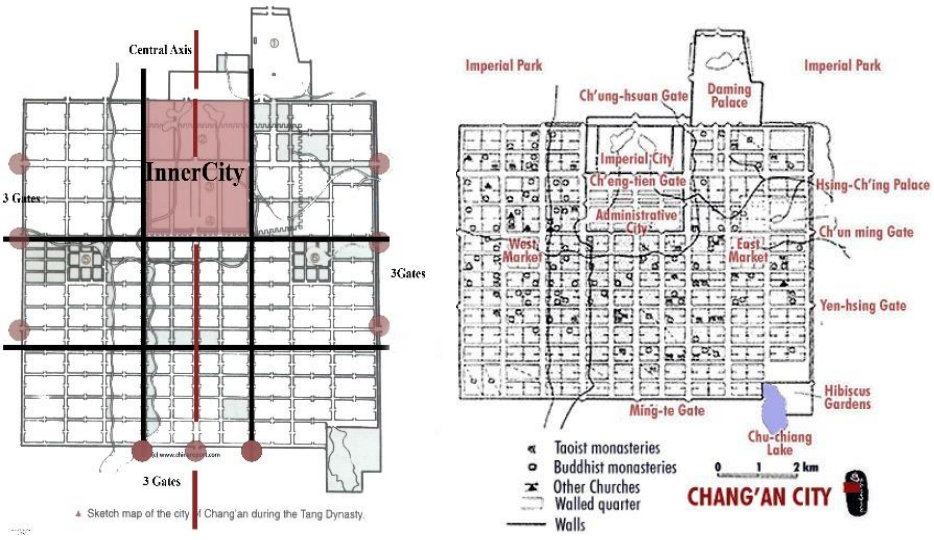

Figure 3 Chang'an Prototype

Many assumptions or reasoning behind such modification. Among those theories of the transference was to highlight the royal residence, as many orthogonal streets lead and end with limits of internal city. Further suggestion is to recognize the royal zone from external city or to diminish cuts in existing urban

fabric. In fact, the rationale behind this adjustment was Qinling Mountain located north of the city acted as natural barrier and protected the inner city from possible conquest from north. Whereas the urban fabric beneath inner city is a further obstruction if invasion occur from southern direction. The city has good *feng shui* and connection with the five elements through the mountain and water source as Wei River with its streams flow through Chang'an city providing water supply for citizens.

LUOYANG CITY

Luoyang the timeworn city was situated on eastern China and in the west of Henan Province where Huanghe River (Yellow River) divided the city into two districts. The city is regarded as an antiquated capital of nine noteworthy lines in China. It was implicit the Zhou tradition as the eastern capital in acknowledgement of the effective foundation of Zhou. Initially the city was set up as capital thence advanced to be an incredible business hub. But the broadened part of the city was finished by Emperor Guangwu amid Han period. It is apparent that the city is comparable to previous case study (Chang'an) outline and its layout educed from the well field system. Yet the internal city is situated in the north of the scheme between two natural barricades, the mountain Mangshan in the north east embraces inner city and is a great barrier. Meanwhile, Luo River is southwards, segregating internal city form outer district (Figure 4).

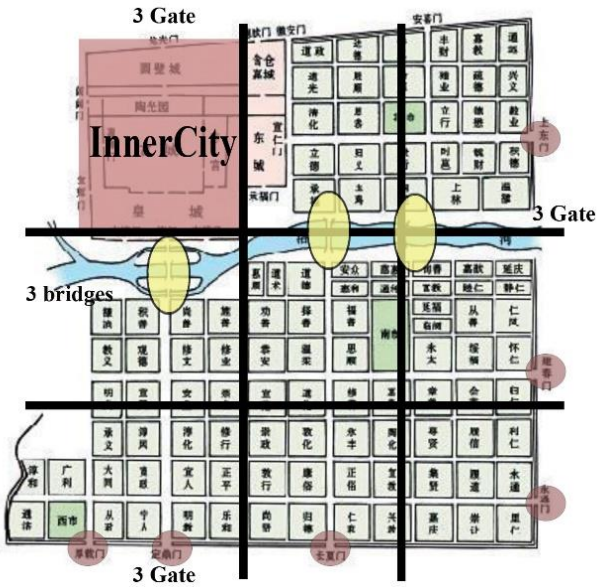

Figure 4 Luoyang the Timeworn City

The city is a squared grid layout once the river omitted and roads are orthogonal, similar to well field diagram. But the city irregular shape ensued by geological factor and the urban fabric east of the royal district is a third obstacle layer against invasion from east. The city has good *feng shui* through its location at the foot of the mountain and watercourse within its fabric. Furthermore, it acknowledges the male forces through the usage of odd digit 3 as the two banks of the city linked by 3 bridges and each side of external wall accommodates 3 main gates.

BEIJING CITY

Beijing, similar to Chang'an city, was an ancient capital of five lineages including the last three supreme dynasties (Zhou, Ming, and Qing). Likewise, it was the auxiliary principle of two northern administrations (Liao and Jin.). Beijing layout is considerably similar to the well field system in particular the location of inner city at core square number five with slight shift southwards to protect the city from conventional conquests attempts from Mongols state north of China. The design of the city and its components emulated the customary of urban arranging in old China. It highlighted the idea of central axis and a focal area of inward city to symbolize the stature of the supreme ruler who deemed as the focal point of the universe (Figure 5). *"The imperial palace, known as inner or forbidden city, was built at the heart of Beijing bisecting the city symmetrically along a North – South axis"* (Yanxin, 2010, p. 17). Several treatments in the city reflect great recognition to *feng shui* philosophy and Yin -Yan forces through emphasizing southern orientation and main access to inner city likewise its premises is via south Axis. China was subject to frequent invasions from north when Mongolians cause severe destruction to many capitals. Hence, north is a symbol of annihilation, enemy, evil, poorness and bad luck. Central axis in Forbidden City (known as inner city) is stressed by locating crucial building along it and main route to agriculture as well as heaven temples is across same axis. Moreover, Meridian the main gate to inner city is on central path. Royal Buildings in Forbidden City were laid in group of three or five stressing the male force. Even the main gate Meridian accommodating three entry path and leads to five bridges over the stream (Figure 6). *"The compound is divided into two complexes along the north–south axis; the southern outer court has three principles halls and the northern inner courtyard has another three main buildings"* (Yanxin, 2010, p. 3). Another feature of the Zhou diagram is to place sanctuaries on both sides of majestic palace. Hence the Ancestral temple was built to the left side of royal residence with Altar of earth on the right. Beijing city was changed over various densities, for instance the supreme city was moved southwards to enhance the entrance to the royal residence and another divider was developed outside the southern mass of the city during Ming dynasty. However, the wall was not finished on different sides because of absence of assets (Figure 6). *"The southern*

wall of imperial city within Beijing city was relocated further southwards by approximately half mile, to facilitate the extension of the road (for imperia carriage) leading to the main gates of the innermost imperial palace" (Yanxin, 2010, p. 7).

The last modification of Beijing city occurred when the leader of the Ding line held the fundamental design of Beijing city and revamped the Palaces which were decimated by seismic tremor or blazed and requested to move neighbourhoods from the internal city into the external city while the inward city retained cabins and camps for the horde of the Imperial militaries.

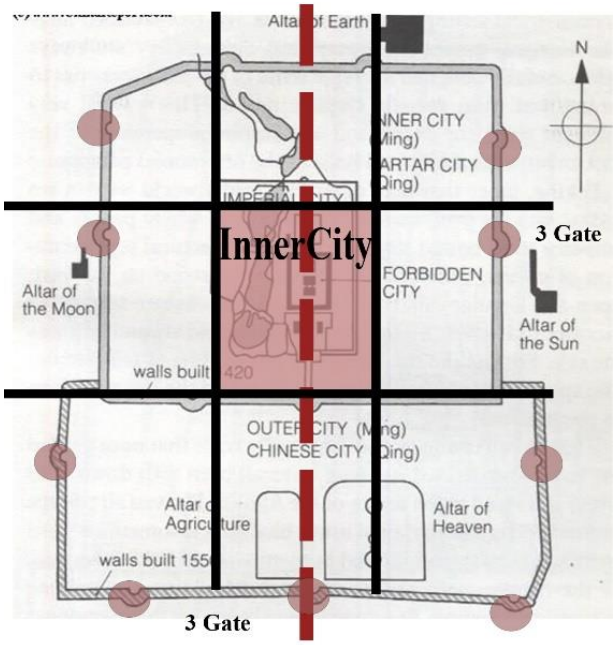

Figure 5 Beijing City Focal Point of the Universe

Like early antiquated urban areas specified, Beijing layout recognizes *feng shui* as the city shielded by various mountains and placed toward the end of Miaofeng Mountains and a few streams with aquatic canals spout through the city to supply drinking water to city populace.

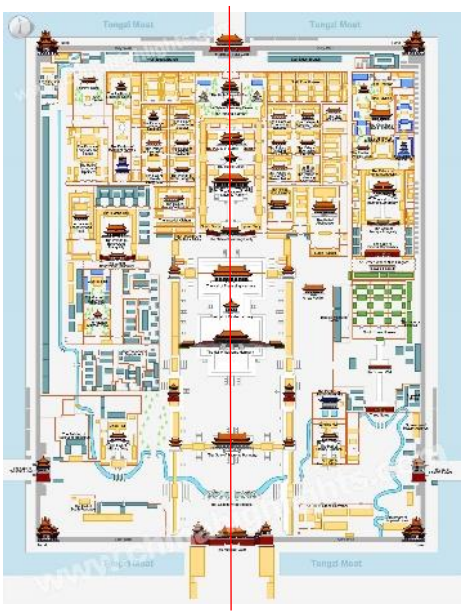

Figure 6 Main Gate Meridian

The legends and philosophies of Chinese cast its shadow on urban planning and even on buildings layout. For instance, temple of Heaven in Beijing emphasizing the Yan and Yin forces in particular the usage of number 3. The temple accommodates three components; the Hall of Prayer for Good Harvests, the Imperial Vault of Heaven and the Circular Mound Altar. Central Axis is dominant and entry into the temple and vital buildings were located along it. Main gateway to the halls accommodate three doors and access to temple is through southern direction. The Prayer hall crowned by thee roofing layer and stands on three rings of stones similar to Circular Mound Altar, stressing the male force (Figure 7).

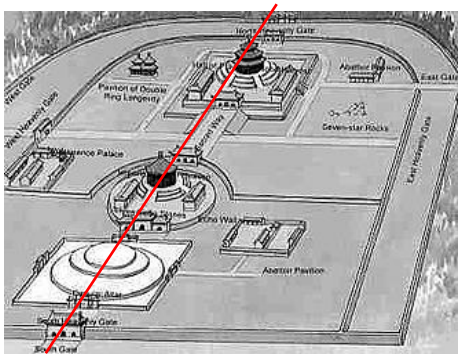

Figure 7 Circular Mound Altar

CONCLUSION

The influence of Chinese mores and metaphysics theories is extremely evident in modelling the ancient cities of China and in particular *feng shui* philosophy and the two opposite forces Yin and Yan. *Feng shui* notion imposes great association with surrounding environment or even beyond our planet. It recognizes the stars and the entire cosmos. *Feng shui* principle and the theory of five elements were identified in the three case studies by establishing the cities at the foot of mountains and nearby water bodies to provide water for drinking and farming. Whereas, the mountains acted as natural barriers against possible invasions.

Another critical rationality in Chinese custom is pertinent to emperor stature and his position at the centre between earth and heaven. Emperor power overshadowed religious sovereignty during Zhou Dynasty. He was recognized as son of god and his duty was central to guard the earth and harmonizing the two main forces Yin and Yan. Hence ruler leverage was symbolized by focal area of magnificent castles or inward city inside the city arrangement, such as Beijing city. This vision inspired Chinese to develop the well field diagram during Zhou Dynasty and set it as guideline for many urban models where the administration premises and head royal residences involve the focal point of the outline or the city. The diagram addressed emperor perception and acknowledgement of order as great tool to rule the nation and organize society. Principal door to the city or royal residences normally situated along central access and dwellings commonly faces south direction. In effect, the guideline elements of pivotally and cardinal introduction are fundamental since Chinese trust that north spoke to the severities of winter, the danger of savage triumphs and malice impact while south speaks to paradise or positive Yang *qi* subsequently. Essential structures opened towards southern heading and primary portability ways are south.

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PLANNING MALAYSIA:
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HOUSING AFFORDABILITY IN THE STATE OF MELAKA

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Abstract

Housing is a basic need to man. It provides shelter and comfort from the elements and improve quality of life of the residents. Hence, housing should be affordable to all. This paper assesses the housing affordability for the districts in Melaka. This was achieved by calculating the median multiple of the price income ratio and comparing the score to the housing affordability index. Secondary data were obtained from reports published by the governmental agencies. The results show that housing is mostly moderately unaffordable in the districts of Melaka. Additionally, housing affordability has improved from 2012 to 2014 in majority of the districts.

Keywords: Housing affordability, affordable housing price, district, Melaka.

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INTRODUCTION

Owning a home for shelter and comfort is considered by many as a life goal and a measure of personal success (Hashim, 2010). However, the price of houses is increasing, so much so that housing has become unaffordable to many. In Malaysia, the same situation occurs where house price is surging upwards, unproportionately to income. Land scarcity and economic growth have often been cited as the factors that drive house price up to the point that it becomes unaffordable to the majority of Malaysian public (Hashim, 2010). As Malaysia aspires to be a developed nation with high-income economy by 2020, the housing industry needs to be adaptive and responsive to demand for special groups, especially the medium and low income earners. ISIS (2013) proposes that the Government must take appropriate measures to ensure access to quality and affordable housing is enjoyed by all. ISIS (2013) also notes that as public purchasing power has reduced, housing affordability gap has widened even further. However, Chang (2013) argues that the determining factors on the ability to purchase a property is not dependable solely on income but also by the high house price and the mortgage interest rate. Making houses affordable, especially to the lower income group is critical for poverty reduction, institution building, good governance at the local and national levels, and conflict prevention. (Shuid, 2016).

The objective of this paper is to provide an overview of the affordable housing scenario in Melaka and to determine the housing affordability index for each districts in Melaka. It is hoped that the findings from this paper would contribute in making housing more affordable to the Malaysian public.

SITE PROFILE

Melaka is a state in Malaysia and located in the southern region of the Peninsular Malaysia. The state borders the famous Straits of Malacca on the west, Negeri Sembilan to the north and Johor to the south. Melaka is also well known by the inclusion of its city centre in the UNESCO World Heritage Site. Melaka is one of the smaller states in Malaysia, measuring a little over 165,000 hectares. The state is made up of three districts, which are Melaka Tengah, Jasin and Alor Gajah. Alor Gajah is the largest district in the state, but Melaka Tengah, although the smallest district, has the highest number of population. The historic Melaka City Centre is located in the Melaka Tengah district.

AFFORDABLE HOUSING IN MELAKA

Affordability is defined as 'the ability of households to meet housing costs, while maintaining the ability to cover other basic living costs' (AHURI, 2004). Meanwhile, Shaqra'a, Badarulzaman and Roosli (2015) define affordability as appropriate and reasonable house price based on its quality and location. In terms of housing affordability, Khazanah Research Institute (2015) ranks Melaka as the

state with the most affordable housing in Malaysia. In fact, according to KRI (2015), Melaka is the only state in Malaysia that achieved a median multiple of 3.0 in 2014, indicating that housing in Melaka is affordable to its population.

Melaka is also one of the few states in Malaysia that has established its own Housing Board. The Melaka Housing Board is a state government agency that oversees housing development projects in Melaka. The Board was established in 2002 through the passing of the Melaka Housing Board Enactment 2002. Prior to the establishment of the Board, housing development projects in the state were monitored by the State level housing department and the local authorities of the area.

METHODOLOGY

Affordable housing is related to the ability of a household to pay for their house (EsruqLabin, 2014). The concept of housing affordability can be measured from three perspectives, namely Repayment Affordability, Purchase Affordability and Price Income Ratio (PIR). For the calculation of housing affordability index (HAI) for each district in Melaka, the PIR was used. To derive the HAIs, the median multiple formula, which makes use of the annual income and median of all house prices, was employed (Figure 1). Data on population income and house price for year 2012 and 2014 were sourced from the Department of Statistics Malaysia and the National Property Information Centre of the Valuation and Property Services Department Malaysia.

$$\text{Median Multiple} = \frac{\text{Median All House Price}}{\text{Annual Medium Income}}$$

Figure 1 Median Multiple Formula
Source: Khazanah Research Institute, 2015

The resulting median multiple scores were then compared to the housing affordability index categories as shown in Table 2 below.

Table 2 Housing Affordability Rating Categories

Rating	**Median multiple**
Severely unaffordable	5.1 and above
Seriously unaffordable	4.1-5.0
Moderately unaffordable	3.1-4.0
Affordable	3.0 and below

Source: Demographia, 2016.

FINDINGS

Table 3 shows the housing affordability index by districts in Melaka for year 2012 and 2014. On average, housing affordability in Melaka has improved from year

2012 to 2014. The district of alor Gajah recorded HAI of seriously unaffordable in 2012, has improved to moderately unaffordable in 2014. For the district of Melaka Tengah, although the HAI for both years remained at moderately unaffordable, the median multiple has reduced to 3.1 in 2014 from 3.6 in 2012. However, for the district of Jasin, the HAI has worsened from moderately unaffordable in 2012 to seriously unaffordable in 2014. At state level, the study KRI (2015) shows that the HAI has improved from moderately unaffordable in 2012 to affordable in 2014.

Table 3 also shows that there was a substantial increase in the annual median income for both Alor Gajah and Jasin. This helped to lower the median multiple score for the districts, resulting in improved HAIs. Similar situation also occurred at state level where the percentage increase in annual median income was larger than the percentage increase in median house price, resulting in improved HAI. In Jasin, the percentage increase of income is lower than that of house price, which led to worsening HAI.

Table 3 Housing Affordability Index in Melaka by Districts in 2012 and 2014

District	**2012**				**2014**			
	Annual Median Income (RM)	Median - All House Prices (RM)	Median Multiple Affordability	HAI	Annual Median Income (RM)	Median - All House Prices (RM)	Median Multiple Affordability	HAI
Alor Gajah[#]	38,370	185,500	4.8	Seriously Unaffordable	56,628	190,000	3.4	Moderately Unaffordable
Jasin[#]	36,523	140,000	3.8	Moderately Unaffordable	53,520	221,000	4.1	Seriously Unaffordable
Melaka Tengah[#]	44,977	160,000	3.6		62,940	195,913	3.1	Moderately Unaffordable
Overall Melaka*	47,076	160,000	3.4	Moderately Unaffordable	60,348	180,000	3	Affordable

*Source: *Khazanah Research Institute (2015); [#] Authors own calculation.*

RECOMMENDATION

Despite the affordable HAI for the state of Melaka, housing is still found to be unaffordable at district level (Table 3). Hence, Table 4 shows the suggested median house price for the districts in order to meet the affordable HAI rating (i.e. median multiple score of 3.0). The suggested median house price is derived by multiplying the 2014 annual median income of each district by 3.0.

Table 4 Housing Affordability Index of Ration by Median All House Prices

District	Annual Median Income 2014 (RM)	Median All house Price 2014 (RM)	Proposed Affordable Median House Price (RM)
Jasin	53,520	221,000	RM 160,560
Alor Gajah	56,628	190,000	RM 169,884
Melaka Tengah	62,940	195,913	RM188,820
Overall Melaka	60,348	180,000	RM181,044

Source: Authors own calculation

Earlier findings show that Jasin experienced worsening HAI from 2012 to 2014. To achieve affordable HAI rating, the median house price for the district of Jasin is proposed to be capped at a maximum price of RM160,560. Meanwhile, for the districts of Alor Gajah and Melaka Tengah, the proposed price are RM169,884 and RM188,820, respectively.

Figure 2 compares the 2014 median house price and the proposed median house price for each district in Melaka. Again, it can be seen that difference between the 2014 median house price and the proposed median house price is largest in the district of Jasin. This corroborates the findings that Jasin has the worst HAI as compared to the other districts in Melaka (Table 3). Melaka Tengah has the smallest difference between the two prices. This is reflected in the 3.1 median multiple score for the district, which is only slightly above the affordable rating of 3.0.

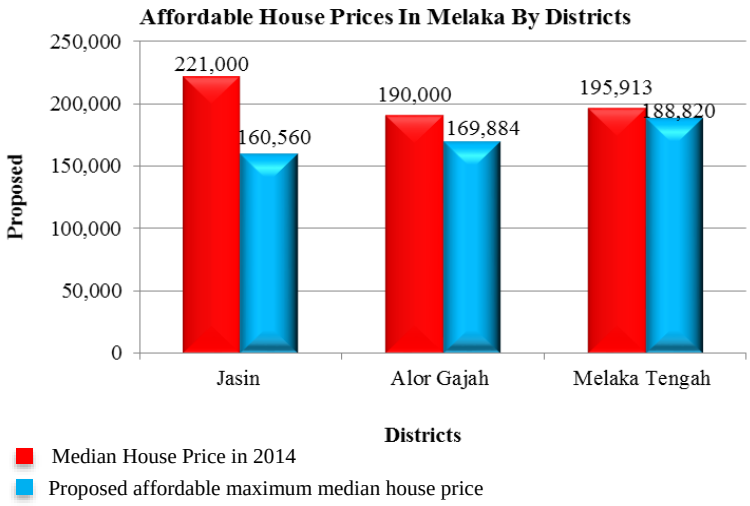

Figure 2 Comparison between 2014 Median House Price and Proposed Affordable Median House Price for Districts in Melaka

CONCLUSION

This paper has shown that despite the affordable HAI of the state, at district level housing was still unaffordable in Melaka. Nevertheless, the level of unaffordability was not severe. Only one district recorded a seriously unaffordable HAI, while the other two were at moderately unaffordable. However, measures must be undertaken by the state and local governments in Melaka to ensure that the population of each of the district can truly enjoy access to affordable and quality housing.

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THE ESTABLISHMENT OF ISLAMIC DWELLING PRINCIPLES FOR THE MALAYSIAN COMMUNITIES

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Abstract

Strong family ties built on the teachings of the Quran and Sunnah produce excellent foundation in forming a household which are constantly under the protection and blessing of Allah and in turn contribute to the overall health of a community. A dwelling filled with the remembrance of Allah will no doubt find an aura of peace and tranquillity. This is called a home, a place for a family to worship Allah, to relax body and mind, enjoy legitimate worldly delights, teach, learn and propagate the message of Islam. Therefore, provision and design of a dwelling should be considered important to make it a blessed home. This includes the provision of spaces for religious activities, daily basic chores of households, social production, reproduction hygiene needs, privacy and security. Cultural, religious and sustainable aspects of inhabitants should be considered in the planning and design process of a dwelling in the Malaysian context. The Syariah sources have provided basis for its design to conform to Islamic criteria, thereby facilitating various *ibadah* activities for the inhabitants and users. A review of theory and philosophy of dwelling from Islamic perspective is analysed to justify the comprehensive living approach as promoted by Islam. This paper aims to review literature pertaining to housing principles in Islam and to present basic principles for developing housing criteria based on Islamic teachings.

Keywords: Islamic, dwelling, principles, model, design, communities

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INTRODUCTION

Dwelling may mean the same as house, home, residence, abide, lodging, accommodation, or housing, among other meanings. The social unit that lives in a dwelling is known as household. Most commonly, a household is a family unit of some kind, though households can be other social group, such as single persons, or groups of unrelated individuals. Many people leave their houses during the day for work and recreation and return home for other activities. The meaning of dwellings has been studied from many different perspectives, such as psychology, phenomenology, sociology and environment-behaviour studies. A good dwelling design must be set out according to the conditions of that locality and meet the technical, hygienic, quality requirements and social-cultural aspects. Coolen (2006) notes that a dwelling is an individual's primary anchor in the environment. It may serve many functions, such as shelter, privacy, security, control and status. From an ecological point of view the meaning of dwellings lies in these functional relationships between human beings and their dwellings.

DWELLING FROM ISLAMIC POINT OF VIEW

Islam shaped ideas and styles about dwellings and other architectural forms as well. A dwelling was once considered a typology within Islamic architecture, as it facilitated the religious life as it was a space for daily prayer at home. It was designed based on religious prescriptive regarding family, privacy, spirituality and hospitality (Ibrahim, 2012). Yusuf al-Qardhawi, the Islamic researcher and chairman of the International Union of Muslim Scholars, defines a dwelling as the place where an individual protects himself from the climatic elements and in which he finds freedom from the restrictions and pressure of society. It is a place of rest for the body, and relaxation for the mind and soul. The Quran highlights that a dwelling is a shelter or a private sanctuary to its residents. Allah says, *"And Allah has made for you from your homes a place of rest…"* (al-Nahl 16:80).

Creating an atmosphere of faith in the home and taking the home as a place of worship is very important as Allah says, *"And We inspired to Moses and his brother, "Settle your people in Egypt in houses and make your houses [facing the] qiblah and establish prayer and give good tidings to the believers" (*Yunus 10:87).

A dwelling from an Islamic view celebrates good and righteous people and seekers of knowledge to visit the home. As Allah says, *"My Lord, forgive me and my parents and whoever enters my house a believer and the believing men and believing women…"* (Nuh 71:28).

SUMMARY OF LITERATURE REVIEW

In order to identify publications that provide insights of Islamic dwelling, database searches were undertaken. Thirty selected publications published from 2000 to 2015 were selected for this research. However, only 15 most related

publications were chosen for the purpose of this paper. These publications are looking at as many criteria as possible and their respective principles to the design of Islamic dwellings. A summary of all 15 publications are provided in Table 1 below.

RESEARCH FINDINGS

Principles of Islamic Dwelling

Based on the publications analysed and the key findings in Table 1, the following are the main domains which should feature in nearly all Islamic dwellings.

Location - Land

The most important feature for an Islamic dwelling is its land, good air, much water, and flat and smooth land. Ali (as) stated, 'Housing is not desirable, but with three things: good air, plenty of water and fertile ground' (Amar, Ismail & Salleh, 2012). Imam Ali (as) also emphasizes on suitable home and states, 'The blessing of a house is its good location, large yard and its neighbours'. Besides that, a dwelling is best located near to a mosque to enable men to join the congregational prayers.

Climate and Topography

All climatic aspects within the tropical regions such as climate, topography, wind direction, sun movement and humidity must be taken into account for effective self-heating, cooling, ventilation and illuminating mechanism. The adaptation of climate-responsive design in coping with heat and humidity reflected in dwelling design of a vernacular Malay house such as open floor plan arrangement, raised floor on stilt, full length window, large overhang, interconnected open space, and shading trees and shrubs helps modify microclimate around the house by cooling down air temperature and directing cool breeze towards the dwelling (Limthongsakul et al., 2012). Generally, an Islamic house will be favourably responsive to its ecosystem, energy efficient, nature friendly and sustainable where it will not depend solely on artificial sources and means of energy (Omer, 2010).

Orientation - Qiblah Direction

Qiblah means the direction one should face when observing the prayer. Therefore, the orientation of every Islamic dwelling should consider *qiblah* direction. The *Sunnah* of the Prophet (peace be upon him) is to respect and revere the prayer direction. This is indicated in several hadiths, such as *"When one of you stands in his prayer, he is in close conversation with his Lord or his Lord is between him and his qiblah. Therefore no one should spit in the direction of his qiblah"* [Sahih Bukhari, Kitab al-Salah].

Table 1 Summary of Literature on Islamic Housing Principles

No	Author(s)	Year	Publication	Purpose	Key findings
1	Fakriah and Ahmad	2009	Journal article	To assess the adaptable house design attributes in Malaysia related to Islamic principles.	Space organization (sleeping area, eating area, recreation and leisure area, kitchen, toilets, storage and circulation areas) and architectural design style are the main determining factors of an Islamic house design.
2	Majid Yazdani et al.	2013	Journal article	To analyse the characteristics of suitable home from Islamic views and modern architecture	Important housing characteristics in Islam view are suitable land, location, neighbour, building design and its architecture and extension of the home.
3	Hashim et al.	2008	Journal article	To identify urban malays user-behavior and perspective on privacy and spatial organization of housing	Re-introduction of the serambi concept in modern housing as a transition zone for informal entertaining and social interaction space for the immediate neighbourhood to fulfill privacy needs.
4	Ahmad and Zaiton	2008	Journal article	To study the influence of privacy regulation on urban malay families living in terrace housing.	Defined territory and the need to respect the neighbors' privacy are found to indirectly affect community intimacy among Muslim families living in terrace housings.
5	Ahmad et al.	2005	Journal article	To analyse visual privacy and family intimacy among Malay inhabitants living in low-cost terrace housing.	Visual privacy due to location of openings, separation of sleeping places of male and female family members and separation area during social interactions should be considered in the planning and design process.
6	Hannah Ibrahim	2012	Doctoral Dissertation	To identify a contemporary house that is a manifestation of the practices of the Islamic religion.	Courtyard type dwelling, openings on external walls, bent entry, separation of male and female area, clear division of public, private and semiprivate areas, multifunction musallah design for individual and collective.
7	S. Omer	2010	Book	To analyse the subject of housing in Islam, as both in concept and reality.	Front door design, windows design and other apertures, privacy protection among family members / between visitors and the occupants, maid's room, bedrooms, toilets, kitchen, house orientation consider qiblah direction, musolla and studying area.
8	S. Omer	2011	Article	To identify Islamic principles through conceptualizing Islamic housing	Inner courtyard, partly or fully screened windows, raising windows above the eye level, bent entrances, parapets, or protective walls, along the edges of balconies and open roofs, double circulation houses.
9	Fakriah and Ahmad	2009	Journal article	To assess the adaptable house design attributes in Malaysia that relate to Islamic principles.	Space organization (sleeping area, eating area, recreation and leisure area, kitchen, toilets, storage and circulation areas) and architectural design style are the main determining factors of an Islamic house design.

10	Nahid and Sakineh	2001	Journal article	To investigate muslim women privacy requirements with ventilation needs in Malaysian terrace houses	Privacy spaces in a house can be divided into public area, semi-private and private. Terrace houses could not provide complete privacy and some traditional adaptation can be applied by rearrange the unit floor.
11	Ghaffarian Hoseini et al.	2014	Journal article	To analyse the environmental and social-culture values of Malays vernacular house.	Nature and tropical climate are main basis of design. Privacy and optimal use of space are significant social values while natural ventilation is most significant environmental value.
12	Muhammad Suhaimi bin Musa	2011	Journal article	To discuss topics on the needs of design elements for the establishment of Muslim behaviour in traditional and modern Muslim dwelling.	**S**pace configuration that consider place of worship, size of space, internal layout, privacy, cleanliness, pictures and study of traditional Malay house in space zoning.
13	Noorul Huda	2013	Journal article	To identify residential visual privacy on traditional and modern architecture house designs and urban designs	Majority of women regard visual privacy at home from outsider as extremely important. Urban designers are to incorporate core values of the culture to meet the needs of residents.
14	Zeenat Begam	2011	Journal article	To find guiding principle from Al-Quran and Sunnah regarding the planning amd design of a house.	Privacy is principles that separate owners private life and public intercourse which consider visual privacy and acoustical privacy, safety, interior decoration aspects, cleanliness, avoid wastage.
15	Amar et al.	2012	Journal Article	To produce basic Islamic guidelines for the developers to build and design the internal part of houses for Muslims.	A basic guideline of building a Muslim house accordingly to the Islamic teachings, considered of house location and site layout, main entrance, living and dining area, fencing and bedrooms.

Space Configuration (Zoning)

The spatial planning and layout in the dwelling design should divide spaces that are public, semi-public, semi-private and private spaces. These spaces are determined based on gender segregation, limitation of *awrah*, privacy and isolation from the interest of the public that constitutes with visual and accessibility restriction. The public spaces receive and entertain non-mahram guests such as neighbours, relatives and friends (Mortada, 2003). The private area is specially created for family members and females without being interfere by non-mahram guests (Mortada, 2003; Abdul Rahim, 2008). Spaces that are indefinite and unclear whether they are public or private allow less control on social interaction and create conflicts (Ramezani & Hamidi, 2010).

Privacy - Visual Privacy

Privacy of the dwelling is significantly stated in many places in the Quran. Allah says, *"O you, who have believed, do not enter houses other than your own houses*

until you ascertain welcome and greet their inhabitants. That is best for you; perhaps you will be reminded" (An-Nur 24:27).

Visual privacy inside the house should be maintained by the design treatment by both public and private domains as well as spaces declared as sacred such as bedrooms, in the private domain. Guest room location should be close to the entrance and separated from the family domain to maintain the privacy of women in the rest of the house. Creating a space for hosting guests is encouraged in the Muslim dwelling. Although Islam greatly encourages invitation of guests, it disallows mixing between unrelated male guests and the family females. Therefore, direct visual access between the guest domain and family is prohibited. Design measures should be provided to eliminate such access and to maintain the privacy of the family domain. The Quran stated very clearly that one's privacy is one's own right and no one should intervene in it without one's permission. Muslim scholars emphasize three elements of design that can control the visual privacy of a dwelling for instance the entrance door, windows, openings and screen height (Omer, 2010; Mortada, 2003; Abdul Rahim, 2008).

Privacy - Acoustical Privacy

Acoustical privacy is of no less importance than the visual. Mortada (2003) and Abdul Rahim (2008) mention that privacy of acoustic means controlling the transmission of sound from inside to the outside of the dwelling that can be heard by opening doors and windows. Therefore, precautions should be taken to prevent sound transmission from the house to the outside and from the family domain to the guest inside the house. Through creative space organization and suitable building materials, it ensures the acoustic privacy between the internal zones and the outside zone.

Privacy - Sense of Smell

Olfactory privacy also plays an important role in the control of smells privacy or odours produced in kitchens to prevent them from spreading to spaces where guests are entertained. Muslim narrated, *"If you cook something with gravy, increase the gravy and send some of it to your neighbours."* In another hadith, Islam encourages another caring attitudes amongst Muslims as follows, "*One is not a perfect Muslims who eats until he is full and leaves his neighbours (also kith and kin, one has more responsibility for them) hungry."* [al-Tabarani]

Internal Layout - Main Entrance

A front door should be designed in such a way that it does not give immediate access to domestic dwelling, but lead to an intermediate space, or a lobby which act as a mediator between inside and outside of the dwelling. In short, it is a buffer between public and personal space (Amlashi, Mousavi & Falakian, 2013). The buffer can be in the form of a wall or just a screen, outside or right in front of the

doorway. Ibrahim (2012) notes that the entrance is designed to obstruct any view of the interior: a bent entrance faces a blank wall with reception adjacent. This provides privacy and further protects the house from noise.

Internal Layout - Living & Dining

The living area is the most public of the private. It is a place for family and close friends (Omer, 2010). The family area should have an open space allowing for numerous activities at once. It is a space for more intimate family friends to socialize. Thus a living area should be located near a front door. Dining area is a semi-public area. In Islam, it is advisable to have separate doorways for the living, dining and kitchen due to the restriction access of male to the female guests. Having a double circulation system inside the house is recommended.

Internal Layout - Bedroom

Bedrooms should be designed such that the bed position can be placed perpendicular to the *qiblah* direction. The bed should be positioned so that someone sleeping on their right side will be facing the *qiblah*, as recommended by the Prophet (pbuh). One can also sleep with his head facing the *qiblah* and his feet facing the opposite direction. If one has a study area, one could also orient the desk such that one is facing the *qiblah* when studying. The Prophet said: "*Lie on your right side"* (Al-Bukhari & Muslim). Barra bin 'Azib reported, "*Messengger of Allah said: If you want to sleep in bed, purify for prayer. Then lie down with you lying on your right side"* (AlBukhari).

Internal Layout - Prayer Room

A main sign of a home that is filled with Allah's remembrance is for it to become lively at *tahajjud, fajar* and other prayers. Therefore, if one is having a dedicated prayer room, all seating arrangements and prayer rugs should be oriented toward the *qiblah*. This will ensure that people are facing the *qiblah* not only while they are praying, but also while they are sitting for *dhikr*, *dua* or Qur'an recitation.

Internal Layout - Kitchen

Kitchens are best located in the deepest and most secured from the public zone of the dwelling since women spend much of their time there. A buffer is needed between the kitchen and other public sections linked between them to ensure that regardless who was in the house, women will not be interrupted of their domestic duties and they are freely to move around.

Internal Layout - Toilet, Bathrooms & Ablution Area

Water closet in a toilet should not face the *qiblah* direction, nor to turn their backs to it. It should be perpendicular to the *qiblah* direction. This way, one is neither facing the *qiblah* nor turning one's back on it while relieving oneself. Muslim

narrated "*If you go to defecate, do not face to qiblah nor turn your back towards it. Instead you should turn to your left side or your right*". *"When any of you goes to relieve himself, he should not face the qiblah nor turn his back on it. He should face the east or west."* [Sahih Bukhari, Kitab al-Wudu]. Water hose or hand bidet should be fixed on the right side of the water closet so that one can turn on the tap using the right hands and doing the cleaning by using the left hands. In Islam, it is sunnah to wash one's private parts with water as purification (Amar, Ismail & Salleh, 2012) The recycled water (*Mustakmal*) is fine for cleaning but not permissible for ablution. Ablution need pure water (*Mutlak*) (Amar, Ismail & Salleh, 2012). Hence, it is good to have a separate compartments for bath, water closet and ablution. Ablution area should be positioned such that one is directly facing the *qiblah* when doing *wudhu*.

Internal Decorations

Traditional Islamic teachings recommend that a Muslim home dweller should beautify the internal space of his/her home by using non idolatry decorations or artefacts, such as flowers and decorated fabrics instead of expensive gold or any animal or human like statues (Mortada, 2003). They are encouraged to decorate their homes with flowers or greenery, pictures and photographs of natural environment because it praises Allah with His beautiful creation.

Openings

Windows are function to gain natural light, fresh air, view the environment and their neighbourhood. At the same time, it should be designed to comply with the requirements of privacy protection. Placement of the window cannot be in a position parallel to the window of the neighbouring house or neighbouring house entrance. At certain location, windows must be built above the eye level for the upper and lower floor of the dwelling, to maintain the internal privacy (Mortada, 2003; Abdul Rahim, 2008). These openings can be strategically and artistically screened using opaque or semi-transparent glass, parapets, vent blocks, louvres, decorative ornamentations, masyarabiyah, slabs and many more so that the *awrah* and privacy of the family members are not infringed upon.

Safety

Having the highest safety and security standards is one of the main criteria of an Islamic dwelling. Yusof (2011) notes that a building with backdoor is necessary because it can be a second exit of the buildings that it is important during emergency. According to her, architects need to comply with Allah's injunctions to achieve the strength of buildings.

Social Interaction - Neighbourhood

Neighbours are the important subject in buying land or house. Imam Ali (as) states, *"Before way ask about about friend of way about friend of way, and before*

buying a house a house ask about neighbours". Prophet (pbuh) says, *"Four things are signs of bliss and happiness of man: good spouse, big house, good neighbour and good vehicle".* An open space within or outside the dwelling act as a place for socialization and occasions to enhance the spirit of brotherhood. Referring to Hashim and Rahim (2008), sharing of external spaces encourages interaction among the communities and strengthens the community bond.

Internal Recreational

Dwelling design with an internal opening such as courtyard, terraces or backyards with appropriate recreational facilities or through creative design inventions helps to improve the occupants' physical, mental and spiritual wellbeing. According to Omer (2010), pursuing a good and ingenious recreation at home is indispensable for maintaining one's emotional and psychological wellbeing. This will also enhance the relationship between all family members and as a result eliminate many social illnesses.

Nature Responsive

It is believed that viewing and being in nature improves our health, both mentally and physically. Weather, nature and temperature clearly influence human behaviour. Thus, an ideal Islamic dwelling will incorporate as much nature as possible and connect open spaces into its fold. Natural ventilation is the most significant environmental value extracted from the analysis of Malay houses (GhaffarianHoseini, Berardi & Dahlan, 2014). This consideration helps dwellings to be energy efficient, sustainable and eco-friendly.

Disabled Friendly

An Islamic dwelling should also consider the needs of the disabled and elderly people. The concept of an ideal dwelling has changed over last century as a response to the changing of demographic, health condition and family patterns. Among the considerations for a disabled friendly dwellings are to avoid split levels within the house, clear doorway opening for wheelchair clearance, spacious bedroom for wheelchair turning and window sill between 450 to 600 mm above floor level to allow view outwards from seated position.

CONCLUSION

Many research findings indicate that despite significant differences between traditional and modern dwelling design and settings, the majority of its occupants regard visual privacy at home from outsiders as extremely important. Occupants who live in the modern neighbourhood often modify the original design of their homes in order to increase the level of privacy and other aspects. This study concludes that urban designers need to understand and incorporate core values of the culture in which they are working, in order to meet the needs of a city's

residents. The most appropriate dwelling design fits the use; it is not the use fits design. As Islam requires homes are to be built in accordance with these principles and therefore designers should treat these principles as guidelines of their dwelling design. It is clear here that the design of a Muslim dwelling should be the product of the Islamic beliefs and values of the inhabitants. In conclusion, an Islamic dwelling is Islam manifested.

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PLANNING MALAYSIA:
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ROLES OF COMMUNITY TOWARDS URBAN FARMING ACTIVITIES

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Abstract

The aim of this paper is to review and analyse the importance of the framework for urban farming activities to be implemented within cities environment. This paper also describes the role of the community to achieve the environmental, economic and social sustainability for the enhancement of the urban environment and healthy lifestyles through community participation in food supplies, nutrition, and spaces utilization. The paper evaluates the benefits and potential of urban farming activities within limited urban spaces and how it improves the quality of life. It also reviews on how urban farming is beneficial to the society due to food shortage crisis which is inadequate for the whole population. It is necessary to apply and practice in our daily lives for the consumption of food security, human safety, and health. Therefore, the role of community is very crucial in the implementation of urban farming activities within urbanized areas as the demand for green development increases. Based on this theoretical framework, it is hoped that the paper will be a useful addition to the body of knowledge in promoting a stronger community interdependence to create the sustainable urban environment.

Keywords: Urban farming, role of community, importance, sustainable.

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INTRODUCTION

Aggressive development challenges the human mind to trigger innovative ideas to create sustainable development in fast growing cities. Certainly, urban farming is widely practiced by the society in rapid urbanization areas, cities and town spaces (Bellows, Brown & Smit, 2003). Suryandari (2012) reported that urban farming activities had been introduced to reduce and overcome the environmental, economic and social problems other than to fulfil people needs and demands.

With regards to the implementation of urban farming, theory on The Garden City Movement initiated by Sir Ebenezer Howard during the year of 1898 has proved that urban farming concept is not a new idea. In retrospect, The Garden City Movement method emphasized on the combination of town and country to offer an alternative to working class in crowded and unhealthy cities (ACT Planning and Land Authority, 2003). It was intended to create cities with economically independent and countryside's preservation. Indeed, the connection between foods and the city had already evolved since ancient times.

Although urban farming is not new worldwide, it is yet to become popular in Malaysia due to lack of awareness and participation from community (Islam & Siwar, 2012; Kaur & Hitam, 2010). Thus, the objectives of this paper are to identify the role of community in the urban farming activities towards sustainable urban environment, and to explore the benefits and potential of urban farming activities and how it improves the quality of life.

URBAN FARMING

Thoreau (2010) defines urban farming as food or livestock growth or processes that are undertaken within the urban area or around the urban centres with the purpose to generate income. Likewise, Watson (2015) also discovered that urban farming is about raising foods including plants and animals in the city ground either at allotment land or non-occupied space. In the context of Malaysia, urban farming is often recognized as "pertanian bandar" or "kebun bandar". Izham Alias, whom the founder of Kebun Bandar: Jom Tanam Sendiri stated that urban farming is an activity that helps to encourage communities to plant crops while saving expenses on foods, which at the same time significantly related to the ecology, health, sustainability and food security (Md Sani, 2016; Mat & Abdul Majid, 2015). Urban farming activity is also beneficial to the society especially urban communities and helps to lessen the problem of food shortage and limited spaces for agriculture (Giedych, 2015; Smith, 2005).

Types of Urban Farming

The application of urban farming varies from every corner of urban settings and its ecosystem. Considering the necessity of urban farming, several studies reported that urban farming has already been implemented on grounds, and on

balcony and rooftop of buildings, as well as on vertical walls, in various cities in different climatic environment, including high-density cities like in the United State of America, Japan, Singapore and many others (Shanshan & Ge, 2013; Hui, 2011).

There are three types of urban farming identified, which are community farming, rooftop farming and vertical farming. Each farm shares similar practices and purposes with specific characteristics due to space organizations and boundaries.

Community Farming in Japan

Rooftop Farming in Singapore

Vertical Farming in Malaysia

Figure 1 Types of Urban Farming

Benefits and Potential of Urban Farming

The benefits and potential of urban farming towards the community can be categorised into four, which are environmental stewardship (Lydecker & Drechsel, 2010; HB Lanarc-Golder, 2013), economic reliance (Giedych, 2015; Lyson, Gillespie & Hilchey, 1995), social improvement (Scott, 2015; Sharp, Imerman & Peters, 2002; Feenstra, 1997) as well as health and nutrition (Kumar, 2015). Cabannes (2006) reported that urban farming is also an investment strategy in developed countries to bring urban people back to nature, opening eyes and minds to the global issues, and to educate children from the natural cycle of life through landscape environment. Besides, urban farming is also seen as an effective measure to increase green spaces, vegetation fields and gardens for recreational purposes and urban revitalization (Wackernagel & Rees, 1996). It is a strategy in the form of "shifting cultivation" by creating new open spaces from unutilized land (Veenhuizen, 2006). By managing the land surfaces, it will improve and conserve the ecological integrity and environment of the city.

Table 1 Four Benefits and Potential of Urban Farming

Environmental Stewardship	*Economic Reliance*
▪ Urban revitalization ▪ Ecosystem enhancement ▪ Climate changes ▪ Waste reduction ▪ Sound insulation ▪ Noise absorption ▪ Minimize transport footprints ▪ Enrich visual quality	▪ Free-cash nutrient ▪ Lowering expenditure ▪ Income generator ▪ Green innovation ▪ Employment creation ▪ Introduce local food production ▪ Positive economic description
Social Improvement	*Health and Nutrition*
▪ Community empowerment ▪ Youth development and training ▪ Green education opportunities ▪ Cultural integration and preservation ▪ Positive community interaction and social well-being	▪ Food access and security ▪ Organic fruits and vegetables ▪ Nutrient retention ▪ Therapeutic treatment ▪ Amenity recreational and garden spaces ▪ Physical activities and exercises ▪ Aesthetic values

THE ROLES OF COMMUNITY IN URBAN FARMING ACTIVITIES

Community perception and participation in urban farming is highly related to the level of awareness of the benefits of the activity. To be successful, it is important that community involvement is kept continuous in the implementation of urban farming.

Community Perception

Russell (2008) discovered perception as the way of people grouping particular matters into things or perspectives which derived from sensations or images. It is the way people classify things through the ability of sensory and reaction of their personal judgment. People can acknowledge something through physical senses by seeing, hearing, tasting and feeling during certain situations. They get to understand, interpret and become aware on something from their point of views and giving the opinions based on the limited knowledge a person has.

Community Participation

World Health Organization (2002) define community participation as to actively involved or taken part in the community development issues and strategies through the physical actions taken by the neighbourhood members in the particular community area. Likewise, Burns et al. (2004) note that community participation is associated with the individuals' or groups' opportunities of sharing some involvement and engagements in the decision-making process. They get to express themselves by showing their concerns through the significant physical powers, efforts and influences which they had clearly understood and

realize about the importance of something that may help in changing and enhancing their quality of lifestyles.

A positive correlation was found by Banning (2015), indicating that the practices of urban farming activity are linked with the commitment and the awareness of urban communities towards preserving and protecting the natural resources for future growth through establishing environmentally-friendly educational community programs held in the neighbourhood green spaces. Access to food supplies and knowledge of health among the communities will also provide positive outcomes to the number of participations of the urban community in urban farming (Trutko, 2014).

Sustainable Urban Environment

Considerable evidences support the notion that the public play important roles in in creating sustainable urban environment through the practice of urban farming. Although many researchers have mentioned about the benefits of urban farming activities in the urban context, very few studies regarding urban farming have been conducted in Malaysia (Islam & Siwar, 2012; Kaur & Hitam., 2010). This is because urban farming in Malaysia is currently lacking public support, especially in terms of public participation.

Table 2 presents the relationship between community participation with the urban farming activities towards sustainable urban environment. According to recent researches as in Table 2, urban farming activities can provide opportunities in fostering community building and support environmental education.

Table 2 Relationship between Community Participation in Urban Farming Activities and Sustainability

Sources	Urban Farming Activities	Community Participation	Sustainable Urban Development
Evan, Valsecchi & Polastri (2012)	Matter of awareness about progressive detachment in the reality of food production knowledge.	Hesitation due to the different attitude and perceptions (farming is rural and traditional senses).	It is necessary to maintain a growing and living spaces in the changing environment.
Peemoeller (2011)	For future, people need to understand the relevance of food in their lives.	Engage and educate the public about healthy and sustainable food systems.	Community leadership is essential, recognize the strength of diversity.
Funders' Network (2011)	Physical, technical, educational and programmatic support is important to urban agriculture success and longevity	Absences of community engagement and opportunities (lack of supportive public policies and community visioning).	-

Kaur & Hitam (2010)	-	Lack of community participation in sustainable program.	Local Agenda 21 - fewer authorities efforts "words are, action not".
Rujiroj Anambutr (2010)	-	Community need for motivation and application experiences for better understanding and awareness to gain good results.	Policy → apply→ enforcement - time, efforts and cooperation are needed.
Victor Rubin (2008)	-	Increase environmental justice campaign from development projects & healthier activities	Contribution of greening-need diverse methods and supports, connection for green movement.

CONCLUSION

Scholars agreed that there is a widespread realization of efforts and determination aimed at the restoration and preservation of natural ecosystem. This has, to an extent, promote the rapid emergence of urban farming especially in relation to meeting demand for local food and resilient community (HB Lanarc-Golder, 2013). However, the success of urban farming is dependent on many factors, most importantly the perception and participation of the local community. Active community participation indicates the power and control of the community in the decision-making as according to their demands for environmental justice and community interdependence for better well-being (Kumar, 2015; Burns et al., 2004; Rubin, 2008). Several scholars indicated that community involvement in the urban farming activities can help strengthen the ties between communities (Sharp, Imerman & Peters, 2002; Nemore, 2015). Farming itself can build a strong and vibrant brotherhood, create a sense of partnerships, and enhance community cohesion as well as diverse cultures among the growers and farmers.

Urban farming has existed in many cities throughout the world. It provides a valuable complimentary farming activity to the urban residents. It is time for urban farming to also enjoy popularity in Malaysia. Further researches are required to look at other criteria of urban farming like sustainability strategy and investment returns so that the public as well as the authorities in Malaysia can be convinced to implement urban farming in their cities.

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PLANNING MALAYSIA:
Journal of the Malaysian Institute of Planners
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THE TOURIST BEHAVIOUR IN DIFFERENT ENVIRONMENTS: A LITERATURE REVIEW

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Abstract

In ensuring the tourism destinations are successful and sustained, good quality environments are needed. Furthermore, without an attractive environment, there would be no tourism activities. Nevertheless, people generate and encompass many different types and patterns of changes in the environment and in turn, the environment can facilitate and even reduce stress to people. In this context, it is necessary to understand the perspective of tourists and knowing what they look for in a particular destination to obtain a better understanding of spatial tourism behaviour and areas of sustainable tourist destinations. The primary focus of this paper is to understand the perceptions, expectations, experiences and motivations that tourists have when they choose to visit specific tourist destinations. Based on the literature, identifying and examining the elements of tourist attractions, tourist preferences, the values which characterize the tourism demand and their relationship to the environment would highlight challenges as well as implications for tourism development especially in Malaysia.

Keywords: Tourist behaviour, environment, perceptions, expectations, experiences, motivations

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INTRODUCTION

Despite a wide range of publications assessing the behaviour of tourists to various environmental settings, little is actually known about the complexity of demand responses towards different environments in the Malaysian context. The purpose of this paper is to review and discuss existing studies and provide a framework for a better understanding of tourist behaviour. The literature indicates that tourism has a significant effect on social life globally that can no longer be understood as merely what happens at the location of the destination, nor why tourists choose to do something different from their normal life and work. Tourism is a central part of understanding the social organization of destination and is no longer simply a specialist consumer product or mode of tourist consumption (Inglis, 2000; Framke, 2002). In other words, tourism is not only about supply and demand but also relates to the behaviour of tourists.

The reasons for undertaking a literature review is because it provides as complete a list as possible especially all the published and unpublished studies relating to particular subject areas and towards the end, this study summarizes and draws conclusions about the relevant topic. This study undergone a few stages of the literature review. It began with an extensive review to establish the context and rationale for this study so as to confirm the choice of research focus or question. Then, the topic is refined by narrowing down the relevant and detailed literature. The topic is then divided into key themes to make it easier to look for information. This study also uses different journal articles and books to identify key authors and significant theories that relate to the themes and make them as a starting point. Finally, this study relates the findings from the literature and identifies the implications for this study.

TOURIST BEHAVIOUR

In order to identify behaviour in relation to tourism, it is crucial for researchers to understand what motivates tourist, their perceptions, expectations and also their experiences. This begins with a particular focus on the perception of the tourist. Tourism is no longer simply regarded as a universal and homogenous phenomenon, it is essentially a contemporary phenomenon and thus needs to be analysed in view of the larger context of modernity (Wang, Yamada & Brothers, 2011). It can be stated as the linkages between travel and knowledge recognized in contemporary travel practices which people in modern world tend to explore other parts that are different from their normal place. In other words, people use traveling as a mean to perform their own modernity.

The tourism, in which the modern world lust for visuality and geographical movement, accelerated tremendously with the inventions of cameras; caused a profound multiplication of images and sights; a constitutive part of modernity's traveling cultures. In addition, little research has been conducted looking at movements of tourists. As Lau and McKercher (2006) reported, factors such human (motivation and travel party) and physical (destination geomorphology) affect tourists' choices of itineraries and give

reasons to support the shaping of the movement patterns. Thus, it can be said that contemporary tourism is fundamentally constructed culturally, socially and materially through images and performances of destinations.

The term perception refers to a view of the total environment that is cognitively sensed and experienced and becomes the basis for decision-making (Morin, Gates & Zimmerman, 2009). Furthermore, people construct views through space, and organize the acquired knowledge, information and experience through the senses (Lau & McKercher, 2006). Thus, the tourist perception is generally referred to the outcomes that visitors have constructed for a physical and social environment they have visited. This perception differs between each individual, as there are various perception within individuals depending on their past and present experiences through values, needs, memories, moods, social circumstances, and expectations (Saarinen, 1976). This means that perception is different for each individual tourist at any time regarding anything or towards different environment setting. This is indeed because of the perception is strongly linked to psychology, and people construct their views based on cognitive processes that capture and organize knowledge, experiences and information through the senses (Lau & McKercher, 2006). Thus, a destination's pull factors, such as their promotional activities, weather, beaches, scenery, facilities and attractions are also important influences in setting expectations, and subsequently, in meeting the needs of tourists.

Tourists' perception of a destination is also likely to be influenced not only by their own experience but also by their expectations of that destination. These expectations are built on the representations permeating their own culture and absorbed from the media, the advice from friends and relatives, and guidebooks and travel brochures (Jenkins, 2000). However, tourists' expectations of a destination do not necessarily match as what the guidebook or travelogue describes. In short, different expectations held by different tourists in different kinds of environments resulted in different types of behaviours. Expectation derives from a number of sources that include the qualities and perceptions which will be influenced by tourists' cultural backgrounds (Fountain, Espiner & Xie, 2011). Once tourists activated their needs and requirements of travel, motivation is the key factor in the formation of expectations. The expectation, conversely, determines the perception of a performance of the products and services at a destination, and the perception of the experience. Tourist behaviour may have distinctive phases of expectation, partly because tourists have the ability to transform their expectation through their experience. Presumably, the understanding of what to expect at a destination also colours the behaviour that different tourists use to interpret their travel experience.

In parallel, the tourist experience comprises everything that tourists have seen, done or felt during their trips (Inglis, 2000). Khalilah (2006) argues that tourist experience is a significant process and outcome of tourism. It will determine whether a visit is successful or not for the tourists, and consequently, how they rate their overall experience will influence their future travel decisions.

McIntosh (2003) reported that gazing and authenticity are among the dimensions of the tourist experience. Chui, Rahim, Hassan, Musa, Yusof and Hashim (2010) defined tourist experience "as a temporal account of the tourist gaze as to describe the process through which a tourist reminisces the place or experience he or she encounters". In other words, the gaze is a recollection of the temporal experience which, there is an aura to the fullest extent of the experience. However, tourist's experiences vary according to the varieties of people and their geographical distribution. At the same time, tourist experience is influenced by different factors such as traveling experience, destination attributes and attractions (Li, 2000). Apparently, destinations can offer and provide more than just one type of tourism experience. In relation to that, to provide a high-quality experience, one must understand what factors can motivate and influence people to travel.

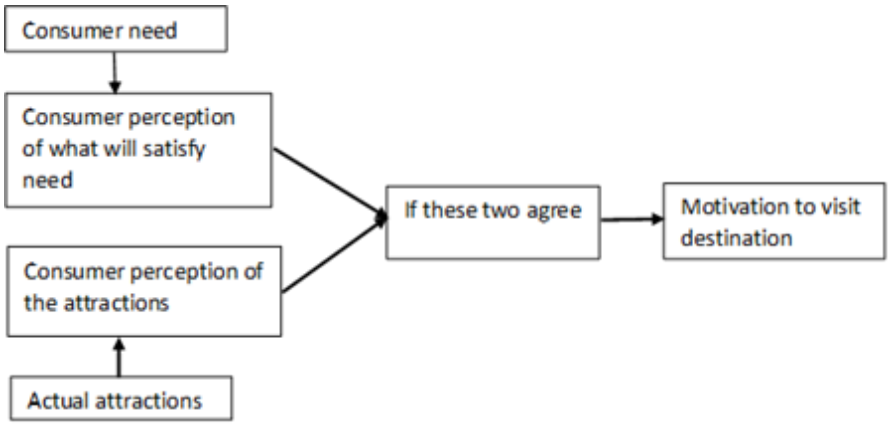

Figure 1 Formation of Travel Motivation
Source: Humphreys & Holloway (2009)

Another view states that motivation is one way of determining tourist behaviour (Dann, 1981). He continued in his assessment of tourist motivation mentioned that there is consent, that an understanding of motivation express why an individual or group have behaved or are about to perform an action. Sharing this view, Moutinho (1987) similarly asserts that motivation refers to a state of need, a condition that exerts a push on the individual towards certain types of actions that are likely to bring satisfaction. In other words, motivation is closely related to a tourist's needs, personality and way of life. On top of that, motivations activate and direct the behaviour of the tourist. According to Deci and Ryan (2000), there are two types of motivation, intrinsic and extrinsic motivations. Intrinsic motivation refers to motivation that is driven by a curiosity and exists within the individual while extrinsic motivation comes from outside sources such as motivation to gets a reward or reinforcement. Wang, Yamada and Brothers (2011) add that when people have a need to travel, they must also have equivalent

individual factors and external environmental conditions, such as physical fitness, financial status, weather, and transport, etc. as shown in Figure 2 below.

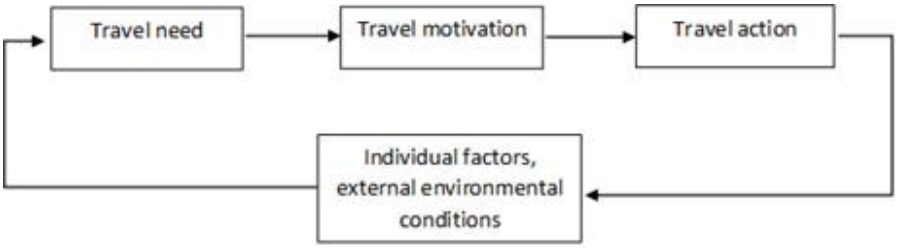

Figure 2 The Formation of Travel Motivation and Travel Actions
Source: Education Bureau (2009)

Thus, motivation is essential to be successful in any activities and is still needed in order to boost behaviour. In short, motivation can be defined as the inside or outside stimulant that drives humans to satisfy their needs. Motives and motivations, thus explain why people (tourists) behave or are about to perform an action. In parallel, it can be stated that features or the environment, which attract tourists to a site, can be considered as motivations (and when acted upon, become activities).

Tourist decisions about destination and motivation are related to images that are created based on personal experience and knowledge, recommendations and opinions of others and information provided by the media. Images developed and travelled to many places, and became a train of ideas to another object, places, cultures and people. In short, the image of the destination is actually referred to the perception of tourists towards attractions that available in the destination. In fact, the perception of the image of tourist destination is a major factor that plays a role or motivation to bring tourists to visit a destination. Accordingly, tourism motivations may help to predict tourist behaviour (Patterson, 2006), whereby tourist behaviour is the interplay of forces – avoidance of routine or stressful environments and seeking recreation places for certain psychological rewards. Motivation obviously impacts on satisfaction formation. As stated by Murphy (2004), closing the distance between what stakeholders want and expect with what they experience, increases their satisfaction. In this sense, motivations and preferences play a role in the formation of satisfaction and enhances the experience in destinations.

In short, the behaviour of tourists actually represent tourist's needs, personality and way of life. Therefore, knowing about tourist behaviour is particularly important in developing the tourism industry today. In Malaysia, it is the government's intention to maintain and control the tourism development. Bhuiyan, Siwar and Mohamad Ismail (2013) conclude that Malaysian government has played a significant role in instituting a legal and institutional

framework for ensuring sustainable tourism. It can be seen from the number of foreign tourist's arrival and tourist expenditure that is increasing year by year. The study also reveals that the Government has given special emphasis on the tourism sector during each Malaysia Plan period by adopting and formulating various laws and regulations to ensure sustainable tourism development as well as implement necessary policies.

However, despite these actions, Bhuiyan, Siwar and Mohamad Ismail (2013) also emphasise that many other issues need to be addressed, including identifying the benefits that community will get, attracting foreign investment and identifying region based tourism development which is necessary to enhance tourism sector in Malaysia. Other than that, initiatives for sufficient human resource and entrepreneurship development, and emphasis on education and research activities can be developed as to enhance Malaysia's tourism sector.

DISCUSSION

The discussion above clearly indicates that the tourist experience is affected by the availability of attractions, destination features and amenities. The performance of a place bounds to how the tourists remember that particular place (Baerenholdt et.al, 2004). Tourists perceive destinations in varying ways, hence, each is looking for different signs to lead them to different experiences (Backhaus, 2003). Some look for the extraordinary, where signs will suggest the potential for experiences that differ from normal expectations; but most signs also serve to contribute to the selection of a destination. These interactions and involvement between the tourists and their destinations can significantly influence the level of experiences experienced by the tourist. As Urry (2003) emphasizes that tourists are attracted to features which are unique and not in their everyday experience because it provides them with intense pleasure and anticipation. Thus tourists are often perceived as being more motivated by destinations' attributes such as sun, sea and local culture than their internal disequilibrium, which they wish to consume.

The tourist's experience actually allows the tourists to feel unique and relevant to what/where they are visiting. The good and memorable experience is the most important quality of place experience for tourists. Nonetheless, the degree of tourist satisfaction gained from their experiences relates to the expectations of the tourist, the basis of those expectations, the ability of the tourists to adapt to the actual experience and the nature of their experience (Urry, 2003). Thus, this study suggests that tourist experience is the result of the tourist's ability to tolerate the behaviour of others, context, and pattern of activities, motivation, expectation, and perception. As Cohen (1972) contended, this experience could be positioned on a scale, with a desire for pleasure at one end of the scale and a desire for meaningful experiences at the other. He added this type of tourist holds different views predicated on a relationship between the centre of their own societies and the centre of other societies.

In short, a destination which is the space of tourism is a place of experience and as such, tourist behaviour influences tourist experience, which in turn is heavily influenced by external factors such as the attractions, place features and amenities. To sum up, it can be summarized that there are two independent uncontrollable variables considered during tourism decision making (Figure 3).

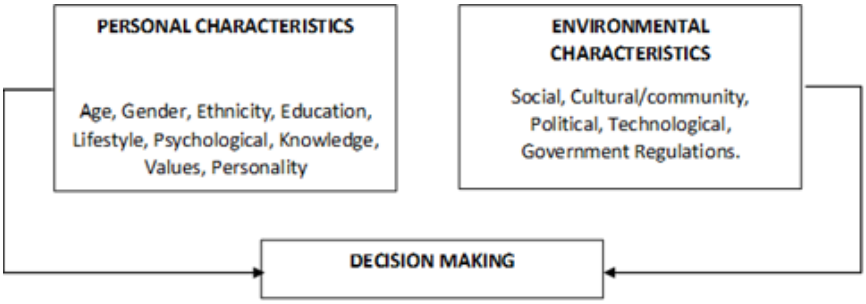

Figure 3 Tourist Behaviour Model

Arguably, tourists are looking for an extraordinary experience that is totally different from their normal lives, and regardless of what happens during their travel experience, will shape tourist destination selection and repetition. Thus, attitudes, mood and expectations also affect the evaluation of tourist's own experience rather than just the quality of the product which offered by the destination. As mentioned, people desire to visit other places to experience the cultural, social and environmental differences that exist, although this desire varies between individuals. To state the obvious, an individual's perceptions and responses to a place will vary according to differences in gender, ethnicity, religion, culture, wealth as well as education.

As a developing industry, tourism in Malaysia has many components comprising the overall travel experience. Other than accommodation and facilities, it includes such things as food and beverage, transportation, entertainment, and special events. Thus, it is clear that the Malaysian destinations require proper development. At the same time, it requires the cooperation between the public and the private sectors, and to understand perceptions, expectations, experiences and motivation that tourist have. The key point to understanding tourism and tourist behaviour is to understand what motivates tourists to travel or their preferences towards destination environments. This including the physical influencing elements such as transport network, accommodation and attractions which characterize the destination itself. Thus, the environment can be recognized as one of the major forces modifying and defining tourism development and also the behaviour of the tourist. However, the main concern is how to incorporate all elements in order to make the resultant environment and view more useful and beautiful for the tourists to experience.

The good environment is essential for tourist satisfaction and repeat visitation. Thus, the measurement of tourist expectations and perceptions of the environment in the context of tourism development plays a vital role in the future success of a destination.

CONCLUSIONS

From the discussion above, it is clearly shown that there is the variation of tourist behaviour, especially their perceptions, expectations, experiences and motivation, depending on the characteristics of the environment. Thus, it can be concluded that the influence of environments on tourism demand patterns can be shaped by the response of tourists' perceptions, motivations, expectations and experiences. Tourists have the largest adaptive capacity of elements within the tourism system because of their flexibility to substitute the place, timing and type of holiday, even at very short notice. Consequently, understanding tourist behaviour and reactions to the impacts of destination environment is essential to anticipate the potential different environment in tourism demand, as well as the decline or increase of specific tourism markets.

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PLANNING MALAYSIA:
Journal of the Malaysian Institute of Planners
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MEASURING SOCIO-ECONOMIC INDICATORS FOR CLIMATIC ANALYSIS

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Abstract
Socio-economic indicators are important indexes to measure the effect of human activities towards climate. This paper aims to study on the two main socio-economic indicators for the urban area, namely population and GDP, to determine the relationship between these variables and climate condition. The State of Selangor, Malaysia was chosen as the study area as this state is among the highest GDP contributors to the country. Secondary data was used for this study by utilising datasets from Statistical Department and Department of Meteorology. The model derived shows that climate condition is moderately dependence of population and GDP. Further analysis can focus on more important socio-economic variables which may contributed to the climate condition in the urban area.

Keywords: Socio-economic indicators, GDP, urban area

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INTRODUCTION

The expansion of impervious surface by transforming green and natural areas is a part of human activities, and gives impact towards local and global environment. Globally, more people live in urban areas than in rural areas. Starting in 2007, the global urban population exceeded the global rural population and this pattern continues until now (United Nations, 2014). A study by United Nation Statistics Division (2012) shows that the urban population in Malaysia is 73.5% of the total population. Thus, the need to understand the relationship of human activities with the environment is crucial to ensure a good standard of quality of life of the urban population.

At local scale, urban heat island (UHI) is an example of the climatic problem as the temperature in the urban area rises higher than that of the area outside the city. The size of city and the number of residents are shown to have an inverse connection with regional wind speed and the logarithm of the population (Oke, 1973). Oke (1973), and Torok, Morris, Skinner and Plummer (2001) studied the relationship of UHI and population and found a relationship through logarithmic relationships. In addition, Oke (1973) concluded that even a city with a small population could be affected by UHI. However, another analysis had a correlated surface temperature and population density and found a quite linear pattern by removing the influence of the rural area (Streutker, 2003). Several other studies have correlated UHI or surface temperature to the economic and social indicators (Foroni et al., 2007; Murphy, 2009), which illustrated that the concern about how far temperature can impact people's way of life and vice versa.

In a study carried out by Zhang, Wang, Shen and Da (2009), the socio-economic indicators used were population, electricity power consumption and gross domestic product. The found a high correlation between UHI intensity and these variables. In addition, Cheval and Dumitrescu (2009) calculated UHI using remote sensing imagery by comparing average temperatures of 5 km and 10 km buffers, which is due to the heterogeneity of the land cover causing larger differences between adjacent surfaces. These studies support the argument that UHI is a local environmental problem which is related to land cover changes.

Human activities are also modifying the chemical composition of the atmosphere through the urban build-up of greenhouse gasses which significantly increases the urban heat (Bhiwapurkar, 2007). The alteration of landscapes to urban impervious surfaces has also altered the energy balance of outgoing and incoming solar radiation. As a result, this contributes to the higher urban air temperature as compared to the surrounding areas, adding to the UHI effect.

The above discussion on previous studies highlighted the impacts of human activities to climate. Hence, this study will seek to understand the relationship between socio-economic indicators and temperature using datasets of 40 years.

METHOD

This study utilised secondary socio-economic and mean-monthly temperature data. Data on GDP were obtained from the World Bank datasets to represent economic indicator. These data were recorded in US dollar. GDP is one of the primary indicators of economic activity. Meanwhile, population data were sourced from the Department of Statistics Malaysia to represent social indicator. Temperature data were obtained from the Malaysian Meteorological Department. These were mean temperature recorded at the Petaling Jaya, Selangor weather station. Linear regression method was used to analyse these data. It was discussed in the literature that appropriate analysis should use datasets covering more than 30 years. For this current dataset, the mean annual temperature was used from 1971 until 2010 (39 years).

In the meantime, a supervised classification of four satellite imageries was also generated to identify the urban areas within the study area. The land cover map was produced by using the Supervised Classification by the iteration of the clustering algorithm. Series of classes are produced to determine the signature of each class so each of the pixel was compared to these signatures and labelled to the most similar values digitally. Figure 1 show the work flow of the research.

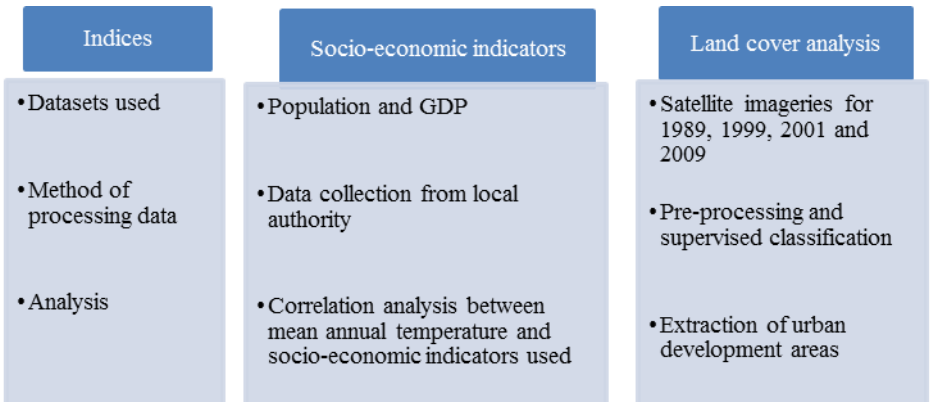

Figure 1 Framework of the work flow

RESULTS AND DISCUSSION

The analysis demonstrated the influence of socio-economic indicators towards urban growth and the increase of the air temperature in the study area. For instance, Figure 2 shows that a moderate significant linear relationship is evident between GDP and the mean annual temperature, which means that a moderate dependence of urbanization growth (R^2 =0.6) has impacted the increase of mean annual temperature. The rest of regression (0.4) are due to other factors. This

study suggested that the economic growth of Kuala Lumpur and mean annual temperature have consistently increased over the years.

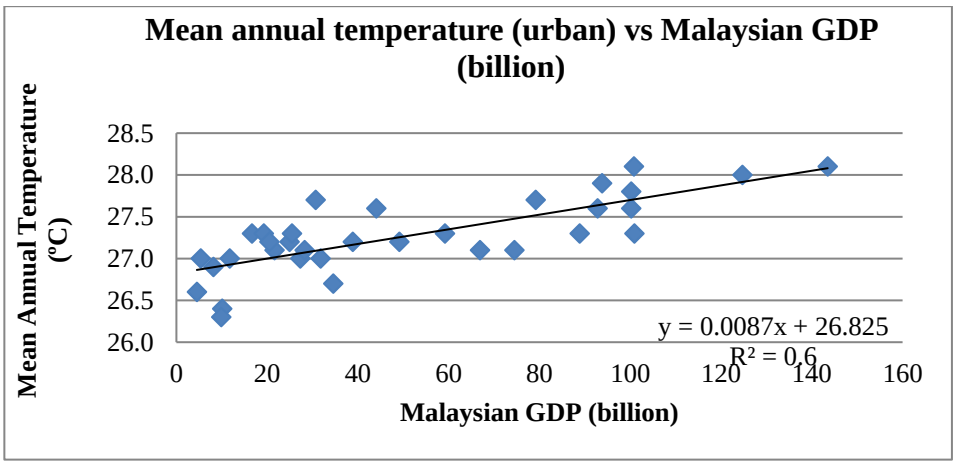

Figure 2 Mean annual temperature and Malaysian GDP (billion)

Figure 3 shows the scatterplot of Malaysian GDP and urban development areas (in km^2) where the time studied is according to available images. According to the graph, a strong linear regression exists between GDP and urban development areas. This relationship indicates that the good positive linear relationship exist between these two variables. The underlying factor of this finding is that the Malaysian GDP is always related to the economic development, which in turn is closely related to the physical activities such as industrial and commercial development. These development often involve conversion of large greenfields into urban areas which has accelerated the impact of UHI intensity.

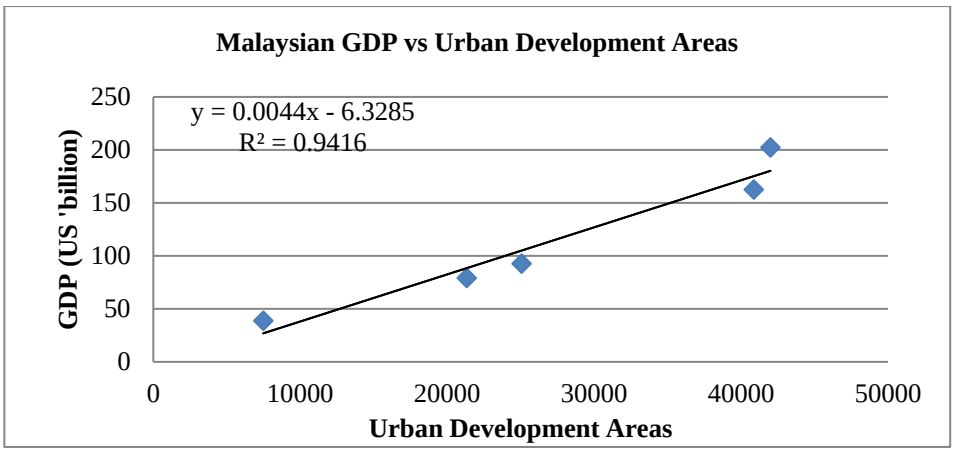

Figure 3 Malaysian GDP and urban development areas

The scatterplot in Figure 4 shows the mean annual temperature versus population ('000). The analysis shows that it has a moderately linear regression between mean annual temperature and population data at R^2 = .557. A positive correlation was also identified, which indicated that the mean annual temperature was increasing as the population number increased over the time period.

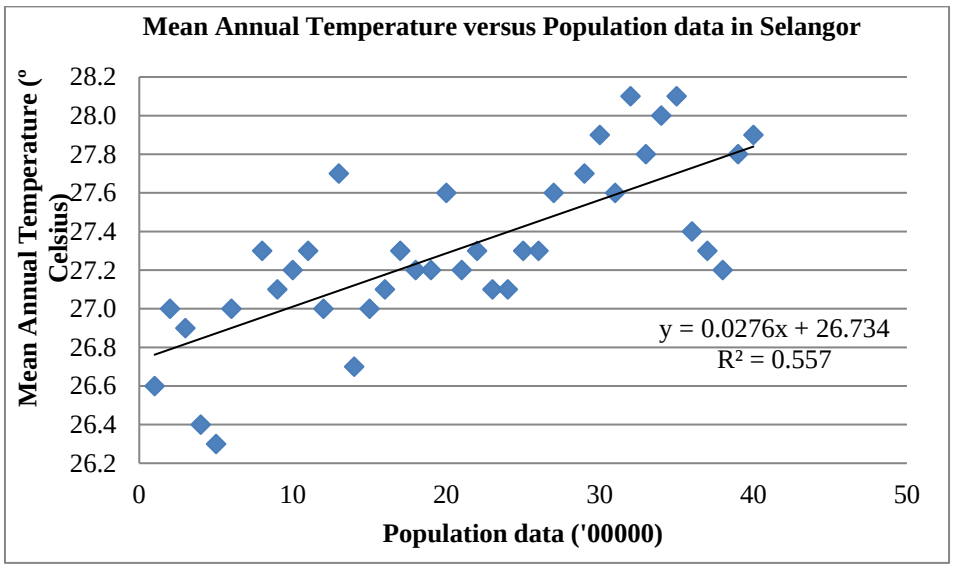

Figure 4 Mean annual temperature and population data

The analyses conducted show that there is a relationship between mean annual temperature and socio-economic indicators, where the temperature has increased in sync with the increased in GDP and population growth. The growth of urban areas is also closely interrelated to UHI intensity of the study area. These indicate that economic development do accelerate the temperature increase in the urban area. This result shows consistency with the findings by Zhang et al. (2009) that UHI has increased linearly with population, and a significant logarithmic relationship is evident between UHI intensity and GDP. Oke (1973) also found that population has a logarithmic relationship to UHI. However, Pindyck (2010) argues that the economic impact of warming should be modelled as a relationship between temperature change and the growth rate of GDP, and suggests that future research should not simply depend on temperature alone, but also the entire path of temperature.

CONCLUSION

This paper have shown that there is a significant increasing trend in mean annual temperature and the relationship of mean annual temperature is higher with GDP compared to its relationship to population. The increase of GDP and population

have brought about spatial growth in urban development as well as increased in motorised vehicles, and also the conversion of greenfields into built-up areas. This has changed the landscape of the study area and has contributed rising local temperature. Future analysis should focus on the density of housing, number of vehicle, household income and telephone lines which and seek their relationship to the climate condition, especially of the urban areas.

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RISE OF ECLECTICISM IN THE 21ST CENTURY MALAYSIAN MOSQUE ARCHITECTURE

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Abstract

A stylistic survey of Malaysian mosque architecture shows four distinct trends: 1) Traditional style, which covers most of the mosques that were built before the country's independence in 1957; 2) Colonial style that was influenced by Indian Mughal architecture, was followed partly after independence, and continued for a while after that; 3) Modern trend began with the National Mosque completed in 1965, and scattered mosques that were built after the National Mosque until the end of the 20th century; and 4) Mosques that were erected in the 21st century, which can be generally explained by the term 'eclectic' design. Eclecticism gained rapid momentum in the field of Malaysian mosque architecture since the dawn of the current century. Significant eclectic mosques that have transformed the scene and skylines of major Malaysian cities have often been heavily financed by the government – an indication of conscious choice of direction. This paper aims at providing a categorisation of the process of evolution of contemporary mosque architecture in Malaysia, not based on independent stylistic tendencies, but under three major historical/thematic phases: 1) Independence and Departure from Tradition; 2) Middle Eastern Inspirations; and 3) Rise of eclecticism, with an emphasis on the last phase, i.e. rise of eclecticism in the 21st century. Masjid Wilayah, completed in August 2000, was chosen as a case study because it is the first major eclectic mosque born in the 21st century, incorporating some six established styles, and also the most comprehensive example.

Keywords: Eclecticism, 21st century, style, architecture, mosque, Malaysia

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INTRODUCTION

The evolution of Malaysian mosque architecture, from its traditional timber prototypes that related and connected it to the large family of Southeast Asian vernacular architecture, to the unique and independent styles that emerged after independence, all the way to the colourful eclectic developments in the 21st century, exhibits a rapid transformation of political thought, aesthetic values and socio-economic identity. Adjustment to this change has not been easy, as it brought about challenges at various levels – personal, cultural and national. But it paved the way for problem-solving and creativity at a higher level. The ongoing change expanded the views in the realm of architecture and environmental design, and led to opportunities for new developments. At the same time, it disturbed the tempo of life and introduced a lifestyle that is more exciting and less peaceful. The evolution of architecture in any society is a byproduct of the evolution of mindset, social norms and aesthetic values of the said society. On the other hand, the appearance of new buildings changes a city-scape and, in a timespan, imposes a new mindset, norms and values on the citizens. Eclecticism, which involves borrowing forms and styles rooted in another culture, and using them in a single monument/complex is an embodiment of this challenge.

PHASE 1: INDEPENDENCE AND DEPARTURE FROM TRADITION

Modernism, which was initially formed and developed in mid-19th century Europe and America as a movement in art and literature, was soon spread to other aspects of life and to non-Western societies, not only as an artistic form of expression, but as a world view that favoured new over tradition. Modernism is characterized by a deliberate rejection of tradition. Malaysian mosque architecture before its independence in 1957 can be explained as having certain style(s) of traditional timber architecture built from heavy hardwood species called *cengal* (Balanocarpus heimii), constructed in post and beam system with no metal fasteners to join the timber members (Ismail Said, 2001). Kampung Laut Mosque, located in Kota Baru, Kelantan is the oldest existing example of traditional Malay Mosque architecture. It is in many respects similar to Malay house architecture (Figure 1).

Traditional Malaysian mosque architecture is part of a family of vernacular tradition in Southeast Asia that includes Indonesian archipelago, Malay Peninsula, Thailand and the Philippines. "*What has so far been emphasized in recorded history are the pyramid or meru type of timber roof which are either placed on stilts or which cover masonry colonnaded wall with tiled floor*" (Mohamad Tajuddin Mohamad Rasdi, 2012)." Meru is a sacred mythical mountain in Indian religious traditions (Hinduism, Buddhism and Jainism) and considered as the central axis of the universe, both physical and metaphysical. As most of the population of Southeast Asian countries were followers of Hinduism and Buddhism before converting to Islam, the term survived mainly due to its

cosmological connotations that associate it with the concept of the place of worship – on the confluence of heaven and earth.

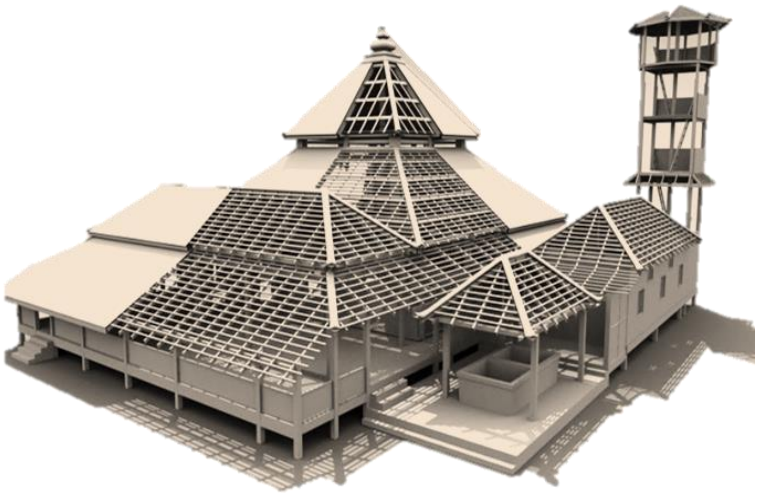

Figure 1 A Scaled Model of Kampung Laut Mosque

After Independence, the first outstanding monument that stressed on the country's independence as a nation on the one hand, and on its Islamic inclination on the other, was the National Mosque or *Masjid Negara*. Unlike the typical traditional Malay mosques, which were closely associated in their general characters with Malay house architecture and conversed in the same visual language of its surroundings, the National Mosque communicated a different message using a different tone.

This monument, built from concrete, made a statement that projected country's new mindset and preferred future direction – not to continue with the old traditions, but a deliberate departure from them. Although the National Mosque's semi-open umbrella-shaped roof may have some formal resemblance to Malay traditional mosques, it projects a different spirit; it loudly resonates a political slogan of nationalism adorned with religious embellishments in monumental scale. A similar building with a white roof, known as 'Hero's Mausoleum' (*Makam Pahlawan*), was erected within the National Mosque's compound. It further echoed the political/national spirit. *Makam Pahlawan*, completed in 1965, is the burial ground of a number of Malaysian leaders (Figure 2).

Figure 2 National Mosque or Masjid Negara, completed in 1965 is the larger structure with patterned roof on the right while the smaller building with similar roof structure on the left is the Hero's Mausoleum (Makam Pahlawan).

PHASE 2: MIDDLE EASTERN INSPIRATIONS

The concept of umbrella-shaped roof for mosques stayed fashionable for a short while, but by 1980's the idea "…*declined rapidly in popularity amongst the architects, as onion-shaped dome regained its earlier prominence*" (Abdul Halim Nasir, 2004). The prominence of onion-shaped domes in Malaysia's history in the past few centuries, however, was not necessarily connected to Islam or any religion for that matter, as it was also used extensively in the secular colonial buildings by western non-Muslim rulers. No wonder then that the earliest recorded mosque in Malaysia with onion-shaped dome, Ubudiah Mosque in Perak (built in 1913-1917), was designed by a British architect Arthur Benison Hubback (1871-1948). An overview of the architectural elements reveals a strong inspiration from the Mughal architecture of India.

The trend of mosque architecture in post-independence Malaysia, however, unveils a drastic change of inclination. Some scholars have put an effort to provide a timeline for the dominance of architectural styles that emerged after 1957 until the end of the 20th century and vaguely called it modern (A. Ghafar Ahmad, 1999). While buildings are called colonial simply for having onion-shaped domes, it seems an over simplified or even misleading to include well-established architectural styles such as those from Mughal India, Safavid Iran and Ottoman Turkey that mark the majority of mosques erected during the period with the term 'Modern.'

Malaysia, after her independence, gradually exercised an open-door policy that had significant impact on the country's economy and culture, and as a result, a wide range of styles – originating from the Subcontinent to the Middle East, and even North Africa and Spain – appeared on the plain of mosque architecture. Among them, mosques inspired by Turkey and Iran designs gained

more popularity, especially with the major state funded mosques. An outstanding example is the Blue Mosque or Shah Alam Mosque, the largest mosque in Malaysia that was completed in 1988. This mosque which is also known by the name of its founder as Sultan Salahuddin Abdul Aziz Mosque, has been reported by the Malaysian Ministry of Tourism in 2011 to be Malaysia's largest mosque and the second largest in Southeast Asia. First glance at the pictures of the mosque one could easily imagine that its location is somewhere in Iran or Turkey. The form of the dome as well as the glazed blue tiles that entirely cover it, and coloured windows seem Persian. While the overall plan with the four tall minarets shows Ottoman influence (Figure 3). From the outer appearance of the Blue Mosque, no Malay element is noticeable; although the inner skin of the dome is covered with wooden panels that reflect Malay traditional architecture.

Figure 3 Blue Mosque Shah Alam, Selangor, Malaysia

PHASE 3: RISE OF ECLECTICISM

As stated earlier, the trend of adopting foreign styles of mosque architecture on Malaysian soil picked up during the last two decades of the 20th century. During this period architects experimented with various forms, styles, colours and material, and as a result, a large number of small and medium size mosques of a very wide spectrum of styles and designs were erected. The fast process of mosque construction changed the landscape of Malaysia significantly. Most of the newly built mosques were clearly influenced by certain well-established styles or even a certain well-known mosque; a Qubbat al-Sakhra Mosque in Jerusalem, for instance, has often been imitated. Though most scholars have stuck

to the general categorization of 'traditional, colonial and modern,' Mohamad Tajuddin Mohamad Rosdi (2012) steps a little further and uses terms that are more specific. He divides Malaysian mosque architecture historically into three periods: "the Early Vernacular, the Colonial Adaptation and Modern – Post Modern.

From the dawn of the 21st century, however, combining various architectural styles in a single mosque became more of a conscious trend. Funding bodies, which in most cases were government institutions, encouraged incorporating foreign styles into mosque design. This was in line with promoting tourism under the open door policy. Architects were given free hand to come up with creative ideas, and financial support was there to implement them. A systematic amalgamation of styles began to sprout, which in the process gave birth to a rather new trend in Malaysian mosque architecture that may be designated as "Eclectic Style" (Amir H. Zekrgoo, 2014).

Eclectic architecture is a product of amalgamation of elements from various structural, spatial and decorative forms that carry features representing specific and distinct cultures in a single structure (Turner, 1996). Although in an overall assessment formal similarities were observed between Post Modernism and Eclecticism, while studying it in Malaysian mosque architecture context one realizes a fundamental difference. Post Modernism in architecture was a reaction to Modern Functionalism in western architecture, which was perceived a failure. This was partly because Modern architecture had undermined ornamentation at the cost of function, and Post Modernism was there to revive the aesthetic aspect of mosques.

Malaysian Eclecticism, on the other hand, had a total different background. Modernism, in the technical/stylistic sense, never actually found manifestation in Malaysian mosques; moreover, mosques were never deprived of their ornamentation. In other words, architects of the 21st century Malaysia experimented with formal and structural elements of existing styles in the Muslim world in search of new compositions while their efforts were not in any way a reaction or objection to the existing conditions.

From among a number of major eclectic mosques that the author has surveyed, Masjid Wilayah, the grand regional mosque of Kuala Lumpur, seems a distinct example.

Completed in August 2000 Masjid Wilayah is the first major eclectic mosque born in the 21st century. While discussing the subject of eclecticism in Islamic architecture, the author had a tradition of taking his students to this mosque every semester for over a decade. In its construction, refined features borrowed from renowned traditional styles are blended with sophisticated modern technology. Studying the structure as well as its decorative components one can trace the presence of features from the Sultan Ahmed Mosque of Istanbul (Turkey), Shah Mosque in the Naqsh-e Jahan Square of Isfahan (Iran), the Taj

Mahal of Agra (India), and Egyptian and Moroccan features, alongside native traditional elements (Figure 4).

Figure 4 Masjid Wilayah, KL, Malaysia

FINDINGS AND DISCUSSION

DOMES: The mosque's 33 domes were arranged in a typical Ottoman style – a central main dome surrounded and supported by half-domes and smaller domes. From afar the mosque brings to mind the Sultan Ahmet Mosque of Istanbul (1609-1616), but the colourful skin of the dome with turquoise blue tiles in the background adorned with floral motifs in white and yellow with black contours are inspired by the Shah/Imam Mosque of Isfahan (1611-1629).

*MINARETS***:** Wilayah Mosque's two 96 meter minarets follow a mix of Egyptian and Ottoman styles. The minarets are divided into 5 segments that reflect the Turkish example, whereas the whole style of minarets is Egyptian. Egyptian minarets are based on a square plans, and are constructed on different levels and parts (usually three). The minarets of the Wilayah Mosque are four-sided at their foundation and at their highest level they become eight-sided. They resemble the minarets of Abu al-Abbas al-Mursi Mosque (1775) in Alexandria.

*PORTICO AND MIHRAB***:** The main arch that leads to the prayer area is a structure that is special and inspiring. It combines the Persian Muqarnas and

Parchi Kari. Parchin Kari, also known as Pietra Dura is a technique of inlay of semi-precious colourful stones usually in marble. The end result is highly polished to get a glossy surface. An art employed by ancient Iranian craftsmen that was perfected by Indian artisans during the Mughal Empire (1526-1707). The famous Taj Mahal (in Agra, India) is adorned with the best examples of Parchin Kari. Some of the master craftsmen from Agra were in fact commissioned to make geometric, arabesque and calligraphy panels on the façade of the main entrance as well as the *mihrab* of Masjid Wilayah (Figure 5 & 6).

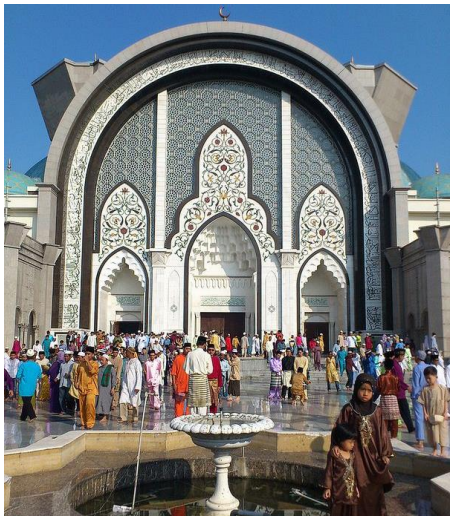

Figure 5 Portico, Masjid Wilayah
(Picture by Azman Aziz)

Figure 6 Parchinkari with Semi-Precious Stones and Mother of Pearls, Mihrab of Masjid Wilayah
(Picture by Amir Zekrgoo)

ARCHES: Masjid Wilayah has five covered porchs, marked by horse-shoe arches in Moroccan style, surrounding its large courtyard. (Figure 8)

MINBAR, DOORS & SCREENS: Traditional Malaysian art of wood carving is seen in the making of all the doors, the screen partitions that mark women's prayer area on the second floor. The large and tall *minbar* that stands to the right side of the *mihrab* is the most prominent wooden element in the mosque. The wood carving is done by Malay craftsmen from Kelantan and Terengganu (Figure 9).

Figure 7 Moroccan Arches Surrounding Masjid Wilayah's Courtyard.
(Picture by Amir Zekrgoo)

Figure 8 Traditional Malay Woodcarving with Floral Motifs Inspired by Local Plants, Door to the Main Prayer Hall, Masjid Wilayah
(Picture by Amir Zekrgoo)

CONCLUSION

Malaysian mosque architecture underwent drastic transformation since its independence in 1957. Before independence the mosques shared general characteristics of South-east Asian vernacular timber architecture. Masjid Negara marks the first departure from tradition towards modernism. After the erection of this historic landmark, until the end of the 20th century, Malaysian urban landscapes were witness to the sprout of countless mosques that were inspired mostly by the Middle Eastern mosques. The result was colourful structures with no clear stylistic direction. The 21st century however displays a conscious direction towards treating eclecticism as a style, a deliberate bringing of multiple styles under a single roof, which Masjid Wilayah in Kuala Lumpur seems to be a comprehensive and impressive example. Eclectic mosque architecture of Malaysia needs wider and deeper investigation, as the change of form and structure of the mosques dictates different social behaviour of the Muslims in their collective acts of worship. Acceptance or resistance towards such changes can be regarded as an indications of the degree of willingness to depart from indigenous cultural and aesthetic values.

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BIBLIOMETRIC ANALYSIS ON QUANTIFYING URBAN SPRAWL IN ASSESSING A COMPREHENSIVE MEANING OF SPRAWL: A REVIEW

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Abstract

After more than half century has passed, urban sprawl remains as one of the most important and unresolved matters in the urban development process. This paper adopts "Bibliometrics Analysis" technique, which is a statistical analysis of scientific publications to review the studies on urban sprawl from the year 1996 till 2015 in order to identify the fundamental issues and problem of urban sprawl. This method allows the researcher to review the literature of topic of interest critically, not only based on national and international networks but includes the multi-disciplinary fields of science and technology relating to urban planning. The publications on urban sprawl were retrieved from the two largest scientific databases namely Scopus and ScienceDirect. The sampling of publications was based on the "Most Cited Articles" indicator. The findings on urban sprawl issues and problems are presented in four categories, which are the lack of consensus in defining urban sprawl, unavailability of method to quantify urban sprawl, access to data and tools, and varying urban sprawl patterns based on area. The findings of this study provide the gap for future research on urban sprawl.

Keywords: Urban sprawl, sprawl issues and problem, urban sprawl planning, bibliometric analysis.

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INTRODUCTION

The paper uses "Bibliometrics Analysis" technique to analyse research publications on urban sprawl topic ranging from 1996 till 2015 in order to extract the relevant issues and problems of urban sprawl. Since the term became apparent in the 1950s, "Urban Sprawl" has been globally studied by researchers from various backgrounds and interests. Unfortunately, even after a few decades have passed, the definitive way to define urban sprawl is still absent. Urban sprawl is a fundamental issue in modern urban development since its rapid, but uncontrolled expansion is alarming for many professionals in the built environment (Altieri et al., 2014; Arribas-Bel, Nijkamp & Scholten, 2011). Some researchers agree that urban sprawl is something undesirable and have more negative impact rather than positive consequences (Ewing, 2008; Ewing et al., 2016; Ewing, Pendall & Chen, 2002; Knaap et al., 2005). Urban sprawl is a broad term involving different characteristics and types, and caused by various factors, thus different approaches are needed to address them (Majid & Yahya, 2010, 2011). Advocating for certain development concept or planning policies may not necessarily be successful without initially knowing the key issues and problem of sprawl faced by a city (Chorianopoulos et al., 2010; Habibi & Asadi, 2011).

THEORETICAL REVIEW ON URBAN SPRAWL

According to Wu (2006), a city is a highly complex socio-economic and spatial entities with a distinct hierarchical order. It is a hub of almost all human activities (Rajeshwari, 2006). Apart from physical forms, cities are shaped by various development forces such as economic, political, cultural and social, which later imposing themselves in physical forms and closely relate to urban sprawl (Apostolos, 2007; Ardeshiri & Ardeshiri, 2011).

In Western countries, urban development is characterized by two important processes which are the inner-city decline and urban sprawl. These two processes are in fact interrelated as urban sprawl accelerates the inner-city decline. Bhatta, Saraswati and Bandyopadhyay (2010b) consider "Urban Growth" and "Urbanisation" are both the processes of "Urban Development." Meanwhile, urban growth and urbanisation as defined by EEA (2006) are "the increase in the number of people living in towns and cities" and "the proportion of a country that is urban". The process has a high impact on the environment such as depletion of natural resources, landscape deterioration, pollution and climate changes (Olujimi, 2009; Ramachandra, Bharath & Sowmyashree, 2014; Weng, 2001).

Based on the growing awareness of the public on the uncontrolled urban development issues, it is vital to improve understanding of this phenomena and their underlying causes (Rajeshwari, 2006; Verbeek, Boussauw & Pisman, 2014). However, some scholars also argue that urban sprawl is inherent to city growth and that it will always continue to be a side effect of urban development process

(Steil, Salingaros & Mehaffy, 2007; Almeida, 2005; Bhatta, Saraswati & Bandyopadhyay, 2010b; Altieri et al., 2014). Thus, what is required is not halting urban sprawl but to lessen its negative impacts in order to promote sustainable development (Steil, Salingros & Mehaffy, 2001).

Sprawl has become a characteristic of urban development worldwide. Urban sprawl has became one of the most important issues in the urban area around the world since the twenty-first century whose importance is still growing today (Altieri et al., 2014; Arribas-Bel, Nijkamp & Scholten, 2011). Its rapid and uncontrolled expansion are alarming for many professionals including planners, urban specialists, statisticians, engineers and decision makers Arribas-Bel, Nijkamp & Scholten, 2011; Bruegmann, 2015; Ewing, Pendall & Chen, 2002). On the contrary, sustainable development concept espouses development that meets the requirements of the present without conceding the capability of upcoming generations to meet theirs. (Ardeshiri & Ardeshiri, 2011; Tanguay et al., 2010). The sustainable development concept has become increasingly significant for creating a better future for the world, economically, socially and environmentally (Arbury, 2005). As a result, this concept depends on the future role of urban planning in handling urban sprawl issues (Catalán, Saurí & Serra, 2008; Yeh, 2000).

METHODOLOGY

Bibliometric analysis was used to obtain reliable information on urban sprawl issues and problems. Bibliometric analysis offers a powerful set of methods and measures for studying the structure and process of scholarly communication. Besides, this method is expected to play an increasingly important role in research assessment and management (Campbell et al., 2010; Bellis, 2009; Borgman & Furner, 2002). Also, bibliometric indicators which quantify the production and use of bibliographic material, have been used extensively in the assessment of research performance (Russell & Rousseau, 2010; Campbell et al., 2010; Bellis, 2009; Reuters, 2008). The scientific databases used to collect journals and articles include Scopus, ScienceDirect, and Web of Science ranging from the year 1996 to 2015 (20 years) as the principle search parameter. Specific keywords were retrieved from the title and abstract of each journal and article using Boolean Searching technique for urban sprawl publications of different subject areas. The enormous numbers of publications for this topic were then limited by "Most Cited Paper" for each year making the final document analysed pertinent to the interest of this paper only 100 records from all databases. Based on the selected publications, a detail and comprehensive analysis on the content of the literature review was conducted using content analysis technique to extract the issues and problems of sprawl.

The results from Bibliometric analysis not only provides valuable information on the scientific trend and pattern of urban sprawl studies but assist

the researcher in indicating the most important and relevant issues and problems associated with urban sprawl for the last 20 years. The findings were discussed into four categories of challenges namely (i) urban sprawl, (ii) geospatial indices, (iii) GIS and remote sensing, lastly on (iv) the different urban context. The identified issues and problems stand as the gap in determining urban land use sprawl through geospatial indices measurement method using GIS and remote sensing.

ANALYSIS AND FINDINGS

The term "Urban Sprawl" is a concept that is vague in its definition. Despite being vigorously researched into, urban sprawl remains to be without a universally accepted and well-established definition (Altieri et al., 2014; Arribas-Bel, Nijkamp & Sholten, 2011; Barnes et al., 2001; Bhatta, 2010; Bhatta, Saraswati & Bandyopadhyay, 2010a, 2010b; Bruegmann, 2015). Bibliometric analysis on urban sprawl publications (Table 1) shows that publications on urban sprawl topic have been increasing since 1996. This indicates a growing awareness among academicians and professionals on urban sprawl. However, publications that emphasise on defining urban sprawl are still lacking. For over 20 years, only 20% of the publications focus on defining urban sprawl. The lowest publication on urban sprawl studies is from medicine subject area (4.1%), business, management and acccounting (4.8%), and economics, econometrics and finance (5.6%), proving that there is some form of disregard of urban sprawl importance in some subject areas.

Lack of awareness on sprawl issues from some areas cause the efforts to contain sprawl sometimes resulted in increasing another (Coisnon, Oueslati & Salani, 2014, 2012; Galster et al., 2001; Gottlieb, 1999; Ngoran & Xue, 2015; Wu et al., 2006). Besides, the analysis of the pattern of urban sprawl publications also indirectly explain why there are so many unintegrated methods and tools to measure sprawl. In terms of the urban context, the United States is the leading country in the urban sprawl research with 1,127 documents published in 20 years period. The publication gap between the Unites States and China (391) is 736 publications. The huge difference proves that urban sprawl issues first acknowledged and conducted in the United States. Most of literature and debates on urban sprawl also have been based on the US experience (Chorianopoulos et al., 2010; Habibi & Asadi, 2011; Nechyba & Walsh, 2004; Travisi, Camagni, & Nijkamp, 2009). China is taking the lead in the context of Asian Countries, followed by India (91 publications) and Japan (49 publications). Countries with a low number of research publications are either developing or third world countries that faced problem such as over-populated, slum area, congestion and apparently sprawling.

Table 1 Publications on Urban Sprawl

		Urban Sprawl			Urban Sprawl Definition		
	Year	**Scopus**	**Science Direct**	**Web of Science**	**Scopus**	**Science Direct**	**Web of Science**
1.	**2015**	314	821	132	8	379	9
2.	**2014**	331	663	136	8	278	7
3.	**2013**	310	661	111	8	290	8
4.	**2012**	296	562	98	9	250	1
5.	**2011**	265	404	90	5	160	6
6.	**2010**	238	316	87	3	151	2
7.	**2009**	202	373	90	4	148	2
8.	**2008**	217	339	63	5	150	1
9.	**2007**	170	261	55	4	105	1
10.	**2006**	143	259	41	4	110	1
11.	**2005**	147	186	36	12	76	3
12.	**2004**	118	212	35	4	77	2
13.	**2003**	108	158	17	7	68	5
14.	**2002**	81	135	17	3	56	1
15.	**2001**	86	173	26	3	64	3
16.	**2000**	57	107	12	1	37	1
17.	**1999**	37	63	7	0	24	0
18.	**1998**	37	72	7	1	27	1
19.	**1997**	25	106	4	0	47	0
20.	**1996**	25	92	5	0	39	0
TOTAL		**3,207**	**5,963**	**1,069**	**89**	**2,536**	**56**
			10,239			**2,679**	

Sources: Scopus, ScienceDirect, WoS

DISCUSSION OF ISSUES AND PROBLEMS

Urban Sprawl

Unavailability of agreeable definition for the term

Urban sprawl is a term that has a long history in the academic and development practice. Nonetheless, it is still widely discussed as a major problem today (Coisnon, Oueslati & Salani 2014). Surprisingly, a standard and precise definition of urban sprawl is still not existed (Altieri et al., 2014; Bruegmann, 2015; Terzi & Kaya, 2008; Theobald, 2003; Wilson et al., 2003). Bhatta, Saraswati and Bandyopadhyay (2010a) claim urban sprawl as a concept suffers from difficulties in the definition. Hammer and Witten (2011) question if there is a single widely accepted definition of sprawl on which the majority of stakeholders can agree. Hasse and Kornbluh (2004) add that there is a need to better define the term to focus specifically on the undesirable and problematic development that many stakeholders are arguing.

According to Ewing (2008), Ewing, Pendall and Chen (2002, and Galster et al. (2001), most people especially professionals may recognise sprawl when they see it, but this may not be helpful in practice especially in the rule or decision making. Currently, sprawl has been loosely defined as dispersed and inefficient urban growth that is always associated with characteristic such as low-density, decentralization and fragmentation (Farber & Li, 2013; Hasse & Lathrop, 2003). Without a universal definition, quantification and modelling of urban sprawl are difficult (Bhatta, Saraswati & Bandyopadhyay, 2010b; Wilson et al., 2003). Moreover, Bruegmann (2015) also states that there has been a significant debate in academia on how to measure sprawl and to understand its dynamics, thus a universal definition of urban sprawl is required.

Ambiguous ways in determining the urban sprawl concept

Urban sprawl is a critical issue in today's world. While being a manifestation of development, it is known for its negative environmental and social impacts (Crawford, 2007; Feng et al., 2015). Over the years, urban sprawl concept has been defined in many ways by many different groups with each definition seemingly only serving each particular group's interest (Haase & Nuissl, 2007; Hammer & Witten, 2011; Ngoran & Xue, 2015). As a matter of fact, not all urban growth is considered as sprawl and one person's sprawl can be another person's solution to sprawl (Almeida, 2005; Gottlieb, 1999). Numerous studies have revealed the nature of urban sprawl and the reasons for its occurrence in different contexts (Coisnon, Oueslati & Salani, 2014). Much of the confusion about sprawl, especially on causes, consequences and conditions, stems from the conflation of ideology, experience, and effects (Galster et al., 2001).

Universality: Sprawl from a broader context

As pointed out earlier, the term ‘‘urban sprawl’’ is loose and ambiguous. It can be seen that urban sprawl is not only important issue for urban specialists, planners, and statisticians, but this issue expanded to the mainstream. The rapid and uncontrolled urban expansion in the world is alarming, both in developed and developing countries (Altieri et al., 2014; Banzhaf & Lavery, 2010; Bruegmann, 2015; Wassmer, 2007). However, this variety of views and understandings on the matter may also enrich the analysis if performed universally (Arribas-Bel, Nijkmap & Scholten, 2011; Barnes et al., 2001). Urban development process without sufficient understanding of its wider context leads to inadequate interpretations of sprawl and its impact (Altieri et al., 2014; Bhatta, Saraswati & Bandyopadhyay, 2010b; Chorianopoulos et al., 2010). Ewing (1997) prove that there are different standpoint of viewing and defining urban sprawl from town planners and economists perspectives. Anas and Pines (2008) and Vyn, (2012) explore the idea of studying the relationship between different aspect of sprawls

that proved unintegrated development policies might reduce sprawl in one aspect but increase in another.

Other issues and problem associated with urban sprawl

Urban sprawl is a serious challenge for urban management and planning in many countries (Gennaio, Hersperger & Burgi, 2009). Assessment of the environmental and socio-economic impact of sprawl fails to find the solution and is still a subject of debate (Haase & Nuissl, 2007). Furthermore, many urban management strategies for sustainable development such as compact city, smart growth and green city concept contradict one another and failed to curb sprawl comprehensively (Arbury, 2005; Ardeshiri & Ardeshiri, 2011). Besides, urban sprawl has contributed to the deterioration of the quality of life. A study by Ewing et al. (2014) shows that adults living in sprawling counties have a higher body mass index (BMI) and are more likely to be obese than are their counterparts living in compact cities.

Sprawl is widely discussed but poorly understood. It may mean different things to different people. However, most observers seem to agree that sprawl can be characterized by a fragmented pattern of land development (Wu, 2006). However, Gottlieb (1999) claims that many economists do not see sprawl as a problem nor acknowledge its existence because the fragmented pattern of city growth is a result of fair-market being in operation. Many economists also argue that sprawl occurs due to market failures and lack of useful integrated economic model (Anas & Rhee, 2006; Brueckner & Helsley, 2011; Nechyba & Walsh, 2004). In contrast, urban planners and policy makers favour land use controls that directly limit the expansion of cities and encourage high-density development in central cities, which are widely presumed to reduce sprawl (Ewing, 1997).

Geospatial Indices

Distinguishing urban development from urban sprawl

As urban development occurs, its growth is often confused with urban sprawl. Ewing (2008) suggests that there are three dimensions associated with urban development namely land use, density and time. The same dimensions also apply to sprawl. However, to what extend the growth is dispersed or compact remain as a problem (Almeida, 2005; Burchfield et al., 2006; Tsai, 2005). Additionally, understanding on urban sprawl, especially in Asian countries, still heavily relies on qualitative discussion instead of quantitative analysis (Feng, 2008). Some scholars propose that urban sprawl needs to be quantitatively measured in order to determine whether it is on the rise or decline, and whether it is a recent occurrence or has been evident for a long time (Gerundo & Grimaldi, 2011; Bruegmann, 2015).

Limitation in capturing the characteristics of urban sprawl in measurement

As mentioned earlier, many definitions use characteristics such as low density or dispersed development to identify urban sprawl. However, these features are not adequately defined or explained, nor these can comprehensively determine urban sprawl (Ardeshiri & Ardeshiri, 2011; Couch & Karecha, 2006). As different factors caused various types of sprawl, different approaches are required to address them. Any measures taken without first knowing what kinds of sprawl the city is facing may not necessarily work (Majid & Yahya, 2010; Verbeek et al., 2014). Numerous researches were dedicated to the measurement or urban form, but they have limitations in capturing the overall characteristics of urban sprawl. (Almeida, 2005; Jaeger, Bertiller, Schwick, Cavens & Kienast, 2010; Jaeger, Bertiller, Schwick & Kienast, 2010; Li & Yeh, 2004; Steil, Salingaros & Mehaffy, 2007; Yeh & Li, 1999a, 1999b). Bhatta, Saraswati and Bandyopadhyay (2010a) assert that effective way to identify sprawl can never be achieved without first defining its solid characterisations. However, this is not an easy task since previous researches on characterising sprawl have either failed to draw a conclusion or cannot be universally implemented.

Managing urban sprawl from different geographical background

According to Ewing et al. (2016), there is rather limited researches that explore the global characteristics of urban development and urban sprawl as well as their implications for equity and sustainable development. Gennaio, Herperger and Burgi (2009) relate this problem to the difficulties in comparing the international urban development due to diverse databases. They found that different countries have different databases and in many cases, the data is different between cities, counties and states of the same country.

GIS and Remote Sensing Application

Availability of routinely update database

Frequent monitoring of urban sprawl is needed to limit the impact of this phenomenon towards the environment. Thus regularly updated data is required for that purpose Altieri et al., 2014; Durieux, Lagabrielle & Nelson, 2008). As highlighted beforehand, there are not many quantitative contributions in urban sprawl research as compared to the qualitative discussion. One probable reason for this scenario is the limited availability of good and reliable data (Arribas-Bel, Nijkamp & Scholten, 2011). Information on urban development especially in developing cities is often unavailable, due to their rapid development and capacity constraints of planning authorities to keep track. The ability to assess, measure and monitor sprawl depend on the availability of relevant, accurate and reliable data (Altieri et al., 2014; Belal & Moghanm, 2011; Bhatta, Saraswati & Bandyopadhyay, 2010b; Feng, 2008; Herold, Couclelis & Clarke, 2005; Osman, Nawawi & Abdullah, 2008).

Lack of synchronizing tools/methods to control urban sprawl

Allen and Lu (2003) state that modelling and predicting urban growth has begun in the 1950s, but slowed down during 1970s to 1980s. Recent availability and improvement of spatial data combined with the advancement of geographic information system and computer technologies, the activities have again increased since the 1990s till now. However, there are still very few methods used to assist in the identification and monitoring of urban sprawl in development areas. Therefore, there is a clear need for such method to be used with geospatial databases from GIS and remote sensing data (Altieri et al., 2014). Anas and Pines (2008) argue that if local urban planners and decision makers were to use uncoordinated land use policies that are generated based on less accurate data and inadequate evaluation methods, the overall urban sprawl rate may increase and cause shuffling of population among neighbouring cities. Last but not least, the recent demand for the data with high resolution and accuracy as well as the latest technology of geospatial tools. The high cost of data acquisition and tools used to process the data has affected the stages in conducting research and the quality of outcomes (Gamba, 2009).

Urban Context

Excessive concentration on urban sprawl experience from specific urban context

Many researchers have come to conclude that modern debates on the urban form and urban sprawl have become influenced strongly by the result of an excessive concentration on American experiences, hence, leading to neglecting of experience from urban context of other countries. Urban sprawl occurrence varies in different context due to various economic, geographic, environmental, social and political situations (EEA, 2006; Castracane et al., 2003; Catalán, Sauri & Serra, 2008; Chorianopoulos et al., 2010; Couch & Karecha, 2006; Habibi & Asadi, 2011; Nechyba & Walsh, 2004). Most of the developing countries particularly in Asia suffer the absent of clear quantitive approaches to indicate sprawl and way to evaluate the extent of its growth (Feng, 2008). Moreover, there is a growing awareness from researchers in Europe, Asia and Africa on the issue where majority of the literature on sprawl focuses on American urban areas (Travisi, Camagni & Nijkamp, 2009). Based on the bibliometric analysis conducted for this research, it can be seen that as of 2015, the United States of America has the highest number of published literature on sprawl. For Asian countries, China and India are taking the leads while Malaysia is still in infancy stage. Osman, Nawawi and Abdullah (2008) proclaim that in Malaysia, there is relatively low visibility of urban issues and there seemed to be many lingering problems which were the outcome of the urban development process for the past thirty years. The development process influenced by globalisation and economic

competitiveness factors that seen many main cities as economic growth engines, so the control of its previous expansion almost not exists. The intensification of urban sprawl within the three top Malaysia's metropolitan areas has led to greater growth in urban areas outside the city centre boundaries (Abdullah, 2012).

CONCLUSIONS

The paper provides an insight of the current trend and status of urban sprawl studies based on published literature through most used scientific databases. By doing so, the researcher was able to find most relevant and reliable sources of research information on urban sprawl to extract the issues and problem. Examining the issues and problems of this topic helps the researcher to find the most significant research gap, and the best solution can be explored. The author explores the Bibliometric analysis technique, which is the best known of sophisticated approaches, in evaluating the qualitative literature into quantitative assessment (Borgman & Furner, 2002). This paper contributes to determining the research gaps for author's research on 'Developing Land Use Geospatial Indices (LUGI) in Measuring Urban Sprawl using GIS and Remote Sensing Techniques: Case Study of Kuala Lumpur."

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ETHICS & VALUES IN CONSTRUCTION INDUSTRY FROM ISLAMIC PERSPECTIVE

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Abstract

The purpose of this paper is to explore the principles of Islamic ethics to be applied in construction projects by establishing Islamic ethical practices to improve project performance. In an Islamic system, ethics and construction business are inextricably linked. This paper aims primarily to identify the ethics in general and from the Islamic perspective, and to identify the principles of Islamic ethics in construction projects. The methodology of was content analysis of peer-reviewed empirical studies published in academic journals. In addition, specialist texts to review the principles of Islamic ethics in construction projects in order to give an overview of main ethics theories. This paper will discuss the impact of Islamic ethics on performance jobs and project outcomes. Finally, this study also shows how construction companies could adapt the Islamic ethics and create Islamic ethical work climate in their projects and in society as well. In conclusion, implementation of the recommended solutions can minimize unethical acts in the construction projects.

Keywords: Islamic ethics, ethics and values, construction industry and Islamic perspective, Al-Quran, Al-Sunnah

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INTRODUCTION

Different researchers give different definitions of ethics. A partial reason of the collapse of a number of construction projects in the past was probably the failure to follow ethical values as propagated by Islam. Failure of construction projects has led the Western societies to develop their own sets of work ethics for professional involved in construction projects. However, these sets of ethics were developed based on human intellectual capacities without looking into what the divine religions might have to say about them, although some of these man-made ethics are in conformity with what Islam or any other divine religion might have regarding them.

In recent years, attempts have been made to develop Islamic work ethics for professionals. One of such attempt is the book written by Abdi Omar Shuriye and Ahmad Faris Ismail. This research paper intends to deduce the principles of ethics and values for construction projects from Islamic sources, i.e. the texts of the Qur'an and Hadith of the Prophet (PBUH), so that this set of ethics would represent the Islamic values and perspective. This paper also explores the impact of embracing Islamic work ethics towards job performance and project outcomes. Finally, this paper puts forward several suggestions to reduce ethical issues in construction projects in the future.

LITERATURE REVIEW

Ethic & Islamic Ethic

Ogbonna and Ebimobowei (2011) state that ethic and values is reflected in the rule that a man uses to govern his/her actions and the personal standard by which a person distinguishes the correct from the wrong. Islamic work ethics are the yearnings of the relations between the individuals themselves and their conduct at work in light of Islamic principles and fundamentals. Islamic work ethics stress on two things; (i) to accomplish every task with the best of an individual's capacity and (ii) to perform the task to please Almighty Allah alongside satisfying essential socio-economic needs. However, Islamic ethic incorporates the outer and inner parts of individual's life (Ibn Manzur, 1990; Miqdad Yaljin, 1973).

Beekun and Badawi (2005) analyse Islamic ethic from a standard perspective. Their essential finding asserted that Islamic ethic could not be isolated from a Muslim's day-to-day life. The Islamic ethical system is fair, balanced, just and benevolent, and looks to respect the rights of both primary and secondary stakeholder's without taking into consideration abuse, nepotism and other human ills. Beekun and Badawi (2005) additionally emphasise that humankind must not overlook his/her part as God's steward or vicegerent on earth.

In Islamic context, ethical framework is revealed from the teachings of the Quran and the Sunnah. Islamic ethic manages all aspects of human life. It

manages relationships between man and Allah, man and his fellow man and other elements and creatures of the universe, and man and his inmost self (Hanafi & Sallam, 1997). Besides, the objectives of Islam itself are not fundamentally materialistic. They depend on Islamic ideas of human prosperity and great life that underline fraternity and financial equity, and require an adjusted fulfilment of both material and needs of all people.

Additionally, Islamic ethic is also known as *akhlak*. *Akhlak* is the Islamic values, which have been specified in the Quran and executed by Prophet Muhammad (PBUH). Primarily, there are two (2) types of *akhlak*, bad or good. Islam underlines the imperative of honing good *akhlak* in all parts of human life and realizes it as one of the purpose of sending His messengers (Shaharuddin, 2005). Prophet Muhammad (PBUH) said: "I have been sent only for the purpose of perfecting the qualities of good *akhlak*" (Imam Malik). Beekun and Badawi (2005) state that the term most closely related to firmly identify with ethic in the Quran is *khuluq*. Allah says in the Quran, *"And thou (standest) on an exalted standard of character." (68:4).*

The Quran additionally utilizes an entire cluster of terms to portray the idea of goodness, for example, *khayr* (goodness), *birr* (uprightness), *qist* (equity), '*adl* (equilibrium and justice), *haqq* (truth and right), *ma'ruf* (known and approved) and *taqwa* (piety). Devout activities are depicted as *salihat* and irreverent activities are portrayed as *sayyiat*.

The Principles of Islamic Ethics in Construction Projects

Adl and Qist (Justice and Equal)

Muhammad et al. (2008) suggest that Justice as Equity or 'Adl intends to treat individuals similarly is a pre-imperative of decency and equity. It is an equiponderant implementation of obligations and rights. Allah says in the Quran with regard to justice,

> *"Allah commands justice, the doing of good and liberality to kith and kin. He forbids all shameful deeds and injustice and rebellion; he instructs you, that ye may receive administration." (16:90)*

In construction projects, the standard of justice applies both figuratively and literally. As far as relationship between project manager and his subordinates, the standards of justice infers that managers should exercise fair and equal treatment to all professionals (workers) paying little respect to gender, physical appearance, race, religion and political belief. Surely, experience, skills and attitude will decide the standings of the professionals (workers). Furthermore, Islam completely dismisses the act of bias and cronyism that lead to unfairness in procuring workers and in their promotion. Indeed, professionals ought to be picked or promoted based on their level of experience, academic qualification,

job competency and, in addition, their good qualities (Shaharuddin, 2005). It is intriguing that another significance of 'Adl is equity and equilibrium. As can be seen from the above citation of the Quran, a balanced transaction between stakeholders and construction companies is likewise evenhanded and just. Generally, Islam dislikes man's affinity for rapaciousness and his love for possessions (Beekun, 2005).

Amanah (Trust)

Trust is a key to constructive interpersonal connections in different settings since it is fundamental to how we communicate with others (McKnight & Chervany, 1996). Ahmad (1995) points out that the acknowledgement of God's will by carrying on ethically is a piece of man's trusteeship and an obligation that he has taken upon himself to fulfil. More significantly, the wealth and other resources that mankind has access to are not his, but rather have been credited to him by God as instruments to fulfill the obligations of the trusteeship. Without a doubt, trust is accentuated in the Qur'an and Hadith. Allah says in the Quran,

> *"If ye are on a journey, and cannot find a scribe, a pledge with possession (may serve the purpose). And if one of you deposits a thing on trust with another, let the trustee (faithfully) discharge his trust, and let him fear his Lord. Conceal not evidence; for whoever conceals it, his heart is tainted with sin. And Allah knoweth all that ye do." (2: 283)*

The Prophet (PBUH) specified the sigificance of trust as,

> *"Any ruler who has been entrusted with the affairs of a group of Muslims and who dies as a dishonest ruler, to him paradise is forbidden by Allah."*.

Islam considers human life and assets as a trust rested on men by Allah. Subsequently, every project manager is in charge of the professionals (workers) and other resources with whom he is depended upon. Trust is particularly imperative for Muslim stakeholders in construction industry as result of the need to make profit and the enticements to upgrade the characteristics of their project or service during construction period. The project manager ought to treat all project resources as a heavenly trust. In this manner, the partner or administrator ought to make the most productive and socially alluring utilization of the project resources. The project activities ought to not harm the society or the natural environment. In reality, Islam underlines man's role towards the natural environment by making him in charge of his surroundings as Allah's vicegerent.

Ihsaan (Benevolence)

Ihsan means capability, fineness or charitableness in managing other. Muhammad et al. (2008) describe *ihsaan* as "a demonstration which benefits persons other than those from whom the demonstration continues with no

commitment". The concept of benevolence is additionally frequently repeated in the Quran and the Hadith. Allah says,

> *Spend your wealth for the cause of God, and be not cast by your own hands to ruin; and do good. Lo! God loves those who behave with ihsan." (2:195)*

The Prophet (PBUH) is reported to have said that,

> *"The inmates of Paradise are three types: one who wields authority and is just and fair; one who is truthful and has been endowed with power to do good deeds; and the person who is merciful and kind-hearted towards his relatives and to every pious Muslim, and who does not stretch out his hand in spite of having a large family to support." (Sahih Muslim).*

Absence of justice in project construction causes damages and aggravates peace and harmony, however the absence of benevolence does not harm anybody. It suggests a more liberal treatment than what equity requires (Hasanuzzaman, 2003). Aside from justice, the relationship between project managers and professionals (workers) ought to be on the basis of benevolence.

Ikhlas (Sincerity)

Sincerity is most usually comprehended to be truthful in word and act. Additionally, sincerity can be characterized as the quality or state of being genuine; honesty of mind or intention; and devoid of hypocrisy, false pretence or disguise (Muhammad et al., 2008). Islam has accentuated *ikhlas* as we see in Quran and Hadith. Allah says,

> *"So woe to the worshippers, who are neglectful of their Prayers, Those who (want but) to be seen (of men), But refuse (to supply) (even) neighbourly needs." (107: 4- 7)*

The Prophet (PBUH) said, in respect to sincerity,

> *"Actions are but intention and every man shall have but which he intended. Thus he whose migration was for Allah and His messenger, and he whose migration was to achieve some worldly benefit or take some woman in marriage, his migration was for that for which he migrated."*

Hence, the execution of obligations requires that all professionals in construction projects work with sincerity. Establishing sincerity in the construction projects can enhance the professionals' effectiveness in job implementation resulting in higher productivity. Furthermore, such ethical code additionally debilitates control or misuse of others for individual reasons (Ahmad, 1995). Thus, a sincere professional is not anticipated to swindle resources, create mischief and exploit others deliberately.

IMPACT OF ISLAMIC ETHICS ON JOB PERFORMACE AND PROJECT OUTCOMES

Earlier studies show that there is a positive relationship between Islamic ethics and job performance because Islamic ethics forms a constitutive part of a Muslim employee's belief system (Haroon, Zaman & Rehman, 2012; Hayati & Caniago, (2012); Marri et al., 2012; Batool, Gul & Shahzad, 2013; Yousef, 2001). As a result, professionals who view their work environment in harmony with Islamic teachings and the ethical values are more satisfied in performing their duties. Consequently, this increases their intrinsic motivation to work. According to Daft and Marcic (2013, p. 400) "a positive attitude toward one's job" is called job satisfaction.

Also, Manan, Kamaluddin ad Puteh Salin (2013) explain that Islamic notion of considering work as a worship can make professionals become further motivated to work hard with higher rate of efficiency and effectiveness, which in turn benefits the organization both in the long and short run. Moreover, studies also reported that Islamic ethics has a positive significant correlation with project outcomes (Abbasi, Rehman & Bibi, 2011: Yesil, Sekkeli & Dogan, 2012).

CONCLUSION

In conclusion, this paper gives a review of the concept of ethic from Islamic perspective, in relation to construction projects. This paper provided the empirical proof of the positive relationship of Islamic ethics with job performance and project outcomes, but literature review revealed a number of issues. One of the major issues is that the review of the literature did not provide any theoretical arguments and reasoning as to how such a relationship exists. Therefore, this paper suggests that future studies into Islamic work ethics, especially in construction work ethics, to work on building strong logical arguments and theoretical studies by supporting their hypothesis and results. Moreover, future researchers are also recommended to build Islamic framework to in order to structure the values and principles of ethics in construction projects.

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THE INTEGRATION OF MOSQUES AND CHURCHES TO URBAN PLANNING OF IBADAN NIGERIA: A HISTORICAL OVERVIEW

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Abstract
In the face of the uncontrolled expansion of Nigerian towns and cities since independence, urban planners and other stakeholders have accepted that development policies for urban and rural areas have failed or have not worked as expected. Cities in Nigeria, especially, Ibadan have been observed to have changed in size, spatial organization or morphology, quality and distribution of public services and infrastructure, and in its employment base. Despite many efforts aimed at resolving the urban problems through the enactment of plethora of planning laws and regulations, the administration and implementation of these laws and regulation have been problematic, especially due to the rapid increase of religious sites (places of worship) such as churches and mosques in Ibadan. The objective of this paper is to propose a solution to the problems created by religious sites in the planning of Ibadan. The study employs a qualitative research design using survey method, with field observation as the research instrument used for data collection.

Keywords: Nigeria, Ibadan, urban, rural, mosques, churches.

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INTRODUCTION

Ibadan is located and situated in the southwestern part of Nigeria, in the southeastern part of Oyo state, about 120km east of the border with the Republic of Benin. The city total area is 1,190 sq miles (3,080km^2). The city is naturally drained by four rivers which have many tributaries i.e. streams flowing into larger lake: Ona River on the north and west, the Ogbere River towards the east, Ogunpa flowing through the city and Kudeti River in the central part of Ibadan metropolis.

In 1931, less than 7% of Nigerians lived in planned urban centres. Over a period of exactly 30 years (1952-1982), the population in significant Nigerian towns has increased. For example, in the city of Ibadan, it rose from 625,000 in 1963 to 2.8 million in 1982 (Adekilekun, 2001). The people were scattered all over Ibadan in areas that are not properly planned, and in building that are not structurally sound. More easily observable is the lack of Islamic principle in rapid urban growth in Ibadan. This paper examines the historical analysis of urban planning in Ibadan, Nigeria, from 1960 to 2010, with special emphasis on its presumed Islamic connection. It explores factors that have contributed in shaping the planning of urban settlements, in addition to the influence of local topography and morphological features of pre-existing cities such as Ibadan.

RESEARCH METHODOLOGY

This study looks into an extant historical phenomenon of an urban planning. It adopts a qualitative research design using survey method. Data were obtained through site observation and also from secondary sources. Content analysis method was employed to analyse the data.

INTEGRATION OF MOSQUES AND CHURCHES INTO URBAN PLANNING IN IBADAN

Integration of Mosques

Obviously, in view of the pledge of Islam to provide a house in paradise for whoever builds a mosque, Ibadan Muslims have individually and collectively put up structures of different sizes, designs and magnitude for praying purposes. Doi (1984), Adekilekun (2001) and Agbetola (1999) have given an account in their work of the origin, development and administration of the mosques in the southwestern part of Nigeria. Agbetola (1999), in his account writes that the early Muslims merely chose a clean spot to spread their animal skins, mostly ram, and mats to establish their prayers. Later, a marked off area with a fence made from sand emerged; "this is the Musallah, the Yoruba Ibadan called it Masalasi" (Agbetola, 1999).

> *"The Masalasi gave way to small permanent structure known as the real Masjid (English: Mosque) because it had structures and a few facilities. The development of the simple form of thatched roof hut resting on four or six*

> *forked sticks similarly gave way to one supported by mud walls. This was a real building, but with a design of open windows and door ways of no security... This structure also with time developed into modest architectural design with facilities such as modest minarets. They carried simple designs of Muslim traditional slate (Arabic Lawh) on the roof or minaret as the sign for a Muslim place of worship."*

Doi (1984) however, writes about the decorations given to mosques by the Ibadan Muslims:

> *"The decoration in the mosque buildings is simple, but most eye-catching, restrained according to the principles of Islamic art and architecture, and avoids the use of icons or even the slightest resemblance to any living animal or insect..."*

He continues:

> *"The mosques are planned with such great dexterity that at a given time, one can see only one or two decorations because of the contrast of light and shadow in the total scheme of the construction"*, (Doi, 1984).

Nevertheless, Doi (1084) also observes that some mosques were decorated with icons contrary to Islamic principles by having decorative elephants on the top of the mosques. He also claims that the icons had been removed thereafter. Agbetola (1999) also gives some pictorial views of some mosques in Ibadan and environs. However, this study contains of pictures which cut across central, community (ratibi), institutional, organizational and government house mosques in Agodi Ibadan (Doi, 1984).

However, based on observation made on site, some of the present mosques, such as the Aare Abdul Azeez Arisekola Central Mosque, Iwo-road Ibadan and Adeojo Mosque along Lagos-Ibadan express way are more impressive than those described by Agbetola (1999) and Doi (1984). Some of these mosques are even up to three-storey high. Some mosques, such as the Shamsu-suud mosque, Omowumi-Olorunsogo, Ibadan have tall minarets built using stones or concrete. Others have minarets carrying domes against the flat head of the mosques, with the demands of modern time such as parking space, social hall, and committee room (Akintola, 2004). Many mosques, particularly the early ones, do not have space for such facilities. Some of these mosques were built within compounds obviously for family use, while others were constructed close to the road and lined up in the streets of Ibadan, leaving barely trek able distance to one another. For example, the Ayegoro mosque could hardly be distinguished from residential buildings. In fact, the distinguishing factor between a part of a building used as a mosque and that used as residence is the loudspeaker which, as in other mosques, is located on top of the mosques or beside or within the

walls. There have been issues generated between the Muslim community and non-Muslims who feel that the loudspeakers are being abused by some mosques within Ibadan and other cities in Nigeria. Also, some mosques are built close to the main roads and left the road users with narrow roadway, which escalate obstructions and blockage of road during the large turnout of worshippers on Fridays and when there are some other occasions within the mosque premises (Liadi, 2001).

Church Integration

In the 1970s, when orderliness reigned in Ibadan, churches were built with maximum conformity to planning regulations, societal overall aesthetic appeal, beauty and comfort of users and neighbours (Joseph, 1997). Aside from the expansive worshipping area, ample parking spaces were provided to discourage street parking and minimize the likely inconvenience to other road users. Within the church precinct, it was conventional and traditional to find houses for the leadership and church workers, and small scale or small size commercial building to generate income to support the church activities. In some churches, complementary buildings, such as schools and clinics, which provide services to the immediate and remote communities could be found (Shope, 1954).

Between 1975 to 1979, the Ibadan population rose and church development had kept pace with this growth without any adverse effort on the urban planning system, urban infrastructure and societal psyche. Among the then prominent churches were Catholic, Anglican, Methodist, Jehovah witness, Seventh Day Adventise, Apostolic and Redeem among others. The downfall of the Nigerian economy in the 1980s and subsequent political crisis of 1993 were the impetus for a substantial number of manufacturing industries within Ibadan to terminate their productions (Iyanda, 2004). In the wake of this development, many manufacturing sites and warehouses were left vacant.

The inability of the Urban Planning Ministry to be pro-active on the best alternative uses of those abandoned premises provided a veritable platform for churches. As a result, the stretch of Oluyole estate roads to Challenge Elewura, Iwo Road to Basorun were littered with flags and banners of different churches. The conversion of the industrial premises and private houses into churches in Ibadan had created a severe traffic burden for the city since the emerging scenario was not envisaged during the presentation of Ibadan master plan. With the end of the manufacturing sector and growth of population within Ibadan metropolis, poverty incidence increased, and the cry for divine intervention became louder. Churches in Ibadan continue to expand on the old denominations as well as the erection of new ones. For example, The Redeemed Christian Church has over 100 branches within Ibadan (Kabir, 2006).

The demand for industrial premises and warehouses to be converted into churches became enormous. Consequently, the price of those premises rose to

astronomical rate and was no longer affordable, hence recourse to residential area. Although the foray is more pronounced in residential areas, it is not limited to this stretch of land or zone. Business premises such as quick service restaurants, cinemas, like Baba Sala cinema at Agbowo, and merchandising shops, were not spared. Currently, the presence of churches in residential areas within Ibadan has significantly depleted the housing stock available to the populace, in a city grappling with an estimated hundreds of thousands of housing deficits (Kabir, 2006). The situation is alarming and generating sudden fear as churches are now influencing building owners to eject their tenants to take over their apartments. The occupation range from one bedroom or three bedroom apartments in multiple apartment buildings either on long lease, contract or outright purchase from the building owners. No neighbourhood in cosmopolitan Ibadan is devoid of this phenomenon, except in the emerging higher class residential estates where there is control of church development (Kabir, 2006). As of today, the population of Ibadan has climbed to about 3 million and churches have continued to grow geometrically.

SUGGESTED SOLUTIONS

To overcome this problem, this study proposes that the Oyo State Ministry of Physical Planning and Urban Development with the Ministry of Lands, Housing and Survey in Ibadan should undertake a primary and the traditional role with the Christian Association of Nigeria (CAN) and the Nigeria Supreme Council for Islamic Affairs (NSCIA). The Ministries should engage CAN and NSCIA with a view to identify the number of churches and mosques in each residential district. At the same time, adequate resettlement and re-planning strategies must be put in place for the residents of the acquired properties, reference should be made to existing regional or local plans, and Environmental Impact Analysis of such church and mosque agglomeration must first be submitted and discussed with the stakeholders in each district.

Also, there is a need for the CAN and NSCIA to sensitize their members on the negative implications of church and mosque incursion to residential areas and to encourage them to set up a Development Control and Standardization Department within their respective organizations. All measures to improve urban planning in Ibadan will be meaningful; thus it is crucial to reverse the rattle of church depletion of housing stock through strict adherence to planning regulations and effective engagement of relevant stakeholders. It will be of utmost importance to draw attention of the Ministry of Physical Planning and Urban Development to the emergence of mega churches at the Basorun Olowo-Nla axis, also Lagos-Ibadan Expressway. If the trend and progression of church development continue, as it is in this corridor, Lagos-Ibadan Expressway may not be able in the next ten years to rival this pristine location in terms of traffic imbroglio and other social and economic crises.

CONCLUSION

Town planning has become an integral and necessary portion of governance in the modern time. In the case of Ibadan, the state government which oversees the planning and development of the city has undertaken significant efforts in ensuring the city is well planned. Nevertheless, the proliferation of religious houses in the city has undermined the planning efforts of the government. However, efforts to plan and develop Ibadan in orderly manner must continue. This paper has made several proposals on how this can be achieved.

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MODELLING WILLINGNESS TO PAY FOR IMPROVED PUBLIC TRANSPORT SERVICES: THE CHALLENGES OF NON-RESPONSE TO STATED PREFERENCE HYPOTHETICAL QUESTIONS

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Abstract

The paper focuses on the modelling attempt of willingness to pay for an improved bus service in selected cities and towns of Malaysia. Using responses from on-board intercept surveys, 1,130 samples of bus passengers have been analysed so as to arrive at a simplified model of how passengers trade off their money with possible upgrading of bus services elements. The willingness to pay among these bus riders was very low, despite the high expectation of improvements aspired by them. For service providers, fares are a function of travel time, travel distance and other operating costs. For passengers, the utility function is explained by costs, time, distance and various latent parameters. This paper highlights the significant results of chi-square analysis at various confidence levels. However, modelling the exact utility function of preferences for staggered increased in fares could not be carried out successfully at 95 percent confidence level, due to the relatively small number of respondents stating their and/or undecided response to willingness to pay for the additional fare rate. The issue of non-response to hypothetical survey questions is also raised, explaining the difficulties in modelling this choice behaviour.

Keywords: Public transport, bus, willingness to pay, frequency, increased fare.

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INTRODUCTION

Improvement of public transport services is essential in ensuring the maintenance of operation and sustenance of patronage. Among the less unattractive public transport provision is the bus service. Buses are more susceptible to congestion and incidents due to shared road spaces with other road users and vehicles, having no exclusive right of ways. For users, higher aspiration could be expected compared to rail and taxi services due to the lower comfort and convenience levels offered to bus passengers.

This paper elaborates on the passengers' expectation of improved bus services in various aspects. The case study presented in this paper is eight towns and cities in four Malaysian states of Johor, Pahang, Perak and Penang. The aim of the research is to model the willingness to pay for an increased fare rate among passengers for specific bus improvement areas. The objectives of the research are: i) to identify the socio-demographics of bus passengers in Malaysia, ii) to determine the proportion of passengers willing to pay additional fare in return of improved bus services and iii) to develop simplified model explaining such willingness.

BUS FARES AND WILLINGNESS TO PAY

Contemporary literature has been focusing on improvement of buses in various aspects of the services. The focus of this paper, is however, limited to the determination and structuring of the fare system. Basic fare system which concentrated on time and distance costs has been discussed by Turvey and Mohring (1975), and Pedesson (2003). The utility function for fare structure, has been globally set to be consisting of travel time which include both in-vehicle time and waiting time, travel distance and seating capacity.

Other factors or parameters found to be significant in determining the fare amount and structure are fleet supply or vehicular interior configuration, as well as fuel type and utilisation rate. Among these studies, O'Garra et al., (2007), Ricci, Bellaby and Flynn (2008), and Saxe, Folkesson and Alvfors (2007) have discussed the effects of fleet and vehicular aspects such as chassis, fuel, route capacity and seating or standing capacities on fare structure change.

Time variability, confidence in schedules and consistency in operation time, headways and frequency have been found to be significant in determining fare structure as propagated by Phanikumar and Maitra (2007), Hensher and Stanley (2003), Li, Hensher and Rose (2010), and Dodgson and Katsoulacos (1988).

Waiting and other support facilities and amenities are also essential in fare rate determination (Hess, Brown & Shoup, 2004). Politis et al. (2010) argued that information provision and dissemination system are also important in influencing fare structure. Latent variables such as comfort and convenient are

also deemed important in explaining the changes in fare structure and system (Espino, Roman & De Ortuzar, 2006).

Most researches have been contemporary yet were not conducted in South East Asian context, let alone, in the Malaysian scenarios. Hence, it is timely and essential that such similar study be undertaken in the Malaysian context so as to assist operators, regulators and authorities relevant to the public transport sectors to understand better the local or domestic bus fare and market structure.

METHODOLOGY

The research has deployed on-board intercept survey upon some 1,130 samples from four different states in Malaysia, namely Johor, Pahang, Perak and Penang. By 2014, National Key Results Areas of the Malaysian public transportation have been almost completely undertaken, with various initiatives and bus improvement schemes being implemented.

During the survey, passengers on board bus vehicles were approached with questionnaire survey set to be completed and returned within the respective duration of the bus trips. Questions were relating to socio-demographics, trip characteristics, perception of current or existing bus services, anticipation and aspiration of the future services and the hypothetical amount in fare increased given such anticipated improvement be implemented within stipulated time period.

Descriptive and inferential analyses have been conducted using SPSS version 23 software. The next section elaborates both analyses.

FINDINGS AND DISCUSSION

Socio Demographics

From the 1,130 samples, females were disproportionately represented, forming some 64 percent of bus passengers. With this gender bias distribution, it might be possible to expect some latent variables, including safety, security, comfort and convenience to be essential in explaining their responses, perception and choice behaviours. Figure 1 below shows the unequal distribution of age range, with higher representation (more than 30 percent) of young (20 to 30 years old) in the sample. So, it can be expected that aspiration of a modernised or state-of-the-art bus technologies are on the high. It can also be assumed that the samples represented users with a lower level of education, lower income earned and higher proportion of income being allocated and spent on transportation. Hence, willingness to pay for additional fare towards bus improvements can be expected to be relatively lower.

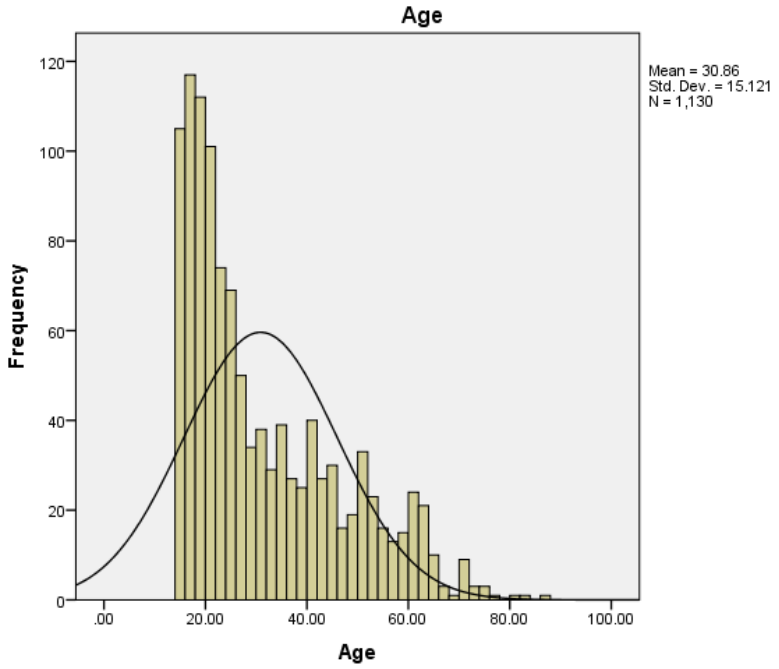

Figure 1 Respondents' Age Range

Trip Characteristics

Rides for leisure (43 percent) and commuting (38 percent) purposes on the bus were in the majority. The answers relating to fare would be expected to be very elastic because of the leisurely nature of the trips made.

Table 1 Respondents' Trip Purpose

	Frequency	Percent
Business	47	4.2
Educational	167	14.8
Leisure	490	43.4
Workplace	426	37.7
Total	1,130	100.0

About 40 percent of respondents were using the buses less than 5 days per month. In other words, they were infrequent bus riders. About 18 percent were regular passengers, using the buses almost on daily basis (more than 20 days in a month). Hence, the answers relating to fare would be expected to be very elastic due to the non-frequent usage of the bus services.

Table 2 Respondents' Current Monthly Trip Frequency

	Frequency	Percent
less than 5 days per month	452	40.0
6-10 days per month	69	6.1
11-15 days per month	113	10.0
16-20 days per month	296	26.2
21-25 days per month	86	7.6
more than 26 days per month	114	10.1
Total	1,130	100.0

Bus Conditions and Improvements Aspired

In general, passengers surveyed were dissatisfied (60 percent) with the current bus services, reflecting the possibility of lower willingness to pay for increased rate of fare. These passengers had already had negative perception of the quality of services provided and would not be in favour of any price increase. This is further supported by the list of improvements aspired by the respondents. Most remarks (31 percent) were made on punctuality, frequency, departure and arrival time. Next, they would prefer clean and comfortable vehicles (17 percent) and new or modern vehicles (10 percent). It can be said that, expectation was high of the current quantity and quality of vehicle fleet. Waiting facilities were also of great concern (7 percent). Affordability (6 percent) however, received less than proportionate attention by the respondents. Information provision and safety or security issues were also ranked lower by respondents (4 percent, respectively). Some 19 percent users did not respond to this question. It is quite common that survey of this nature to receive non-preference feedback as discussed by various authors (Sanchez & Morchio, 1992; Duffy & Smith, 2005). Refer Table 3 and Table 4 below.

Table 3 Respondents' Satisfactory Level with the Existing Bus Services

	Frequency	Percent
Dissatisfied	682	60.4
Between Satisfied and Dissatisfied	242	21.4
Satisfied	206	18.2
Total	1,130	100.0

Table 4 Respondents' Aspiration of Aspect of Bus Services to be Improved

	Frequency	Percent
On-time service and more frequent	353	31.2
Reliable and accurate information	54	4.8
Comfort and clean vehicles	195	17.3
Safe and Secure service	47	4.2
Affordable service	70	6.2
New vehicle and modern system	115	10.2
New waiting facilities and infrastructure	80	7.1

No comment or positive comment for current service	216	19.1
Total	1,130	100.0

Respondents were also asked about other preferences. The stated preference for frequency of use can be seen almost equally distributed (between 16 percent and 25 percent). Lower responses (12 percent) were gained for "never" to ride the bus again. The majority (41 percent) would prefer buses to operate between 6am and 10pm, which was a fairly appropriate service duration for a typical bus service. However, a high majority (62 percent) would like to see a more frequent service in the future, with buses arriving or departing every 15 minutes. This reflected the invariability of bus frequency that the respondents were experiencing, disclosing the issue of punctuality and headways. The speed at which most respondents (37 percent) preferred was that bus operating at 70 km per hour. Refer Table 5, Table 6, Table 7 and Table 8 below.

Table 5 Respondents' Stated Preference of Trip Frequency if Bus Services are Improved

	Frequency	Percent
everyday	260	23.0
5 days per week	276	24.4
3 day per week	182	16.1
1 day per week	278	24.6
never	134	11.9
Total	1,130	100.0

Table 6 Respondents' Stated Preference of Bus Service Duration

	Frequency	Percent
9.00am to 6.00pm	243	21.5
6.00am to 9.00pm	134	11.9
6.00am to 10.00pm	458	40.5
8.00am to 11.00pm	210	18.6
7.00am to 9.00pm	85	7.5
Total	1,130	100.0

Table 7 Respondents' Stated Preference of Bus Frequency

	Frequency	Percent
every 60 minutes	43	3.8
every 45 minutes	40	3.5
every 30 minutes	190	16.8
every 20 minutes	152	13.5
every 15 minutes	705	62.4
Total	1,130	100.0

Table 8 Respondents' Stated Preference of Bus Average Speed

	Frequency	Percent
90 km/h	132	11.7
80km/h	220	19.5
70km/h	423	37.4
60km/h	228	20.2
45km/h	127	11.2
Total	1,130	100.0

When posed with issues of priority improvements, respondents ranked high aspects related to safety and waiting facilities (29 percent). However, combined together (43 percent), issues relating to travel time, frequency and punctuality were deemed important too (Table 9).

Table 9 Respondents' Stated Preference of Prioritised Area Public Transport Improvement

	Frequency	Percent
on time	235	20.8
frequent	255	22.6
safe and facilitate with proper bus stop	331	29.3
clean and comfort	210	18.6
trained and competent driver	99	8.8
Total	1,130	100.0

A hypothetical scenario relating to fare increased in return for better and improved services was received with mixed responses. Table 10 below indicates passengers surveyed perceived that safety, comfort and cleanliness (30 percent) were the stronger aspects to be prioritised if fare was to be increased. This was followed by provision of wifi and television on board (25 percent), quality drivers (17 percent), fully seated vehicles and electronic fare system (14 percent respectively).

Table 10 Respondents' Stated Preference of Bus Services Aspects, if They Have to Pay Increased Fare Rate

	Frequency	Percent
trained and competent driver	188	16.6
safe, comfort and clean bus	337	29.8
provide wifi and tv	283	25.0
no standing passengers	162	14.3
electronic ticketing system	160	14.2
Total	1,130	100.0

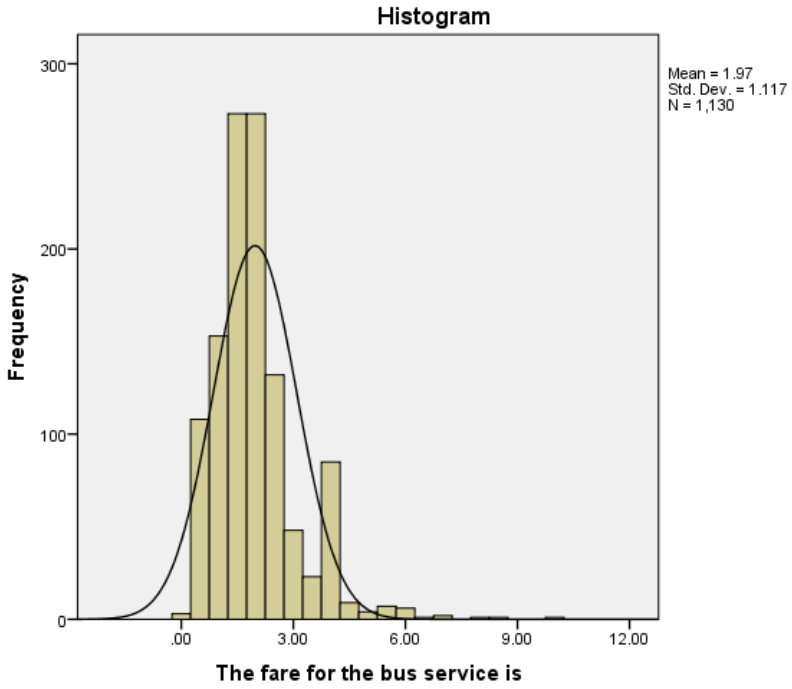

Figure 2 The Distribution of Ranges of Current Fare Paid Respondents

Current fare ranges paid by respondents was from RM0.00 to RM10.00 (Figure 2). Half of respondents (50 percent) paid between RM2.01 and RM3.00. Some 20 percent paid RM1 and less. This was followed by those who paid between RM3.01 and RM4.00 (17 percent). About 10 percent paid between RM4.01 and RM5.00. The remainder (3 percent) paid between RM5.01 and RM10.00.

When hypothetical questions relating to willingness to pay, only 64 respondents or less than 6 percent stated positive reactions (Table 11). Issues of lower responses for willingness to pay questions and their parameters have been discussed by many authors including Lui and Jansen (2017), Martinez-Espiniera and Lyssenko (2012), Manisera and Zuccolotto (2014), Gibbs Jr. and Bryant (2008) and Lietz (2008). These authors discussed the effects of social desirability, political correctness, cognitive effects and efforts, optimal relevance and attitude as hindrances to extraction of exact responses for hypothetical questions. This was especially true of questions relating to monetary, finance and fiscal elements relating to respondents' personal income and expenditure. Due to this negative reception of willingness to pay questions, it has been a challenge for the authors of this paper to develop and determine the most suitable model to reflect this choice behaviour.

Table 11 Respondents' Stated Preference of Future Increased in Fare

		Frequency	Percent
Valid	maintain current fare	1,066	94.3
	increase 10-20cent	40	3.5
	increase 30-40cent	16	1.4
	increase 50-60cent	8	.7
	Total	1,130	100.0

Willingness to Pay for Additional Fare

This section elaborates the stated preference for increased fare rate. It discusses the attempts at modelling this preferential behaviour.

Table 12 Fare Increased Preferred by Respondents Willing to Pay for Increased Fare

		Frequency	Percent
Valid	increase 10-20cent	40	62.5
	increase 30-40cent	16	25.0
	increase 50-60cent	8	12.5
	Total	64	100.0

Table 12 above, indicates that only 64 users surveyed preferred fare increase at various levels to be paid for improvement of bus services. The majority (63 percent) were willing to spend some RM0.20 for this purpose. A quarter (25 percent) were willing to pay additional RM0.40 to see bus improvements in the near future. For the 6 percent respondents who were willing to pay additional fare in return for improved bus services, the followings are the aspects of bus improvements they would like to see in the near future (Table 13).

Table 13 Bus frequency Preferred by Respondents Willing to Pay for Increased Fare

		Frequency	Percent
Valid	every 60 minutes	2	3.1
	every 30 minutes	9	14.1
	every 20 minutes	7	10.9
	every 15 minutes	46	71.9
	Total	64	100.0

For the fare increased, the majority (72 percent) would prefer to have bus service at every 15 minutes or 4 buses in an hour (Table 13). Other non-time related improvements were comfort (33 percent) and safety (23 percent). Refer Table 14 below.

Table 14 Bus Improvement Priority Areas by Respondents Willing to Pay for Increased Fare

		Frequency	Percent
Valid	increase the safety	15	23.4
	fix trip/schedule	6	9.4
	on time trip	8	12.5
	more frequent trip	8	12.5
	waiting time less than 10-15 min	5	7.8
	comfort (wifi, air-cond, etc.)	21	32.8
	to remain the current fare	1	1.6
	Total	64	100.0

Modelling

Inferential analysis for this study has been chi-square tests and a linear regression modelling for the willingness to pay additional fare. The following tables provide the analysis results.

Table 15 Chi-Square Cross Tabulation of Fare Choices (DV) * Reason to Increase Fare (IV)

	Reason to increase fare		Total
	Comfort safety and latent parameters	Travel time parameters	
increase 10-20cent	21	19	40
increase 30-40cent	9	7	16
increase 50-60cent	7	1	8
Total	37	27	64

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	3.370[a]	2	.185
Likelihood Ratio	3.844	2	.146
Linear-by-Linear Association	2.554	1	.110
N of Valid Cases	64		

Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Phi	.229	.185
	Cramer's V	.229	.185
	Contingency Coefficient	.224	.185
N of Valid Cases		64	

From the three tables above, results have shown that willingness to pay for additional fare were not significantly different for those users who preferred improvements in latent variables (comfort and safety) compared to those preferring travel-time related variables. At 95% confidence level, p-value was 0.185 (higher than critical 0.05) and Phi and Cramer's V values were small (0.229), indicating a failure to reject the null hypothesis.

Another attempt at explaining the willingness to pay additional charge was upon the headways of bus in an hour. The three tables below, show that bus headways or frequency in an hour had been significant in explaining the difference in fare increased preferred by users surveyed. The results of p-value at 0.045 and slightly higher Phi and Cramer's V value of 0.312, indicated a significant relationship between fare rate increase and bus frequency. In other words, passengers who were positive about additional fare would consider paying more for increased bus frequency or reduced headways.

Table 16 Chi-Square Cross Tabulation of Fare Choices (DV) * Preferred Bus Frequency (IV)

		Preferred frequency		
		1	4	Total
Fare choices	increase 10-20cent	4	36	40
	increase 30-40cent	6	10	16
	increase 50-60cent	1	7	8
Total		11	53	64

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	6.213[a]	2	.045
Likelihood Ratio	5.527	2	.063
Linear-by-Linear Association	1.351	1	.245
N of Valid Cases	64		

Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Phi	.312	.045
	Cramer's V	.312	.045
	Contingency Coefficient	.297	.045
N of Valid Cases		64	

Next, a simple linear regression was carried out to model the willingness to pay for increased fare, in the attempt at predicting the value for money of these respondents. The following four tables can be summarised to represent a significant model at 90 percent confidence level, with fare rate increased being positively determined by the increased in bus frequency or reduced headways (albeit lower $R^2 = 0.049$ and p-value of 0.080). The derived utility function would be as follows: Fare increased = RM0.18 + 0.347 (hourly bus frequency)

Table 17 Regression Analysis for Variables Entered/Removed

Model	Variables Entered	Variables Removed	Method
1	Preferred frequency[b]	.	Enter

a. Dependent Variable: Fare choices
b. All requested variables entered.

Table 18 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.221[a]	.049	.033	14.014

a. Predictors: (Constant), preferred frequency

Table 19 ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	623.827	1	623.827	3.176	.080[b]
	Residual	12176.173	62	196.390		
	Total	12800.000	63			

a. Dependent Variable: Fare choices
b. Predictors: (Constant), preferred frequency

Table 20 Coefficients[a]

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Model	B	Std. Error	Beta		
(Constant)	18.394	4.100		4.486	.000
Preferred frequency	.347	.194	.221	1.782	.080

a. Dependent Variable: Fare choices

RECOMMENDATIONS AND CONCLUSION

This paper has discussed the perception of 1,130 bus passengers on the current bus services in four Malaysian states. From the analysis, the users surveyed had generally negative views on the existing service provision. They were highly aspired to see more improvements on buses services, especially in the following aspects: travel time, waiting time, punctuality and bus frequency. Also receiving attentions were issues of safety, comfort and vehicles quality. Hence, these are priority areas that bus operators, vehicle suppliers, transport regulators and monitoring authorities and respective agencies related to public transport must be focusing on, when initiating pilot improvement schemes or investing in the future public transport systems.

When hypothetically faced with increase fare rates, preferences were clearly skewed towards increased frequency or reduced headways compared to other latent variables. The paper has attempted at modelling and predicting the necessary improvements in bus services, especially with regards to frequency, when the inevitable price or fare increase is to be executed by public transport operators or regulators.

All three objectives of the papers, including determining the proportion of passengers willing to pay additional fare amount in return of improved bus services, and developing a model explaining such willingness have been achieved. It is therefore concluded that, public transport passengers were willing to pay for additional fare, provided that service frequency was to be increased. This paper confirms findings of previous research by Hensher and Rose (2010), and Phanikumar and Maitra (2007). The findings were also in congruent with previous on issues faced by hypothetical questionnaire types of data collection methodology, whereby high proportion of respondents were not willing to help in determining prices or monetary values even if they possessed the expertise and experiences to answer these questions types as propagated by Sanchez & Morchio (1992), Lietz and Petra (2008) and Duffy and Smith (2005).

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HOUSING AFFORDABILITY IN THE STATE OF JOHOR

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Abstract

The Malaysian property market has been facing significant changes in terms of housing price since a decade ago and these changes are different between states. The changes in housing prices are being supported by the economic theories of demand and supply as well as the regional economic and demographic factors such as income level, housing supply stock, speculative buying and population changes. This paper provides an overview of the affordable housing policy and elaborates on the housing affordability index for the districts in the State of Johor. Using datasets for year 2012 and 2014 in order to determine the median multiple of price-income ratio, this paper found that housing in all the districts were generally unaffordable. Some districts recorded HAI of severely unaffordable, while others in the seriously and moderately unaffordable index categories.

Keywords: Property market, housing affordability index, affordable housing, Johor, Malaysia

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INTRODUCTION

Home ownership or the ability to own residential property has been a goal for many people in Malaysia. Owning a residential property provides sense of security which leads to happiness, productive and fulfilment of one's live. Moreover, home ownership will improve stability and the quality of life of the people. However, rapid economic growth of the nation has somewhat led to a surge in housing prices, making houses in Malaysia unaffordable to many of her citizens. Research by Hashim (2010), for instance, shows that price movement is influenced by the economic fundamentals, affecting purchasing power and borrowing capacity. Despite the various housing policies and strategies outlined and implemented to regulate and monitor the housing supply in Malaysia (Shuid, 2010), house prices in Malaysia keep increasing, especially in city areas. As a result, of late, housing prices and housing affordability have been a great concern to the Government of Malaysia.

The objective of this paper is to identify the affordable housing policies for the State of Johor and to analyse the housing affordability index at the district level in the state. It is hoped that the findings from this paper would contribute in making housing more affordable.

LITERATURE REVIEW

The idea of affordable housing recognizes the needs of households whose incomes are not sufficient to allow them to access appropriate housing in the market without assistance (Milligan et al., 2004). Thus, the term 'affordable housing' describes housing that assists lower income households in obtaining and paying for appropriate housing without experiencing undue financial hardship (Milligan et al., 2004).

The growth of economy and scarcity of land have caused major issues that resulted in many housing provision-related issues. As can be seen today the issues on housing affordability have been the main concerns to many agencies, political leaders, experts, public as well as governments in many countries. Although this issue is not new in Malaysia, but concrete solution has yet to be found. The problem is heightened in part because housing affordability carries different meaning to different parties. Therefore, a specific mechanism or a precise measure of housing affordability need to be considered to ensure aspired home owners can own their own houses as well as the basic need of shelter is not jeopardised.

Furthermore, housing also poses a significant impact on the competitiveness of local economy (Quigley & Raphael, 2004). Review of literature indicated that if the house price is not competitive and beyond the affordability of the locals, companies in the area will find it difficult to keep and recruit personnel as fewer families could afford to own a house and reside in the area. Unaffordable housing will also contribute to financial problems, due to

lower disposable income to finance the house mortgage (Hashim, 2010). Besides, due to tight housing market, people are unable to afford a house within or near to city centre as the prices offered are usually beyond affordability level of the people. As a consequence, households will have to reside farther from the city centre, where houses are relatively more affordable, and commute a longer distance to work in the city centre. This would result in higher transportation cost, longer journey time and exhaustion, which would reduce productivity at work place. Additionally, rising of house prices with stagnant income level will result in property overhang, where houses are left unsold.

As a rule of thumb, usually a house is considered affordable if it costs less than 30 percent of gross household income. However, this is not often the case in Malaysia. Even for houses marketed as "Rumah Mampu Milik (Affordable Houses)" by many developers in Malaysia, the price of these houses was set without referring to any established affordability fact or indexes as its basis (Hashim, 2010).

Thus, this paper aims to analyse the housing affordability index for the districts in the state of Johor so that it will become a basis or reference point in determining the price of housing which is sustainable to the population. According to a recent study by Khazanah Research Institute (KRI) Malaysia (2015), Johor has been ranked as the 9th state in Malaysia in terms of housing affordability. The housing affordability index for Johor was 4.2 in 2014, which is considered as seriously unaffordable (KRI, 2015). The index was calculated based on the median all-house price over the median annual household income. This study will focus on the housing affordability index by districts level in the state of Johor for year 2012 and 2014.

SITE PROFILE

Johor is a state in Malaysia, located on the southern part of Peninsular Malaysia and is one of the most developed states in Malaysia. The state capital city of Johor is Johor Bahru and it is adjacent to the Republic of Singapore. The total acreage of Johor is 1,898.676 hectares and it is the second-most populous state with the population of 3,230,440 people in 2010. The state is the 3rd largest conurbation in Malaysia and consist of 10 districts namely Kota TInggi, Ledang, Mersing, Segamat, Batu Pahat, Muar, Pontian, Kulai Jaya, Johor Bharu and Kluang. The districts are governed by 14 local authorities.

JOHOR HOUSING POLICY

The policy of *Dasar Perumahan Rakyat Johor* (DPRJ) or Housing Policy for Johorean were introduced in January 2014. The policies deal with several criteria related to the low cost and middle low cost types of housing. The policy proposed several types of housing components namely *Perumahan Komuniti Johor A* (PKJ A) or Johor Community Housing Type A, PKJ B, *Rumah Mampu Milik Johor*

(RMMJ) or Johor Affordable Homes and medium cost shop lot. The policy is applicable state-wide although there are some dissimilarity in housing requirements for Iskandar Malaysia as compared to the rest of the state.

DPRJ Requirements for Areas within Iskandar Malaysia

The percentage composition for low and medium cost housing within the Iskandar Malaysia is as shown in Table 1 below. Any new housing development within Iskandar Malaysia is required to provide several types of low and medium cost houses based on the categories stipulated in the DPRJ. Affordable housing should constitute a minimum of 40% of a housing development project. Out of this, 5% should be the PKJ A, which are low cost units (high-rise flats/apartments) to be priced at RM42,000 and targeted for buyers with household income of less than RM3,000 per month. 10% should be for PKJ B, to be priced at RM80,000 and targeted for those with income of less than RM4,500 per month. The RMMJ should constitute 20% and to be priced at RM150,000 and targeted for buyers with income of less than RM6,000 per month.

The requirement to provide these low and medium cost housing is to assist lower income earners to purchase houses at affordable prices. However, when compared with the household income survey for the year 2014, the average income of the people in the District of Johor Bahru, where Iskandar Malaysia is located in , is RM7,473 with a median of RM6,121 (Department of Statistic, 2015). This clearly show that 50% of the people in Iskandar Malaysia are within the medium income categories and eligible to buy these affordable houses.

Table 1 The Composition of Affordable Housing Based on DPRJ for Areas Within Iskandar Malaysia

House type	%	Floor Area (Sq. ft.)	Plot Size	Type	Maximum Selling Price (RM)	Target Household Income/month
PKJ A	5%	720 sqft	Nil	Strata	42,000	RM3,000
PKJ B	10%	850 Sqft	Nil	Strata	80,000	RM4,500
			16’ x 55’	Landed		
RMMJ	20%	1,000	18’ x 60’	Landed	*150,000	RM6,000
			20’ x 70	Town House		
			NA	Strata		
Medium Cost Shop	5%	1,200	NA	Landed	200,000	RM7,000
Total	**40% From Total Development Units**					

Source: Pekeliling Am Kerajaan Johor on Dasar Perumahan Rakyat Johor, 2014

DPRJ Requirements for the Areas Outside of Iskandar Malaysia

For areas outside Iskandar Malaysia, different affordable housing type composition and prices is applicable, as shown in Table 2 below. The main differences are in the percentage of PKJs and RMMJ, and the selling price of RMMJ and medium cost shop.

Table 2 The Composition of Affordable Housing Based on DPRJ for Areas Outside Iskandar Malaysia

House Type	%	Floor Area (Sq. ft.)	Plot Size	Type	Maximum Selling Price (RM)	Target Household Income/ Month
PKJ A	10%	720	16' x 60'	Landed/ Strata	42,000	RM3,000
PKJ B	15%	850	18' x 60'	Landed/ Strata	80,000	RM4,500
RMMJ	10%	1,000	20' x 70'	Landed/ Strata	*140,000 *150,000	RM6,000
Medium Cost Shop	5%	1,200	NA	Landed	*150,000 *170,000	RM7,000
Total	**40%**	**From Total Development Units**				

* for city council area.

Source: Pekeliling Am Kerajaan Johor on Dasar Perumahan Rakyat Johor, 2014

HOUSING AFFORDABILITY INDEX

Affordable housing is related to the ability of a household to pay for their house (EsruqLabin, 2014). The concept of housing affordability can be measured from three perspectives, namely Repayment Affordability, Purchase Affordability and Price Income Ratio (PIR). For the calculation of housing affordability index (HAI) for each districts in Johor, the PIR was used. To derive the HAIs, the median multiple formula, which makes use of the annual income and median of all house prices, was employed (Figure 1). Data on population income and house price for year 2012 and 2014 were sourced from the Department of Statistics Malaysia and the National Property Information Centre of the Valuation and Property Services Department Malaysia.

$$\text{Median Multiple} = \frac{\text{Median All House Price}}{\text{Annual Medium Income}}$$

Figure 1 Median Multiple Formula

Source: Khazanah Research Institute, 2015

The resulting median multiple scores were then compared to the housing affordability index categories as shown in Table 3 below.

Table 3 Housing Affordability Rating Categories

Category	Median Multiple
Severely Unaffordable	5.1 and Over
Seriously Unaffordable	4.1- 5.0
Moderately Unaffordable	3.1- 4.0
Affordable	3.0 and Under

Source: Demographia, 2016.

FINDINGS

Table 4 below shows the median multiple and the associated HAIs calculated for each district in Johor for year 2012 and 2014. Generally, there has been an improvement in terms of housing affordability in many of the districts from 2012 to 2014. Out of the ten districts in Johor, eight have experience improved housing affordability in 2014 as compared to 2012. For instance, the District of Kota Tinggi recorded a median multiple of 4.7 in 2014, as compared to 6.9 in 2012. This could be due to increase in median income among the population higher than the increase of median house price in the district. Other districts that experienced improved housing affordability were Ledang, Batu Pahat, Muar, Pontian, Kulai Jaya, Johor Bahru and Kluang. Despite the improvement in affordability, the median multiple for these districts were still above 3.0, indicating housing unaffordability. For example, for the District of Ledang, the median multiple for 2014 was 5.3, indicating that housing in the district was severely unaffordable despite slight improvement in the affordability index from 2012.

Two districts experienced worsening median multiple, which were Mersing and Segamat. The median multiple for Mersing was 5.7 in 2012 but worsen in 2014 to 6.1. For Segamat, it worsen slightly from 5.2 in 2012 to 5.3 in 2014. For these districts, the HAI indicated that housing in the districts were severely unaffordable both in 2012 and in 2014.

Table 4 HAI for 2012 and 2014 by Districts in Johor

District	2012					2014				
	Median Income (RM)	Annual Median Income (RM)	Median - All House Prices (RM)	Median Multiple Affordability	HAI	Median Income (RM)	Annual Median Income	Median - All House Prices (RM)	Median Multiple Affordability	HAI
Kota Tinggi	2,338	28,061	195,000	6.9	Severely Unaffordable	4,814	57,768	272,500	4.7	Seriously Unaffordable
Ledang	2,161	25,937	152,500	5.9		4,398	52,776	278,800	5.3	Severely Unaffordable
Mersing	2,437	29,241	167,500	5.7		3,253	39,036	237,500	6.1	
Segamat	3,437	41,250	215,000	5.2		4,249	50,988	270,000	5.3	
Batu Pahat	3,251	39,012	202,500	5.2		5,142	61,704	255,000	4.1	Seriously Unaffordable
Muar	2,569	30,822	140,000	4.5	Seriously Unaffordable	4,787	57,438	178,750	3.1	Moderately Unaffordable
Pontian	3,158	37,899	171,000	4.5		4,658	55,896	180,000	3.2	
Kulai Jaya	3,242	38,900	166,250	4.3		5,066	60,792	247,500	4.1	Seriously Unaffordable
Johor Bahru	4,540	54,485	221,000	4.1		6,121	73,452	288,800	3.9	Moderately Unaffordable
Kluang	3,112	37,346	149,000	4.0	Moderately Unaffordable	3,833	45,996	170,000	3.7	

Source: Researcher calculation,2016

Affordable house price for each district was then derived based on the annual median income of population of each district multiplied affordability index of 3.0. The results are as shown in Table 5. These are the maximum median house price if houses in the districts were to be made affordable to the population of the districts.

Table 5 Affordable House Prices by District in Johor based on Data for 2014

District	Annual Median Income (RM)	Median All House Price (RM)	Affordable Maximum Median House Price Based on Housing Affordability Index Ratio of 3.0
Mersing	39,036	237,500	117,108
Segamat	50,988	270,000	152,964
Ledang	52,776	278,800	158,328
Kota Tinggi	57,768	272,500	173,304
Batu Pahat	61,704	255,000	185,112
Kulai jaya	60,792	247,500	182,376
Johor bahru	73,452	288,800	220,356
kluang	45,996	170,000	137,988
Pontian	55,896	180,000	167,688
Muar	57,438	178,750	172,314

Source: Researcher calculation,2016

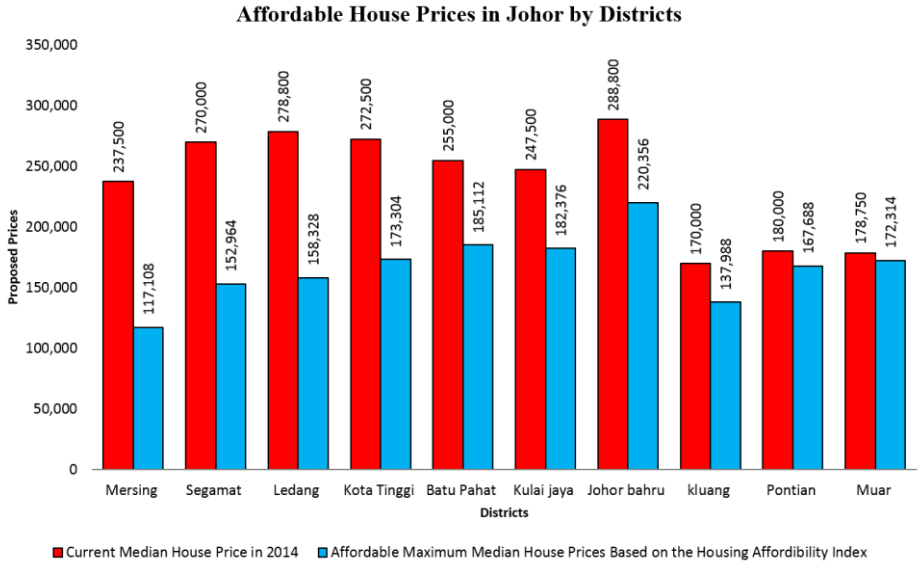

Figure 2 Affordable House Price in Johor by Districts in 2012 and 2014
Source: Researcher calculation, 2016

Figure 2 compares the actual median house price in 2014 and the derived affordable maximum median house price based on population median income. In all of the districts, the actual median house price is higher than the derived affordable median house price, indicating that housing in the districts are unaffordable given the income of the population. The difference between actual median house price and the derived affordable median house price are largest in the districts of Mersing, Segamat and Ledang. This corroborates the HAIs in Table 5 where the three districts were identified with severely unaffordable housing. Smaller difference between actual median house price and the derived affordable median house price occurs in the districts of Kluang, Pontian and Muar, all of which were identified with moderately unaffordable HAI in Table 5.

CONCLUSION

In conclusion, this paper has shown that despite the presence of affordable housing policy for the State of Johor, house prices in the state is largely higher than what the population can afford, making housing unaffordable to the population. The housing affordability index for some of the districts was worst at severely unaffordable while others were in the seriously and moderately unaffordable categories. None of the districts was found to have median house price that commensurate the population income. Although some districts experienced improvement in terms of housing affordability in 2014, the HAI of these district was still in the unaffordable rating categories.

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A REVIEW ON SUSTAINABLE WELLBEING INDICATORS FOR HUMAN INTERRELATIONSHIPS WITH THE ENVIRONMENT

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Abstract

The environment should appear not only as a commodity to humans but as an inspiring source that appeals to humans' ethical ability. In Malaysia, studies concerning factors influencing pro-environmental behaviours are vast. However, studies on interrelationships between humans and the contextual surroundings are scarce. Towards achieving sustainable well-being, it is undoubtedly important for humans to have conforming emotions, behaviours, cognitions and motivations towards the environment. This study intends to identify the determinants of human values and ethical behaviour concerning the environment towards developing a theoretical framework of interrelationship between human and environment.

Keywords: sustainable well-being, human interrelationships with the environment

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INTRODUCTION

This study is a part of an ongoing research to discover variables of sustainable well-being for Malaysia at the local scale. Sustainable well-being in simplest understanding means to pursue well-being without compromising others' abilities to pursue their well-being (Kjell, 2011; Kajikawa, 2008; O'Brien, 2008). The term 'others' refer to all living and resourceful beings. This study recognizes 'others' as humans and environment. Variables of sustainable well-being manifests in human interrelationship with other humans and human interrelationship with the environment (Kjell, 2011). The term 'interrelationship' refer to mutual reliance between two groups, which in this case (i) between human and other humans, and (ii) between human and the environment. The variables are practical for national and international use in measuring the readiness and the extent of efforts of everyday practices towards sustainable well-being at the local scale. This paper focuses on theoretical exploration of the interrelationship between human and environment.

The natural resources have fulfilled many of humans' basic needs, such as water, food, materials and shelters. In return, human activities have been exploiting and polluting the environment (Kajikawa et al., 2007; Yarime, Takeda & Kajikawa, 2010). The principal reason for this alarming issue is that humans have conceptualized the natural environment as the resources of utility and commodity (Kjell, 2011). Environment ought to inspire human's ethical ability. In pursuit of sustainable well-being, it is vital for humans to have conforming emotions, attitudes, cognitions and motivations that relate to their contextual environment (Kjell, 2011; Krajhanzl, 2010; Horayangkura, 2013). The ethical ability refers to positive human engagements with natural surroundings reflected in norms, lifestyles and outdoor skills (Krajhanzl, 2010). This paper demonstrates the theoretical framework of human interrelationship with environment towards developing the intended variables at the local scale. The variables serve as quantifiable indicators of mutual reliance between human and environment.

This paper discussed examples of findings from recent environmental studies from the year 2010 onwards to capture the variables involved in human interrelationship with the environment. This paper was presented at 2015 Asia Pacific International Conference on Environment-Behavior Studies. In association with the conference's follow up journals, the environmental studies were gathered from published articles of ajE-Bs and jABs. The purpose of limiting the sources is to establish parameters in determining the patterns of recent findings on human-related environmental studies, particularly in Malaysia. The selection of the papers depends on the relevance of the papers in examining the human-environment concerned issues as well as the addressed dynamics and factors involved in human interrelationship with the environment.

SUSTAINABILITY AND HUMAN WELLBEING

Environmental sustainability acknowledges to the balance between the rate of depletion of natural resources and replenishment of natural resources (Schultz, 2002). Common scientific research fields that concern on environmental sustainability are forestry, fisheries and agriculture (Kajikawa et al., 2007; Yarime, Takeda & Kajikawa, 2010). A number of authors found that there is a lack of study on the relations of well-being with mentioned research fields (Yarime, Takeda & Kajikawa, 2010; Kjell, 2011). Sustainability research objectives include the pursuit of happiness of both present and the future generation (Kajikawa, 2008). There is a large number of authors that recognize well-being within sustainability (Kjell, 2011; O'Brien, 2008). However, the nature of the "well-being" has not been clearly explained (Horayangkura, 2013). Therefore, profound understanding of well-being from the view of sustainability research is in need.

The significance of sustainable well-being lies in the interdependencies between a variety of interaction processes and systems (Lele & Noorgard, 1996). As asserted by O'Hara (1998), every so often human interaction systems are in tension and not mutually compatible. Interdependencies can be a result of well-being that is sustained at another's expense. The studies of social context illustrated how one person's well-being may source from ill-being of others, which in reverse is also true (Lele & Noorgard, 1996; O'Hara, 1998; Lazarus, 2003; Kjell, 2011). Thus, interdependencies between human and the contexts which he acts in are a significant measure of sustainable well-being (Lazarus, 2003; Horayangkura, 2013). The theories of sustainable well-being suggested that sustainable well-being is achievable through supportive and congruent interaction system (Kjell, 2011; Krajhanzl, 2010; Lazarus, 2003). In other words, for well-being to be sustained, the entities in the interaction system must also achieve compatible and cohesive wellness. The entities, for the most part, are people and environment.

Sustainable well-being between human and environment is achievable when humans and environment are supportive of each other and relied on one another for mutual wellness. As achieving human well-being growingly followed by environment ill-being, the interrelationship between human and environment rise in pressure. Among recognized causes of this pressure are sheer neglectfulness, lack of knowledge and experiences and hesitant to change attitudes and lifestyles (Krajhanzl, 2010). However, there are more to the barriers of environmental ethics. Other factors which lack in academic discussions are individual personality, intentional and unintentional interaction with natural environment, and external conditions such as economic constraints and cultural roots (Krajhanzl, 2010; Lim, 2011; Delima & Zaman, 2012).

Therefore, more theoretical understanding and observable indicators are necessary to comprehensively discern the interrelationship between human and

environment. The following subsections discuss on common findings of human-related environmental studies as well as dimensions and factors influencing human interrelationship with the environment. The outcome is used to develop quantifiable subjective indicators of human interrelationship with the environment suitable for Malaysia.

RELATED ENVIRONMENTAL STUDIES IN MALAYSIA

Human-related environmental studies refer to broad interdisciplinary academic fields that investigate the interaction between human and environment in the attempt to provide a solution to complex issues. The study fields cover topics relating to the natural environment, built environment, behavioural studies relating to the environment and the relationships between them (Knight, 2015; Delgado, Aceituno & Loaiza, 2015). Horayangkura (2013) stresses the need for profound theories and observable measures on human interrelationship with the environment for architectural designs. The field of environmental psychology can assist to elucidate understanding of interrelationships between human and environment for more people-centric built environment. According to Krajhanzl (2010), the dynamics of human interaction with the environment is a very wide web. The model cannot be static, but it changes from time to time as determinants of the interrelations between human and environment evolve. Table 1, Table 2, Table 3 and Table 4 summarized findings from human-related environmental papers in ajE-Bs and jABs.

Table 1 Environmental Behaviour

Summary of Findings	Authors
Inception of ecopsychology elements in environmental education increases attitudes towards environment.	Kamidin et al., 2010
Gender and parents' education levels have no effect on conservation behaviour. Urban and rural strata and faculties have a linear effect on conservation behaviour.	Asmuni et al., 2010
Students preferred the convenient modes of transportation: personal cars over the public transports due to needs and constraints.	Singhirunnusorn et al.2011
Recycling attitudes cannot guarantee recycling behaviour. Consumers with high collectivistic values have high recycling behaviours than consumers with high materialistic and individualistic values.	Abdul Latif and Omar, 2012
Knowledge, attitude and recycling behaviour have significant and positive correlations.	Singhirunnusor et al., 2012
Sense of community and place develops willingness to take responsibility for more than their immediate surroundings.	Laurens, 2012
Situational factor has significant and direct effect on both recycling behaviour and intention to recycle. Intention to recycle is a partial mediator in linking situational factors to recycling behaviour.	Abdul Latif et al., 2012

Communication barely occur between designers and building users. Due to continual cultural factors and adaptations, inclusion of environment-behaviour in architectural practices seemed impossible.	Horayangkura, 2013

Table 2 Outdoor Environment

Summary of Findings	Authors
The community believed that it was necessary to maintain stability of social life to provide peace and stability to the forest.	Zahari et al., 2010
Users feel safe in surrounding with vegetation that was well maintained, not dense, provided a clear view, clean and spacious. Gender and age had no significant relationship on personal safety in public park.	Maruthaveeran, 2010
Influential factors affecting house value were (i) variety of park elements, (ii) conceptual or design of the park, (iii) distance to the park, (iv) views towards the park, and (v) active areas in the park facing the house, respectively.	Othman & Nawawi, 2010
The lower the satisfaction levels of the patients due to bed positioning in relation to window and inaccessibility to outdoor garden, the longer their recovery process.	Ghazali & Yusoff Abbas, 2011
There exist positive and strong correlation between diversity of green infrastructure and (i) physical well-being, (ii) cognitive well-being, and (iii) social well-being.	Mansor et al., 2012
The pre-test indicated there was a relationship between people's accessibility to green open space and their corresponding social health and behaviour. Most of respondents showed very few cases on physical symptoms, stress, and anxiety disorder.	Singhirunnusorn & Sahachai-saeree, 2012
Stimulation of natural elements is statistically effective on (IV) and (i) flexibility of functions, (ii) play-participation, and (iii) curiosity (DV).	Faizi et al., 2013
Urban-rural strata, age and gender had significant effect on outdoor walking speed. Walking distance and walking time were dependent on physical ability, stamina health, and availability of pedestrian space, visual appropriateness, and obstacles.	Azmi et al., 2013
Park users were equally distributed among gender and age groups which implied safety and implausibility of unwarranted juvenile. Human behaviours response to the physical setting of the park.	Ngesan et al., 2013

Table 3 Environmental Policy

Summary of Findings	Authors
Failing to enforce regulations due to limited resources had increase pressure on SWM industry and intensify barriers to residents' participation in recycling and waste separation. Awareness and behavioural change were crucial to improve the situation.	Lim, 2010
EEC of Malaysian managers was statistically explained by (i) regulation aspects, (ii) financial aspects and (iii) stakeholder information Costs of environmental efforts help to lower cost of operations, reduce environmental impact and improve corporate image. Stakeholder involvement impart pressure and promote awareness.	Delima & Zaman, 2012

Table 4 Environmental Stress and Pollution

Summary of Findings	Authors
Environmental stressed are statistically related to housing size, surrounding living area and exposure to natural disaster. Housing size	Sahari et al., 2012
Improper construction process and procedures during alterations of houses often resulted to issues to the house and surrounding areas. This include natural environment, health and quality of life.	Isnin et al., 2012
There exists simultaneous relationship between per capita income and per capita pollutant emission.	Borhan et al., 2013
People living in tropical climate such as Malaysia adapted to higher temperature, more humid and less breezy conditions.	Nasir et al., 2013

The tables summarize the findings and highlight important variables involved from the selected articles of human-environmental studies. The pattern of the summary suggested that a majority of the studies tend to examine socio-psychological aspects of human-environment relations. The findings provide understanding on how human-environmental studies are conducted and the dynamics or relationships between the variables tested in the research. Highlighted key variables from each article can be used to formulate the indicators of human interrelationship with the environment.

DIMENSIONS OF HUMAN-ENVIRONMENT INTERRELATIONSHIPS

Dimensions of human interrelationship with environment refer to the locations where variables of human interrelationship with environment manifested. That is the settings or conditions to which interaction between human and environment occur. Human interaction with the environment can be influenced by internal factors and external factors (Krajhanzl, 2010). Internal factors refer to the physical and the mental aspects of the individuals while the external factors refer to the environmental surrounding of the individuals. Internal factors vary from personality and lifestyle, commitment and ability while interacting with nature and responsible behaviour towards the environment. External factors vary from

legalities, cultural and social values, public amenities and economical aspects. There are four dimensions of human interrelationship with the environment. The first dimension is Individual Personality which manifests in lifestyle, life values and personal qualities (Schwartz, 1992; Nickerson, 2003; Krajhanzl, 2010; Kamidin et al., 2011; Krajhanzl, 2010). The second dimension is Interaction with Nature which manifests in the need to interact, norms, commitment, abilities and skills relating to natural environment (Kaplan & Talbot, 1983; Gifford, 1997; Kaiser, 1999; Bell et al., 2005; Bechtel & Churchman, 2002; Krajhanzl, 2010). The third dimension is Environmental Behaviour which manifests in sensitivity, concerns and behaviour towards environment (Schmuck & Schultz, 2002; Bechtel & Churchman, 2002; Clayton & Myers, 2003; Krajhanzl, 2010). The fourth and final dimension is External Control which manifests in economic development, legalities, physical context, cultural roots and social values (Bechtel & Churchman, 2002; Saunders, 2003; Krajhanzl, 2010).

Potential Indicators of Human-Environment Interrelationships

Based on the literature reviews and findings from articles in ajE-Bs and jABs (Refer to Table 1, Table 2, Table 3 and Table 4), the potential subjective indicators are developed (Refer to Table 5) and categorized under the four dimensions of human interrelationship with environment.

Table 6 Potential Indicators for Human Interrelationships with the Environment

Dimen-sions	Manifesta-tion	Potential Indicators	Sources
Indivi-dual Perso-nality	Lifestyles, life values and personal qualities	Levels of consumerism, materialism, collectivism and individualism, extent of voluntary modesty, conformity and indolence, sense of control.	Kamidin et al., 2011; Kamarul Zahari et al. et al., 2010;
Interac-tion with Nature	The need to interact with nature, norms, commit-ment, abilities and skills relating to natural environ-ment	Personal health in association with surrounding, time spent in open air, presence of natural objects at home, extent of exposure to nature during work hours, able to cope outdoors physically, emotionally and intellectually (relating to skill and knowledge), used to various types of weather and common outdoor temperature, able to see and hear what others miss, notice scientific details, in harmony with nature, able to recall experiences with nature.	Kamidin et al., 2011; Kamarul Zahari et al. et al., 2010; Maruthaveeran, 2010; Shukur et al., 2010; Mansor et al., 2012; Singhirunnusorn and Sahachaisaeree, 2012; Faizi, et al., 2013; Azmi, et al., 2013; Ghazali & Mohamed Yusoff Abbas, 2011; Ngesan et al., 2013; Nasir et al., 2013

Environmental Behaviour	Environmental sensitivity concerns, and behaviour	Motivated to understand and preserve nature and environment, acquire whole range of pro-environmental habits, concern on environmental damage, willing to reduce needs for the preservation of environment, involved in public activities or political programs.	Asmuni et al., 2011; Singhirunnusorn et al., 2011; Abdul Latif et al., 2012; Singhirunnusor et al., 2012; Laurens, 2012; Singhirunnusorn et al., 2012; Horayangkura, 2013
External Condition	Economic development, legalities, physical context, cultural roots and social values	Affordability, availability, common collective needs, environmental pollution and stress, waste handling, animal abuse, traditions, moral rules, religious and value system, influence of organizations and employers, availability of conducive environment, current environmental condition, traffic infrastructure, civic amenities, waste management regulations, and enforced laws.	Kamarul Zahari et al. et al., 2010; Lim, 2011; Delima & Zaman, 2012; Sahari et al., 2012; Isnin, et al., 2012; Borhan et al., 2013; Nasir et al., 2013

Table 5 shows the potential indicators of human interrelationship with the environment which are yet to be statistically confirmed. The potential indicators are gathered from the literature reviews and summarized findings of selected articles. The potential indicators are organized under dimensions of the interdependencies between human and the environment. The dimensions are the location where the indicators are found. The manifestation indicates the expression or demonstration of the dimensions. Finally, the indicators proxy the manifestations and dimensions of the interdependencies. In other words, the indicators provide ways for the interdependencies between human and environment to be gauged.

CONCLUSION

This exploratory review focuses on developing potential quantifiable subjective indicators of human interrelationship with the environment at the local scale. The literature review is important to establish understanding of operational terms and variables in the theory of human interrelationship with the environment. The review also distinguishes the determinants and the dimensions of the interdependencies. Previous studies which attempted to determine relationship between human and environment have assisted this research to recognize important factors and potential indicators for the interdependencies. The indicators are valuable to measure the readiness of the locals in embracing sustainable well-being in their lifestyle. The indicators are also useful to indicate

the extent of current lifestyles that incorporates relations between human and environment. Other opportunities of use include additional indicators for the environmental component in the current national well-being reports. The indicators serve as helpful data for policy review, which before was difficult to evaluate due to lack of unquantifiable data (MWR, 2013).

This study is a part of an ongoing research to develop sustainable well-being model for Malaysia. The limitation of this paper is the lack of empirical data to statistically prove the presence of dimensions of human interrelationship with the environment. The study will also need to assess more relevant and reliable publish academic sources especially from social indicator research towards finalizing the subjective indicators of human interrelationship with the environment. Apart from establishing potential indicators, reviewing ajE-Bs and jABs articles enable the researcher to distinguish the pattern of human-related environmental research particularly in Malaysia. The next challenge of the study is to substitute the potential indicators into questionnaire inquiries in comprehensive yet concise manner, which are understandable to the targeted respondents. During the analysis stage, the dimensions of the interdependencies between human and the environment will be the latent variables and the finalized indicators will be the observed variables. The data obtained and analysed from the questionnaires will determine if the dimensions of human interrelationship with the environment do in fact multivariately correlated and contribute to sustainable well-being.

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YOUNG PROFESSIONALS' HOUSING AFFORDABILITY THROUGH HOUSING PREFERENCES IN KUALA LUMPUR AND A REVIEW ON THE MEANS-END CHAIN MODEL

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Abstract

In a broad-spectrum, housing affordability issue is interrelated to young professional's well-being. However, this paper deliberated on young professional's housing preference in affordability context by taking into account some attributes of housing preference criteria. Data was obtained through questionnaire survey among 50 respondents aged between 25 and 35 years old and working in various professional fields in Kuala Lumpur. Descriptive analyses were then undertaken on the data from the survey. The study found that security criterion is the highest priority in housing preferences among the respondents. Having Wi-Fi is the second most important criterion. Additionally, this paper also provides a conceptual review on the Means-End Chain model.

Keywords: Housing preferences, affordability, young professional, Means-End Chain model

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INTRODUCTION

A house is beyond a shelter. It also plays important role in the design of psychological significance and economic well-being and individual wealth (Bourne, 1981). Due to this reason, a house has evolved from a mere shelter to a preference. Housing affordability among the young generation has become precarious circumstances. Youth Access (2007) views that young people struggle over housing affordability issues, as they are more likely to experience rented housing and homeless issues as compared to other groups. In dealing with housing preferences, young professionals also experience housing affordability limitation.

RESEARCH OBJECTIVE

Firstly, the study aims to identify young professionals' housing preferences through descriptive analysis. Secondly, the study aims to provide a conceptual review on the Means – End Chain (MEC) model.

LITERATURE REVIEW

Young Professional

In Malaysia, young professionals are referred to as graduates who have a Diploma or Bachelor Degree qualification. To elaborate the young professional cohort, age is another criterion that should be emphasised, although from international point of view, there is no consensus on the definition of youth based on age. The United Nations suggest that youth cohort refers to people aged 15 to 24 years while other studies have defined youth age is not later than 35 years old (Ministry of Youth Affairs and Sports India, 2014). On the contrary, from Malaysia's perspective, youth are those aged between 15 and 40 years. Because of the large range of the age, some scholars suggested the youth category is further divided into early youth comprises those 15-20 years old, middle youth 21-24 years old and late youth 25-35 years old (Hamzah et.al., 2007).

Overview of MEC Model in Housing Preferences

A review of housing affordability literature is considered voluminous. However, young professionals' affordability was not measured in these studies, but they were asked directly about affordable housing prices. When they make a decision to buy a house, they need to consider the housing preferences since it could be reflected on affordability.

Initially, MEC model has been applied to consider user's motives and found widespread application in marketing and consumer behaviour studies to identify consumer's value based on the choices made (Gutman, 1982). It has also been accepted broadly in various fields for its versatility (Zachariah & Mohd Jusan, 2011). Even though MEC model adaptation in housing study is considered

still at the infancy stage, it has been found to be a worthy method to identify housing preferences.

The MEC model was introduced by Gutman (1982), and its function is to understand value of product or service. The key point of MEC model is that consumer's option for achieving the desired consequences and minimalising the undesirable consequences. In a similar vein, some scholars posit that MEC is associated with attributes of good to achieving objectives and values (Coolen, Boelhouwer & Kees, 2002). The "means" in the model are product or service in which consumers employ such as buying, consuming and reading. Meanwhile, "end" is valued states of being such as satisfaction, happiness, etc.

The MEC model structure associates attribute (A), consequences (C) and values (V) as shown in Figure 1. The theory is accepted in the study of housing preferences as it depicts how a house buyer makes a decision based on housing attributes and the consequences of the usage of prospect housing and finally the buyer's value.

Figure 1 MEC Model Structure

Briefly, attributes in the chain explain the product or services' features, which some argue that attributes are signified as perceptible characteristics of a product (Veludo-de-Oliveira, Ikeda & Campomar, 2006). Meanwhile, consequences are referred as effects of product use or, in other words, consumer's positive or negative responses towards product consumption (Lin, 2002). Values are viewed as life's drives, which motivate people to function in their actions (Gengler, Mulvey & Oglethorpe, 1999). Adaption of the MEC model in measuring housing preferences has been extended from the original approaches by using quantitative method namely the laddering interview instead of depending merely on depth interview.

METHODOLOGY

The review of the MEC model was based on information from published previous studies, which was obtained through literature review. The housing preference of young professional, on the other hand, involve the use of questionnaire survey to obtain primary data from respondents. For the survey, young professionals aged between 25-35 years old (late youth) in various professional fields such as academic, architecture, engineering, banking and legal practice in Kuala Lumpur were given a self-administered questionnaire. The respondents were required to rate the housing attributes that they desire. The housing preferences attributes considered in this study comprises locational attributes which are access to the public transport and proximity to the places of occupation, shop and community services, parklands, and friends or family. Availability of facilities were also

considered including having a garden, shopping mall, Wi-Fi, self-service laundry, religious facilities, restaurant and sports facilities. Neighbourhood attributes such as a sense of community, security, privacy and quietness were also considered. A 5-point Likert scale, ranging from "Not Important" to "Critically Important" was used. Additionally, the affordable housing price or rent was also asked to identify their affordability.

The convenience sampling technique was applied in the survey. Initially, one hundred survey forms were handed out but only 70 were returned. Out of this 70, 20 were incomplete, leaving only 50 questionnaires for analysis.

RESULT AND ANALYSIS

Respondents Background

Table 1 illustrates the respondents' characteristics in this survey. In terms of living quarters, the analysis found that a majority of the respondents (52%) lives in an apartment, followed by terraced house (30%) and other type of houses (10%). Over half of them (62%) are renting and about 24% live in their parents' house. Only 10% of the respondents own a house. In addition, about 68% of respondents have three-bedroom home, regardless of renting or owned.

Table 1 Characteristic of Respondents

	Frequency	Percentage
Gender		
Male	17	34
Female	33	66
Age		
25-30	19	38
31-35	31	62
Marital status		
Single	25	50
Married	24	48
Divorced	1	2
Education level		
Bachelor Degree	24	48
Master Degree	22	44
Doctor of Philosophy	1	2
Other	3	6
Professional Level		
Undergraduate degree	23	46
Postgraduate degree	25	50
Professional qualification	2	4

Housing Affordability

In terms of affordable housing price, 41% of the respondents agreed that they can afford a house priced between RM150,001 to RM200,000. Meanwhile, 27% of them felt that they can afford a house priced between RM200,001 to RM250,000,

8% can afford a house priced between RM250,001 to RM300,000. 10% of them agreed that they can afford a house priced between RM300,001 to RM350,000. For a house priced more than RM350,000, less than 10% of the respondents felt that they can afford it. On the other hand, 4% of the respondents felt that they can only afford a house priced RM150,000 and below.

In terms of affordable rent, 35% of the respondents are willing to pay RM501 to RM700 rental monthly. The percentage became lesser as the rental rate becomes higher.

Housing Preferences

Almost all of the respondents (98%) desired to buy a house. Only 2% preferred to rent. Additionally, 82% of the respondents intended to buy a house to live and only 18% intended to buy a house for investment. Based on current affordability, most of the respondents responded that they live in an apartment, regardless of owned or rented. However, they desire to stay in a terraced or semi-detached house in the future.

The respondents were also asked about their preferences for house size. 44% of them wished to have spacious house (more than 1,100 sq. ft.), 28% preferred to stay in a house of 701 – 900 sq. ft. and 901 – 1100 sq. ft. respectively. Houses with less than 700 sq. ft. was not preferred by any of the respondents (Figure 2).

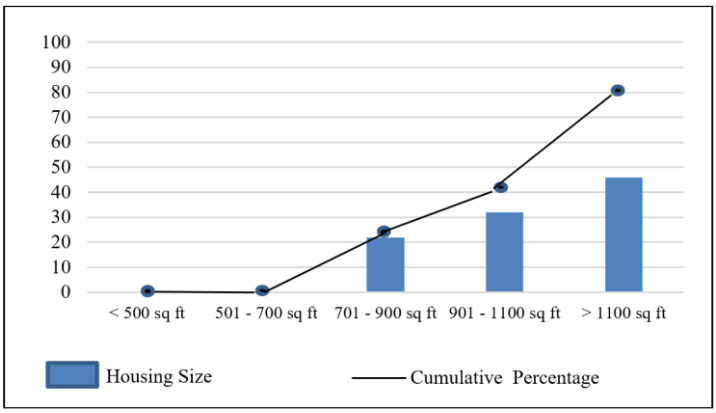

Figure 2 Housing Size Preferences

Additionally, the respondents were required to indicate the importance of housing criteria as illustrated in Figure 3. Number 1 to 16 in Figure 3 represent the house criteria. Whereas, number 0 to 4 is the axis to measure the degree of importance of the housing criteria, where four (4) is the highest degree of importance and zero (0) is the least degree of importance. In this analysis, the preference on the housing criteria is explained based on respondents' salary category.

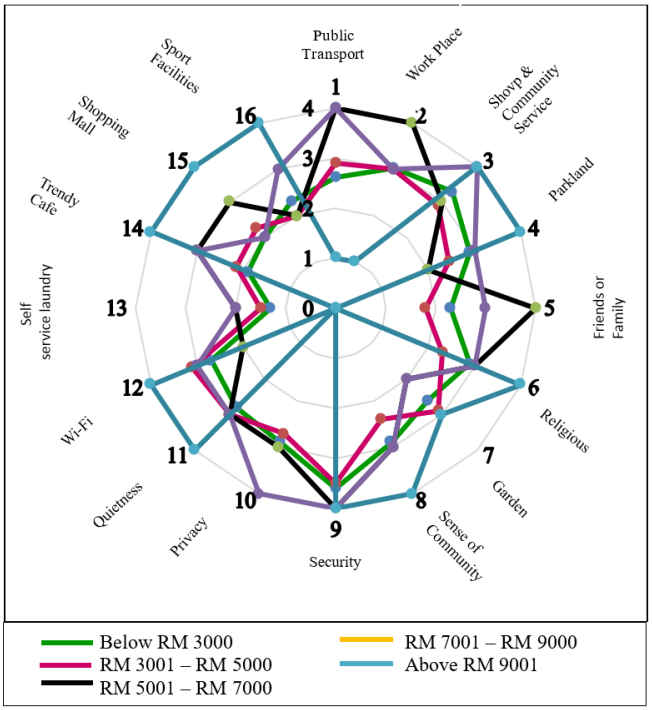

Figure 3 Importance of Housing Criteria

In overall, security criterion is the most important criterion among the respondents from all salary categories. However, respondents from three salary categories (RM5,001-RM7,000, RM7,001-RM9,000, and RM9,001 and above) have highest preference on security criteria at level 4 degree of importance while the respondents from other salary categories rate security at level 3.5 degree of importance.

Besides security, respondents also preferred houses with proximity to the shop and community service. Respondents with salary of RM7,000 and below have strong preference on this matter at about level 3 degree of importance, but those with salary of more than RM7,000 rated this criterion at level 4 degree of importance.

Availability of Wi-Fi was also important among the respondents. Respondents from all salary categories, except the RM5,001-RM7,000 category, indicated that Wi-Fi is important to them at level 3 to 4 degree of importance. The importance of Wi-Fi was almost identical to the proximity to the workplace criterion, where most of the respondents also rated it as important criteria at level 3 to 4 degree of importance. Only respondents with salary of RM9,000 and above did not rated this criterion as important in choosing a house.

Respondents in the highest salary category, which is RM9,000 and above, have high preference in many criteria such as proximity to shop and community service, parkland, religious facilities, sense of community, security, quietness, Wi-Fi, trendy cafés, shopping malls and sports facilities. They rated all these criteria at level 4 degree of importance.

Other criteria such as such as parkland and open space, religious facilities, quietness, a sense of community, privacy and proximity to public transport cannot be ignored as these are also needed by young professionals. All of these criteria averaged level 3 of the degree of importance. On the other hand, respondents rated facilities such as shopping mall, sports facilities, trendy cafés and garden or yard were only proved as moderately important house criteria. Other criteria such as proximity to friend or family, and self-service laundry were even less important, averaging about level 2 degree of importance.

CONCLUSION

In conclusion, this paper has explored the young professional's housing preferences. Young professionals have been chosen as the respondents since their contribution in human capital is considered significant and potentially affect the nation's economy growth. On that note, affordable housing is vital to improve the wellbeing of young professionals. Home is no longer perceived as only a shelter, but also importantly, with the right criteria it provides comfort and good quality of life.

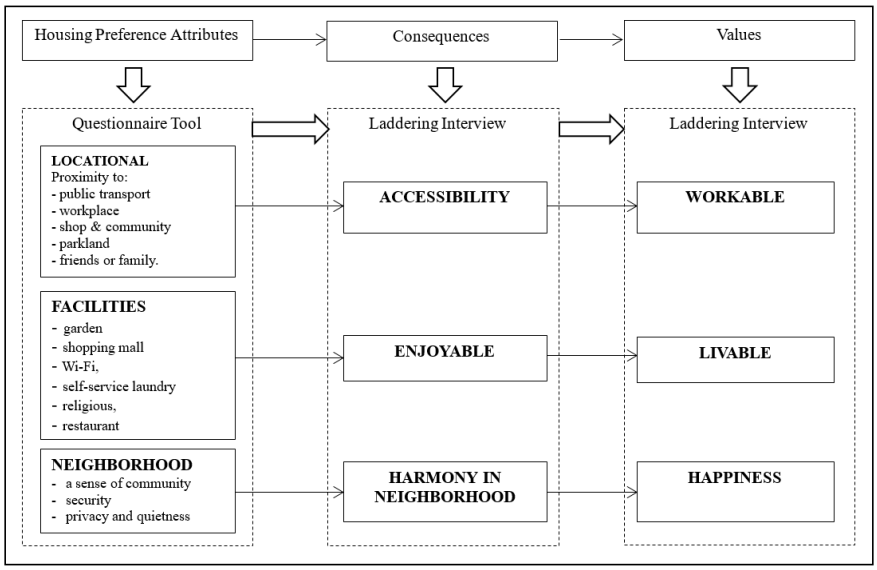

Figure 4 Proposed Extension of MEC Model on Housing Preferences Study

This paper also provided a brief review on the MEC model. It is suggested that the model be employed in further housing preferences research. Even though the MEC model was established quite a while ago, it is still considered to be at infancy level in housing research (Zachariah & Mohd Jusan, 2011). Coolen's (2002) study on housing preference was probably the first attempt to adapt the MEC model to housing preference studies. The MEC model is also recommended to be expanded by applying the laddering technique, since the technique is useful for studying the complexities of consumer's cognitive structures. By expanding the model technique, it can be combined with survey question by asking the housing attributes, before proceeding with the laddering interview (Figure 4). Previous scholars also highlighted that the MEC approach is able to divulge the unseen choice behaviours (Zachariah & Mohd Jusan, 2011). Therefore, the MEC model is well suited as a method for determining both objective and subjective features of housing environments and consumers' choice behaviours respectively.

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LOCAL LEADERSHIP MODEL TOWARDS A RESILIENT CITY IN SEMARANG MUNICIPALITY

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Abstract

This study assessed local leadership necessary for developing city resilience in the phase of more escalating, complicated and critical disaster phenomenon. The study departed from an assumption of the need for an effective and creative model of local leadership in order to transform risks into resilience, so that the city possesses a local capacity to develop Semarang as the resilient city. Leadership competency can be taught and trained by a leadership education and training under the Center for Education and Training of the Provincial Government of Central Java. Learning premise and practice of the leadership education and training in this study was formulated as follows: (1) Why was the leadership of Semarang Mayor unable to improve effectiveness of state internal bureaucracy towards city resilience?; (2) How was the model of local leadership necessary to develop Semarang city resilience?; and (3) What learning model of leadership education and training was effective to educate and to train the effective and creative bureaucratic leaders? Using a case study based qualitative approach, this study resulted in as the followings: (1) the mayoral leadership concerning hazard and city resilience issues was proven effective, but was unable to improve the effectiveness of the state internal bureaucracy due to structural conflict; (2) local leadership model related to disaster and city resilience issues that can be applied to Semarang Municipality is a congruent model with public-private partnership approach; and (3) the effective learning model that can be applied to the leadership education and training is a constructivist learning model with an intuitive approach.

Keywords: Local leadership, city resilience, constructivistic, leadership training and education

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INTRODUCTION

Semarang Municipality is a city familiar with disasters due to its geographical condition. The city is unique and specific, composed of coastal area at the "lower city zone" and highland at the "upper city zone". The coastal area is prone to such disasters as elevation of sea level, tidal flood, abrasion, and erosion, to mention some. Whereas, the highland has been identical with landslide, land movement, hurricane, drought, and flood due to high rainfall.

Previous studies (2009-2011) have proven that prior to 2010, effort from the municipal government of Semarang to overcome the disastrous conditions were technical, short-termed, and not integrated within medium- and long-term city planning. A study by Bisrie, Salim and Suroso (2011) revealed that Semarang became the coastal city in Indonesia with the most vulnerable of disaster. The Resilient City 2015 workshop identified shocks and pressures faced by Semarang. The determination of priority was done according to the 100RC tools by considering risk levels and probabilities. The workshop identified six major shocks currently faced by Semarang (Table 1):

Table 1 Disaster-Related Conditions in Semarang Municipality and Their Impacts

No.	Shock	Major sub-mover	Main dimension
1.	Heavy flood	Ecosystem and asset management	Leadership and strategy
2.	Fire	Ecosystem and asset management	Environment and infrastructure
3.	Landslide	Ecosystem and asset management	Leadership and strategy
4.	Dengue hemorrhagic fever (DBD)	capacity and facility of public health service	Health and social welfare
5.	Drought	Ecosystem and asset management	Environment and infrastructure
6.	Stability of raw material supplies	Provision, storage, and distribution	Economy and social

Strategies and actions promulgated within the City Resilience Strategy had been performed under the co-ordination of the Working Group for the Resilience of Climate Change of Semarang Municipality, an *ad hoc* and multi-stakeholder team formalized by the Mayoral Decree of Semarang Municipality. The success of managing risk, adapting and mitigating disasters in a sustainable manner is affected by leadership, in particular the municipal leader (the mayor) and his or her municipal bureaucratic staff. Etzioni and Gross (1985) explain that a leader can be divided into two categories: formal and informal. Informal leaders are individuals with ability to control the others/followers by attribute, characteristic, and leadership capital derived from his or her personal strength. On the other hand, informal leaders are those having power due to his or her position, which, in turn, becomes the leadership requirement to influence the others, differing his or her from the "non leaders".

Leadership is an art/way and/or ability to influence the others, to direct attitudes of subordinates or groups, to have particular abilities or proficiencies as required for obtaining organizational or group objectives (Kartono, 2003). Leaderships refers to three important aspects namely (1) leading process, (2) all leading activities or behaviours, and (3) ability to influence the others to perform particular duties determined by the leader for the group or organization objectives (Williams & Cudjoe-Braithwaite, 2012).

In case of the current study, local leader is defined as a formal leader's leadership due to his or her strategic role and function in determining city (urban) development. By positional authority, formal leader is capable of mobilizing participation and collaboration of informal leaders and civil society to mutually develop local capacity for developing the city resilience.

The focal point of the local leadership comprises three leadership aspects namely (1) political leadership by the municipal leader (the mayor) and his or her bureaucratic leadership and staff, (2) professional and/or managerial leadership by professionals and/or higher education institutions, and (3) community leadership by community/civil society, non-government organization, autonomous institution and private sector leaders. Figure 1 illustrates the perspective of local leadership.

Figure 1 Local Leadership Perspective

Local leadership has an important role to develop local capacity to build a city resilience in order to decrease and to manage risk, to adapt, to give response, and to mitigate impact as well as to restore from damage and/or loss due to disasters. Towards this end, the local leadership is urged to integrate efforts of decreasing and managing the risk and adaptation of the disasters by planning the spatial development at short-, medium-, and long-terms.

The purpose of developing the city resilience can only by achieved when the city is considered as a system where good urban governance is found.

The substantive meaning of the good urban development from the perspectives of disaster and city resilience are as follows: (a) the municipal government of Semarang becomes a conceptor, initiator, and implementor of policies on the local capacity building towards the development of a "resilient city" based on local identity, directing towards the actualizing "local identity", a situation that identifies localities of the city (geography, history, characteristics, and culture). These aspects become the foundation of the local capacity building; (b) local capacity building is achieved by productivity and growth in political, economic, social, and cultural aspects; (c) development efforts must allow participation of stakeholders and/or civil society at the stages of decision-making, planning, implementation, and evaluation; (d) development results, in forms of productivity and growth, must not be achieved by ignoring principles of equality and harmony in economic, social, and environmental aspects; and (e) urban system development must agree with the principles of good urban governance.

RESEARCH METHODOLOGY

This study applied a qualitative research method with a case study approach. The author assessed data with a comparative analysis, in a reflective manner, and followed it up with comparing interpretation translated into codes and categories.

Research Design

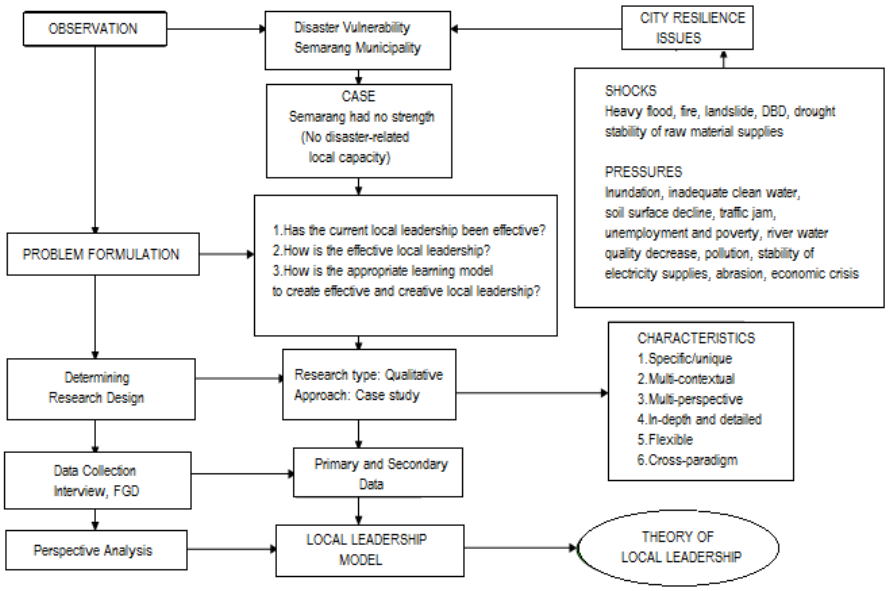

Figure 2 Research Design
Source: Remenyi et. al. (1998); CIPG elaboration by Budiati (2015)

Conceptual Framework

A conceptual framework is a result of the author's thought about problems currently assessed and discovered to get the problem solution. It is a dialectical accumulation of vary activities, i.e. observation, seminar, workshop, and focus group discussion (FGD) concerning shocks and pressures faced by the city of Semarang due to hydro-meteorological and climate change disasters. The empirical reality observed was ecological damage footprints and vulnerability of the city towards the disastrous conditions, which had demanded the need for developing a sustainable, resilient city. Figure 3 illustrate the research conceptual framework.

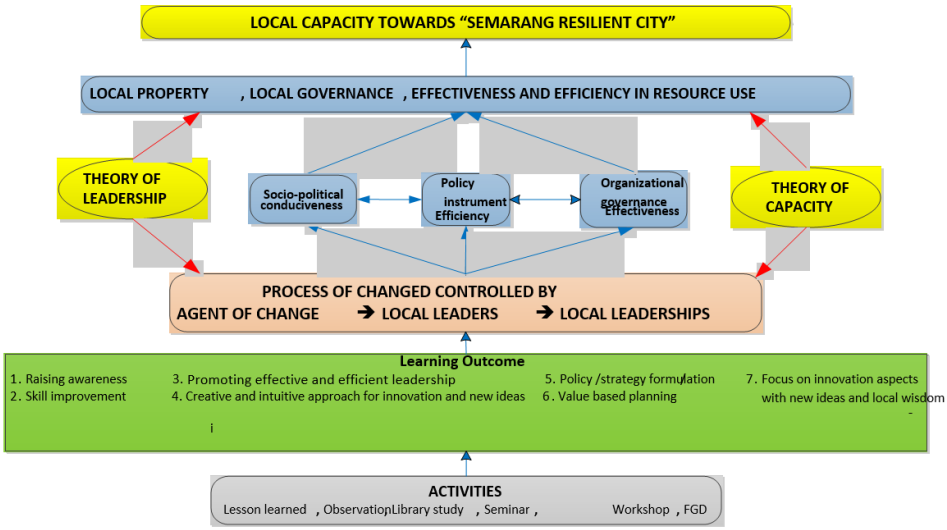

Figure 3 Conceptual Framework

RESULTS AND DISCUSSION

According to the Working Group for the Capacity of the Semarang Municipal RC Team (Municipal Government of Semarang, 2016), at sectoral level from the perspectives of disaster and city resilience, the effectiveness of the Semarang Mayor concerning the disaster (chronic shocks and pressures) had been in line with the reality, as the followings:

a) Evaluation and control of risk and adaptation to climate change impact
b) Financial and program aids from central government, international donors, and partner countries
c) Adaption and mitigation of acute shocks and chronic pressures (construction of folder, retention pond, critical area conservation, river stream restoration/west riverbank)
d) Development of strategy and roadmap for city resilience
e) Initiative of Semarang RC program

f) Establishment of Semarang Municipal RC Team

At the larger scope, the FGD results proved that the leadership of the Semarang Mayor had not been effective to build the local capacity necessary for developing the city resilience, as proven by the following empirical facts:

a) Citizens of Semarang and the Performing Work Unit (SKPD) had not known and understood city resilience and/or Semarang RC programs
b) The implementation of the retention pond construction in Muktiharjo for overcoming flood and social aid project for poverty alleviation had not been accountable and been prone to corruption;
c) Programs/projects dealing with disaster control by the Municipal Disaster Prevention Agency (BPBD) and other concerned SKPDs were not integrated in a single package;
d) Lacking data and information of disasters. The available data were only understood by their makers.
e) "Alert Village" Program (*Program Desa Siaga*) promoted by the BPBD to build the preparedness and response of the community to the disasters was perceived as a subsidiary or grant project. Therefore, the BPBD was required to allocate funds by the community.

In case of BPBD of Semarang Municipality, the performance ineffectiveness is not merely caused by the poor influence and ability of the mayor to motivate BPBD to perform its principal duty and function effectively, but also due to internal gap because BPBD itself also lacks of instrumental efficiency by its structural construction. The BPBD structure is built upon *Perka BNPB 3/2008* on the establishment of BPBD and *Permendagri 46/2008* on Guide for Organization and Work of BPBD.

The FGD held on March 31, 2016 found that the ineffectiveness of the mayoral leadership for building the local capacity for developing a resilient city was due to the following factors:

a) The government tended to focus on policy or program during and post disaster. the policy only had a single purpose with a limited scope in particular disaster, such as flood. The implementation of the policy on flood in Semarang were as follows: early warning system, river sedimentation removal, road raising, and retention pond construction.
b) From the perspective of a city as a system and disaster context, the policy and program implemented by the municipal government of Semarang had not been effective because of lacking the good local/urban governance with the following principles: inclusion, productivity, locality, and sustainability. The program/project dealing with the flood was initiated by the government using the local budget (APBD) and/or the national budget (APBN) and had a single purpose to overcome problems related only to the flood.

c) Social transformation where the citizens mobilize vertically and take part into the city planning did not occur. The mayoral policy flow was to-down and the aspiration and opinion flow of the citizens was bottom-up. Both flows were not integrated into a compromising point by mutual consent to make a decision of the city planning.
d) Gap between the effective mayor performance and ineffective local stage bureaucratic performance can be explained by the theory of situational leadership. According to Hersey and Blanchard (1998), the maturity of the subordinates (bureaucratic leadership under the mayor) is at the lowest level (unable and unwilling) to follow up and implement the Semarang RC program.
e) The position of the mayor as a political leader at the top of the hierarchy of the state bureaucratic structure at the local level, which manages the structural officials from the echelons IV to II, were generally career positions. This situation might lead to structural gap from authority distribution of the functions in the bureaucratic structure.
f) The establishment of the Semarang Municipal RC Team was *ad hoc* in characteristic. In other words, it was outside the bureaucratic structure. Thus, the Semarang RC program was unknown and lacking objective realities as the mutual agenda and goal.

Table 2 Ineffectiveness of Policy of Semarang Mayor

No.	Cause of ineffectiveness	Current condition of Semarang Municipality
1	Practical politics in planning	Some policies of the Semarang Municipality were incremental, incomprehensive, lacking preventive efforts. The government tended to focus on policies or programs during or post disaster. The comprehensive policy may result in good result or effect because of rational thinking process supported by complete data or information. It is expected to guarantee the sustainability of the policy.
2	Limited data and information	From the aspect of policy transparency, the government was not active in socializing the policies on the city resilience. the citizens should have managed to access the information from either conventional media or social media. For example, the policy on license and surveillance of ABT in Semarang was relatively unclear.
3	Ego sector	Confusing programs caused multi-interpretative programs with similar substances.
4	Programs/ activities were not aspiring, participative, and inclusive.	A program or policy must be inclusive by involving and providing opportunities to all stakeholders to give their opinions, complaints, and to determine the role and contribution towards end result. Implementation in Semarang Municipality still needed an improvement of the citizens' active participation. Private sector was expected to enlarge its role by co-ordinating with the government and the community/civil society with an integrated effort towards a much better policy implementation.

5	Poor monitoring and evaluation	The importance of monitoring and evaluation of the implementation of a policy or program as the main indicator for finding out to which extent the program has been achieved, along with its obstacles and the solutions. The poor monitoring and evaluation became an obstacle for the Municipal Government of Semarang to implement its policies, such as that of dealing with Underground Water (ABT) license. The license had been strict by a prohibition at the red zone, but the monitoring and evaluation in practice must be actually performed to prevent violations.
6	Capacity of *ad hoc* institution	Institutional networks were not integrated in the planning process, as evidenced by authority and program overlapping, causing the lacking focus of the program. A grand design should have been made available and mutually agreed by concerned parties, i.e. the government (Bappeda, BPBD, and concerned institutions), private, and community.

The Semarang Municipal RC Team had managed to develop an organizational structure, which composes of three local leadership, i.e. political leadership (the mayor), professional leadership (academics/higher education), and community leadership (civil society), as well as private sector, as illustrated by Figure 4.

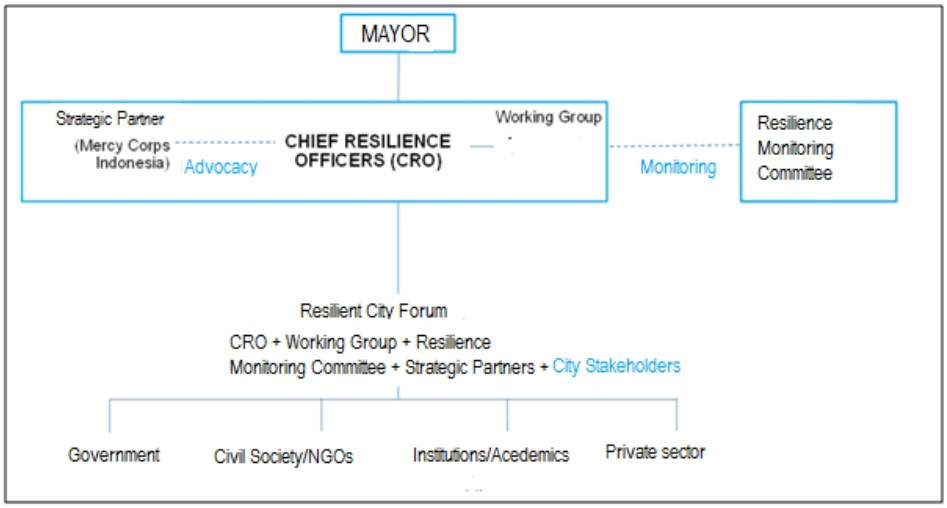

Figure 4 Organizational Structure of Semarang RC

The above organizational structure represents a policy networks at the program level with a public-private partnership. The problem will be how to make the program performance effective towards an optimal outcome. The main function of the local leadership, in particular the mayor, becomes a key factor to the successful program. However, the empirical reality proved the otherwise.

Handayani (2015) found that the support of the municipal government of Semarang to the implementation of the 100 RC program was not significant and "business as usual", without any innovation.

The involvement of the stakeholders through development plan meeting (*Musrenbang*) was ineffective and exposed by challenges. The developmental pattern tended to elitist, technical, partial and project oriented with short-term paradigm. In such condition, the local leader as the "agent of change" is necessary.

The 100 RC contains formal (the government) and informal (non-government and civil society) organizational components. Therefore, a leadership model that integrates both component area needed. The formal organization of Semarang Municipal Government was structural (the functions were composed systematically in a hierarchical structure). Whereas informal organizations were functional (non-hierarchical structure). The difference in the organizational characteristics had created gap prone to counter-productive conflicts. The delineation of both components can be done by adopting a congruent model introduced by Nadler and Tushman (1997) modified by the program need.

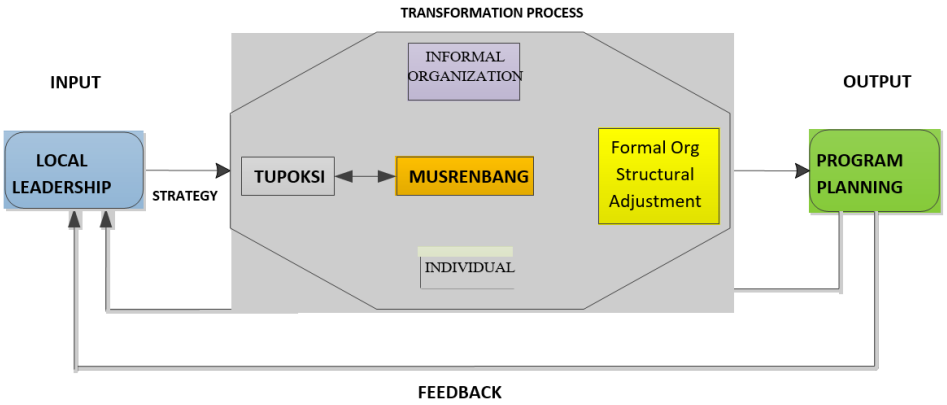

Figure 5 Local Leadership Model

At the input stage, there were components of local leadership, i.e. political leadership the mayor), professional leadership (professional organizations and higher education), and community leadership (civil society and NGOs). At the transformation stage, the strategy was transformed by the SKPD's principal duty and function as planned. At the output stage, work/program plans were established by a full support from the communities. The program/work plan implementation was monitored and evaluated in concert as feedback to the local leadership.

New pattern of Leadership Education and Training is a learning model based on experience by the State Administrative Agency (LAN) to replace the

old pattern. The New Leadership Education and Training demonstrates a novelty that fulfilled the requirement as an innovation. The innovation was actualized as planned and systematically towards greater outcome, greater benefit, greater impact, cost effective, lesser risk, lesser resources, and greater performance. The novelty in the New Leadership Education and Training compared to the Old Leadership Education and Training is illustrated in Table 3 below:

Table 3 Novelty of New Leadership Education and Training Model

Dimension	**Old Leadership Education and Training**	**New Leadership Education and Training**
Policy	Output-oriented participant competency	Outcome-, integrity-, innovation- and collaboration-oriented networks
Paradigm	Administration	Public service
Approach model	State centred (by State Administrative Agency, LAN). Domestic approach model	A combination between state centred, pluralistic, and transnational (intermestic) approach models
Provision	Off-campus education and training unavailable	Off-campus education and training available
Learning	Behaviouristic, cognitivistic, competence-based learning	Constructivistic – *experience based learning*
Change project	Unavailable	Available
Coach & Mentor	Unavailable	Available
Passing output	100%	Less than 100%
Networks concept	Unavailable	Available
Intensity of collaboration between institutions	Low	High

Constructivistic learning model applied to the New Leadership Education and Training had been adequate. However, the implementation had not been effective as expected. The problem lied in the leadership substance as taught and trained by the education and training program. Towards the 21st century, the leadership model contains new leadership values to answer the current threats and questions.

CONCLUSION AND RECOMMENDATION

Based on the findings, it can be concluded that:

a) The leadership of the Semarang Mayor related to disaster and city resilience had been effective but yet unable to improve the effectiveness of the state internal bureaucracy due to structural conflict.
b) The local leadership model that could be proposed for developing a resilient city towards the Semarang RC was a partnership-based congruent model, in which public and private sectors co-operate to implement a city resilience forum.

c) The ideal learning model applied to the Leadership Education and Training was constructivist with an intuitive approach.

Recommendations to be proposed according to the findings of this study were as follows:

a) As a regulator, the municipal government of Semarang must re-evaluate its policies and programs for aiming targets in line with the actual needs. The municipal government must also perform periodical monitoring and evaluation over the policies and programs transparently for their sustainability.
b) As a facilitator, the municipal government of Semarang has to make effort to improve community awareness of the importance of the city resilience by socializing and updating issues, programs, achievements by means of official website, printed and electronic mass media, and social media networks.
c) There is a need for integration and co-ordination between formal organization (the government) and informal organizations, either internally (inside the administrative border of Semarang Municipality) or externally (areas nearby the city), in order to manifest local leadership for the successfully implemented city resilience program and policy.
d) Citizens of Semarang are expected to participate in activities dealing with decision-making, in particular those related to the city resilience, either in the planning, implementation, monitoring, or evaluation processes.
e) There is a need for mobilization and recognition of actual roles played by private sector by a co-ordination in planning and utilizing the CSR programs in integrated, transparent, and sustainable manners.

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SIDEWALK ACCESSIBILITY AT MELAKA'S TRADITIONAL STREETS FOR PEOPLE WITH DISABILITIES (PwDs)

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Abstract
The accessibility of street as a social arena that fulfils the need for people with disabilities (PwDs) is an important consideration in the urban design of an area. With the rising number of PwDs in Malaysia, this aspect of street design is even more critical. This paper evaluates the accessibility level of sidewalk along Jalan Hang Jebat, Melaka to PwDs. On-site access audit simulation was carried out. Actual PwDs were engaged for the simulation. It was found that the sidewalk in inaccessible to PwDs due to presence of barriers and the design of the sidewalk itself. This paper suggest that the minimum requirement of MS1184:2014 must be implemented in the sidewalk design and the concept of 'shared space' can be adopted in the study area.

Keywords: Traditional street, accessibility, public space, access audit, people with disabilities (PwDs).

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INTRODUCTION

In urban design, street is an indispensable element in shaping a city. Lynch (1960) identifies street as 'path', which is one of the main elements of urban design. The importance of street can be seen from its appearance and its function as 'public open space' where it becomes a major node as an arena for various social activities such as relaxing, walking and chatting. Important streets generate their own individual character, which are mainly evident in old and traditional cities and towns (Abdul Rahim et al., 2014; Sulaiman, Shamsuddin & Anwar, 2007; Bashiti & Abdul Rahim, 2015).

Streets should also cater for the people with disabilities (PwDs). This is to promote similar level of accessibility to PwDs as to the general public. The consideration of PwDs' needs in street design is even more critical now, especially when the statistics from the Jabatan Kebajikan Masyarakat (Social Welfare Department) show an increasing trend in the number of PwDs in Malaysia (Bashiti & Abdul Rahim, 2015). Similarly, Ja'far (2015) and Mohd Hussain et al. (2016) also state that the number of application for PwDs cards/passes in Malaysia is also increasing.

Abdul Rahim et al. (2014) propose that a sustainable design for accessibility should be considered in all of our physical development in order to make our cities world class. Accessibility in the built environment is increasingly relevant to Malaysia, not only to prepare for the ageing population and PwDs, but also for the whole population at large. In order to understand the best way to include the widest range of users it is necessary to recognise the range of abilities that must be served and hence to be able to prioritise their different needs (Harisson & Dalton, 2013). Universal Design, having moved on from 'barrier-free' design, embraces more diverse needs than just providing for people with disability and recognises that in everyone's life course various forms of disability will be experienced, with differing degrees of seriousness. Perhaps one of the greatest advantages of adopting universal design principles is that they are inclusive of everyone, and not just providing for 'special needs' users or thinking merely of a 'barrier-free' environment.

In a more local context, Mohd Hussain et al. (2016) agree that the needs of PwDs have received attention from all parties since their number keeps increasing year by year. It is thus vital to provide proper planning and design guidelines to ensure that this group of people have the opportunity to access the environment (Ja'afar, 2015). Moreover, improved accessibility enhances the value of the built environment, thus creates a place or street that facilitates the people to have a better quality of life (Kose, 2014).

It is important that street environment, especially of the traditional streets, is accessible to all group of people including PwDs. Traditional streets are places of legacy. By having access to the streets, their legacy would be enjoyed and experienced by the people including PwDs and also tourists. Thus,

this paper analyses the level of accessibility for PwDs to sidewalk of a traditional street design by referring to the minimum design requirements provided in Malaysian Standards MS1184:2014.

METHODOLOGY

Jalan Hang Jebat, which is located in the Historical City of Melaka, was selected as the study area. The Historical City of Melaka is one of the heritage site listed under the UNESCO World Heritage Sites. The Jalan Hang Jebat is a popular street in the City, which is frequented by locals and tourists alike. The street is lined with old shophouses on both sides. Sidewalks separate the street from the shophouses.

Data was obtained through access audit simulation, in which actual PwDs were employed to conduct the simulation on-site. Access audit is an examination of an existing building, including its facilities and services, against pre-determine criteria to assess its usability. The main objective of access audit is to study the accessibility level of a place (in this study, Jalan Hang Jebat) in order to aid the planning, design and improvements so that the objective of inclusive and universal use may be achieved (Mohd Hussain et al., 2016; Jabatan Kebajikan Masyarakat, 2014).

The simulation was carried out with actual disabled persons from three categories; elderly (including frail person), visually impaired and mobility impaired persons. These three categories were selected because they are the most significant category of the PwDs (Harrison & Dalton, 2013; Shamsuddin & Sulaiman, 2008). The objective was to test how well the outdoor street environment performs in terms of access and ease of use by these groups of users. Six PwDs were engaged for the simulation, with two PwDs per category. They are well trained in conducting access audit and simulations identify the types of barriers and dangers to PwDs in an area that may be unforeseen by urban designers, architects and city planners.

Checklist form was pre-prepared and used during the audit simulation. Elements of accessibility that were observed included curb cuts, tactile walking surface indicator (TWSI), pedestrian crossing and general obstructions. All identified problem areas were photographed as evidence and used in data analysis. Consequently, semi-structured in-depth interviews were conducted with the participants of the audit (the six PwDs) to gain information on their perceptions towards the accessibility level of the study area. Data from the simulations were compared to the Malaysian Standards MS1184:2014 in order to identify the level of accessibility. Colour codes were used to denote access level of the study area: (i) red (inaccessible), (ii) yellow (moderately accessible) and (iii) green (accessible). These approaches have been used by other researchers in conducting access audit simulation such as Zen, Abdul Rahim & Abu Bakar (2012), and Ja'afar, Sulaiman and Shamsuddin (2012).

RESULTS

One of the main outputs of the access audit was a layout plan of the study area indicating the accessible routes along the Jalan Hang Jebat. For the study area, five main pit stops were identified along the street (Figure 1). The destination to each point was analysed, measured and marked. The results of the access audit are as in Table 1 below.

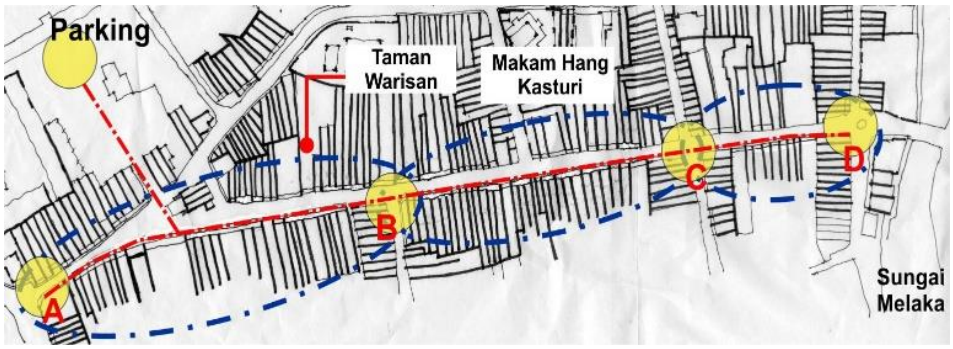

Figure 1 Journey of PwDs Base on 5 Main Stations

Table 1 Sidewalk Accessibility at Jalan Hang Jebat to PwDs

Component & Spaces	**Disability**								
	Wheelchair user			Visual impaired			Crutches / walking with stick / elderly		
Sidewalk	✓			✓			✓		

Legend:

Level of Accessibility	**Colour Code**
Accessible	
Moderately accessible	
Inaccessible	

Based on the access audit simulation, several obstructions were identified. It was found that the location of street lamps and vehicle that were parked on the sidewalk have obstructed the movement of PwDs (Figure 2) especially the wheelchair users and the visually impaired persons. According to the PwDs, *"The location of lamp post in the centre of sidewalk obstructs the movement of people, especially the PwDs. There are also vehicles parked on the sidewalk and this irresponsible behaviour has created difficulties for people to walk along the sidewalk, especially PwDs. I think people who illegally parked their vehicles should be penalised."*

Moreover, poorly designed and poorly maintained sidewalk also posed difficulties to the visually impaired persons and the wheelchair users (Figure 3). Poor design includes irregular width of the sidewalk, especially the portion where

the sidewalk is too narrow. Width of sidewalk is also affected by peddlers and shop owners using the sidewalk to display their merchandise. Poor maintenance include broken surface of the sidewalk and missing tiles from the sidewalk surface.

Figure 2.1 Obstructive Elements Along The Sidewalk: Lamp Post

Figure 2.2 Loading Activities Obstructing the Accessibility of Sidewalk Especially for Wheelchair Users and Visual Impaired Persons.

Figure 3.1 The Width of Sidewalk is Narrow at Some Locations

Figure 3.2 Poor Maintenance of Pavement Surface Create Barriers for PwDs

RECOMMENDATIONS

The information emerged from the access audit simulation indicates that the overall level of accessibility for PwDs at Jalan Hang Jebat is poor (inaccessible) especially for wheelchair users and visual impaired persons (Table 1). Thus, this paper recommends that the universal design approach based on the minimum requirements of the MS1184:2014 is implemented in the study area.

According to MS1184:2014, the clear minimum width of sidewalk should be 1500mm (Department of Standards Malaysia, 2014) (Figure 4). Therefore, this paper suggests that the street lamps should be relocated away from

the sidewalk. At the same time, strict enforcement of traffic rules must be implemented to penalise and discourage people from parking their vehicles on the sidewalk.

The narrow width of sidewalk also obstructing the movement of the PwDs. One of the reason of narrow sidewalk in the study area is because of limited area. Thus, it is recommended that in cases where sidewalk width cannot be provided at the minimum of 1500mm, then sidewalk should not be provided at all. Instead, the concept of 'shared space' can be implemented where movement priority is accorded to pedestrians (Figure 4). Previous research shows that motor vehicles will slow down in shared space area because drivers will have to be aware of the pedestrian movement (MPMBB, 2010). In some cases, the 'shared space' can be transformed from street into pedestrianized area with limited vehicle access.

Other measures to improve sidewalk accessibility in the study area to PwDs must also be implemented. These include regular maintenance of the sidewalk and the restriction to shop owners and peddlers to use the sidewalk to display their merchandise.

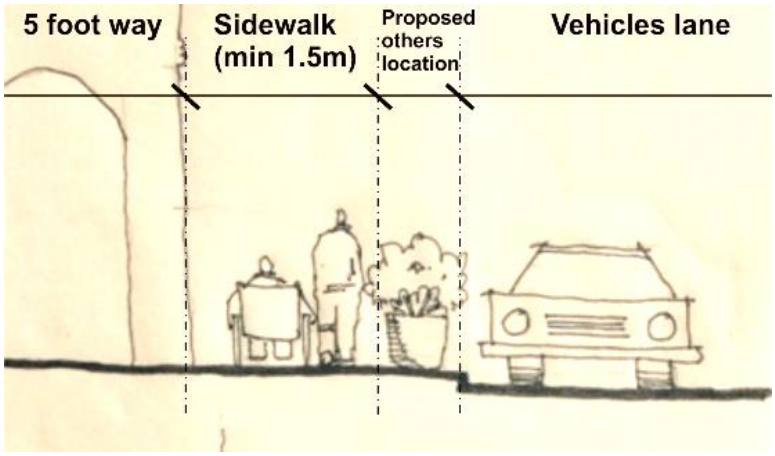

Figure 4.1 Minimum 1.5m width of sidewalk without any obstacle

Figure 4.2 An Example of Shared Space Approach

CONCLUSIONS

This paper has shown that despite the provision of sidewalk in the study area, it is not accessible to PwDs because of the existence of barriers and obstructions on the sidewalk, as well as the design of the sidewalk itself. This paper recommends, among others, the implementation of 'shared space' concept in the study area in order to ensure accessibility to PwDs. At the same time, the access audit which was conducted with actual PwDs proved to be reliable and useful.

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   Halimaton Saadiah Hashim & Rahimah Abdul Aziz
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   Rahimah Abdul Aziz, Halimaton Saadiah Hashim, & Ibrahim Komoo
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   Che Aziz Ali & Tanot Unjah
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   Sarah Aziz, Halimaton Saadiah Hashim, Rahimah Abdul Aziz, Chan K. L. Geraldine & Tanot Unjah
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   Ong Puay Liu & Sharina Abd Halim
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   Rahimah Abdul Aziz & Ong Puay Liu
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   Chan K. L. Geraldine, Halimaton Saadiah Hashim & Sarah Aziz
10. Participation towards Heritage Conservation: Case of a Fishing Community in Langkawi Geopark
    Sharina Abdul Halim, Ong Puay Liu, Nurhafizah Yussof & Lim Choun Sian

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1. Determinant Factors of Neighbourhood Quality
   Norainah Abdul Rahman, Dasimah Omar & Abdul Ghani Salleh
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   Saniah Ahmad Zaki & Jamalunlaili Abdullah
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   M. Zainora Asmawi

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   Ahmad Nazri Muhamad Ludin, Norsiah Abd. Aziz, Nooraini Hj Yusoff & Wan Juliyana Wan Abd Razak
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   M. Rafee Majid, Jamal Aimi Jamaludin & Wan Yusryzal Wan Ibrahim
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   Wan Yusryzal Wan Ibrahim, Ahmad Long & Ariva Sugandi Permana
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   Soheil Sabri, Ahmad Nazri M. Ludin & Foziah Johar
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   Ariva Sugandi Permana, Norsiah Abd. Aziz & Abd. Razak Jaffar
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   Nabila Abdul Ghani, Muhammad Zaly Shah Muhammad Hussein & Safizahanin Mokhtar
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   Foziah Johar, M. Rafee Majid, Abdul Razak Jaffar & Adi Safyan Yahya
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   Faizah Ahmad, Ibrahim Mohd., Syra Lawrance Maidin, Rosilawati Zainol & Norzailawati Mohd Noor
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   Norhaslina Hassan, Noor Ismawati Mohd Jaafar, Raja Noriza Raja Ariffin, Asnarulkhadi Abu Samah & Mohd Nazari Jaafar
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   Shuhana Shamsuddin & Natasha Azim Hussin
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   Normah Abdul Latip, Nurwati Badarulzaman, Azizan Marzuki & Mohd Umzarulazijo Umar
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   Syahriah Bachok, Mariana Mohamed Osman, Ummi Aqilah Khalid & Mansor Ibrahim
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   Norzailawati Mohd Noor, Alias Abdullah & Mohd Nasrul Hanis Manzahari
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   Wan Nurul Mardiah Wan Mohd Rani
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   Intan Afida Mohamad Amin & Halimaton Saadiah Hashim
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   Illyani Ibrahim, Azizan Abu Samah & Rosmadi Fauzi

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   Alamah Misni, Sakurah Jamaluddin & Siti Mazwin Kamaruddin
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   Mongkol Khan & Syed Zainol Abidin Idid
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   Benika Morokuma
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    Neha Saxena & Chidambara
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    Taku Nohara, Yu Okamura & Susumu Kawahara
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    Sule Abass Iyanda & Mohammad Abdul Mohit
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    Muhammad Faris Abdullah, Alias Abdullah, Rustam Khairi Zahari & Samsuddin Jaafar

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   Mozhgan Samzadeh, Zunaibi Abdullah, Saari Omar & Aniza Abdul Aziz
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    Muhammad Azzam Ismail, Karam M. Al-Obaidi, Raha Sulaiman
12. Preferences of Student Residents Towards Sustainability with The Concept of Bioclimatic Design
    Adi Ainurzaman Jamaludin, Hazreena Hussein, Nila Keumala & Ati Rosemary Mohd Ariffin

13. Synthesising an Effective Incentives System in Safeguarding the Heritage Village of Melaka and George Town
    Indera Syahrul Mat Radzuan & Yahaya Ahmad

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1. Main Criteria in the Development of Smart Cities Determined using Analytical Method
   Zurinah Tahir & Jalaluddin Abdul Malek
2. Understanding Land Idling as a Strategic Behaviour: A Brief Note Using the Real Options Approach
   Haniza Khalid
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   Siti Syazwani Ahmad Sofi & Abdul Azeez Kadar Hamsa
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   Rosilawati Zainol & Cheong Peng Au-Yong
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   Mohd Amirul Mahamud, Narimah Samat & Norzailawati Mohd Nor
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