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SUSTAINABLE AND RESILIENT CITIES: THE WAY FORWARD

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PREFACE

Sustainable and Resilient Cities: The Way Forward

Our environment today is changing because of the rapid urbanization and this scenario has intensified as we face the climate change affect. The challenges and issues that we experience today are more complex, multifaceted and are becoming more visible and frequent. Cities are vulnerable and at the same time have to play significant roles in tackling climate change through various actions of preparedness, mitigation and adaptations. Cities are complex systems combining spatial and non-spatial elements. A system, which consists of interconnected and interdependent elements, can only function well if these elements interact with each other. These elements comprise physical environment, social, infrastructure and economy. The interaction among the elements enable the city to function as a whole. In this context, to achieve a sustainable and resilient city requires a collaborative effort from various disciplines and interrelated expertise to address each element. The increase on the awareness and interest in the related research areas have witness the upsurge on the efforts towards achieving sustainable and resilient cities. Every day new studies and findings emerged from scientists, researchers, academics and scholars deliberating on ways to mitigate, prevent and prepare for the future risks that may pose impact to our cities either physically, socially or economically.

Planning Malaysia Journal aims to continuously become the platform to provide the opportunity for academicians, researchers, practitioners and scholars to share and discuss their novel findings. Hence, this issue of the Journal explores the theme of "Sustainable and Resilient Cities". To achieve sustainable and resilient cities requires a holistic, collaborative and cross-discipline effort. It is evident in this issue of the Journal, contribution of articles come from various disciplines discussing issues, new findings and potential solutions to ensure integrated and inclusive approach is achieved.

The articles published in this issue are divided into several sub-themes namely sustainable urban planning and design; environmental studies; sustainable architecture; transportation management and planning; sustainable asset and facilities management; and finally, disaster risk reduction and management. The first sub-theme, Sustainable Urban Planning and Design, consists of articles that address issues on resilient cities such as '*Malaysia efforts in transforming Melaka into resilient cities*', issues within the public spaces are discussed in the articles '*Physical characteristics of a public space*', '*Comfort character for traditional street users*', '*Urbanization and its impact on public spaces*', '*Universal design in urban public space with disability*', '*The appropriate open space quality indicator for children in high-density settlement*'

and issues on walkability in cities are captured by authors of '*Factors towards achieving a walkable city*', and '*Factors influencing the willingness to walk to the bus stops in Penang Island*'. Issues on urban design are captured by authors of '*Regenerating urban marketplace identity*' and '*Inheriting city: Georgetown UNESCO world heritage site*'. Meanwhile, '*Bonus zoning as zoning regulation tool to provide public space in Bandung*' highlighted the need for a proper management on bonus zoning for sustainable planning.

For the Environmental Studies sub-theme, the article '*The viability of an integrative framework for urban design and regional environmental justice*' offers an insight on the impact of Malaysian urban design planning policies on environmental justice, while an author from Indonesia have explored issues on the violation factors of the ground floor coefficient that could increase water runoff. Other articles under this sub-theme include '*Sustainability assessment for higher education institutions*'.

Sustainable Architecture sub-theme comprises three articles that look into issues related to the architectural practices and history of architecture. '*Architectural practices of project communication management in Iraq*' assessed the needed competencies and skills to increase the effective implementation of project communication management. '*Mosque: A statement of citizenship*' explored the role and contribution of mosque within a non-Islamic environment, while '*Identity and Malaysian city*' looked into issues on how to represent a universal Malaysian identity reflecting Malay Asian character with Islamic vocabulary. '*Measuring the sway of imperceptible factors in shaping the distinct character of ancient Indian architecture and city planning*' looked into the impact of intangible factors such as traditional belief and religion in shaping the astonishing character of Indian architecture.

The transportation management and planning sub-theme consists of three articles exploring issues on the relationship between distance to city centre and land price, the sustainability of intra-urban toll way system and the toll road traffic performance with case studies in selected areas of Indonesia.

Under the sub-theme of Sustainable Asset and Facilities Management, two papers addressed ageing community; '*Ageing in place framework as reference guide for housing in Malaysia*' and '*Social capital among ageing residents of housing*'. Though the researches were conducted in two different countries and confronting different aspects of the issue, both papers have similar aim, which was to enhance the standards of living for senior citizens within urban areas. On the other hand, the article '*Mediation effect of social aspect in the relationship between environmental and economic aspects*' revealed that green commercial office property enjoys various advantages, which translate as significant attribute of the property towards being sustainable and resilient. Other articles under this sub-theme include '*Understanding facility management in helping solving poor indoor environment quality*' and '*Valuer's behavioural*

uncertainties in property valuation decision making'. Finally, the sub-theme of Disaster Risk Reduction and Management include articles such as '*Disaster risk management in Malaysia: issues and challenges from the perspective of agencies*' that identified three major issues and challenges of DRM in Malaysia and '*Key issues in the management of the humanitarian aid distribution process during and post-disaster in Malaysia*' that explored the issues on the distribution of humanitarian aid during disasters.

Lastly, through the compilation of these diverse research articles, we hope that this issue of Planning Malaysia Journal would become a useful reference for researchers and stimulate further researches in relation to sustainable and resilient cities.

Dr. Wan Nurul Mardiah Wan Mohd Rani
Guest Editor

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ARCHITECTURAL PRACTICES OF PROJECT COMMUNICATION MANAGEMENT IN IRAQ

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ABSTRACT

Architects are significant initiators for the built environment projects, while architecture is all about communicating effectively with clients. Yet, some problems occur in regard to the mutual transfer of project information between those two parties. Thus, it is essential to enrol a proper system for managing project communication through communication management. Communication management is a notable part of the project management body of knowledge that coordinates and manages the process of exchanging information of the designing projects. However, studies confirmed that practices of communication management are often underestimated and overlooked. This article discusses communication management from architects' perspectives with the objectives of determining the current practice in Iraq and examining the required communication competencies to improve it. An online questionnaire survey was administered via surveymonkey.com to 100 architects working in private firms in Basra City, south of Iraq. The collected data were analysed with Statistical Package of Social Sciences (SPSS) version 23. The analyses for the two objectives showed that Iraqi architects have little information and knowledge in project communication management, where standards and methodologies are not followed. The results also indicated the top-rated competencies to be obtained. Thus, this article concludes that there is a need to introduce communication management as an evolving knowledge area to the architects in Iraq, and develop its implementation through communication competencies that attempt to fulfil clients' requirement and aspirations regarding the architectural design.

Keyword: communication management, architects, practice, clients, Iraq, competency.

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INTRODUCTION

Architects are the first initiators of the direct communication process with the clients during the designing phase. Moreover, communication has an influential impact on the architectural practice among individuals and project teams (Shen, 2011). Communication is also the backbone of project success, and miscommunication may cause unpleasant consequences and delays that lead to project failure (Charvat, 2003). Therefore, an adequate communication management system is necessary to help avoid such problems (Foley & Macmillan, 2005).

Communication management is a fundamental part of the project management field, as it controls the systematic information exchanges among the involved parties of the project (Muszynska, 2017). However, scholars claim that little attention was paid to the significance of communication management, and project management studies are also scarce (Dainty, Moore, & Murray, 2006; Papke-Shields, Beise, & Quan, 2010; Zulch, 2014). Therefore, Samáková, Sujanová and Koltnerová (2013) highlight the necessity of major changes and improvement in communication plans, as well as in managing the required communication. Subsequently, it is a demanding call to assist architects to set exquisite guidelines on communication management methods that ensure effective communication and correspondence with the features and environment of the project (Muszynska, 2017).

In Iraq, many studies have been conducted to investigate the implementations, practices and knowledge of project management in the Architecture, Engineering and Construction (AEC) industry. According to Al-Agele and Ali (2017), Iraq's construction projects have significantly increased after the war in 2003 to reconstruct the caused damages. However, these projects were poorly planned and managed, resulting in less than intended results. Project management in AEC industry was confirmed to be evidently weak by Abdulmajeed (2017), who states that most of project managers in construction projects were architects. However, the study concluded that project managers were still practising to manage projects despite the little knowledge they hold in this field. Thus, scholars like Al-Samaraie and Al-Hasnawi (2016) suggest that there is a significant need to specifically focus in the communication between designers and clients, due to their roles in the overall construction project.

This research intends to outline the current implementations of communication management among Iraqi architects and to examine the required communication competencies to be adopted by architects to improve communication management. This research targets the architects working in the private sector in the city of Basra, Southern of Iraq, with a minimum of two years of experience. Data were obtained through self-administrated closed-ended online questionnaire survey. A pilot study was conducted for testing the reliability of the research instrument using Cronbach's alpha coefficient of internal

consistency. Refined questionnaires were then distributed to respondents through surveymonkey.com. The findings showed that little attention was given to project communication management in Iraq, where the practices among architects were considered weak. This article recommends that project communication management must be given sufficient attention by all parties in AEC industry as it is one of the vital parts in construction projects.

LITERATURE REVIEW

Human interaction is based on the mutual communication between two parties, or more. In architectural project, this relies on the communicating act between the architect and the client to reach a level of understanding that could ensure project success. Basically, the process of communication is composed of four elements, namely the sender, who encodes the information; the receiver, who decodes it; the message that is shared; and the channel, which is the medium of transferring data (Cheney et al., 2010). In the context of this research, the sender is the client, who shares his thoughts with the architect, who receives the message of the requested design and transfer it through the channel (Lunenburg, 2010).

Definitions of communication have been studied by scholars due to the significance that communication holds (Taleb, Ismail, Wahab, Rani, & Amat, 2017). For Keyton (2010) and Barrett (2006), communication is a process of transferring information and produces mutual understanding between participants. Conversely, Den Otter and Prins (2002) see communication as the human behaviour, which facilitates the information and meaning sharing, while it is being adopted in a certain social context. In terms of architecture, communication is the backbone of this industry (Gabriel & Maher, 2002), and it denotes two parties involved together, attempting to employ their common understanding of particular terms and conceptions related to the industry, through verbal and non-verbal channels. Establishing effective communication during the designing phase of a project is important to avoid project failure due to insufficient communication (Taleb et al., 2017). Since the architect is responsible for creating a convenient venue for discussion with the client (Norouzi, Shabak, Embi, & Khan, 2015), and due to the big amount of information exchanges during the designing phase between client and architect, a coordinated management of exchanging data between the participants is required (Melzner, Feine, Hollermann, Rütz, & Bargstädt, 2015).

Communication management is a notable area in the project management field that holds a critical effect on projects or organisations. To Riel (1995), it is an instrument of managing all the means and forms of internal and external communication, which are being commonly compatible to attain prosperous results. PMI (2013) identified communication management as one of the ten areas of project management, as it covers the processes needed to assure proper and in-time actions to create, plan, disseminate, restore and manage the project-related

information. Communication management is the basis of decision-making process throughout the total project time (Mnkandla, 2013), and it ensures adequate information is acquired at the right time and is sent to the right audience. The main features of communication management include developing strategies for corporate communications, setting instructions of communication processes and managing the flow of project information.

In Iraq, project communication management is hardly studied by those in the project management discipline. Nevertheless, Al Saffar, Raheem and Ghaleb (2014) emphasise the issues arise, such as time and effort loss, due to the patent weakness of communication management during the project planning. Moreover, they highlighted that the reason behind these issues was usually the little time given for planning project communication in comparison with other processes of the project. Therefore, they suggest management techniques and implementations to be developed to avoid communication breakdown and failure. Meanwhile, Ali and Nabil (2014) examine the effect of information and communication technology (ICT) on the local engineering projects and focused on the project's designing and planning phases from an architectural perspectives. They introduced the theoretical framework of ICT, value and implementations.

Architecture industry is project-based by its nature, and the understanding of project is a prerequisite, fulfilled by adopting proper management based on international standards, which are seen as a critical method of improving project management effectiveness (Young & Wagner, 2015). This study discusses the PMBOK by the Project Management Institute (PMI) as one of the most related standards to the project communication management (Samáková et al., 2013). PMBOK is a set of guidelines in the project management field of knowledge, as it distinguishes the processes of project communication management into three: plan communication management, manage communication and control communication (PMI, 2013).

Plan communication management is a process in which approach and arrangement for effective communication schemes that are consistent with the stakeholder's needs and requirements are formulated. This process is undertaken at the initial stage of the project to assure efficient use of resources, time and budget. Furthermore, managing communication is about creating, collecting, disseminating, storing and retrieving project information. It ensures the communicated project information are well generated, received and understood (Taleb et al., 2017). Finally, plan communication is observing and controlling the communication throughout the project life to attain stakeholder's needs. It requires negotiations between the project parties to set the most relevant methods to increase project performance that satisfies stakeholder's requirements.

Required competencies must be possessed by architects to improve their communication management practices with their clients. A competency is an integration of many aspects to attain success in a particular job, such as

knowledge, individual behaviour and professionalism (Varajão & Cruz-Cunha, 2013). In terms of project management, IPMA (2006) defines the competency as the potential that uses the owned skills and knowledge to show the person's distinctive features. Parry (1996) sees competency as a set of related knowledge, skills, behaviours and personal features that influence the individual's job, correspond to the performance of the work and can be improved with practice.

Due to the significant value of holding relevant competencies in project management, PMI (2007) presented the Project Manager's Competencies Development Framework (PMCDF), in which communicating falls under the personal competencies of the framework. This covers the exchange of accurate and pertinent information through relevant methods. It also demonstrates the person's ability in managing the project through performed attitudes, behaviours and personal characteristics. The personal competencies suggested by the framework were used as the fundamentals in developing the questionnaire used in this research.

METHODOLOGY

A close-ended self-administered online survey was employed as the method to obtain data. Online survey was selected since it is an instrument with increasing significance to survey population, less costly, faster to expand, with growing levels of response, less responding errors and notable flexibility (McDonald & Adam, 2003). Baruch and Holtom (2008) also agree on the significance of online survey and stated that the response rate achieved by the online surveys could be equal or higher than those by emailing surveys. The questionnaire consisted of three sections: respondents' background, current practices and communication management competencies. Answers were categorised based on a 4 Likert scale measurement option, with 1 being strongly disagree and 4 strongly agree. Although studies are commonly using five responding options of Likert scale with the neutral option, this research follows Nemoto and Beglar (2014) who demonstrate that having a Likert scale of four or six measurement option can be more reliable. Similarly, Garland (1991) states that removing the neutral option helps to increase the reliability of responses.

The online survey was conducted among through surveymonkey.com. Respondents, who were practising architects in Basra City, Iraq, were sampled through the non-probability sampling method, where respondents were basically chosen with no probabilities of selection. This method was common among researchers who conducted studies among a particular group of respondents (Lemeshow, Hosmer, Klar, & Lwanga, 1990), and results can be further generalized to the overall population. Some researchers consider setting criteria for the sample is a necessity to increase adequacy of the study (Muhwezi, Acai, & Otim, 2014). Additionally, Kakepoto et al. (2012) suggest that setting a limitation in terms of working experience is essential, due to the gained

understanding and perception of communication and feedback during this period. Thus, for the purpose of this research, sampled respondents must possess at least two years of experience of practising architecture, designing and dealing with clients within their practice. This research was undertaken in Basra City, where most of Basra architects got their degrees from University of Basra, where its Department of Architectural Engineering was only established in the academic year of 2001/2002. Therefore, the maximum working experience of Basra graduate architects is 10 years. Hence, sampling limitation of at least two years of working experience was adequate relative to maximum working experience of graduate architects in Basra.

Statistics show that the total population (N) of practising architects in Basra who have at least two years of working experience was 150. Therefore, following Krejcie and Morgan (1970) recommendation, a sample of 108 architects was selected.

A pilot study was then conducted to test the reliability of the survey instrument. The Cronbach's alpha coefficient of the pilot study was 0.845, indicating acceptable consistency (George & Mallery, 2011). Subsequently, the online survey was conducted in the period between 22nd January and 14th March 2017, resulting in 82% response rate. Data collected through the survey were then analysed using Statistical Package for the Social Sciences (SPSS) software version 23. Descriptive data analysis was to calculate the mean, the standard deviation (SD), as well as the Relative Importance Index (RII). The mean is the most commonly used measure of the central tendency, as it refers to the scores' average which summarises the interval scores (Patel, 2009). For this research, scales of mean that range between 1.00 to 2.99 are considered low, whilst values $\geq$ 3.00 are high and accepted. On the other hand, the standard deviation is the value of average distance for each element from the mean value.

Relative Importance Index (RII) is an analysis of relative importance, where it assesses the ranking of survey's questions in relation to other questions per survey's responses (Ismail, 2015). RII is calculated through the formula presented by Somiah, Osei-Poku, and Aidoo (2015):

$$RII = \frac{4(n4)+3(n3)+2(n2)+n1}{4(n1 + n2 + n3 + n4)}$$

Where:

n1= the number of respondents who selected 1 (strongly disagree/ not at all important).

n2= the number of respondents who selected 2 (disagree/ not important).

n3= the number of respondents who selected 3 (agree/ important).

n4= the number of respondents who selected 4 (strongly agree/ extremely important).

In this context, the RII value ranges between 1 and 0, and when the value increases, the importance of the factor increases subsequently. Thus, the studied elements are sorted ascending in tables, from the more important to the less important (Doloi, Sawhney, Iyer, & Rentala, 2012).

FINDINGS AND DISCUSSION

The respondents' background is shown in Figure 1. This includes age, gender, affiliation (according to the Iraqi Engineers Union) and years of experience. In terms of gender, male and female respondents were almost equal in percentage, which were 50.6% and 49.4%, respectively. The majority of the respondents were aged between 25 to 34 years old, with 25 years old was the minimum age to gain at least two years of experience in order to fulfil sampling requirement. As shown in Figure 1, 65.2% of respondent were 25-29 year olds, whilst 29.2% were 30-34 year olds. 1.1% age between 35 and 39 years old, where they represented the least percentage of respondents, and finally, 4.5% age more than 40 years old, and they usually represent the consulting architects and University lecturers. This demonstrates that the architects in Basra mostly belong to the Y generation. As previously mentioned, Y generation is one of the biggest cohorts among the workforces (Nightingale, 2011).

The respondents' age ranges affect their years of experience, where results show that it ranged between 2 and 10 years, due to the generation cohort they belong to, and to the relatively new established architectural engineering department in Basra University. 36% have 2-4 years of experience, 37.1% have 2-7 years, and 21.3% have 8-10 years of experience.

Finally, architects in Iraq follow the engineers' affiliation under the Iraqi Engineers Union. It consists of four categories, namely assistant engineer, practitioner engineer, licensed engineer and consultant engineer. Promotion between categories is time-based, where it takes at least 14 years before an assistant engineer could be promoted through the ranks to become consultant engineer. This is reflected in Figure 1 where, because of the youthful age of the respondents, the majority were assistant or practitioner engineers, which represent 39.3% and 41.6% respectively. In addition, the licensed engineer represented 13.5% of respondents, and the consultant engineers were only 5.6% of the total sample.

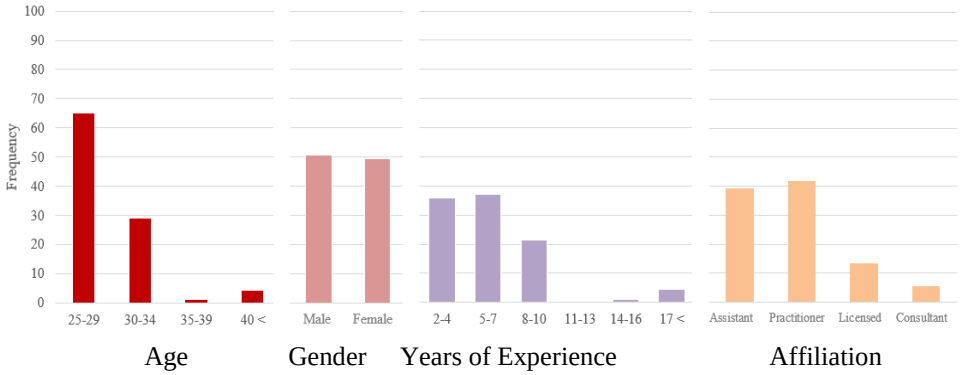
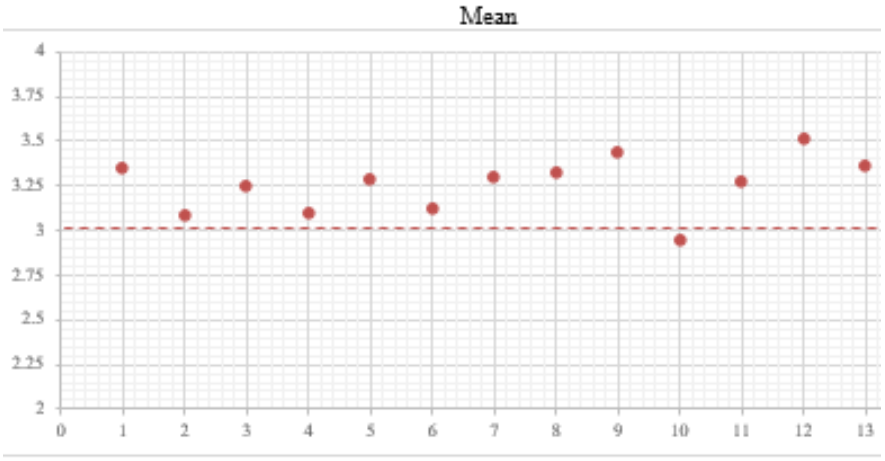


Figure 1: General demographic information

The questionnaire also consisted 13 questions regarding the current practice of project communication management in Iraq including the implementation of project communication planning, knowledge and compliance to international project management standards and methodologies, and the various applications of the communication management during the project design phase. Likert scale of 1 to 4 was used to record answers. Collected data were then analysed to determine the mean and standards deviation (SD), which are shown in Figure 2.



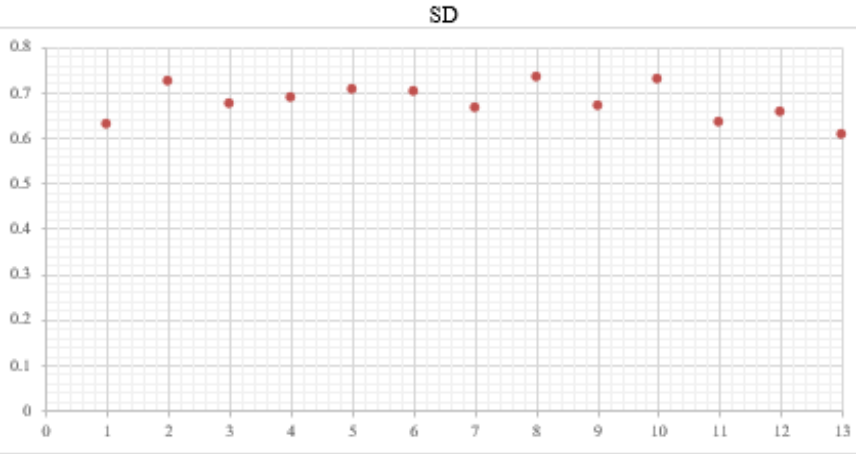


Figure 2: Distribution of mean and standard deviation values

Results show that architects had a unanimous agreement on the weak practices of project communication management, and little attention was given to the implementations of communication management. In addition, the international standards and methodologies, such as PMBOK and ICD, were not recognised or followed by the architects. However, architects saw a need to adopt proper communication methods with their clients, as well as to improve their communication skills to manage their relationships with clients. Thus, it is the architect's responsibility to propose, maintain, manage, perform and instruct the communication, in relevance to the project environment and requirements. These results are supported by the studies conducted by Samáková et al. (2013), Carvalho (2008) and Bilczynska Wojcik (2014), who also find that communication management was not given adequate attention, international standards of communication management were not followed, weak implementation of communication management plans, and significantly limited knowledge and practices of this field.

The final section of the questionnaire attempts to explore the competencies that should be obtained by architects to help them improve the process of communication with their clients. The leading five competencies of PMBOK that architects confirmed to be considerably adopted by them are listed in Table 1.

Table 1: Relative Importance Index (RII) values for PMBOK competencies

No.	RII Value	Competency (PMBOK)	Justification
1	0.907	Architects help clients to understand what	In some occasions, clients are inexperienced and have little information about the design, the expectations and the requirements. The architect

		they want and can be achieved.	needs to be able to demonstrate and share project information properly and help the client to reach a convenient understanding of the design potentials (Shen, Shen, & Sun, 2012).
2	0.907	Experience makes communication with clients more achievable and manageable.	To gain more experience through increasing the years of working and dealing with clients can enhance the architects' ability to understand the clients' needs and to properly manage to communicate, explain and exchange information with them (Kakepoto et al., 2012).
3	0.904	Architects need to build trust with their clients.	Trust is the ground base for any relationship and is a critical success factor. An architect-client relationship needs to be developed to a certain level of trust, and it is the architect's responsibility to take this action (Siva & London, 2011).
4	0.902	It is essential to guide the clients to the correct solutions and techniques and guide them to communicate effectively.	As communication methods and techniques vary according to the project, cooperation and effective communication with clients have a direct impact on the project success, where insufficient collaboration is an impactful cause of low-end innovation (Holmen, Pedersen, & Torvatn, 2005).
5	0.865	Adopting proper technological talents of the 3D visualisation as a part of communication management.	Architecture is the core of the world of visualization, and 3D renderings or perspective drawings are considered to be a critical approach of communication between the client and the architect (Kitchens & Shiratuddin, 2007; Shen, 2011). It helps the client to attain a clear understanding of the design solutions.

Meanwhile, the leading five competencies as highlighted by the PMCDF are shown in Table 2 below.

Table 2: Relative Importance Index (RII) values for PMCDF competencies

No.	RII Value	Competency (PMCDF)	Justification
1	0.884	Provide accurate and factual information.	The significance of exchanging real information between the client and the architect to assure the desired final results are fulfilled (Cheung, Yiu, & Lam, 2013).
2	0.862	Use appropriate information sources (primary, secondary, etc.).	Sources of information are divided to primary sources and secondary sources. The architect needs to set the most relevant ones to the designing project (Sindhu, 2011).

3	0.862	Provide relevant information.	Adopting the adequate presentation skills and getting feedback of the relevance level of information from the recipient (Hoezen, Reymen, & Dewulf, 2006).
4	0.853	Align communication with environment or setting.	The selected methods of communication must be corresponded to the environment of the project and the needs and background of the client (Norouzi et al., 2015).
5	0.842	Actively listen.	Architects need to carefully listen and respond to the received feedback and argument from the client regarding the project initiating and results (APM, 2012). In addition to being open to the other party's views and ideas.

CONCLUSION

By the end of this research, the current practice of project communication management, as a significant part of project management, has been determined through the responses collected from the architects in the City of Basra, Iraq. Results showed that architects have little knowledge in terms of project communication management, and international standards such as PMBOK and ICB were not practised. However, they agreed to the need to improve the implementation project communication management due to its significance in obtaining project success. Moreover, the communication skills and competencies that architects need to adopt were discussed according to those highlighted by PMBOK and PMCDF. Five competencies of each framework were found to be more effective. For PMBOK, these included *help clients to understand the expectations, focus on enriching their experiences, build trust, guide client through project life, and develop 3d visualisation technologies*. While for PMCDF, they were *provide accurate information, use appropriate sources, provide relevant information, align communication with environment,* and *use suitable communication methods*.

It is hoped that the findings of this research would help the architects in Iraq to increase their knowledge and understanding regarding project communication management, so that it will increase the client-architect mutual understanding level, and ultimately project success.

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MALAYSIA RESILIENT INITIATIVES: CASE STUDY OF MELAKA INTO RESILIENT CITY

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Abstract

Asia experienced 70% of all the disasters in the world and there is no indication that this will decline in the future. The disaster experienced by a city is mostly caused by the combination and collision of climate change, urbanization, social-economic instability, terrorism, natural disaster, cyber-attack, poverty, and endemic outbreak. The crisis fallen upon a city has captured attention of many audiences, thus in order to conquer the issues, city needs to be resilient in order to face and overcome the situation. Melaka was declared as a world heritage site and the government are taking serious efforts in order to maintain its heritage site by making it a resilient city. This article discusses the policy related initiatives taken by Melaka in preparing the city into resilient state. This is done by using literature and document analysis method on relevant reports, policies and literatures. The output of the research would be beneficial to the state of Melaka in the context of local authorities preparing strategic directions and managing urban development in order to become a resilient city.

Keyword: climate change, urbanization, resilience city, Malaysia, Melaka

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INTRODUCTION

As recorded in the Global Risks 2016 report (World Economic Forum, 2016), the world is facing issues of climate change, social instability, unmanageable inflation, large scale involuntary migration, biodiversity loss, terrorism, and so forth. It is forecasted that countries like Asia are likely to experience major natural catastrophes with extreme weather events (World Economic Forum, 2016). Asia accounts for 70% of natural disasters in the world (ADB, 2012). The main reason for this is because Asia Pacific lie within Pacific Ring of Fire, which accounts for 90% world's earthquakes and 70% of world's volcanoes (Jha & Brecht, 2011).

Asia accommodate half of the world urban population and are contributing to the rising number of cities in the world. The rise of urban population will create different types of disaster threats and vulnerability (Mitchell, Enemark, & Molen, 2015). Cities especially in the developing countries are at risk from climate threats and vulnerabilities due to high population density, unmaintained and inadequate drainage channels, concentration of solid waste, construction of large infrastructures on risky sites that disrupts natural channels and uncontrolled land development (Lavell, Wisner, Cannon, & Pelling, 2003; and Bull-Kamanga et al., 2003). The combination of climate change together with the global environmental alterations, human societies, and urban infrastructures will further endanger human life and its surrounding environment. As such, it is critical for city to participate in becoming resilient because the risk of not becoming resilient will lead to serious decline of the economy, resources and ecosystems, and which finally will lead to loss of trust by the people.

The increasing industrialization and urbanization substantiates the research on Resilient Cities. Scholars have mentioned that the key factors influencing cities to resilient approach are the connection of urban system with environment, social, economic, infrastructure and governance. Cohen (2011) highlighted that cities that can be categorized as resilient are those working towards low carbon initiative to minimize the impact of climate change from greenhouse gases (GHG) of which cities accounted for 80% of GHG emission globally.

The Centre for Research on the Epidemiology of Disasters (2016) reports that disaster occurrence recorded in Malaysia such as floods, earthquake, storms, epidemic and transport accidents has affected more than three million people and has taken thousands of lives from year 1990 to 2016. Flash floods in Malaysian cities such as Kuala Lumpur, Melaka (Malacca) and Johor Bahru have led the Malaysian government to engage in Disaster Risk Reduction (DRR) programme and adapting climate change strategies into national agenda. Therefore, government of Malaysia has taken initiatives toward resilient approach by participating and involving in a series of sustainable action plan and disaster

mitigation plan such as Millennium Development Goals (MDGs), Sendai Framework for Disaster Risk Reduction 2015-2030, 2030 Agenda for Sustainable Development and Hyogo Framework for Actions (HFA) (EPU, 2016).

This article discusses policy related initiatives taken by Melaka Government in preparing the city into resilient state. The output of the research would be beneficial to the state of Melaka in the context of local authorities in preparing integrated strategic plans and in managing Melaka urban development in order to be resilient in the future.

CONCEPT OF RESILIENCE

The origin of the word resilience originated from middle of 17th century, it derived from Latin 'resilire', which means leap back. Subsequently the oxford dictionary defines resilience as "able to withstand or recover quickly from difficult condition". Even though resilience is a familiar word but it bears diverse interpretations across diverse contexts.

For the past few years, there has been substantial increase of publications, researches and policies that centre on resilience as the research background. The concept of resilience is one of the most important research topics in the context of achieving sustainability (Perrings, Mäler, Folke, Holling, & Jansson, 1995; Kates et al., 2001; Foley et al., 2005). Holling (1973) was the first to introduce resilience in ecological term. Since then, resilience has been frequently redefined and extended by exploratory dimensions (Pickett, Cadenasso, & Grove, 2004; Hughes, Bellwood, Folke, Steneck, & Wilson, 2005).

In the context of built environment, resilience refers to one that is planned, constructed, operated, positioned and maintained in a manner that make best use of the capability of built properties and the individuals that present or work with in the built properties, to endure and recuperate from the impacts of natural hazards and man-made hazards (Bosher, Dainty, Carrillo, Glass, & Price, 2008). In addition, the concept of resilience for urban environment or city development as defined by The Rockefeller Foundation is "the capacity of individuals, communities, institutions, businesses, and systems within a city to survive, adapt, and grow no matter what kinds of chronic stresses and acute shocks they experience" (100ResilientCities, 2016). In this article, resilience will be defined as the capacity of a city to be able to absorb, bounce back and recover from stress and shock it received.

Cities are the settlement for human, places where people gather, centre of population, cores for commerce, social, productivity, science, culture and economic development. According to United Nation (2013), cities are categorised into urban agglomeration and metropolitan area. According to World Economic Forum (2015), the top 5 global risks are the interstate conflicts, extreme weather events, failure of national government, state collapse or crisis, and high structural unemployment. The global risks have evolved with new issues

such as terrorists attack and cyber-attacks. The survey done by World Economic Forum also showed that in the next 10 years, societal risk such as water crises and social instability along with environmental risks such as failure of climate change adaptation will be the major concern for the societies. In terms of threats that cities face, infrastructure failure, terrorism, rainfall and flood, and cyber-attacks are categorised as shocks for cities, while threats such as unreliable transportation, aging infrastructure, poverty and drought falls under stresses for cities (100ResilientCities, 2016). Researches on resilient cities have helped to bridge the gap between disaster risk reduction and climate change adaptation (100ResilientCities, 2016). It moves away from traditional disaster risk management, which is founded on risk assessments that relate to specific hazards. Instead, it accepts the possibility that a wide range of disruptive events – both stresses and shocks – may occur but are not necessarily predictable.

RESEARCH BACKGROUND

Profile of Melaka

Melaka is located on the west coast of Peninsular Malaysia, bordering the states of Johor and Negeri Sembilan. It has a population of 870,000, and is divided into 3 districts namely Melaka Tengah, Jasin and Alor Gajah with 4 local authorities (LAs). In 2008 Melaka was installed as a UNESCO World Heritage Site due to its historical value. In 2010, it was declared as a developed state by the Organisation for Economic Co-operation and Development. Being announced as world heritage site has reinforced tourism industry as one of the main economic pillars in Melaka (Goh, Tan, Lam, & Yeo, 2012; Syakir Amir Abdul Rahman, Mariana Mohamed Osman, Syahriah Bachok, & Mansor Ibrahim, 2014 & 2017). Green design characteristics were adopted in parts of Melaka in order to accommodate the city heritage image and also to support urban sustainable development in order to attract tourists (Ismail & Baum, 2006; Syakir Amir Abdul Rahman et al., 2014 & 2017).

The disasters and challenges faced by Melaka include rainfall flooding, disease outbreak, landslide, unreliable transportation system, air pollution, declining or aging population, rising sea level and coastal flooding (100ResilientCities, 2016). The most shocking challenges in Melaka is traffic congestion particularly during weekend, public and school holidays due to people visiting historic sites around Melaka (ADB, 2014; Syakir Amir Abdul Rahman et al., 2017). Transport and industrial emission has also brought air pollution into the scenario. Melaka urban expansion and development has brought consequences associated with coastal erosion, flash flood, landslide and depleting environmental resources (ADB, 2014; Aisyah Abu Bakar, Mariana Mohamed Osman, Syahriah Bachok, & Mansor Ibrahim , 2014).

METHODOLOGY

This paper reviews and analyses published literature as well as government reports and policies on the issues of sustainable, green initiatives, resilience in climate change, disaster risk reduction and land use planning in order to determine the efforts and initiatives undertaken by the Malaysian Government and the Melaka State Government in pursuing resilient city.

THE EMERGENCE OF RESILIENCE CITY CONCEPT IN MALAYSIA

Among the early resilient city efforts by the Malaysian Government was the implementation of the Making Cities Resilient Campaign (MCRC) in 2011 featuring Putrajaya, Melaka and Kuala Lumpur as model cities (UNISDR, 2011). MCRC was launched by the United Nations Office for Disaster Risk Reduction (UNISDR) together with local partners that included local governments and authorities with the aims to raise awareness of resilience and disaster risk reduction among the local governments and communities. The MCRC also served as a support for the execution of Hyogo Framework for Action (HFA) at the local level. Together, the MCRC and HFA support the implementation of Sendai Framework for Disaster Risk Reduction 2015-2030 at the local level (UNISDR, 2005).

POLICIES EVOLUTION TOWARDS IMPLEMENTING RESILIENT CITY

Since the Third Malaysia Plan (1976-1980), issues related to environmental distresses have been progressively emphasised and gradually formulated in the development strategies (Hezri & Hasan, 2006). From then on, various departments and ministries have drafted policies that take into consideration the environmental interest based on unambiguous needs (Muthusamy, 2007). Following the Ninth Malaysia Plan (2006-2010), the on-going development plan and numerous national policy programmes have been co-opted to help manage the issues of climate change mitigation and adaptation (Pereira & Tan, 2008). Meanwhile in the Tenth Malaysia Plan (2011-2015), governance has become the main focus in addressing issues of climate change and environment (EPU, 2011). In all the previous (2006-2015) Malaysia Plan, government emphasized on managing environmental distress due to climate change, and in the latest Eleventh Malaysia Plan (2016-2020) government strengthening environment for climate resilient development and resilience development against climate change and natural disasters (EPU, 2016).

Table 1: Malaysia's Initiatives towards Resilient City

No.	Initiatives Involved	Year
1.	Third – Eleven Malaysia Plan	1976 - 2020
2.	National Physical Plan	2005 - current
3.	Land Use Planning Appraisal for Risk Areas	2005

4.	National Security Council Directive no. 20	2005
5.	National Climate Change Policy (NCCP)	2009
6.	KL Action Plan (KLAP)	2009
7.	National Green Technology Policy (NGTP)	2009
8.	Low Carbon Cities Initiatives (LCCI)	2010

Source: FTCPDPM, 2015

In line with the Malaysia Plan, as shown in Table 1, the government has initiated various policy and plan initiatives to improve the country's readiness in managing, preparing and mitigating issues of overpopulation, environmental degradation, structural failures and natural disaster in order to increase her resiliency against the unforeseen impacts. The National Climate Change Policy (NCCP) integrates national plans and policies to strengthen the resilience of development from climate change impact and to reduce adverse effect of climate change (Ministry of Natural Resources and Environment Malaysia, 2009). Meanwhile, The KL Action Plan (KLAP) 2009 was formulated to accelerate the HFA implementation through National Action Plans and to strengthen Disaster Risk Management (DRR) through empowerment of local government in DRR, adapting climate change to DRR and creating awareness among public about DRR (Asian Disaster Preparedness Centre, 2009). The National Green Technology Policy (NGTP) and Low Carbon Cities Initiatives (LCCI) were initiated by the Ministry of Energy, Green Technology and Water in 2009, parallel with the country commitment to United Nations' Framework Convention on Climate Change (COP15). The NGTP and LCCI main objective was to achieve sustainable development and subsequently reduce carbon emissions by promoting low carbon transport, and green infrastructure and technology in order to conserve environment, enhance national economy and improve quality of life.

Additionally, Land Use Planning Appraisal for Risk Areas (LUPAr) and National Physical Plan (NPP) were implemented by PLANMalaysia (formerly the Federal Department of Town and Country Planning Peninsular Malaysia). These initiatives centred on ensuring integrated land management and systematic town and country planning in Malaysia in order to achieve sustainable development, strengthen national socio-economy and introduce comprehensive safe city.

The National Security Council Directive no. 20 (The Policy and Mechanism on National Disaster and Relief Management) was also initiated by the cabinet of Malaysia through National Security Division, aiming to manage on scene incident in major disaster on land, to reduce casualties and bring the situation to normalcy (ADRC, 2016).

INITIATIVES TAKEN BY MELAKA TOWARDS RESILIENT CITY

At the state level, Melaka has been playing an active role in resilient city development. The efforts engaged by the government and LAs include policies

and projects in linking organization agencies at regional and global level in order to realise sustainability in Melaka. As shown in Table 2 below, Melaka first sustainability initiative began with the Melaka Declaration on Disaster Risk Reduction (DRR) in 2011. DRR was endorsed by Melaka State Government with main objectives to incorporate climate change adaptation and disaster risk reduction, promote community involvement, and build resilience at the local level. In 2012, the Melaka Green City Action Plan (GCAP) was established and was among the first cooperation between Indonesia, Malaysia and Thailand – Growth Triangle (IMT-GT) Green City Initiatives. This involved the collaboration between the Economic Planning Unit, Malaysia (EPU) and Asian Development Bank (ADB). The purpose of the Green City Initiatives was to educate the public about climate change, global warming, green technology and green practices (ADB, 2014). Later on in 2014, Melaka engaged and consulted with International Council for Local Environmental Initiatives (ICLEI) – Local Council for Sustainability in order to promote local action for sustainable and resilient cities. In 2016, Melaka was chosen to participate in the 100 Resilient Cities Programme organized by Rockefeller Foundation, of which the programme prepares and helps cities to build resilience to the economic, social and physical challenges encountered by cities (100ResilientCities, 2016).

Table 2: Melaka's Initiatives toward Resilient City

No.	Initiatives Involved	Year
1.	Melaka Declaration on Disaster Risk Reduction (DRR)	2011
2.	United Nations Urban Environmental Accords (UEA)	2012
3.	Melaka Green City Action Plan (GCAP)	2012
4.	Melaka Green City State Blueprint	2013
5.	ICLEI – Local Council for Sustainability	2014
6.	Green House Emission Inventory Report	2015
7.	100 Resilient Cities	2016

Source: Authors, 2017

City resilience focuses on improving city's performances in the face of multiple hazards, rather than preventing or mitigating the loss of assets due to specific events. Melaka state has demonstrated progressive engagement as a resilient city with the adaptation of policies and initiatives from national level to state level. This has led to the establishment of the Melaka Green Technology Council (MGTCou) to govern, monitor, plan and implement green city initiatives in the state. Concurrently Melaka Green Technology Corporation (MGTCor) was also founded to provide training pertaining to green technology, and to offer training modules based on Occupation Structure of Green Technology Industry. At the same time, LAs in Melaka have also joined the bandwagon through efforts in educating and promoting to the public programmes like household waste separation programme and no bag plastic programme.

CONCLUSION

Despite being listed as one of the World Heritage Sites, Melaka has been facing threats in terms of resource depletion, flood, water borne diseases, coastal erosion and ecological disruptions due to expanding urban areas and increase in urban population. Therefore, the Melaka State Government has introduced city resilient initiatives by adopting series of strategies such as disaster risk reduction programme, ICLEI – Local Council for Sustainability, 100 Resilient Cities, and local plans and policies. The main interest is to bring the context of resilient city into Melaka by reducing the gap between disaster risk reduction and climate change in the mentioned policies and plans.

Even though there have been series of initiatives taken by the State Government, there is still a need for Resilient City Framework that integrates urban system in a holistic manner which includes governance, health and wellbeing, economic and social, and infrastructure and environment. It is anticipated that such a framework would assist Melaka to assess the extent of their resilience, ascertain areas of weaknesses and to classify plans to enhance Melaka city resiliency.

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EXPERIENTIAL VIRTUAL URBAN ENVIRONMENTS: A PRELIMINARY INVESTIGATION

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Abstract

Virtual reality (VR) technologies enable users to be virtually immersed in reconstructed cities and streets from around the globe. Immersive technologies could provide users a suggestive sensation of "being there" in a reconstructed virtual urban environments (VUE). This research argues that experiential VUE could promote better understanding of a place while offering unique interactions within its surrounding elements. The aim of this research is to present a preliminary study of the factors determining place experience in a VUE. This research examines two related VUE case studies that offer real-time navigation via a 3D virtual environment (VE) platform to analyse the functionality of the offered interactions and user experience via its contents. Although preliminary investigations have shown some promising results in real-time virtual city walkthroughs, there are still some issues that still need to be addressed in order to provide experiential contents. Based on the findings, this research suggests future VUE improvements focusing on contextual setting, interactivity, navigation, level of details, viewpoints and auditory elements to provide an experiential walkthrough within a VUE. Findings from the case studies would assist and identify specific elements suitable for future development of more meaningful and experiential VUE in the Malaysian context.

Keywords: virtual reality, virtual urban environment, experiential, urban design

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INTRODUCTION

The concept of human experiences towards a particular place have been studied under several terminologies such as place attachment, place identity and place dependence (Jorgensen & Stedman, 2006). Some argue that these place concepts inherently belong under the same umbrella term, "*sense of place*" (Cross, 2001; Shamai & Ilatov, 2005). Although there is an exhaustive literature discussing the complexities in translating and defining people-place association, sense of place commonly describes the unique human experience, bonding and emotion towards a particular place (Ghani, Rafi & Woods, 2016).

It could be argued that there seems to be a mutual agreement on some of the core aspects of people-place relationship similarly to those concerned with the phenomenological aspects of place relations. Phenomenology in its simplest term is the interpretative study of human experience which could also be defined as the "*exploration and description of phenomena, where phenomena refers to things or experiences as human beings experience them*" (Seamon, 2000). Phenomenology is also concerned with "*the study of experience from the perspective of the individual, 'bracketing' taken-for-granted assumptions and usual ways of perceiving*" (Lester, 1999). Norberg-Schulz (1984) has highlighted the need for a phenomenological approach in architecture to safeguard the spirit of place or the genius loci, to avoid the loss of place.

In the context of a virtual environment (VE), studies in sense of place are arguably related to the studies of presence (Ghani et al., 2016). Presence or telepresence is commonly defined as a user's subjective sensation of "*being there*" (Lessiter, Freeman, Keogh, & Davidoff, 2001) and known to be a fundamental concept for understanding and evaluating the effectiveness of virtual environments (MacIntyre, Bolter, & Gandy, 2004). This is a vital concept in defining virtual reality in the context of human experiences rather than focusing on its technological hardware (Steuer, 1992). The term presence itself has been used in a wide range of research areas hence expanding its definition, albeit making the concept even harder to define (Meehan, Insko, Whitton, & Brooks Jr., 2001).

This article will initially discuss the theoretical foundation of place experience in an urban setting based on three factors; physical setting, activities and meanings. Then, two case studies of related VUE projects will be reviewed using a qualitative review method that focuses on the structure of the VUE that was used to represent and visualize the city's environment. The elements selected for the review were extracted from studies in VE design, virtual place and presence, and game-style interactions. Finally, based on the literature review and case study findings, this research will discuss the importance of six elements namely: contextual setting, interactivity, navigation, level of details, viewpoints and auditory elements in providing an experiential walkthrough within the VUE.

SENSE OF PLACE IN URBAN SETTING

It could be argued that experiential VUE could promote better understanding of a place while offering unique interactions within its surrounding elements. Elements that were considered in developing place experience are adapted from the theories of perceptual dimension adopted by Carmona, Heath, Oc and Tiesdel (2010), in which it signifies the importance of physical setting, activity and meaning (Figure 1). Sense of place in urban setting could be defined as the qualities that contribute to making each place unique and distinctive. The main qualities that contribute to sense of place are its physical and functional characteristics that relate to the human activities, which in turn, impart meanings to a place.

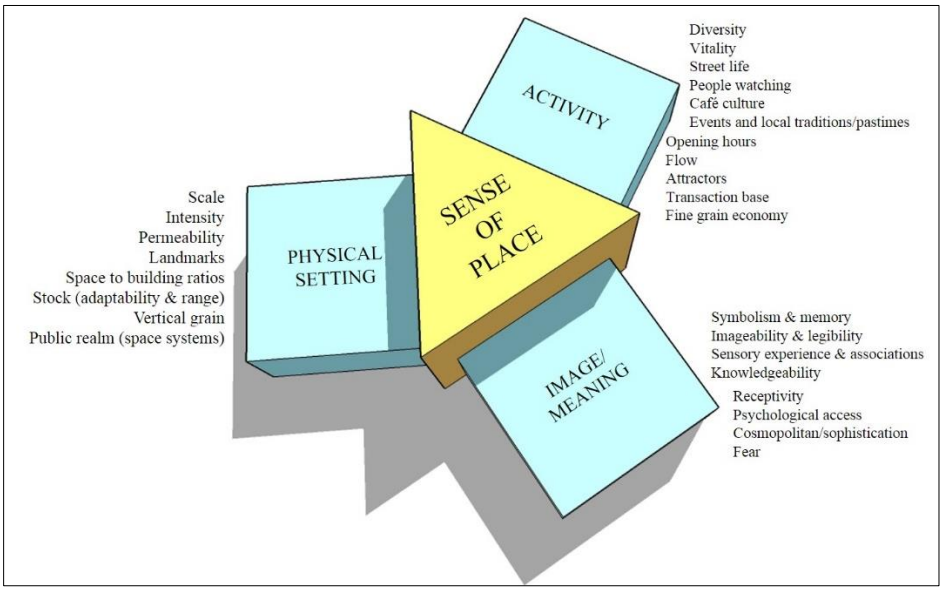

Figure 1: Sense of place dimension
Source: Montgomery, 1998 cited in Carmona et al., 2010

Physical Setting

Physical setting in built environment generally consist of building edges, streets, paths, squares and other outdoor spaces. The relationship between human and their surroundings; setting and space; is distinctive as it is relying on the individual experience including his perception and senses (Wolfe, 2016). Hence, the characteristic of the urban setting in a different context represents different meaning as it depends on how human observe, sense and interpret their surroundings. Spaces and settings will possibly evoke different feelings; either optimistic or undesirable (Nayan, 2016a, 2016b). Jacobs (1961) highlights the importance of the interaction between human and his experience in an urban

space. "…*please look closely to real cities. While you are looking, you might as well listen, linger and think closely about what you see*" (Jacobs, 1961). Lawson (2001) also highlights the importance of setting which constitutes the elements of space, surrounding and contents, as well as the people and their activities.

Each space represents the originality of the city; either through its unique history or distinctive built forms (Nayan, 2010; Nayan & Jones, 2011). The experience is closely depends on the "arrangement of the elements of the urban setting" (Debord, 1955). The path, the streets, the ambience between the building and the transition within a space are among the features that repealed the unique character of a space. The characteristic of an urban setting embodies through a mixture between newer and older built structures (Nayan & Jones, 2011). It is full with different architectural style, decorations and colours which become an 'image map' for the observer. Though, the experience gained is remained very subjective to the observer and it is not solely depends on the characteristic of the physical elements itself (Debord, 1955; Thomas, 2016). The experience in urban setting are abstract and contributed by complexities of the urban characteristics and related to the performance of the urban space components (Thomas, 2016).

Activities

Activities in urban places create a sense of life and vitality (Rahman, Sakip, & Nayan, 2016). Good qualities of physical setting will increase the optional and social activities in urban places (Rahman, Ghani, Bahaluddin, & Hussain, 2017). Social activities are influenced by the users' attributes such as age, past experiences, emotional conditions, and others. Furthermore, Mehta (2013) adds that characteristics of the setting in terms of its location, access, conditions, and sensory qualities also influenced those activities. Social activities in urban open spaces have been used as a measure of the town's vitality and liveliness and as an indicator of the satisfaction of people with their physical surroundings (Mehta, 2007).

Much can be learnt about the culture of a society of a place from the activities and how the place is used (Shamsuddin & Sulaiman, 2010). According to Rahman, Shamsuddin and Ghani (2015), the physical setting of a place either supports or inhibits the use of urban places as a setting for the activities in urban area. Through experiential elements in urban setting, the relationship between people and place setting can be determined; the varieties of personal, social and cultural actors; and physical and functional characteristics of the urban environment that influence people's activities and behavioural in place setting (Thwaites & Simkins, 2007). Jackson (as cited in Carmona et al., 2003) argues that activities and meanings are the more significant elements as compared to the physicality of places in creating sense of place.

Meanings

The meaning of place and sense of place are composed of something more than physical and material. It is how and why people use and interact with their spaces that creates unique and meaningful places. Our sense of being in our local culture has significant effects on our place experience, and how we perceive our surroundings in the physical environment. Augustin (2009) signifies the importance of cultural differences in place design as people from different cultures and origins would respond to the same physical environment in "very different ways." This situation occurs due to their familiarity with their urban settings. Sense of familiarity and belonging to a place are associated with people, place setting and activities (Mehta, 2007).

Meaning of place is created and valued differently by different group of users through their personal experiences and values in urban places. Perception is an important factor in people-place relationships (Lavoie, 2005; Lengen & Kistemann, 2012). Perception is defined as "*the act of using only one's own sense organs to gain knowledge about, interact with and experience the environment*" (Boothe, 2002). According to Rapoport (1977), perceptual components are the ways in which individuals experience the world, which is a principal mechanism linking people and environment.

METHODOLOGY

This research adopted a qualitative review and analysis method for each of the case study. Findings from these case studies helped to identify specific elements suitable for future development of VUE contents in the Malaysian context. Relevant issues and limitations of currently published VUE were also identified to support future developmental phase. The case studies were selected from various publically accessible projects consisting of 3D representations of cities and streetscape from around the globe.

The two case studies selected offers real-time navigation via a 3D VE platform, namely: *Virtual Old Prague* and *Barcelona in Gothic.* Both VUE projects were developed from two different platforms; Virtual Reality Modeling Language (VRML) for *Virtual Old Prague,* and game engine for the iOS based *Barcelona in Gothic* mobile application.

The aim of the case studies was to analyse and compare the relevant methods from published VUE projects to seek the practicality and functionality of the offered interactions and user experience via its contents. The investigation of the VUE projects was evaluated through direct observation method by the authors. A standardised testing setup was used to avoid irregularity and bias to gain uniformity in all of the case study evaluations. The hardware used for the evaluation of the web-based VUE application was a 15.6" Windows 8.1 64-bit gaming laptop equipped with NVidia GeForce GTX 765M graphic card, and the

mobile application was reviewed via an iPad 3 Mini with iOS 8.1.2 installed. Over-the-ear stereo headphones were used for audio review of the VUE contents.

Research on comparative case studies of VUE related projects focusing on user interactions and place experience is still not widespread, which proved to be a challenge in conducting the evaluation. Nevertheless, using direct observation method, the qualitative review focuses on the structure and contents of the VUE that was used to represent and visualize the city's environment.

VIRTUAL URBAN ENVIRONMENT CASE STUDIES

Virtual Old Prague, Czech Republic

The Virtual Old Prague (VOP) project is a web-based virtual tour application, which allows users to navigate through a virtual city stored in a remote database. To enter the site, users are required to install the recommended Cortona VRML Browser from the project's website. The VOP project can be considered to be the first 3D city from the central European region published on the internet.

The VOP website offers 24 virtual locations around the city of Prague which could be customised in the configuration page. The city model only provides the view of the exterior environment that consists of building façade, trees and street furniture such as street lamps and street signage. Users are able to navigate the site while referring to the text information supported with photographs and illustrations of the place elements. Navigation is straight forward in which the users could walk or fly freely throughout the uninhabited virtual cityscape. The main navigation screen is divided into two main sections, which consist of the 3D VRML navigation window (left), and a static section displaying various information on the history and details of the selected locations or buildings (Figure 2). Inside the VE users could click on objects to be redirected to the city's informative website such as Transport Company of Prague from "Little Quarter Square I" environment. Guided tours could also be selected from the main menu.

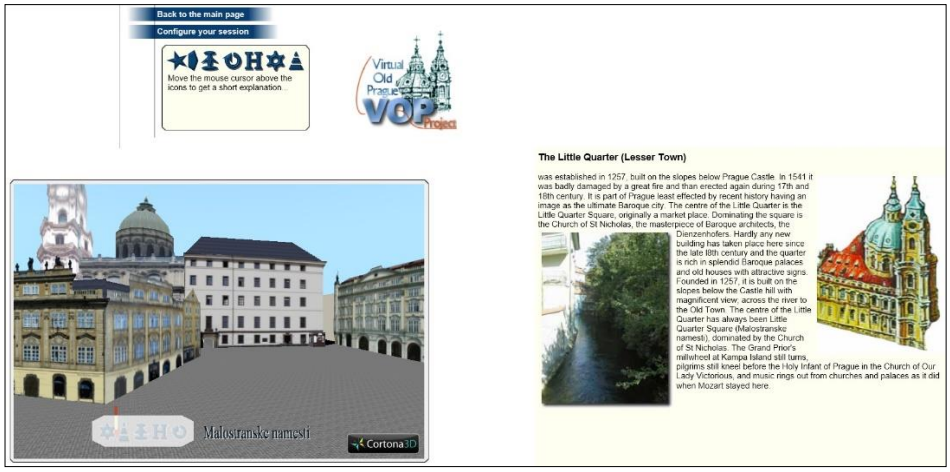

Figure 2: Layout arrangement of the main navigation interface

The interactive section is found in the starting menu that includes the option to customise the level of details (LOD) of the navigation window as well as other VRML setting such as weather, day or night selection. The LOD could be set to the highest setting for better graphics quality but not as rich as those in the more current version of 3D web plugins such as OSG4Web. The navigation offered a first-person perspective viewpoint and could be adjusted to a taller viewing height from the "Avatar size" option. An aerial view of the city could be observed when selecting the flying mode.

However, there is no auditory element in the virtual walkthrough and no auditory-related option available in the configuration page. One of the main issues in VOP is perhaps the incompatibility of certain browsers to load VRML settings which causes some lagging, slow loading of the navigation window or failure to load the application. This is perhaps due to the incompatibility of the older settings in the VRML walkthrough compared to the present setup of the testing platform. This in a way affected users' attempts to experience the interesting place elements as described in the information section. Place elements and cues such as "music rings out from churches" or the "magnificent view across the river to the Old Town" as noted in the supported texts were not translated into the VRML model. Maybe further improvements such as ambience sounds, dynamic elements such as wind effect or avatars could capture some of the interesting heritage elements of the Old Prague townscape.

Barcelona in Gothic, Spain

The project was developed as a mobile application specifically for the iPad in 2011 as stated on the project's web page (http://www.barcelonamedia.org):

"*Developed originally with the consulting of the Museum of History of Barcelona about the platform of three-dimensional visualization of Barcelona Media, the project 'Barcelona in Gothic' combines the technology of video games to access contents of high visual quality, integrating historical information contrasted with experts and introducing the temporary factor in a very visual manner to represent the evolution of singular elements of the city from the 11th century to the present day*".

The VUE sets itself in the middle of a city centre surrounded by a mixture of contemporary buildings and heritage monuments in Barcelona's Gothic Quarter (Figure 3). The city's distinguished landmark is the Barcelona Cathedral which is recognisable from a distance. The city's landscape gives a strong visual image of the city's heritage quarter but lacks any auditory elements.

Figure 3: Some of the buildings encountered in the city

The navigational functions use the similar walk and view touch zones as found in most mobile gaming application. Users are able to walk freely through the city's wide walkway and observe the highly detailed building facades. The navigation only allows navigation along the exteriors of the buildings, as there is no option to enter the interior. Users are offered information on specific heritage buildings (Gothic elements) through the interactive "information points" which needs to be clicked to trigger the pop-up information texts.

As noted on the project's website, the VUE uses video games technology to produce high-quality graphics and informative visual contents. The details could be observed throughout the navigation in which the 3D buildings were mapped with high-resolution textures to create an authentic look. The VUE offers first-person perspective viewpoints and are scaled approximately at human's eye level. However, there is no auditory element present in the VUE.

The Barcelona's Gothic Quarter project offers a rich visual experience on the city's architectural heritage. It combines the present and the past historical contents with interactive functions for the users. The only missing element is the auditory support which could enhance the place experience further.

RESULTS AND DISCUSSION

Based on the case study analyses and findings, it could be argued that supporting elements such as contextual setting, interactivity, navigation, level of details, viewpoints and auditory are necessary to provide an experiential VUE. This is supported by similar studies by Bostan (2009) and, Bostan and Ogut (2011), whom studied the design requirements for VE and their effects on virtual presence via computer role-playing games. The findings of the requirements and elements for virtual presence in computer games by those authors are found to be relevant to the evaluation of the case studies of this research.

Contextual Setting

It was observed that both of the case studies provide unique real-time explorations through the VUE which was specifically designed to accommodate the respected project's objectives. Both projects focused on replication of selected exterior environment, which provides a comprehensive large-scaled environment for exploration through some of the city portions. However, the physical environment in the VUE provided only a visual glimpse of the urban setting and failed to deliver a notion of sense of place due to the lack of "living" entities and activities that could be portrayed by animated avatars.

Interactivity

Both projects offer some forms of interactivity within their contents. The interactive contents are mostly unique to suit each of the respected projects' objective. *Virtual Old Prague* provide interactive customisation functions such as weather modification, day or night selection, and others. *Barcelona in Gothic* provide users with clickable interactive information points at various locations in the city. Some of the other issues identified from the case studies were the lack of auditory elements and interactive avatars to provide interactive contents. Ambient sounds and interactive avatars could provide the extra liveliness factor in the VUE especially for contents that represent urban places with cultural heritage importance.

Navigation

Real-time navigation is offered by all projects reviewed, which could be considered as a standard practice for most architectural walkthrough. As most of the projects reviewed were developed using game engine technology, game-style navigation using mouse and keyboard were commonly used for navigational controls. For mobile-based applications, navigation is possible through "walk and view" touch zones similar to those in mobile gaming applications. While most projects offer the walking mode as the default navigation technique, some projects such as *Virtual Old Prague* include the option for flying through the environment. The different navigational techniques provide users with several options for exploring the VUE. Flying mode might provide an easier and faster navigation option especially when exploring large scaled VUE such as cities or districts. However, flying might deter the sensation of place experience due to its dissimilarity to the users' real-world navigation experience. Experiencing architectural heritage and buildings in a VUE may require human eye level observation as originally intended by the architects who designed them. For sense of place to be experienced, replicating real life movement and navigation in the VUE might be a considerable option.

Level of details

The types of platform for development and dissemination of the VUE contents generally correlate to the type of LOD for most of the projects. Game engine technology such as in *Barcelona in Gothic* provides sufficient visual realism when compared to older VRML graphics such as observed in the *Virtual Old Prague* project.

Viewpoints

All projects and applications offer a first-person perspective viewpoint as their default starting position. Game engine based VUE has been found to be similar to that of a first-person RPG game environment, where users are able to observe their surroundings while walking through some of the reconstructed places. In a web-based 3D VUE such as in *Virtual Old Prague*, viewpoint modifications could be made prior to entering the environment. The avatar size could be increased for a wider view of the surroundings although it might reduce the feeling of realistic walking and perhaps disconnecting the essence of the intended place.

Auditory

Auditory elements could be considered as one of the important components in VUE contents especially those that intend to simulate real places and ambience. Surprisingly, both projects do not include any auditory elements in their VUE considering the visual richness of their contents.

CONCLUSION

Preliminary findings from the case studies have provided some insights on the current trends in VUE contents particularly those that offer real-time walkthrough experience. Designing place elements in VUE require a collective development strategy to provide the user with meaningful content and interaction while immersing in the reconstructed environment (Figure 4). As previously mentioned in the introduction section, studies in sense of place is arguably related to the studies of virtual presence within the context of VEs. The importance of physical setting, activities and meanings in the real environment could be simulated through the elements of contextual setting, interactivity, navigation, level of details, viewpoints and auditory.

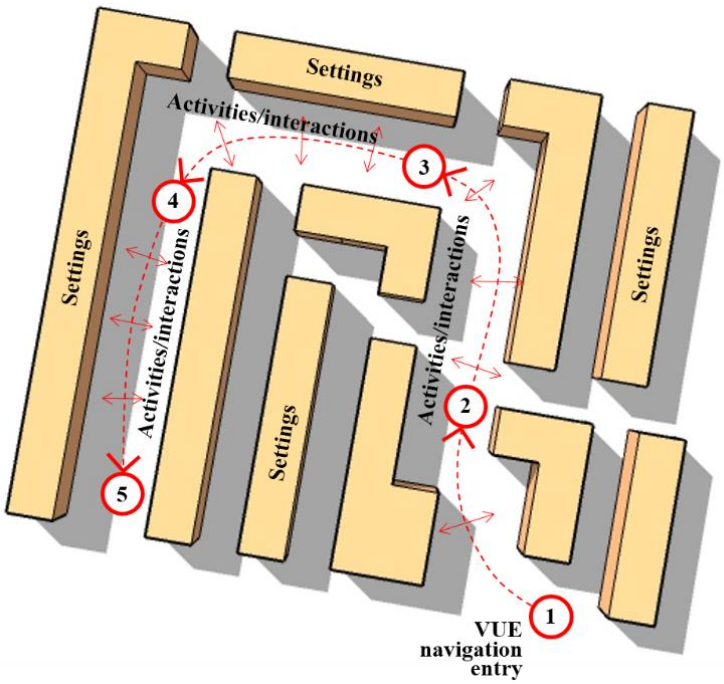

Figure 4: Proposed development strategy for an experiential VUE

Specific consideration should be given from the beginning of the VUE development process to the dissemination of contents to the end user. Aspects to consider include the selection of visualisation platform, dissemination method, interpretative and personalisation features. Further improvements on the development of the experiential contents is vital to suit the current VR hardware for an enhanced virtual urban place experience.

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SOCIAL CAPITAL AMONG AGEING RESIDENTS OF HOUSING COMPLEXES IN SUBURBAN TOKYO: THE CASE OF HARAICHI-DANCHI AND OYAMADAI-DANCHI IN AGEO CITY

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Abstract

Globally, developed nations such as Japan are currently facing an ageing population. The health and social care system in the living environment for the elderly population in Japan must engender strong social ties and social networks that can connect the elderly people and promote active ageing. This research aims to identify the extent of social capital among the ageing population in Haraichi-danchi and Oyamadai-danchi, which are housing complexes located in Ageo City, a suburb of Tokyo. This article focuses on residents in the 60s and 70s age groups. A questionnaire survey was conducted and was divided into three parts which include the basic attributes of the residents, the elements of bonding social capital and bridging social capital. Then, cross-tabulations were done between the age groups and both the social capital categories. Next, chi-square and further post-hoc analyses were conducted to determine the strongest association between the variables. The results show a significant association between the 60s and 70s age groups for both bonding and bridging social capital. The variation of results may be influenced by the physical environment of the housing complexes in which they are currently living.

Keyword: aging society, suburban housing complex, social capital

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INTRODUCTION

Japan, as one of the world's developed nations, has seen the percentage of its elderly population (aged 65 and older) increased from 19.8% in 2005 to 26.3% in 2015 (World Bank, 2016), thus making it the highest ratio of ageing population in the world. To cater such trend, a shift towards focusing on planning for the ageing population in all sectors of development such as social, health and even the physical built environment is needed.

This research aims to identify the extent of social capital among the ageing population in Haraichi-danchi and Oyamadai-danchi, which are housing complexes located in Ageo City, a suburban area near Tokyo. Social capital in the ageing society is important to promote active ageing (Aminjafari, Aghajani, & Hashemianfar, 2016). Thus, it is important to create strong social capital, which can be further understood by examining the three main domains listed by Putnam (2000), which are bonding, bridging and linking social capital. Bonding is associated with the relationship between the community members with the same demographic characteristics and socio-financial positions (Babaei, Ahmad, & Gill, 2012), which often includes family and friend relationships (Twigger-Ross, Bonaiuto, & Breakwell, 2003). Bridging social capital on the other hand is based on the connections between community members that do not have similar characteristics such as age, ethnicity; and education (Szreter & Woolcock, 2004). Lastly, Babaei et al. (2012) define linking social capital as the linking relationship among groups or individuals with power, authority, and access to key resources. This research focuses only on two elements of social capital which are bonding and bridging.

The economic growth in Japan during the post-war period has stimulated the development of suburban residential communities, mainly affordable housing complexes called *danchi*, which are usually 5-storeys. During that time, many *danchi* were created to accommodate the growing population especially working people among the 30s – 40s who started to have family. Today, they aged 65 years old and above, thus belonging to the ageing group. Recently, increasing trends of diminishing social structure among the working age group because of their commitment to working has led to a decreasing number in nuclear families and less social engagements with neighbours (Gouda & Okamoto, 2012). Following this, they will most likely experience social isolation after retirement. Hence, the scope of social aspect among the community in the neighbourhood environment especially among elderly people has become the main topic to be investigated.

The study areas of this research consist of two housing complexes, Haraichi-danchi and Oyamadai-danchi, as shown in Figure 1. These are public housing complexes constructed and managed by the Urban Renaissance (UR) agency in Japan. Located in Saitama Prefecture, currently there are approximately 2,781 residents and 1,532 households in Haraichi-danchi and approximately

3,005 residents and 1,741 households in Oyamadai-danchi. The two housing complexes were chosen as the study areas because the percentage of elderly residents out of the total residents were quite high, about 35.3% and 41.2%, respectively. *Danchi* were usually constructed without elevator but outer staircases to connect two apartment units on each floor (Figure 2 & 3). However, elevators were installed later to cater the needs of the elderly residents in some chosen housing blocks. The difference between both housing complexes is that the neighbourhood environment of Haraichi-danchi is divided into two parts by an arterial highway; and connected by a pedestrian bridge, whereas the neighbourhood environment of Oyamadai-danchi is clustered together. Besides, the neighbourhood associations in both housing complexes have close link with private institutions such as Shibaura Institute of Technology (SIT) in order to promote social participation and neighbourhood liveability. This has encouraged SIT to set up a "Satellite Lab of Ageo" in Haraichi-danchi (Figure 4).

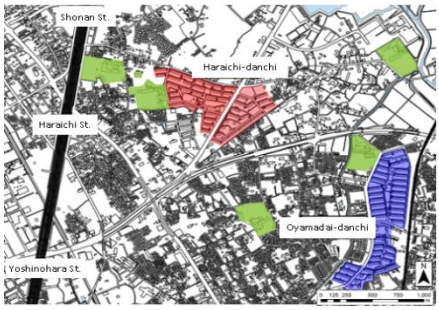

Figure 1: Map of Haraichi-danchi and Oyamadai-danchi in Ageo City

Figure 2: Stairs connecting apartment units in each floor in Oyamadai-danchi

Figure 3: Five-storey apartment blocks in Haraichi-danchi

Figure 4: "Satellite Lab of Ageo" in Haraichi-danchi established by SIT

METHODOLOGY

For this research, the age groups involved were the 60s and 70s, which are considered as young-old and old-old age groups respectively. The age group of 80s was not included because of the limited number of respondents in this age group in both housing complexes. A questionnaire survey was distributed in

November 2015 to the households in Haraichi-danchi and Oyamadai-danchi respectively. The number of respondents in Haraichi-danchi was 593 people and 543 people in Oyamadai-danchi, with an effective reply ratio of approximately 38.6% for Haraichi-danchi and 31.3% for Oyamadai-danchi. The questionnaire was divided into three parts: the basic attributes of the residents including their current knowledge on disaster prevention; their participation in neighbourhood activities, including disaster prevention training; and their relationships with their neighbours. The questionnaire survey were then restructured to adhere to the context of bonding and bridging social capital, which were divided into three parts; the basic attributes of residents, the elements of bonding social capital and bridging social capital.

In the analysis stage of the research, cross-tabulation was done between the two age groups and the social capital attributes, which are bonding and bridging. Then, chi-square analyses were conducted to determine whether the two attributes were associated. Next, further analyses of post-hoc tests were done to determine the strongest associations between the attributes by calculating the adjusted residuals obtained from the Pearson chi-square values in each cell. The criteria to choose the most significant association were adjusted residual values which should be higher than the z-values and only positively adjusted residual values were taken into account.

FINDINGS

In terms of the basic attributes of the respondents, Figure 5 shows men as the majority group of respondents consisting of about 59.9% and 58.8%, whereas women consist of about 39.0% and 40.7% in Haraichi-danchi and Oyamadai-danchi respectively. Figure 6 shows the proportion of residents based on age range, where people in their 60s were the majority respondents, which were about 37.1% and 44.38%; and the second largest group which were people in their 40s – 50s comprising of 29.01% and 28.36% of the total population in Haraichi-danchi and Oyamadai-danchi respectively. People from the 60s and 70s age groups are regarded as elderly in this research, which makes them the highest percentage of residents living in both housing complexes, including people in the 70s which are about 20.4% and 20.44% in Haraichi-danchi and Oyamadai-danchi respectively. It was noted that the people below 30s age group are mainly young adults and workers.

Figure 7 shows about 44.7% and 48.6% of the respondents have lived more than 31 years in Haraichi-danchi and Oyamadai-danchi. Regarding family structure, the majority of the residents were living together with their families, which were about 64.15% and 85.0% in both housing complexes respectively. The category of single person in Haraichi-danchi was around 35.84%, but less in Oyamadai-danchi which was around 15.0%, as can be seen in Figure 8. Figure 9 shows the respondents' occupations in both housing complexes where a majority

of them were unemployed, consisting of about 64.1% and 58.9% in Haraichi-danchi and Oyamadai-danchi respectively. To summarise, most of them were permanent residents living with families where they have lived for a long time in the housing complexes and were unemployed.

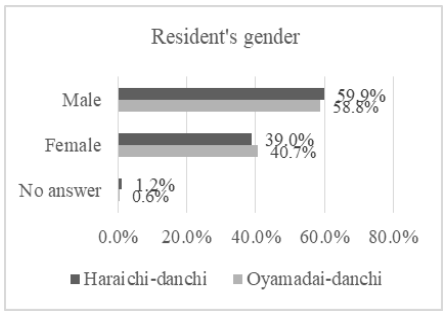

Figure 5: Proportion of residents by gender in both housing complexes

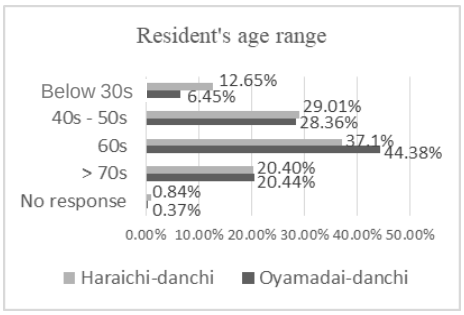

Figure 6: Proportion of residents by age range in both housing complexes

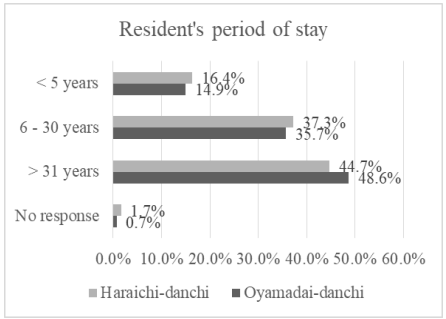

Figure 7: Proportion of residents by period of stay in both housing complexes

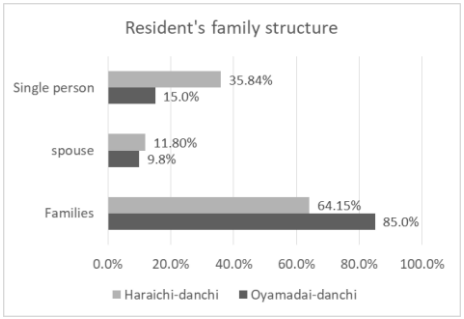

Figure 8: Proportion of residents by family structure in both housing complexes

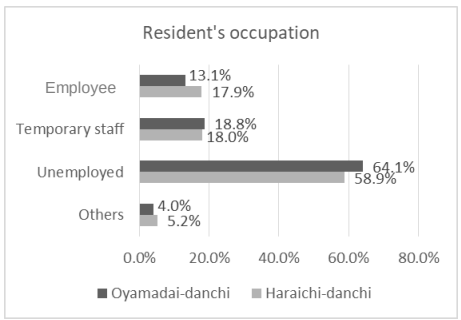

Figure 9: Proportion of residents' occupations in both housing complexes

Table 1 shows the classification of social capital for bonding and bridging included in the questionnaire survey as well as the majority percentages for each of the attributes.

Table 1: Classification of social capital context from the questionnaire survey

Bonding Social Capital	**Bridging Social Capital**
Presence of reliable person - No one (H= 42.3%, O= 36.5%)	Participation in neighbourhood association - Join (H= 71.84%, O= 88.21%)
Relationship with neighbours - No trouble (H= 68.5%, O= 71.1%)	Recognition on neighbourhood association activities - Knows to a certain extent (H= 63.8%, O= 69.2%)
Communication exchanges between neighbours - Chatting & greeting (H= 71.9%, O= 80.1%)	Necessity to join neighbourhood association - Necessary (H= 43.2%, O= 57.5%)
Necessity for communication exchanges - Some are necessary (H= 70.7%, O= 74.8%)	Reasons for not joining the neighbourhood association - Burden to be stairs committee (H= 28.8%, O= 28.9%)
	Problems of neighbourhood association - Low awareness on the association importance (H= 26.3%, O= 28.7%)
	Expectations for neighbourhood association activities - Calm and peaceful activities (H= 67.3%, O= 78.5%)
	Ways to activate the neighbourhood association - Increase members in the association (H= 48.6%, O= 60.4%)
	Experience of stairs committee* - Yes (H= 56.5%, O= 81.4%)
	Participation in volunteering activities - Participate if convenient (H= 41.3%, O= 47.0%)
	Participation in disaster prevention training - Have not participated (H= 65.6%, O= 32.8%)
	Awareness on voluntary disaster prevention training - Did not know (H= 70.0%, O= 28.2%)

*Small floor committee in each housing blocks
H: Haraichi-danchi; O: Oyamadai-danchi

The bonding social capital, which means the relationship between the community members with the same demographic features, in both housing complexes can be described by three characteristics: having no one to rely on even though they have daily social contacts, thinking that communication

exchanges are necessary and being on good terms with their neighbours at the present time. On the other hand, bridging social capital, which means relationship between community members that do not have similar characteristics, can be described by three characteristics: majority of residents in both housing complexes joined the neighbourhood association, knew to a certain extent about the association's activities and thought that it is necessary for the associations to exist in the housing complexes. The reason people did not join the association was due to the obligation to be on the stairs committee and they thought that the problem for low participation was because of low awareness among the residents. Moreover, the residents expected the neighbourhood association to conduct peaceful and calm activities so that more people would have the desire to become a member of the neighbourhood association. Even so, most of them had the experience becoming part of the stairs committee and wanted to participate in volunteering activities if the time was convenient, but significant percentages showed that residents in Haraichi-danchi did not participate in the disaster prevention training because more than half of them were unaware about the voluntary disaster prevention training.

MAIN RESULTS

Based on Table 2, the analyses show significant associations for both bonding and bridging among various age groups in Haraichi-danchi. For bonding social capital, the people in the 60s and 70s age group tended to have at least one person to rely on and greeted their neighbours on a daily basis. For bridging social capital in Haraichi-danchi, those in the 60s age group joined the neighbourhood association, had experienced being members of the stairs committee and had the desire to participate in disaster prevention training if they had spare time. For those in the 70s age group, even though there was no significant motivation found for joining the neighbourhood association, they tended to know very well about the activities conducted by the association. They thought that it was necessary to join the association and had experienced being members of the stairs committee.

Table 3 shows significant associations for both bonding and bridging among various age groups in Oyamadai-danchi. No significant association was shown through bonding among the 60s age group but for the 70s age group, they tended to have several reliable persons and chatted with their neighbours daily. For bridging social capital in Oyamadai-danchi shown in Table 3, those in the 60s age group expected the neighbourhood association to organize peaceful activities and to enhance welfare activities. They also had some experience of being the stairs committee members and participated in volunteering. Different to the people in the 70s age group, they expected the neighbourhood association to organize disaster or crime prevention activities and would like to join the auspicious celebration.

Based on the main results of the analyses, it can be concluded that most people in their 60s and 70s tended to show some significant bonding and bridging social capital; however, this was not always the case for both Haraichi-danchi and Oyamadai-danchi. The major similarities among adults in the two housing complexes were that the people in their 60s tended to participate more in bridging activities and those in their 70s tended to have several people to rely on for bonding social capital. On the contrary, the major differences between the two housing complexes were that the people in their 70s in Haraichi-danchi tended to be aware of the community activities, even though they did not join the association, whereas the people in their 70s in Oyamadai-danchi did not show any significant association for bridging social capital.

Table 2: Summary of findings for both social capital in Haraichi-danchi

Housing Complexes	Age Groups	Bonding Social Capital	Bridging Social Capital
Haraichi-danchi	Below 30s	Communication exchanges are based on family relationship (R: 3.60, Z: 2.96)	Does not join N.A. (R: 13.83, Z: 2.73)
			Know little about activities done by N.A. (R: 6.11, Z: 3.02)
			Thought that N.A. is unnecessary (R: 3.65, Z: 2.77)
			Problems of N.A. is young people and workers are hard to participate (R: 5.04, Z: 2.73)
			Expectation for N.A. activities is to provide child rearing support (R: 4.71, Z: 2.73)
		Trouble with neighbors in the past (R: 3.12, Z: 2.87)	Have no experience in stairs committee (R: 6.90, Z: 2.73)
			Do not want to join volunteering (R: 3.40, Z: 2.87)
			Have not participated in D.P. training (R: 3.02, Z: 2.81)
	40s – 50s	Trouble with neighbors in the past (R: 5.31, Z: 2.87)	Does not join N.A. (R: 3.58, Z: 2.73)
			Activities of N.A. that they would like to join is summer festival (R: 3.38, Z: 2.73)
			Have not participated in D.P. training (R: 3.68, Z: 2.81)
	60s	1reliable person (R: 5.38, Z: 2.96)	Joined N.A. (R: 4.69, Z: 2.73)
		Greeted neighbours on a daily basis (R: 3.19, Z: 2.96)	Problems of N.A. is conventionalization and mannerism issue (R: 3.88, Z: 2.73)
			Have experience in stairs committee (R: 3.52, Z: 2.73)
			Will participate in D.P. training if it is convenient for them (R: 3.00, Z: 2.81)

	70s	More than 10 reliable persons (R: 4.41, Z: 2.96)	Joined N.A. (R: 2.76, Z: 2.73)
			Knows very well about activities of N.A. (R: 5.96, Z: 3.02)
			Thought that N.A. is necessary (R: 5.61, Z:2.77)
			Activities of N.A. that they would like to join is auspicious celebration (R: 3.60, Z:2.73)
			Have experience in stairs committee (R: 3.84, Z: 2.73)

*N.A.: Neighbourhood association; D.P.: Disaster prevention; R: Adjusted residual value; Z: Z-value
*20s – 30s are working people; 10s and below are not included since they are still dependent to their parents

Table 3: Summary of findings for both social capital in Oyamadai-danchi

Housing Complexes	Age Groups	Bonding Social Capital	Bridging Social Capital
Oyamadai-danchi	Below 30s	-	Activities of neighbourhood association that they would like to take part is child rearing support (R: 7.27, Z: 2.73)
			No experience in stairs committee (R: 3.58, Z: 2.73)
	40s – 50s	Communication exchanges are based on family relationship (R: 4.23, Z:2.96)	Does not join neighbourhood association (R: 2.81, Z: 2.73)
			No experience in stairs committee (R: 2.94, Z: 2.73)
			Have not participated in D.P. training (R: 2.98, Z: 2.77)
	60s	-	Expectation for neighbourhood association activities is to held activities with peace of mind (R: 3.52, Z: 2.73)
			Expectation for neighbourhood association activities is to enhance the welfare activities (R: 3.09, Z: 2.73)
			Have experience in stairs (R: 3.02, Z: 2.73)
			Currently participating in volunteering (R: 4.04, Z: 2.87)
	70s	Several reliable person (R: 3.06, Z: 2.96)	Expectation for N.A. activities is to organize disaster/ crime prevention activities (R: 3.25, Z: 2.73)
		Chatting with neighbours daily (R: 3.37, Z: 2.96)	Activities of N.A. that they would like to join is auspicious celebration (R: 3.34, Z: 2.73)

*20s – 30s are working people; 10s and below are not included since they are still dependent to their parents

DISCUSSION

A general observation can be made based on the two housing complexes cross tabulations. For bonding social capital in both housing complexes, responses from the elderly group of the 60s have shown that they have at least one person to rely on while the 70s age group tended to have several reliable persons. This is because both of these age groups have sufficient social contact with their neighbours and significant association with them by greeting and chatting with their neighbours on a daily basis, hence having neighbours as their reliable persons.

As expected, when compared to the elderly groups, the middle-aged group in their 40s – 50s have shown less significant extent of social capital whereby in Haraichi-danchi, they have nobody to rely on and have experienced some trouble with their neighbours in the past. In contrast, the middle-aged people in Oyamadai-danchi have shown significant association for communication exchange with neighbours but only because they had family relationships. Moreover, the middle-aged group in both housing complexes have not participated in the neighbourhood association and in disaster prevention training. The middle-aged group in Oyamadai-danchi also have not had any experience in becoming members of the stairs committee.

A general trend could be observed for bridging social capital in both housing complexes. This has been reflected by people from the 60s and 70s age groups through high level of participation in the neighbourhood association, volunteering activities and experience becoming stairs committee. In the past, residents who were in the middle age groups tended to reside and settle in these types of housing complexes located in the suburbs, living together with their families and commuted daily to work in the nearest urban area, Tokyo. Over time, this middle-aged generation has gotten old; becoming part of the elderly group but still living in these housing complexes after their retirement, making them the majority of permanent residents who have stayed for the longer period. Hence, the elderly group who have been permanent residents in the housing complexes through their long period of stay have had the advantages to be fully aware about the activities happening in the housing complexes, while at the same time developing their social ties and having good social interaction by spending more time outdoors. Consequently, spending their free time outdoors is important for the elderly because they can develop and improve their social interactions and social bonds with new people, acquaintances or even someone that they already knew.

More positive association has been found for the activities that the residents wanted to take part in if the neighbourhood association helped to organize it. Middle-aged people in the 40s – 50s were interested in joining the summer festival whereas most of the elderly from the 70s age group were interested in joining the auspicious celebration, which is Japan's traditional

celebrations of longevity. This is relevant for the younger generation who are more interested to participate in fun activities and for the elderly who would benefit from spending their time in peaceful and calm activities such as the auspicious celebration.

Furthermore, most of the younger age group especially people in their 20s - 30s tended to have less time to participate in bridging activities in both housing complexes due to the fact that they are mostly among the working people and usually have less time during the day. They tended to have free time only during weekday nights and weekends to spend time with their families. Most of them have less time to join the bridging activities because they are busy with working and parenting. People in this age group also hoped that the neighbourhood association could help with child rearing support as one of the expected activities, as they felt it was a burden for them to keep up with their working life while at the same time spending the time to care for their children.

Moreover, the older people from the 60s age group living in Haraichi-danchi thought that the neighbourhood associations conducted conventional activities which made them feel burdened to join. This was supported by the observed data from the residents in Haraichi-danchi about the reasons for not wanting to join the neighbourhood association. The reasons include feeling obligated to be part of the stairs committee and burden to pay the membership fee in the neighbourhood association. The observed data also showed a different trend for the residents in Haraichi-danchi where quite a number of them did not know what the neighbourhood association was doing, when compared to the residents in Oyamadai-danchi.

In addition, a typical trend has been shown regarding the participation of the older people in social and community activities because they usually have extra time due to retirement and unemployment. The trend in Oyamadai-danchi was observed to adhere to this typical trend, but there was a worrying trend for the elderly in Haraichi-danchi where most people in the 60s and 70s age groups have not participated in the disaster prevention training. This was largely due to low awareness about the importance of disaster prevention training, whereby the observed data show most of them did not know about the existence of the voluntary disaster prevention organization even though they expected disaster prevention training should be done.

Generally, based on the research findings, the bonding social capital tended to show more positive associations in Haraichi-danchi but less positive associations for bridging social capital. This was due to the fact that Haraichi-danchi is divided into two areas by an arterial highway. Residents living on the other part of the housing complex may tend to be less interested to join the bridging activities since it would take some efforts for them to cross the overhead bridge especially the elderly. The activities of bonding social capital may take place naturally among the residents, anywhere in the housing complex as it

involves basic daily social interaction but for bridging social capital, the activities are usually held in one part of the housing complex where the SIT satellite laboratory is located.

CONCLUSION

In conclusion, this research has achieved its purpose of distinguishing the features of elderly groups in Haraichi-danchi and Oyamadai-danchi. For bonding among elderly groups of 60s and 70s age group in both housing complexes, they have several reliable persons and have daily social contact with their neighbours as well as high level of participation in most social and community organizations, and they were most interested in joining the auspicious celebration if it was to be held by the neighbourhood associations. Additionally, elderly people in Oyamadai-danchi tended to participate in disaster prevention training, but elderly people in Harachi-danchi did not participate in disaster prevention training because they did not know about the existence of the voluntary disaster prevention organization. From this, further investigation on how to strengthen the bonding and bridging social capital especially among the groups of people in their 60s and 70s in both housing complexes by looking in terms of physical neighbourhood environment should be conducted.

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THE IMPACT OF FREIGHT VEHICLE ACCESS RESTRICTION ON THE SUSTAINABILITY OF JAKARTA INTRA URBAN TOLLWAY SYSTEM

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Abstract

Freight vehicle access restriction policy in 2011 has had an impact on the performance of Jakarta Intra Urban Tollway (JIUT) system. The purpose of this study is to analyse the impact of the policy on Jakarta Intra Urban Toll way system before and after its implementation and to analyse the impact that occurs without the implementation of this policy by using the sustainable transportation indicators as the research parameters. The assessment results of the parameters (speed, amount of fuel consumption, cost of fuel consumption, fatality rate, cost of accident victim, amount of CO_2 emissions, cost of carbon pollution, and noise level) indicate that freight vehicle access restriction policy has a positive impact on traffic smoothness and safety but does not support overall urban sustainable transportation in JIUT system. In addition, if the policy was not implemented, its impact would have been worse than the current condition. It implies that the implementation of the policy is a right decision though some parameters should be improved to attain sustainable transport system.

Keyword: Freight vehicle, access restriction, sustainable transportation, toll way system.

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INTRODUCTION

Economic growth in a country is generally reflected in the increase on trade activities. Economic activities are closely linked to the city logistics system, where these activities involve moving goods from the point they were produced to the point they were consumed. The goods movements will inevitably come into contact with the city and are closely linked to truck trips.

The increase of truck traffic has a large impact on highway transportation in many cities. In congested cities, increased truck traffic worsens the delay, safety, energy use, and emissions. Local transport authority of some cities has proposed a number of strategies to overcome these problems, including combinations of infrastructure, regulatory, and economic mechanisms (Cherry & Adelakun, 2012). From different viewpoint, Munuzuri, Larraneta, Onieva and Cortés (2005) classify the strategies into those related to public infrastructure, land use management, access conditions, traffic management, enforcement and promotion.

Restricting truck traffic to off-peak hours is one commonly used strategy in many cities all over the world, including in developing countries such as Bangkok, Thailand and Petaling Jaya, a major Malaysian city originally developed as a satellite township for Kuala Lumpur. Off-peak hour's delivery provides a methodology to remove truck traffic from the rush hour periods through a co-operative approach amongst road operators and the industry (Aschauera & Starkl, 2010). From several studies, it was shown that this strategy has a positive impact on some of the parameters studied though most of the truck operators initially raise objection to the strategy due to the longer distance of the alternative route that they have to travel (Treerapongpichit, 2003; Mei & Ruban, 2010). Aschauera & Starkl (2010), who simulated trucks schedules, argue that off-peak hour's delivery has made more efficient use of road capacity, and capital expenditure for road construction can be avoided or at least postponed. Furthermore, the elimination of bottlenecks lead to competitive advantages for industry, business parks, and the entire urban area, and also benefits the environment. Qiu et al. (2015) prove that night time-only truck traffic regulation would produce less pavement distresses and better pavement performance due to the contribution of the lower temperature at night time.

In addition to research on the impact of off-peak hours delivery regulation, Dablanc (2007) studied the implementation of truck access restrictions based on environmental criteria in some northern European cities (Amsterdam, Copenhagen, Stockholm, Goteborg) and found that only newer trucks, or fully loaded trucks, are permitted to enter the city centre. These new standards tend to replace former weight and size restrictions, which are now considered quite irrelevant (Dablanc, 2007).

Even though this strategy has been adopted in many cities worldwide, it still needs supporting policies to foster the shifting of urban freight delivery

traffic to the off-peak hours. Veras (2008) investigated some policies from the economic viewpoint and assess their effectiveness in competitive markets. Such policies seemed to be needed because the empirical evidence indicates that in urban freight competitive markets, freight road pricing may not be the most effective way to move truck traffic out of the congested hours. This is because the decision about delivery time is jointly made between the carriers and the receivers; the carriers have great difficulties passing toll costs to receivers; and, in the few cases where toll costs could be passed, the price signal reaching receivers is of no consequence compared to receivers' incremental costs of off-peak hour's deliveries. The result suggests the use of tax incentives to receivers willing to accept off-peak hours deliveries, combined with freight road pricing as a revenue generation mechanism.

Furthermore, off-peak hour's delivery usually comes up against the receivers, who are not willing to change how they receive their goods. Off-peak hour's deliveries and urban distribution centres policy in two Spanish cities (Barcelona and Santander) were studied to investigate the receivers' intention to adopt both policies (Domíngueza, Veras, Ibeasa, & dell'Olioa, 2012). As the results, the receivers were more willing to adopt an urban distribution centre policy, especially in Barcelona, whose receivers opposed firmly off-peak hour's delivery. The incentives strongly influence receivers to adopt these policies; however, this influence is more significant in certain business sectors, such as food (for off-peak hour's delivery in Barcelona), restaurant and hotel, and furniture (for urban distribution centre in Santander and Barcelona, respectively).

From such previous studies it can be seen that though the access restriction strategy has had a positive impact on some parameters, the truck operators as main actors of city logistics were not in favour on it. Hence, we still have some problems to be solved before the optimal results to all stakeholders of city logistics, namely shippers, receivers, carriers, administrators, and consumers can be achieved (Taniguchi, 2001).

Jakarta, as the capital city of Indonesia, is experiencing brisk economic development, and this is indicated by the increased activity of truck trips, both trips within the city of Jakarta and the trips that just passing through the city of Jakarta. The access restriction policy for the trucks has been implemented on parts of the Jakarta Intra Urban Tollway (JIUT) system. JIUT is a ring road in the central of Jakarta, which connects the intercity highway from the south, east and west. Trucks are now prohibited to access the Cawang–Tomang–Pluit segment (statutory segment) from 05.00 am to 22.00 pm (see Figure 1). The duration of the restriction is longer compared to the ones applied in Petaling Jaya and Bangkok (i.e. from about 06.30 to 09.30 am). The alternative segment for trucks movement during this access restriction time is Cawang–Tanjung Priok–Pluit segment of JIUT (advisory segment). As a result of this access restriction, this alternative segment suffered severe congestion at the time of restriction, while

the restricted access segment improved its speed performance. Thus, this policy needs to be evaluated whether this access restriction has a positive impact on JIUT as a unified system rather than each segment individually, i.e. both the restricted segment and the alternative one, especially with respect to the sustainability of the urban transport system. Evaluation is needed since JIUT is located in the central of Jakarta and becomes the main road connecting the movement of people and goods to/from east, west and south of Jakarta. The poor performance of traffic in this system will have a big effect on the wider transportation system, let alone JIUT is also the main access to/from the port of Tanjung Priok and Soekarno Hatta International Airport.

The purpose of this study is to analyse the impact of access restriction policy on JIUT system before and after its implementation and to analyse the impact with the absence of this policy.

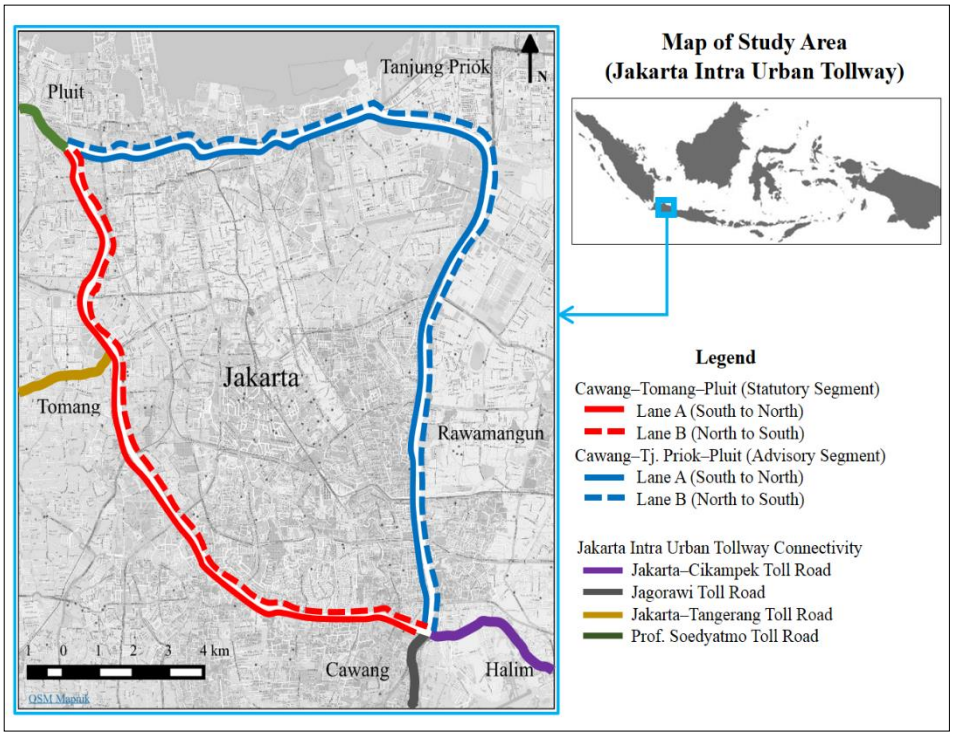

Figure 1: Jakarta Intra Urban Tollway System

RESEARCH METHODOLOGY

JIUT was the first ring road built in the central of Jakarta. It connects four neighbouring cities of Jakarta, namely Bogor and Depok (southern part), Tangerang (western part) and Bekasi (eastern part). On the north of Jakarta is

Java Sea, where the sea port of Tanjung Priok is located and directly connected to JIUT. The Soekarno Hatta International Airport, which is located near Pluit area, is also connected directly to JIUT. Traffic from Bogor and Depok enter or pass through Jakarta through JIUT, and so do the ones that come from Tangerang and Bekasi. Due to the vital role of JIUT, the traffic load of this toll way has been increasing from time to time. The increased traffic has led to the implementation of truck access restriction in some parts of JIUT.

Access restriction on JIUT has been implemented since June, 2011 through the Regulation of Minister of Transportation No. 62, 2011. The restriction is applicable to the operational time of freight vehicles of 1.2 axle configuration or more in JIUT. This Regulation of the Minister was issued based on the foundation that in order to optimize the use and movement of traffic on the Jakarta Intra Urban Tollway, it was deemed necessary to regulate the freight traffic to ensure the safety, order and smoothness of traffic and road transport. Freight vehicles, except fuel-transporting trucks, are not allowed to pass Cawang–Tomang–Puit segments (as statutory segment) during 5.00 am to 10.00 pm. During this restricted period, freight vehicles can use the alternative segment, which is the Cawang–Tanjung Priok–Pluit segment. This segment is named as advisory segment to indicate the transport authority provides this segment as an alternative segment and advises the freight vehicles to use it as a substitute to the statutory segment.

Even though the implementation of regulation has resulted in better performance of the statutory segment, i.e. in terms of vehicle speed, this is not the case for the advisory segment. Hence, this study aims to evaluate the impact of the regulation on the JIUT system as a whole system, by looking at the parameters that could represent the sustainability of the system, and not just vehicle speed.

Sustainable transportation should provide resources for a safe and satisfying future for all people in a society that is just caring for the basic human needs. The main factors affecting passenger transport are physical, psychological, and social needs, but goods transport is affected by market forces and government policies (Richardson, 2005). While there is no standard definition for sustainable transport system, some of the definitions adopted reflect that sustainable transport system must be effective and efficient in providing safe and fair access to basic economic and social services, promoting economic development and supporting environmental integrity (Jeon, Amekudzi, &Vanegas, 2006). In this context, development must be characterized by the definition of economic, environmental, and social sustainability (Russo & Comi, 2011).

Based on this concept, this study evaluates the sustainability of transport system on JUT based on the following parameters: speed and the amount of fuel consumption (as economic indicators); fatality rate (as social indicators); and CO_2 emissions and noise level (as environmental indicators). To integrate these

parameters the cost parameters were used, which include fuel consumption costs, the costs of accident victims and the costs of carbon pollution.

Since the policy was implemented beginning June 2011, its impact was illustrated in terms of changes in the magnitude of these parameters before and after implementation (represented by 2010, 2011, and 2012), as well as the differences of the magnitudes between the conditions after policy implementation (represented by 2011 and 2012) and the conditions if the policy is not applied (with and without regulation) for the same years. The analysis was limited to impact up to 2012 in order to preclude the impact of other specific activities of the city which may also contribute to those parameters. Each parameter was calculated for the statutory segment and advisory segment, as well as a combination of both. The latter was to describe the overall performance of the JIUT system, while the former ones to describe the performance of each segment.

The data used in this study was obtained from the operator of JIUT system, PT Jasa Marga (Persero) Tbk and PT Citra Marga Nusaphala Persada Tbk. They include data such as road length and gradient, the average speed, road capacity, traffic volume, the number of accidents and accident victims. The analysis of the fuel consumption and its associated cost was based on the Indonesian Guidelines for Calculation of Vehicle Operating Cost (Ministry of Public Works, 2005a) and the Indonesian Highway Capacity Manual (Directorate General of Highways, 1997). The cost of casualty victims was calculated based on the Indonesian Guidelines for Calculation of Traffic Accident Cost by Using The Gross Output Method (Human Capital) (Ministry of Public Works, 2005b), CO_2 emissions based on the Indonesian Guidelines for the Methodology for Calculating Greenhouse Gas Emissions, Procurement and Use of Energy (Ministry of Environment, 2012), and the noise level prediction uses the empirical equations adopted by Hajek and Krawczyniuk (1984).

The analysis was mainly based on the vehicle volume of both segments according to the vehicle classifications, namely light vehicle, medium heavy vehicle and large truck. The analysis of fuel consumption was based on the empirical model that involved main variables such as road gradient, speed and acceleration rate, and vehicle weight. The resulting fuel consumption measure was then converted into CO_2 emission by applying CO_2 conversion factor which depends on the fuel type of each vehicle class. For the fatality rate, the analysis involved the number of fatal accident, vehicle volume and road length. For noise level, the measure was represented by the equivalent energy level (L_{eq}) within range of 30 meters from the edge of road pavement. The empirical model of L_{eq} was based on vehicle volume and speed. Subsequently, the cost of each parameter, namely cost of fuel consumption, cost of accident, and cost of carbon pollution was derived by applying unit cost associated to each parameter, such as fuel price, unit cost of accident, and unit cost of carbon emission.

To estimate the parameters for year 2011 and 2012 in case of the access restriction policy was not implemented, regression technique was applied to predict the input data of all the parameters calculation using data of 2008-2010. To produce a more accurate prediction, three types of regression (linear regression, logarithmic regression, and exponential regression) were then selected based on the largest coefficient of determinant (R^2). After the prediction of the parameter data was conducted, the transport parameter values were calculated using all the guidelines previously mentioned.

RESULT AND DISCUSSION

The results of data processing used for analysis of changes in sustainable transportation indicators on the JIUT system before and after the application of Regulation of Minister of Transportation No. 62, 2011 can be seen in Table 1. The result of data analysis was then used to analyse the changes in the sustainable transportation indicator on the JIUT system with and without the application of Regulation of Minister of Transportation No. 62, 2011 can be seen in Table 2.

The Analysis of Before and After the Implementation of Policy

From Table 1 it can be seen that there is an increase in the average travel speed at statutory segment in 2012 compared to 2010. This condition can occur due to a decrease in the number of freight vehicles passing through the statutory segment, given the characteristics of large trucks seen as slow-moving vehicles and impeding the movement of traffic, especially during peak hours. This indicates that the policy of access restrictions on of freight vehicles at statutory segment in 2011 has a positive impact on speed at statutory segment.

Table 1: Sustainable transport parameters before and after the implementation of Regulation of Minister of Transportation No. 62, 2011

Indicators	Parameters	Unit	Segment	Year		
				2010 (Before)	2011 (Transition)	2012 (After)
Economy	Speed	km/hour	Statutory	38.15	45.81	53.95
	Fuel consumption	litre per km	Statutory	323,188,276	315,997,299	322,804,306
			Advisory	323,426,063	336,611,590	362,094,326
			JIUT system	646,614,339	652,608,889	684,898,631
Social	Fatality rate	fatality per 100 million veh.km	Statutory	0.34	0.20	0.26
			Advisory	0.13	0.12	0.12
			JIUT system	0.12	0.08	0.10
Environment	CO_2 emission	kg per year	Statutory	775,731,358	750,196,244	758,506,929
			Advisory	774,702,75	809,795,031	876,271,867
			JIUT system	1,550,434,111	1,559,991,276	1.634,778,796
	Noise level	dBA	Statutory	74.17	74.89	75.64
			Advisory	73.51	75.03	76.55
			JIUT system	77.19	78.30	79.46

Integration	Cost of fuel consumption, Cost of accident victim, Cost of carbon pollution.	rupiah	Statutory	1,531,370,394,967	1,495,624,789,954	1,534,610,085,078
			Advisory	1,530,788,472,292	1,593,258,428,128	1,722,108,708,745
			JIUT system	3,062,158,867,259	3,088,883,218,082	3,256,718,793,823

Table 2: Sustainable transport parameters with and without the implementation of Regulation of Minister of Transportation No. 62, 2011

Indicators	Parameters	Unit	Segment	With Policy		Without Policy	
				2011	2012	2011	2012
Economy	Fuel consumption	litre per km	Statutory	315,997,299	322,804,306	326,079,338	334,988,834
			Advisory	336,611,590	362,094,325	334,650,841	358,523,516
			JIUT system	652,608,889	684,898,631	660,730,179	693,512,350
`Social	Fatality rate	fatality per 100 million veh.km	Statutory	0.20	0.26	0.42	0.08
			Advisory	0.12	0.12	0.40	0.08
			JIUT system	0.08	0.10	0.20	0.04
Environment	CO_2 emission	kg per year	Statutory	750,196,244	758,506,929	783,062,560	804,897,406
			Advisory	809,795,031	876,271,867	801,310,753	859,439,557
			JIUT system	1,559,991,276	1,634,778,796	1,584,373,312	1,664,336,962
Integration	Cost of fuel consumption, Cost of accident victim, Cost of carbon pollution	rupiah	Statutory	1,495,624,789,954	1,534,610,085,078	1,545,701,758,738	1,595,368,468,966
			Advisory	1,593,258,428,128	1,722,108,708,745	1,583,761,956,816	1,704,205,892,028
			JIUT system	3,088,883,218,082	3,256,718,793,823	3,129,463,715,554	3,299,574,360,994

From Table 1 it can be seen that the amount of fuel consumption has decreased by 0.1% at statutory segment in 2012 when compared to 2010. While the amount of fuel consumption has increased by 12% at advisory segment and an increase of 5.9% in total JIUT system in 2012 when compared to 2010. The increase of fuel consumption on JIUT system can be caused by the change of vehicle composition that passes JIUT after the application of PM 62 Year 2011, that is the number of II–V class vehicles (truck with ≥ 2 axles), which using the statutory segment has decreased after the application of policy and gives effect to the increasing number of vehicles of this type that use advisory segment, while the number of Class I vehicles (passenger vehicles) using the statutory segment has increased after the application of policy. Overall, the access restriction has had a negative impact on the amount of fuel consumption on the JIUT system.

In terms of fatality rate, Table 1 shows that the fatality rate has decreased by 22.5% at statutory segment, decreased by 4.8% at advisory segment, and decreased by 16.8% at total JIUT system in 2012 when compared to 2010. This

condition may be caused by the changes in the composition of vehicles passing through the JIUT as described previously. In addition, one of the other factors that could affect the condition of the decreasing accident rate is the establishment of the National Road Safety General Plan in 2011 which has a mission to make road safety a national priority. Overall, the policy has had a positive impact on the level of fatality on the JIUT system.

The analysis of CO_2 emission shows that the CO_2 emissions has decreased by 2.2% at statutory segment in 2012 when compared to the year 2010. While the amount of CO_2 emissions increased by 13.1% in the advisory segment and an increase of 5.4% in the total JIUT system in 2012 when compared to 2010. An increase in CO_2 emissions in the total JIUT system could be due to changes in the amount of vehicle composition in accordance with the explanation in the previous analysis of fuel consumption parameter. This is also due to the amount of CO_2 emissions direct relationship to the amount of fuel consumption. Overall, the policy has had a negative impact on the amount of CO_2 emissions on JIUT system.

Analysis of noise level parameter in safe noisy area shows 2% increase in noise level at statutory segment, 4.1% increase at advisory segment, and an increase of 2.9% in overall JIUT system in 2012 when compared to 2010. Safe noisy area is an area of 30 meters wide from the edge of the road pavement that has noise levels of less than 65 dBA (Ministry of Public Works, 2004). From Table 1 it can be seen that the noise level at statutory segment, advisory segment, and the total JIUT system in 2010-2012 are always above the recommended value of 65 dBA. Overall, the policy of limiting the access of freight vehicles at statutory segment in 2011 has had a negative impact on the noise level on the JIUT system.

Analysis of the combined parameters of the cost of fuel consumption, casualty costs, and carbon pollution costs (integrated cost indicator) shows an increase by 2% at statutory segment, an increase of 4.1% at advisory segment, and an increase of 2.9% in the total JIUT system in 2012 when compared to 2010. Overall, the policy has negatively impacted the overall sustainable transport indicators represented by the integrated cost of each indicator (economic, social, and environment), namely the cost of fuel consumption, the cost of casualties, and the cost of carbon pollution on the JIUT system.

The Analysis of With and Without the Implementation of Access Restriction Policy

From Table 2 it can be seen that the amount of fuel consumption at advisory segment due the application of policy was at 0.6% greater in 2011 and at 1% greater in 2012 compared to without the application of the policy. While the amount of fuel consumption with the application of the policy at statutory segment was 3.1% lesser in 2011 and 3.6% lesser in 2012, as well as 1.2% lesser

in total JIUT system in 2011 and 2012 compared to without the application of the policy. In other words, the application of the policy has an impact on the increase of fuel consumption at advisory segment and affects the decrease of the amount of fuel consumption at statutory segment and the total JIUT system compared to without application of policy. Overall, the implementation of the policy in 2011 has had positive impact on total fuel consumption than if the policy was not implemented.

The analysis on the fatality rate (social indicator) was conducted by taking into account the percentage change of fatality rate in the JIUT system with and without the application of policy. From Table 2 it can be seen that the fatality rate at statutory segment with the application of policy is 51.8% smaller in 2011 and 220.5% greater in 2012 than the absence of policy. The fatality rate at advisory segment with the application of the policy was 69.4% smaller in 2011 and 57.4% greater in 2012 compared to the absence of policy. The fatality rate in total JIUT system was 60.4% smaller in 2011 and 144% greater in 2012 compared to the absence of policy. In other words, the application of the policy has reduced the fatality rate in JIUT system in 2011, but increased in the following year. Overall, the implementation of the policy in 2011 has had a negative impact on the fatality rate than if the policy was not implemented.

Furthermore, the assessment on before and after changes in the parameters of sustainable transport indicators to the overall JIUT system can be seen in Table 3.

Table 3: "Before and after" assessment on sustainable transport indicator due to the implementation of Regulation of Minister of Transportation No. 62, 2011

Indicators	Parameters	Impact	Segment	Percentage Change (Parameters of 2012 compared to the ones of 2010)
Economy	Speed	**Positive**	Statutory	Increased (41.3%) or 53.95 km/hr
	Fuel consumption	**Negative**	Statutory	Decreased (0.1%)
			Advisory	Increased (12.0%)
			JIUT system	Increased (5.9%)
Social	Fatality rate	**Positive**	Statutory	Decreased (22.5%)
			Advisory	Decreased (4.8%)
			JIUT system	Decreased (16.8%)
Environment	CO_2 emission	**Negative**	Statutory	Decreased (2.2%)
			Advisory	Increased (13.1%)
			JIUT system	Increased (5.4%)
	Noise level	**Negative**	Statutory	Increased (2.0%)
			Advisory	Increased (4.1%)
			JIUT system	Increased (2.9%)
Integration ratio		**Negative**	Statutory	Increased (0.2%)
			Advisory	Increased (12.5%)

	Cost of fuel consumption, cost of accident victim, cost of carbon pollution	JIUT system	Increased (6.4%)

The analysis of CO_2 emission shows that the CO_2 emissions at the advisory segment with the application of the policy was 1.1% higher in 2011 and 2% higher in 2012 compared to the absence of policy. While the amount of CO_2 emissions at statutory segment with the application of policy is 4.2% smaller in 2011 and 5.8% smaller in 2012 and in the total JIUT system is 1.5% smaller in 2011 and 1.8% smaller in 2012 compared to the absence of policy. In other words, the application of policy has had an impact on the increase of CO_2 emissions at advisory segment in 2011 and 2012 but decrease of CO_2 emissions at statutory segment and total JIUT system in 2011 and 2012 compared to without application of policy. Overall, the implementation of access restriction policy in 2011 has had a positive impact on the amount of CO_2 emissions compared to if the policy was not implemented.

Analysis on the combined parameters of fuel consumption costs, casualty costs, and carbon pollution costs (integrated cost indicator) shows that the integrated cost at advisory segment with the application of the policy was 0.6% larger in 2011 and 1.1 % larger in 2012 compared to without application of the policy. However, the integrated cost indictor at statutory segment with the application of policy was 3.2% smaller in 2011, 3.8% smaller in 2012, and 1.3% smaller on the total system JIUT in 2011 and 2012 compared to without application of the policy. In other words, the application of the policy has had an impact on the increase of integrated cost indicator at advisory segment in 2011 and 2012 but has an impact on the decrease of such indicator at statutory segment and total system of JIUT in 2011 and 2012 compared to without the application of the policy. Overall, the implementation of the access restriction policy has had a more positive impact on the overall sustainable transport indicators as represented by the integrated cost of each indicator (economic, social and environmental) i.e cost of fuel consumption, cost of accident victim, and cost of carbon pollution on the total JIUT system compared to without the implementation of the policy.

The comparison of the sustainable transport indicators, namely with the application and without the application of the policy, in 2011 and 2012 is shown in Table 4.

Table 4: "With and without" assessment on sustainable transport indicator due to the implementation of Regulation of Minister of Transportation No. 62, 2011

Indicators	Parameters	Impact	Segment	Percentage Change (Parameters of "with implementation" compared to ones of "without implementation"	
				2011	2012

Economy	Fuel consumption	**Positive**	Statutory	Smaller (3.1%)	Smaller (3.6%)
			Advisory	Greater (0.6%)	Greater (1.0 %)
			JIUT system	Smaller (1.2%)	Smaller (1.2%)
Social	Fatality rate	**Negative**	Statutory	Smaller (51.8%)	Greater (220.5%)
			Advisory	Smaller (69.4%)	Greater (57.4%)
			JIUT system	Smaller (60.4%)	Greater (144.0%)
Environment	CO_2 emission	**Positive**	Statutory	Smaller (4.2%)	Smaller (5.8%)
			Advisory	Greater (1.1%)	Greater (2.0%)
			JIUT system	Smaller (1.5%)	Smaller (1.8%)
Integration	Cost of fuel consumption, cost of accident victim, cost of carbon pollution	**Positive**	Statutory	Smaller (3.2%)	Smaller (3.8%)
			Advisory	Greater (0.6%)	Greater (1.1%)
			JIUT system	Smaller (1.3%)	Smaller (1.3%)

CONCLUSION

Based on the trend of changes in sustainable transport indicators associated to the implementation of freight vehicle access restriction policy on JIUT, it can be concluded that the policy has had a positive impact on traffic smoothness and safety but it has not supported the overall urban sustainable transportation in JIUT system. Nevertheless, if the policy was not implemented, the situation would have been worse than the current condition. This implies that the implementation of the policy was a right decision though further efforts must be taken to improve some of the parameters in order to attain sustainable transport system. Moreover, the regulator should also consider the other sustainable transport indicators rather than only the travel time as a single determinant.

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COMFORT CHARACTER OF LANDSCAPE FEATURES OF TRADITIONAL STREETS IN AMMAN, JORDAN

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Abstract
Fast expanding of urban development changes the street function and gives priority for vehicles, which effects the urban fabric and cultural life of the city. It makes walking in the street difficult and uncomfortable. Hence, this research aims to explore the influence of landscape features towards comfort character of traditional streets in Amman, Jordan. The case study was Rainbow Street in Amman, the capital city in Jordan. Mixed-method approach was used in this study, which involved direct observation (visual and behavioural) and user perception (survey and in-depth interviews) techniques. The data was analysed through thematic analyses for qualitative data and descriptive statistics for quantitative data. The results show that landscape features that contribute towards comfort character could be divided into two main categories, namely, pedestrian amenities and sidewalk. This should be taken into consideration in the design of the existing and future streets in Jordan.

Keyword: Landscape, Comfort, Character, Traditional Street, Sidewalk, Pedestrian amenities.

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INTRODUCTION

Streets have been described as a significant part of the urban open space that also defined as the bones of the city (Rahman, Shamsuddin, & Ghani, 2015). Streets serve as a venue for social interaction via different types of human behaviour, including talking, playing, observing, and lingering. Streets also function as a space for families and friends and sometimes a living room or a dining room for city dwellers (Oranratmanee & Sachakul, 2014). Thus, streets symbolize the public realm where people spend a majority of their time (Jacobs 1961; Ja'afar, Rahim, Samad, & Rahim, 2017; Zaidin, Hussain, Tukiman, & Shahli, 2015). According to Carr (1992), there are five major reasons why people go to public places. These are 'comfort, relaxation, passive engagement with the environment, active engagement with the environment and discovery. Rahman et al. (2015) identified comfort as the most basic of needs and the most important design criterion for a liveable street as it has a direct effect on place satisfaction.

Comfort is not just offering protection from sun, wind, and rain, but also providing a physiologically suitable setting of the street environment to support a convenient environment where various activities and outdoor culture events can occur in open public spaces (Mehta, 2006; Hajmirsadeghi, 2015). It is about providing a safe, accessible, convenient and pleasant place for people to spend their time and having their social activities (Zakaria & Ujang, 2015). If streets are alive, secure, pleasant and exciting spaces, they can attract more people (Mehta, 2006). In this regard, the level of comfort could be determined by the length of time where people would spend in the public space (Carmona, Heath, Oc, & Tiesdell, 2003).

At the same time landscape elements, both hard (lighting, urban furniture, paving, and public art) and soft (planting), play a significant role in creating a sense and meaning of place and affect the type of activities such as walking or sitting within the street environment. Consequently, comfort is a characteristic that should be considered when designing a convenient, safe, and friendly street environment which is one of the basic human needs in urban spaces (Carr, 1992; Jacobs, 1996; Carmona et al., 2003; Rahman et al., 2015). It influences the vitality and liveability of urban setting (Shahideh, 2013). Thus, comfort is defined as the pleasant state of physiological, psychological and physical harmony between the human body and the environment (Zakaria & Ujang, 2015).

ISSUES AND PROBLEM STATEMENT

According to Gehl (2015), when public space became unattractive, unwelcoming and uninspiring, people will be discouraged from using it, either by enjoying its surroundings or having social activities in it. But modern urban planning pays more attention to requirements of automobiles rather than pedestrians' needs. The development of modern highways and high-rise buildings destroy the traditional urban fabric and harm urban quality (Jalaladdini & Oktay, 2012; Ultav, Çağlar,

& Drinkwater, 2015). Modernization adversely affected the key role played by traditional streets as a public space that enhances city appearance. When urban design focuses on motor vehicles, a lost local character must be identified (Tawil, Reicher, Ramadan, & Jafari, 2014). Nonetheless, the previously mentioned scenario is common. In fact, it occurs at both local and global scale, which directly affects the pattern of a street or city. Al-Asad (2004) indicates that walking in Amman city has become challenging, uncomfortable, and unsafe because some streets have a problem in the continuity of good and comfort sidewalks. He adds that sidewalks in Amman were not properly maintained, as shown in (Figure 1).

Figure 1: Example of poorly maintained sidewalk in Amman
Source: Jafra News, 2015

Poor maintenance of sidewalks can also be observed in other cities in Jordan, such as Az Zarqaa. Some places have sidewalk pavements of varying heights (blocks have different levels as a result of many factors, such as rain), which affect the safety and comfort of pedestrians. Additionally, low-branching trees were planted in the middle of the sidewalks, causing difficulties to users. Sidewalks in front of markets are also used by traders to showcase their goods. All these resulted in difficulties to users and forced them to walk on the street, exposed to the danger of collision with motor vehicles. At the same time, heavy traffic also makes crossing the street as challenging and dangerous. It is, thus, important that streets are designed suitably as a social arena that gives priority to the comfort of the pedestrian. Therefore, this study aims to explore the influence of landscape features towards comfort character of traditional streets environment.

METHODOLOGY

This study examines the physical elements that contribute towards comfort in traditional street. As a case study, Rainbow Street, Jordan was selected (Figure 2). Street in traditional ambience was selected because according to scholars, the sense of place by its culture, local need and appearance could be felt. This is what makes a place or town is different from another town (Shamsuddin, Sulaiman, & Amat, 2012). Rainbow Street is located at the central location between east and west Amman, the capital of Jordan. It is well connected to the downtown area through magnificent steps. The street reveals a rich history and cultural heritage of the city of Amman; it represents a "distinctive Amman character" through its distinctive building. This street receives a high concentration of visitors and pedestrians from different ages and background, locals and foreigners due to its special location, mixed-use activities heritage and various activities (Turath Architecture & Urban Design Consultants, 2010).

This study adopted a mixed-method approach, where field studies, qualitative method and quantitative method were used. The main techniques that were used in this study were questionnaire survey, field observation (visual and behavioural surveys), in-depth interviews, and literature and document analysis.

The questionnaire survey was conducted on 330 street users who were categorized under two types of users: (i) static users - those who are permanently tied to the study area (shop owners, traders, officers, residents) along the street (ii) mobile users - those who do not live within the study area (shoppers and tourists). In-depth interviews were conducted on 21 street users. Thematic analysis using NVIVO 10 was undertaken for qualitative data and descriptive statistics using SPSS 22 were used for quantitative data.

Figure 2: Rainbow Street, Amman
Source: Turath Architecture & Urban Design Consultants, 2010

RESULTS AND DISCUSSION

The result of the analysis shows that landscape features influence users' feeling of comfort while walking along the Rainbow Street through (i) pedestrian amenities and (ii) sidewalk (Table 1).

Table 1: Landscape elements that contribute towards comfort character

Element	Interview			Survey	Visual
	Yes	No	Σ	N=330	survey
1- Pedestrian amenities					
Public toilet	18	3	21		/
Seating	21	21	-	175(53%)	/
2- Sidewalk	20	1	21	194 (58%)	/

Source: Field work

Pedestrian amenities

Public Toilet

Clean and accessible public toilets are essential in urban public spaces (Ja'afar, Sulaiman, & Shamsuddin, 2012; Askari, Soltani, & Mohd, 2015) because urban public spaces must function as outdoor living room where users can fulfil their needs such as going to the toilet to ensure their comfort (Speck, 2013). According to the interviews, 18 respondents insisted on the importance of public toilet provision, and keeping it clean and well maintained, as this can contribute to the attraction and comfort of visitors to a street.

Based on observation, Rainbow Street lacks public toilet. Therefore, the provision of clean and well-maintained public toilets must be taken into consideration in improving the comfort character of Rainbow Street s well as in designing new streets so that they can attract visitors and prolong their stay in the areas.

Seating

Proper placement of seating in activity areas creates a sense of place, comfort, enjoyment and successful urban area. The results of the survey show that 53% of the respondents feel comfortable with the seating provided in the study area. However, some of the respondents said there should be more seating in such crowded street. All of the respondents in the interview (n=21) mentioned that they like to sit and watch the street activity and the panoramic view.

"I like sitting on the side benches with my friend and having our sandwiches from Al-Quds cafeteria watching people." R13 street user.

The quotation above indicates that the users enjoy sitting on the street benches and watching the street activity, socializing, and having their snacks. Public seating should be oriented toward interest points such as panoramic view, water view, open spaces, or the street itself if it is lively and perpendicular to the curb.

Meanwhile the visual survey (as shown in Figure 3) found that benches along the street have different shapes and designs that meet users' needs. Their placement is also concentrated in areas with more activities. However, shades in the seating areas is required to ensure users' comfort. Public seating should be comfortable, shaded and with different shapes that provide comfortable and active environment where people can rest, socialize, or eat and enjoying public space (Latip, 2011; Austin, 2002; Hajmirsadeghi, 2015).

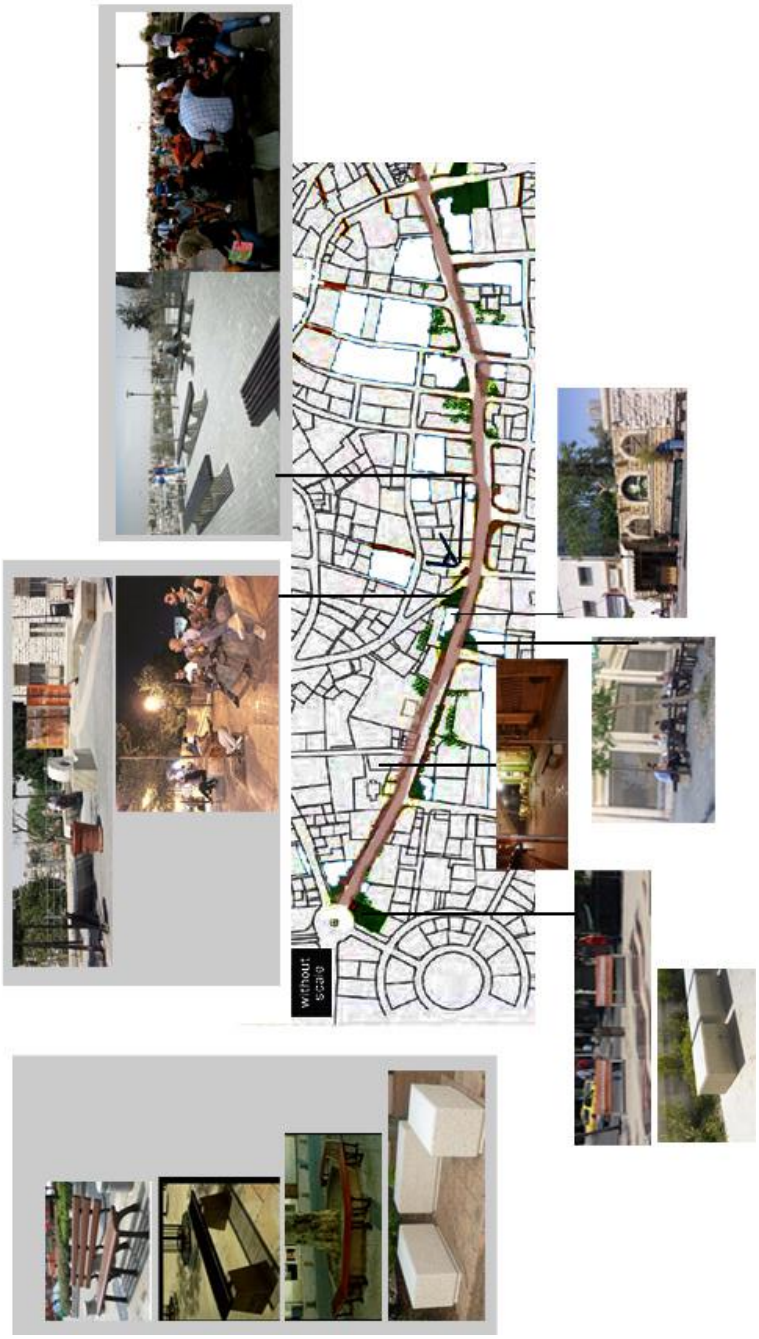


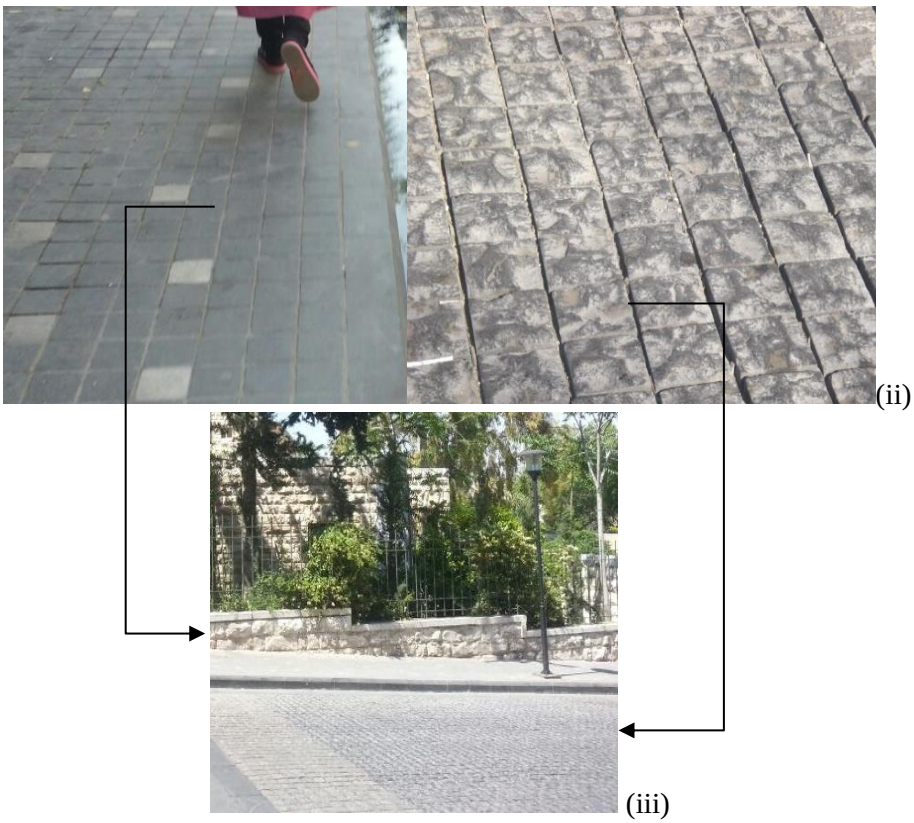
Figure 3: Location and types of seating on Rainbow Street
Source: Fieldwork

Pathway type & Pavement

The survey showed that 58% of respondents were satisfied with the sidewalk condition in the study area, and they feel comfortable while walking on the sidewalk as it was non slippery, free of obstacle most of the time and with a suitable width. Meanwhile, 14 respondents mentioned that they feel comfortable when using the sidewalk as it connects continuously the parking area to their destinations. Even when users were forced to walk on the road due to crowded sidewalk, they still feel safe because the design of the road forces the cars to reduce their speed.

> "*We can use the sidewalk most of the time. Its width is ok, but when the street is crowded it's hard to walk in, so we need to use the vehicle path. It's still okay as the street design is for pedestrian, and its rough pavement and narrow width force the cars to slow down."* R15 street user

The concept of "Traffic Calming" was applied in the design of the streets, thus reducing the speed of vehicle and increase safety to non-motorized users like pedestrians and cyclists, therefore guaranteed comfort environment for the street users (García, Torres, Romero, & Moreno, 2011; Yousif, Alterawi, & Henson, 2013; Karndacharuk, Wilson, & Dunn, 2014; Panchal, Khan, Sharma, Bharti, & Singh, 2017; Grey, Siddall, & O'Shea, 2011). At the same time, the use of suitable non-slippery pavement material for the sidewalk also contributes in enhancing the comfort of the users (Figure 4).

(i)  (ii)

(iii)

Figure 4: Sidewalk pavement of Bazalt Stone, cut finish) (i) and road pavement of Bazalt Stone, light hammered finish (ii) being used at Rainbow Street (iii)
Source: Fieldwork

(i) 

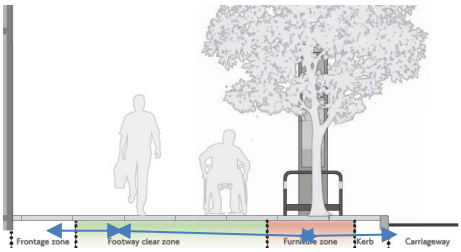
(ii) 

Figure 5: (i) Example of Sidewalk in Rainbow Street; (ii) Sidewalk Divisions
Source:(i) Field work, (ii)(Rice,2017)

Visual survey also confirmed that the sidewalk is continuous, free of obstacles such as tree and lamp post, and with sufficient width, which ranges between 1.5m to 2m (Figure 5). The width of the sidewalk meets the dimension

suggested by many parties. For instance, Keat, Yaacob and Hashim (2016) suggest that sidewalk width should be between 1.8m to 3m. Meanwhile, Brezina, Graser and Leth suggest that it should not be less than 1.5m. Sidewalk with sufficient width would allow at least two people to walk comfortably side by side or in opposite direction, and also would allow wheelchair users to move conveniently. Wheelchair users require 1.5m width to turn around and 1.8m to pass other wheelchair users (Boodlal, 2004; Ja'afar, Sulaiman, & Shamsuddin, 2015; Ja'afar et al., 2017; Grey et al., 2011). Walking zone should be straight and continuous and free of all obstacle to allow people to walk in the most direct route possible. Meeting these requirements will ensure comfort, pleasant and safe environment for street users (Tariq, 2007)

CONCLUSION

Feeling comfort is one of the main reason why people use or go to the public spaces such as street, in addition, comfort is main criteria for the success of streets. At the same time, the landscape features are significant aspects that constitute the street. Accordingly, the purpose of this research is to determine the landscape features that contribute towards comfort while walking in the street in Jordan context, in this research it was revealed that the landscape features that contribute to comfort while walking in the street in Jordan context were mostly similar with the previous theories. The study shows, the landscape features that contribute to the comfort are (a) pedestrian amenities (public toilet and seating), (b) pathway type and pavement. This recognizes the factors that need to be considered in future guidelines and policies for planning and designing new street as a guide to create a comfortable street environment for the pedestrian that is lacking in new streets at present.

a. The design of the pedestrian sidewalk with a minimum size (1.8 m).
b. The sidewalk must be free from any holes or obstacles to ensure the safety of the pedestrians
c. Using traffic calming techniques in designing the vehicle's path that reducing vehicle speed and improve street safety.
d. Reduction of vehicular space to provide for the footpath, cycle lane.

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THE VIABILITY OF AN INTEGRATIVE FRAMEWORK FOR URBAN DESIGN AND REGIONAL ENVIRONMENTAL JUSTICE

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Abstract

Environmental justice is an increasingly problematic proposition, as the clash of political, economic, social and community interests invariably occur. The purpose of this research is to examine the viability of an integrated framework that establishes environmental justice from economic, social and cultural development perspectives in Malaysia. Case studies analysing *Iskandar Low Carbon Blueprint* (LCB) 2025 and the *River of Life Project* (ROL) are presented. Findings suggest that clear national policies on urban transformation is an increasingly important environmental justice issue in Malaysia, but sustaining liveability is a challenge in the face of more critical decisions on infrastructural and resource management and energy use, resulting in a lack of attitudinal and behavioural change in urban planning programmes. This suggests that meaningful stakeholder engagements and collaborations contribute in planning economically and ecologically viable solutions and initiatives for liveable and resilient cities.

Keyword: sustainability, liveable, resilient urban design, environmental justice

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INTRODUCTION

Urban design is an interdisciplinary field incorporating scientific inquiry and empirical research related to architecture, spatial, aesthetic and cultural landscape planning and development (Dovey & Pafka, 2016). Within the practice however, contestations occur: political and economic investment priorities, intertwined with issues of resource and energy dependence, and divergent sociocultural and ecological interests, make urban planning the site of critical studies on place-making, climate change, socio-ecological restoration and environmental justice (Carmona, 2013; Hens & Stoyanov, 2014).

To understand these issues, cases assessing urban design's role in serving environmental justice are examined in this article. Key research questions include: *What is the relationship between environmental justice and sustainable design in the planning of urban communities? How is urban design integrated into planning policies? What is Malaysia's rate of success in fostering environmental justice programmes?*

Countries blessed with abundant natural resources consider themselves well-buffered against climate change since vast assets enable them to support large-scale consumption. Examining data on the contributors of carbon emission, however, urban cities are found to be core carbon producers: consuming two-thirds of the world's energy and generating 70% of global emission of harmful pollutants (World Bank, 2014). Compounded by a lack of regulatory awareness and advocacy emphasising environmental justice from top-down and bottom-up channels; a lack of participatory dialogues addressing social injustices towards low- or mixed-income urban dwellers (C40, 2016) results.

Malaysia must thus increasingly commit to tackling complex global issues such as climate change, urban resilience, and participate in resource efficiency management for several reasons, chief of which is to fully reap the benefit-sharing outcomes of collaborative sustainable strategies and long-range initiatives. With Malaysia now at a critical stage of transformation, the enhancement of socio-spatial surroundings demands a new state of human culture, where the value of environmental wellbeing is cultivated at fundamental and advanced levels among growing populations of urban communities. This article examines the degree in which environmental justice, a concept integrating urban design planning and national urban transformation mechanisms, is actionable in the long term economic development and planning of Malaysian cities.

LITERATURE REVIEW

Urban design is the application of concepts and practices to seek the elusive, but desirable, condition of comparative better quality of life. It evolved from the discipline of ecological economics, a branch of a larger global movement concerned with addressing change through collective action and civic

participation in debating regulatory measures, utilising technical and technological solutions (Pieterse, 2001). As an integrated field, this practice requires modern approaches to normative intervention strategies, mechanisms, policies and processes that instigate actions and produce change.

Environmental justice is defined broadly as the "fair treatment and meaningful involvement of people regardless of race, colour, national origin, or income with respect to the development, implementation and enforcement of environmental laws, regulations, and policies" (US EPA, 2017). The US EPA aligns environmental policies with urban design planning through guiding frameworks, collaborative decision-making processes and systems implementation in efforts to create climate-resilient and robust surroundings for balanced urban growth.

The overall aim of environmental justice is to provide equity of care for society and the environment through accelerating green policies and promoting best practices and choices in planning and designing urban spaces (Washburn, 2013). Simply put, sustainable development cannot be achieved without environmental justice. Not all are advocates of this approach, however. Sustainability is contested by urbanisation critics and researchers, who challenge the validity of environmentalism to achieve social justice, calling it a "smoke screen" under the traditional economic ideology as ethnic and class disparities persist (Bullard, 2000), while polarities of urban development are ambiguously represented. Countries transitioning from a traditional to global economy face constraints of state budgetary allocations which impact the social landscapes and pace of life that differentiates smaller towns from metropolises (Bettencourt, Lobo, Helbing, Kühnert, & West, 2007; Walker & Salt, 2006).

Jacobs' (1999) four "faultlines" theory suggests that growth limitations, environmental objectives, social equity and participation influence the equitable distribution of welfare and access to amenities and facilities. Residential and industrial zoning, for instance, forces the reorganisation of social classes based on income and demographics, green hubs that subdivide public areas proport to perpetuate raw elements such as trees, gardens and walking paths, but may eventually be cordoned off as private recreational zones.

Environmental management must not merely be table talk among those with prevailing knowledge, but intentional dialogues with disenfranchised or resource-poor groups (Martin, McGuire, & Sullivan, 2013). As urban space planning affect water quality and hydrological services, the processes could impact indigenous flora and fauna. McCluskey and Joao (2011) propose the implementation of environmental justice policies by recognising the importance of species diversity and habitat protection, whereby sustainability actions are informed by consultation with environmental institutions and bodies. Evidence of urban design quality can be evaluated by assessing visual aesthetics' role to enrich social experiences and eco-interactions (Cullen, 1961; Gobster, Nassauer,

Daniel, & Fry, 2007), for instance, the conversion of courtyards, balconies or rooftops into vegetable farms, herbal or flower gardens (IDRC, 2006). By being "just green enough", small-scale methods help address environmental justice better, *in lieu* of oversized public projects that concentrate resources in affluent neighbourhoods and introduce gentrification, forcing poorer residents to be resettled in less liveable regions as a result (Wolch, Byrne, & Newell, 2014).

Relationship between Environmental Justice and Urban Design

Environmental justice can be a catalyst for ideal 'healthy communities' by ensuring balance in social access to housing and employment and sustaining property values (Wolch et al., 2014). Adaptiveness, resilience, wellbeing, sustainability and liveability are found through the interstices of spatial design, in the "intensities, rhythms and socialities" represented by people's synergies, psychosocial and cultural dimensions. US EPA (2017) notes that neighbourhoods with infrastructural connectivity, pedestrian walkability, transit amenities and public conveniences, when combined with spatial aesthetics, appeal to people at all stages of life and income levels. This state of social equity starts from identifying the scale of environmental degradation (Martin et al., 2013). Sustainable urban design addresses another aspect: the moral nature of human resilience itself. Deliberate policies and actions to reduce energy use and resource dependency, slow the rate of climatic changes, improve communal wellbeing and encourage adoption of green technologies, are crucial (Washburn, 2013), yet urban planning are seldom financially rewarding in the short term, and few acknowledge the practice as explicitly *just*: it is hard to make an economic case for design per se, being subjective and "slippery in nature", since what is considered 'the best' or 'most rational' planning solution for greater good may merely be advantageous for dominant stakeholders (Carmona & Tiesdell, 2007). Rice and Littlefield (2015) reviewed post-industrial recessionary failure of American real estate and found that sheer commercial misjudgements transgress on architecture, resulting in illegal squatting in derelict properties, abandoned factories, and fringe settlements.

Nassauer and Raskin (2014) argue similarly that vacant properties and abandoned land tracts are vulnerable to *contaminants*, defined as accumulated negative physical legacies such as building defacement, or wanton dumping of household debris, chemicals and littering, resulting in sociocultural decay and criminal risks. Transformative solutions ranging from land use conversion, intentional landscaping and social capital investments stressing development of communal ties are necessary to demonstrate "cues to care", strengthening perceptions of safety and reducing residential fears (Nassauer & Raskin, 2014).

In summing up literature, environmental duties are the underpinning principles in urban design planning to assure fair and equitable access of diverse communities to green spaces (Wolch et al., 2014). Planners must also consider

how eco-design changes affect groups living on the fringes of urban areas. Environmental justice can be integrated into sustainability frameworks through social equity agenda. These goals require stakeholder action groups comprising public and private sectors to be involved in planning, decision-making and implementation (Aiyeola, Ramdzani, Nasir, & Zalina, 2014; Nassauer, Wu, & Xiang, 2014; World Bank, 2014). Literature suggests that careful analysis of prevailing assumptions, attitudes and perceptions about sustainability is crucial, as community input legitimises sustainability at the core of environmental agendas by questioning "who gets what, why, and how much" (Bullard, 2008).

RESEARCH BACKGROUND AND METHODOLOGY

The use of qualitative case study, while evidently limited to specific cases, provides contextual analysis and broad interpretation of findings for complex phenomena (Yin, 2003). Observed phenomena combined with inductive methods make case studies instrumental in discovering motivations behind cultural behaviour patterns (Stake, 1995). To deconstruct relations between people, and relations between people to places and objects (e.g. buildings), narrative cases represent a humanities dimension, complementing empirical research. Qualitative studies on urban design challenges uses descriptive insights (Bettencourt et al., 2007; Dovey & Pafka, 2016), enabling economists, politicians, policymakers and researchers to understand environmental parity in evaluating problems, constraints and solutions beyond financial benefits, since projects may be viewed as "successful in somebody's eyes and [yet be] failures in somebody else's" (Lang, 2005, p. xxiii). Case study method cuts through objective and subjective data to seek how "assemblage of adaptive social interconnections link spatiality to sociality" in urban spaces (Dovey & Pafka, 2016, p.10).

FINDINGS AND ANALYSIS

This research offers a unique insight on the impact of Malaysian urban design planning policies on environmental justice by examining how the participatory model of interaction affects outcomes of two urban projects.

Case Study I: ISKANDAR Low Carbon Blueprint 2025

In an ideal sustainable urban ecosystem, urban design principles thrive alongside significant transformative changes. Under Malaysia's Ministry of Energy, Green Technology and Water (KeTTHA, 2009), a Low Carbon Cities framework involving collaboration with non-profit Carbon Trust UK is aimed at accelerating transition towards a low carbon economy. Quantitative factors include measuring carbon footprint per capita, increase in renewable energy, usage of clean technologies and energy-efficiency solutions for cost reductions among participating stakeholders (Rugg, 2014). The Low Carbon Blueprint (LCB 6-11) 2025 for Iskandar City in Johor exemplifies top-down and bottom-up approaches in enhancing urban infrastructural planning via social engineering and sustainability projects involving state authorities, civil agencies, NGO and private sectors (Figure 1). Under the LCB 2025, local planning authorities, civic communities and private sector networks were identified as stakeholders in development planning by policymakers, guided by the Town and Country Planning Act 1976.

Among the many thrusts, LCB 2025 targets for land use and infrastructural transformation through transit-oriented development or TODs (LCB 9-15). By building transport interchanges orientating pedestrian routes with commercial zones and commuting facilities, this concept of mixed-use development promotes sustainable living and reduction of carbon emissions while providing employment and passenger convenience. Under its action plans, walkable, safe and liveable designs to be developed include Park and Ride installations (LCB 1-5) linking transit nodes with facilities such as luggage lockers, bicycle rental and stands, cashless ticketing system and public services. The blueprint notes that up to 54% of carbon reduction is achievable for Iskandar City by 2025 if low carbon aspects of transportation, lifestyle and environmental care were fully integrated (LCB 0-5). An attitude of scepticism among landowners and property developers was "to be expected" (LCB 3-8) towards LCB adoption, and soft incentives in the form of green building certification, rather than monetary rewards, are proposed to entice corporate investors who take up the smart urban growth challenge.

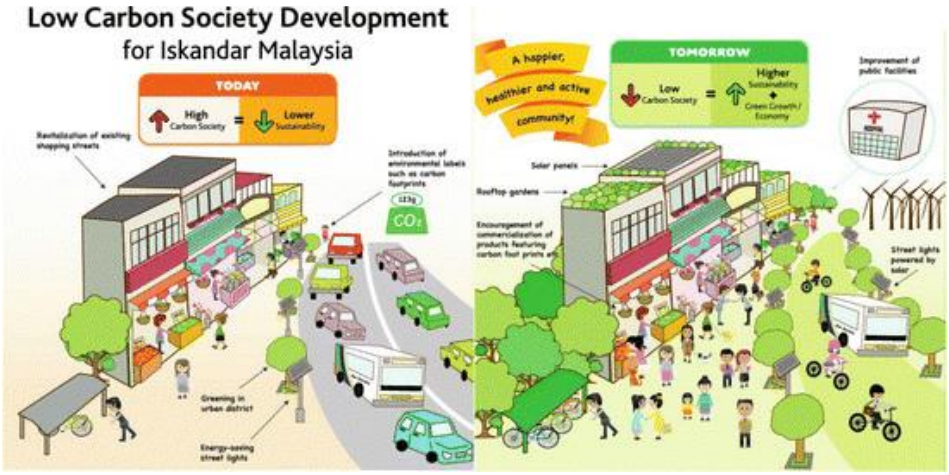

Figure 1: Low Carbon City concept for Iskandar Malaysia
Source: Academic Library, 2014

Case Study II: River of Life (ROL) Project

Ownership is a valuable benefit sharing outcome of aesthetic landscape design. The River of Life (ROL) initiative began in 2010 when the Kuala Lumpur City Hall empowered the Department of Irrigation and Drainage (DID) to turn Greater Kuala Lumpur, the urban zone populated by four million, served by Klang and Gombak rivers and their waterways, into one of the Most Liveable Global Metropolises by 2020 (River of Life, 2017). As part of the national economic transformation programme (ETP), ROL targets to enhance urban economic, land development and tourism opportunities through the implementation of master planning, cleaning and beautification of the historically important rivers, both which have seen better days since Malaya's tin mining era in 1800s (Figure 2). As the capital grew into an economic outpost for the British and post-colonial independence, it accumulated infamy from decades of pollution due to sewage dumping, and indiscriminate littering, from refrigerators to carcasses (Malaysian Digest, 2017). International master-planning architects are steering the US$1.3bil (RM4.4bil) project to elevate commercial value and liveability through 10.7km of vibrant landscaped waterfronts, scenic parks, walkways and cycle lanes (AECOM, 2017).

Figure 2: River of Life upon completion
Source: Malaysian Digest, 2017

Over the years, the challenge to establish ground support through ownership of river sustainability initiatives was much debated. Non-profit organisations claimed that the federal government, typically locked in its self-serving role, had neglected public perceptions:

> *"They [the authorities] say that, we are taxpayers … why should we be helping with the river? Instilling [awareness, knowledge and skills helps the public] reconnect with the river [They] cannot relate with the importance of rivers in daily lives as water consumption can easily be accessed without having to go directly to rivers"* (Malaysian Digest, 2017).

To address the issue, a public outreach programme (POP) was launched after initial pilot testing, aimed to create awareness, knowledge and skills towards attitudinal and behavioural changes using preventative, monitoring and auditing approaches, with emphasis on consultation, partnerships and communication of activities and initiatives between DID and over twenty governmental agencies with local stakeholder communities (Chan, 2016). This improved the visibility of ROL project in national media and alternative information channels such as social networks. Further engagement included organising campaigns, competitions, talks, workshops, trainings, as well as encouraging citizen reporting and online discussions (GEC, 2017).

DISCUSSION AND RECOMMENDATIONS

Malaysian urban design planning cases discussed demonstrate the importance public-private sector collaborations in improving environmental justice outlook for the medium and long term. Qualitative research indicates urban design quality effectively fulfils the basic concept of resilience and adaptiveness but while understanding of sustainability and liveability may have increased, questions of socioeconomic and sociocultural justice to stakeholders, persist. In integrating environmental justice and urban design planning, initiatives to address climate change such as developing renewable energy sources, pollution reduction, waterway preservation and low-carbon policies, remain among *the key concerns* among authorities and economic sectors (KeTTHA, 2009; Universiti Teknologi Malaysia, 2013). Social sustainability agendas are still relatively undervalued. Despite existing policies fostering ecologically sustainable options, an integrative framework that facilitates growth of liveable cities with socioeconomic and cultural fundamentals, is relatively under-implemented and weak. This can be attributed to several reasons: the lack of support from private sector investors, prohibitive costs of sustainability investments, lack of awareness towards the value of ecological resources and cultural attitudes towards landscapes and heritage preservation. Contestations are compounded with over-urbanisation issues: haphazard solutions for stuttering problems like waste dumping, pothole, burst water pipes or open burning; attitudinal indifference to sustainable development, material culture aspirations, and sense of disconnect with conflated economic change agendas (Gobster et al., 2007). Furthermore, considering the vested nature of stakeholder participation in infrastructural development in Malaysia, Tan (2012) argues that the process of designing, implementation and ensuring efficient access to crucial services such as water has resulted in privatisation measures that, while lucrative for government-linked corporations, have failed to generate capital returns, reflecting rent-seeking behaviours characteristic of biased political interests. Washburn (2013), a former chief urban designer of New York, believes the level of civic involvement determines the quantum and quality of public space transformation: "[Building] a fortress of technology that could withstand tidal waves while emitting no carbon would not be [considered] an urban design success if it embittered its residents."(p.8)

It is hence recommended the authorities provide actionable, enabling mechanisms for environmental justice under sustainable policy frameworks to ensure urban resilience besides increasing emotional interactions with aesthetic landscapes (Gobster et al., 2007; Dovey & Pafka, 2016). Ensuring guiding policies are in line with internationally prescribed emissions levels in compliance with Environmental Quality Regulations 2009 (DOE, 2010) without hampering aspirations for metropolis growth, are key issues that urban planners should prioritise to measure the degree of sustainability effectiveness (Aiyeola et al., 2014).

Resource and energy efficiencies are important in development of healthy spaces balancing sociocultural, physical and psychological aspects (Dadashpour, Azizi, & Asgharzade, 2016). In city campuses and schools, there are opportunities to design and incorporate green systems such as solar panelling and solar roofs (Chance, 2012). Other practical approaches that inculcates transformation design thinking include incorporating vertical walls within commercial complexes, as well as harnessing unused spaces such as rooftops for small-scale gardening and urban food production, its upside being pesticide-free methods (IDRC, 2006). Sustainability strategies also require the contextual appropriation of past heritage values for the present. One method to preserve sociocultural integrity without heavy redevelopment costs is through integrating spatial models with heritage aesthetics enhancing the *perceptual realm of experiences* of modern urbanity (Gobster et al., 2007). The conversion of vacant properties into educational or commercial hubs with heritage elements intact is a cost-effective proposition (Nassauer & Raskin, 2014).

From an environmental law standpoint, Noor Mohammad (2011) suggests that suitable actions be taken to ensure justice amid urban transformation. This includes communication and education for awareness of land rights and resource management, ensuring accessible and ethical information related to environmental impact assessments (EIA) by authorities, state agencies, the media, human rights advocates and international environmental alliances). Aside from regulatory frameworks, training and awareness for officers and taskforces are required to build stronger social capital networks between authorities, community stakeholders and the media. Decisive and rigorous enforcement of existing urban planning laws and anti-pollution policies ensures communities are held responsible for their own urban lifestyle management in aiming for better personal health and social wellbeing.

CONCLUSION

Case studies from Malaysia have suggested an evolutionary pattern of sustainability actions from randomly-implemented, community-based undertakings to more organised programmes and social advocacy movements, aligning to sustainability frameworks under the National Green Technology Policy and Low Carbon Cities Framework (KeTTHA, 2009). As stakeholder commitment to reduce energy dependency, promote green technology and adopt sustainable infrastructure solutions increase, resource management and transportation improves. Distributive justice is a critical urban planning principle in this scenario (Aiyeola et al., 2014), and ensuring benefit sharing outcomes through higher stakeholder participation is clearly a key determinant for the future of urban-engineered social projects.

Findings have suggested that urban designers must better communicate appreciation of sociocultural benefits of sustainability, instead of framing the

whole discourse around economic policies. Urban design serves the goals of environmental justice by ensuring early, accurate and transparent dissemination of information from policymakers to stakeholders. Alliances comprising architects, landscape designers, community business owners, NGOs, local urban design researchers and international counterparts must engage in discussions on urbanisation, assessing impacts to environment and society by identifying specific problems and proposing cost-effective opportunities to broaden appreciation of sustainable urban design. Dialogues centring on socio-spatial planning policies improve critical awareness and understanding of urban transformation solutions.

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Images Credit

Figure 1: Iskandar Regional Development Authority [IRDA] (2014). Retrieved from http://www.irda.com.my/

Figure 2: Malaysian Digest (2017, January 3). Revitalising the Klang and Gombak rivers will cost the govt RM4.3bil, what are the benefits? *Malaysian Digest*. Retrieve from http://malaysiandigest.com/frontpage/282-main-tile/650846-revitalising-the-klang-and-gombak-rivers-will-cost-the-govt-rm4-3-bil-what-are-the-benefits.html

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THE IMPACT OF ROAD GRADIENT AND TRUCK COMPOSITION ON THE TOLL ROAD TRAFFIC PERFORMANCE

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Abstract

Jakarta Outer Ring Road (JORR) is a toll road system that circles the outskirts of Jakarta, where the purpose of this road is to reduce congestion on the streets in Jakarta city centre. However, the high composition of trucks in JORR resulted in congestion of the road, which is hypothesized as attributed by the gradient of this road. This study aims to evaluate the impact of road gradient on truck and the overall traffic performance. Using data obtained from 24-hour traffic recording on selected JORR section, a VISSIM model was constructed to simulate traffic performance on some combinations of traffic and gradient conditions. In terms of macroscopic view point of traffic stream, the simulations showed that road gradient alone insignificantly affected truck speed, as well as the overall traffic speed. Instead, truck composition had more effect on the traffic speed rather than the gradient. In a particular composition of trucks different gradients did not significantly affect traffic speed differently. This implies that any policy to restrict truck access to toll road should depend mainly on the composition of truck itself, not the gradient of the road.

Keyword: Trucks, truck composition, road gradient, toll road

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INTRODUCTION

Toll road is generally built to provide a service that is better than the arterial road. The Jakarta Outer Ring Road (JORR) is a toll road system that circles the outskirts of Jakarta, where the purpose of constructing JORR is reduce congestion in the city centre of Jakarta. However, due to the increasing volume of traffic on JORR, its current level of service is less than satisfactory. As an alternative toll road circling the city of Jakarta, JORR currently becomes the main road for freight transport to and from southern, western and eastern part of Jakarta. Therefore, the composition of heavy vehicles in JORR is quite high throughout the day. With the increasingly poor performance of JORR, heavy vehicles (i.e. trucks) are considered to have an enormous share on such condition due to their large dimensions and their relatively slow speeds. Therefore, JORR operator is planning to restrict trucks to use some segments of JORR for certain time window. On the other hand, the logistics users are aggrieved and the aim of constructing the toll road, namely to improve the efficiency of goods distribution becomes questionable.

Prior to enforcing the access restriction system to trucks from using JORR, a review should be conducted to look into other causes of the congestion to find better solution to the problem. Theoretically, one aspect that can degrade performance on JORR is vehicle composition, where high heavy vehicle composition can reduce overall speed of the traffic, especially when it is coupled with steep slopes conditions. Reviews on the traffic performance associated to the road geometry condition, particularly the road gradient, have been aplenty. Bornes and Aakre (2011) developed a model for calculating speed profile for a heavy vehicle uphill in a grade. It is mainly used to decide start and end of passing lanes depending on speed difference between a typical heavy vehicle and passenger cars, and to estimate the influence of grades on the speed and travel time for heavy vehicles on rural roads for use in navigation systems, cost-benefit analysis etc. The model is based on utilized engine power needed to overcome the total running resistance for a specific vehicle. The model is in principle based on physical laws, but there are several factors which make a theoretical description different from real life. The calibration and validation process was carried out using detailed observations of instrumented heavy vehicles where all input data were known. Habtemichael and Luis (2013) studied that the measured speed profile will always contain some noise depending on driver behaviour, power utilization, engine specifications, road geometry, accuracy of observations, etc. Driver behaviour concerning choice of speed, gear, torque, rpm, etc will usually be difficult to model in a realistic way.

Most prior studies were based on the microscopic observation on the performance of individual heavy vehicles (i.e. trucks) in a traffic flow in passing through a certain road gradient. On the other hand, the presence of heavy vehicles in traffic flow may have different effects on traffic performance due to the

gradient of the road. In this case the composition of heavy vehicles in traffic flow may have different effects on the performance of the overall flow in different gradient. This study is intended to investigate the impact of road gradient on the traffic performance on JORR in macroscopic way. This study is expected to determine a rationale for route shifting or climbing lane for trucks to avoid steep gradients that can cause disruption to the overall traffic performance.

RESEARCH METHODOLOGY

Data was obtained through 24-hour traffic recording by video camera on selected JORR section, which was 75m in length. The section under consideration was a 4-lane divided road without shoulder (Figure 1). Traffic volume, speed, and density of the section under was generated from traffic record, and the 24 hour observation was sliced into 5-minute observations. For each time slice the volume, speed and density during the 5 minutes were converted into hourly measures. The vehicles were classified into 4 different vehicle types, which were light vehicle, medium vehicle, large bus, and large truck.

Figure 1: Existing traffic situation at the observed JORR segment

Subsequently, VISSIM model was constructed. VISSIM is a microscopic simulation software package which can be used to simulate traffic (PTG AV, 2011). Model construction consisted of several important stages, namely setting the map, making the road segment, vehicle modelling, distribution speed arrangement, vehicle composition arrangement, setting the number of vehicles input, and setting the drivers' reaction parameter. All the measures were set by trial and error method to arrive to the values that represent the most actual driving

behaviour of the traffic on the road under consideration. In order to test the validity of the model, traffic performance measure resulted from the model was compared with the observed measure which came from the data recording (Park & Schneeberger, 2003). In this study, the traffic performance measure was represented by the flow along the segment under consideration. Hence, GEH statistics were applied to compare two sets of traffic volume with the criteria shown in Table 1. Using the valid VISSIM model, simulations were done to 5 conditions of road gradient, 2 types of traffic density, and 2 types of heavy vehicle composition to estimate the average speed of the overall traffic and of heavy vehicles for some combinations of those three variables.

Table 1: GEH criteria

Criteria	**Decision**
GEH < 5,0	Model accepted
5,0 ≤ GEH ≤ 10,0	Warning: Possibly model is error or poor quality of data
GEH > 10,0	Model rejected

RESULT AND DISCUSSION

To validate the VISSIM model, the data was grouped into 5 sets with various randomly selected conditions. Table 2 shows the results of validation test with GEH method.

Table 2: Result of validation using GEH method

Time	GEH							
	Total Vehicle				Average Speed (km/hour)			
	LV	MHV	LB	LT	LV	MHV	LB	LT
3:00	0.50	2.08	0.65	0.08	0.11	0.02	0.09	0.03
6:00	1.13	1.13	0.70	0.07	2.07	1.87	1.60	1.08
12:00	1.17	0.96	0.96	0.24	3.41	1.62	1.95	1.37
15:00	2.79	1.59	0.20	0.10	3.49	1.90	2.13	1.42
18:00	6.30	1.80	0.35	0.55	2.35	2.37	2.72	1.96

From calibration and validation process, it was found that most of GEH values were less than 5, hence it implied that the driving behaviour parameters that were applied in themodel could represent the actual condition of JORR traffic. In order to see the effect gradient on the speed of both trucks and non-truck, simulations were done on 10 sets of traffic conditions for 5 types of road gradients, i.e. 0%, 2%, 4%,6% and 8% with two types of truck composition, namely 0% and 20%.

Figure 2a shows the result of simulation on truck speed in which all the inputs related to traffic condition for each of simulation were similar but the gradient. Figure 2b shows the result for non-truck speed. They indicate that the

speeds tend to decrease as the road gradient increases. The effect of gradient on speed seems more stable on non-trucks rather than trucks.

Furthermore, Figure 3 shows the speed-density diagrams derived from simulation. Regression technique was applied to find the best-fit speed-density model for 0% of truck and 20% of trucks. Table 3a and 3b show the mathematical model as well as its coefficient of determination.

In order to assess the significance of the differences among the models, Pearson correlation test was carried out with a significance level α=0.05. The test indicated that there were very strong correlations among the models, and there was almost no difference of the models for various types of gradient. It implied that the gradient alone have no effect on the traffic performance, namely speed-density relationship, for both low and high composition of trucks.

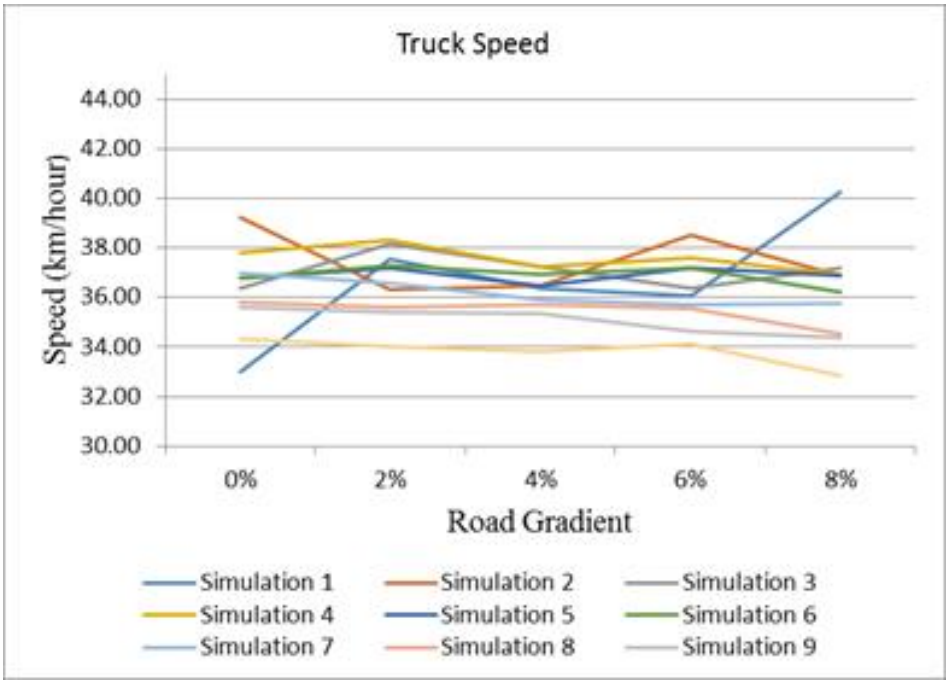

Figure 2a: Truck speed on various gradients

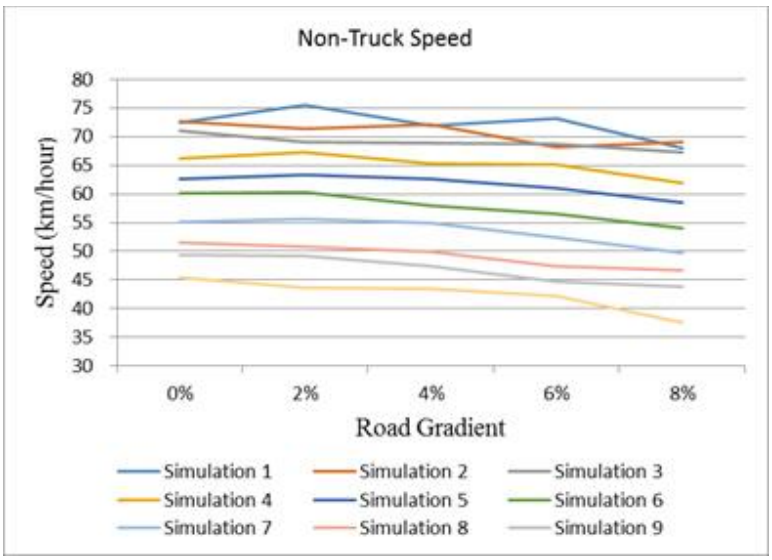

Figure 2b: Non-truck speed on various gradients

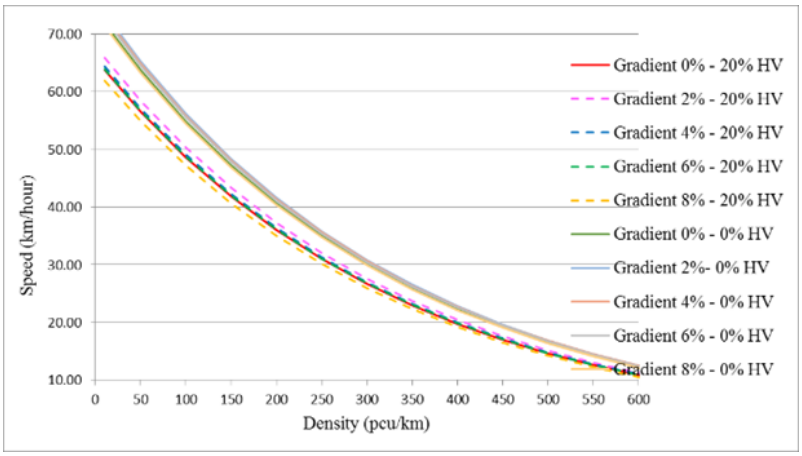

Figure 3: Speed-density model for various gradients and % of heavy vehicle

Table 3a: Speed-density model for various road gradients and 0% of truck

Gradient	Speed-Density Model	R^2
0%	$u = 74.05e^{-0.003k}$	0.9790
2%	$u = 75.78e^{-0.003k}$	0.9874
4%	$u = 75.36^{-0.003k}$	0.9965
6%	$u = 74.96e^{-0.003k}$	0.9855
8%	$u = 73.53e^{-0.003k}$	0.9919

Table 3b: Speed-density model for various road gradients and 20% of truck

Gradient	Speed-Density Model	R^2
0%	$u = 65.646e^{-0.003k}$	0.9913
2%	$u = 67.924e^{-0.003k}$	0.9915
4%	$u = 66.301e^{-0.003k}$	0.9937
6%	$u = 65.831e^{-0.003k}$	0.9847
8%	$u = 63.755e^{-0.003k}$	0.9901

In addition to the correlation test, the mathematical difference among the speeds of various gradients and various densities was determined and the results are shown in Table 4a and 4b. Those simulations confirm the law of relationship of speed-density, which is the higher the density, the lower the speed is. They also confirmed that the more trucks on traffic stream, the lower the speed of the overall traffic. Regarding the road gradient, the simulation indicated that for certain density the higher the gradient (the steeper the road) the lesser the speed was, and this is valid for low and high composition of trucks. However, the effect of gradient on speed seemed insignificant. It may be caused by the view point of this VISSIM simulation, which is macroscopic viewpoint of traffic stream rather than microscopic one. The results of simulation represented the characteristics of the overall traffic rather than individual or group of individual vehicles.

Table 4a: Speed differences for various densities and road gradients and 0% heavy vehicle

Density (pcu/km)	**Speed Difference (compare to speed of 0% gradient) (km/hr)**			
	2%	**4%**	**6%**	**8%**
10	1.677	1.274	0.879	0.509
100	1.280	0.973	0.671	0.389
200	0.948	0.721	0.497	0.288
300	0.703	0.534	0.368	0.213
400	0.521	0.396	0.273	0.158
500	0.386	0.293	0.202	0.117
600	0.286	0.217	0.150	0.087
700	0.212	0.161	0.111	0.064

Table 4b: Speed differences for various densities and road gradients and 20% heavy vehicle

Density (pcu/km)	**Speed Difference (compare to speed of 0% gradient) (km/hr)**			
	2%	**4%**	**6%**	**8%**
10	2.211	0.636	0.180	1.835
100	1.688	0.485	0.137	1.401
200	1.250	0.359	0.102	1.038
300	0.926	0.266	0.075	0.769
400	0.686	0.197	0.056	0.570

500	0.508	0.146	0.041	0.422
600	0.377	0.108	0.031	0.313
700	0.279	0.080	0.023	0.232

CONCLUSION

In terms of macroscopic view point of traffic stream, the VISSIM model simulation results have shown that the road gradient alone insignificantly affects the speed of groups of truck, as well as speed of the overall traffic. The truck composition has more effect on the traffic speed rather than the gradient, particularly on low to medium density situation. On particular composition of trucks, different gradients have not resulted in significantly different effects on the traffic speed. These imply that any policy to restrict truck access to toll road should depend mainly on the composition of truck itself, not the gradient of the road. In case of traffic congestion where the road gradient is relatively gentle but the composition of truck is relatively high, it may be the time to apply truck access restriction, and when the gradient is relatively steep but the truck composition is quite low it is not judicious to restrict the truck to overcome the congestion problem.

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MOSQUE: A STATEMENT OF CITIZENSHIP

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Abstract

Mosque is referred to as a place for Muslim's congregational prayers, a community centre, and a frontage to the Muslim's world. Mosque from the start was intended as a sanctuary and home to the Muslims where they can affiliate in their lives. In Australia, the Afghan cameleers have established the major mosques as they were among the early Muslim settlers of the country after the Makassar Muslims. Afghans Cameleers in Australia are majority Muslims in a faraway land of Afghanistan, who migrated to this place of unfamiliarity in order to place themselves in the society while searching for wealth in sustaining and building their reputation in their homeland. This research seeks to explore the idea of citizenship through the concept of belonging and how it translates to architecture and the Islamic built environment. To express the sense of belonging and citizenship in a land where they are unaccepted, the Afghans resort to creating a building of such that would represent their struggles, identity, religion and legacy to be accepted and represent their citizenship. This research will study the elements that result to the citizenship of the Muslim Afghans in Australia. The citizenship approach will focus on the social inference rather than political or constitutional approach as the 1901 immigration law dictates that these people will never be naturalized.

Keyword: mosque, citizenship, architecture, islamic built environment, sense of belonging

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INTRODUCTION

Mosque is known to be a religious building dedicated to Muslims as a place for congregational prayers and other religious activities. At least once a week, every Friday, Muslim community will engage for Friday congregational prayers that was designed to continuously tie the bond among the Muslim community within the surrounding area and those who affiliates with the mosque. A place to call home, or home is where the heart is, represents the longing of a person to their comfort zone and familiarity. These quotes are often found from people who travel far away from their birthplace or maybe just a traveller going outstation for a few days. Being far away from home makes one search for familiarity, comfort and similarity in all aspects. In order to cure this longing, one usually simulates this familiarity and similarity in one's understanding. Hence, the story of the Muslim cameleers in Australia and the assimilation of the Afghans and the locals through the institution of mosque. Afghan cameleers in Australia are majority Muslims in a faraway land of Afghanistan, who migrated to this place of unfamiliarity in order to place themselves in the society while searching for wealth in sustaining and building their reputation in their homeland (Cleland, 2000). Here, they are different from the European settlers, resulting in being displaced among the settlers. They started in the rims of towns and cities and slowly try to assimilate into the community with their reputations, services and respect towards the settlers. The Afghans created small communities and mosque in their communities as a place to represent themselves and as a method of assimilating and networking among themselves (Scriver, 2004).

This research seeks to explore the idea of citizenship through the concept of belonging and how it translates to architecture and the Islamic built environment. This research addresses how the Afghans struggles in establishing mosque as a building that represents state of citizenship especially during 1901 where White Australia Policy was introduced affecting any chances of the Afghans to be naturalized into the newly formed Australia. To express the sense of belonging and citizenship in a land where they are unaccepted, the Afghans resorted to creating buildings of such that would represent their struggles, identity, religion and legacy to be accepted and represent their citizenship. This research study the elements that result to the citizenship of the Afghans in Australia. The citizenship approach will concentrate on the social inference rather than political or constitutional approach as the 1901 immigration law dictates that these people will never be naturalized. Currently there is limited research on the historical growth of Muslim cameleers' settlement in Australia. According to Rashid and Bartsch (2014), most studies focused on socio-cultural and anthropological issues that do not address the links with other mosques that were once scattered around the outback of inland Australian. Hence, a thorough research on the relationship of mosques and the process of gaining sense of belonging and citizenship should be done in order to further understand this

displaced people in the context of Australia and how they have impacted the built environment.

THE ESTABLISHMENT OF MOSQUES

Mosque, a place to gather for prayers, a community centre, an embassy and a frontage to the Muslims world. Mosques have been made as an institution that represents the Muslim community ever since the time of the Prophet Muhammad (peace be upon him). Mosque was the first structure built by the prophet after the great migration from Mecca and Medina as a place that the Muslims could be comfortable to congregate and practice their daily prayers (Islam, 2012). Mosque from the start was intended as a sanctuary and home to the Muslims where they can affiliate in their lives.

Mosques in Australia

The mosque institution came into picture in Australia during the peak of the cameleers' immigration between the late 1800s to the early 1900s (Jones & Kenny, 2010). This was the result of the prosperity and affordance of these cameleers that had established in the society quite well. Cameleers such as Faiz and Tagh Mohamet, Abdul Wade and Mohamet Allum were well known in the European community as entrepreneurs, socialites and medicine practitioners that contributed towards the community and embodies the Australian patriotism of serving and contributing to the country (Scriver, 2004). These Afghan names did not only resonate locally but was well known among other territories on their reputations and connections that helped build up the nation of Australia (Bartsch, 2015).

Customs Authorities summarized that there were seven active mosques in Western Australia in 1920, three in South Australia (one in Adelaide, two in Marree), two in Broken Hill New South Wales and one in Holland Park in Queensland. This was further verified by A.H Pitchard, Secretary of the Australian Indian Society to a query from Department of External Affair (Rashid & Bartsch, 2014). These entire mosques are active Afghan mosques.

Perth and Adelaide Mosques are two religious buildings that were built purposely as a magnet and as a projection of the Muslim community in a foreign setting. These buildings were the result of a need and as a front to the Muslims in displaying their beliefs, their practice and their faith. Afghan cameleers popularly practiced Islam during their migration to Australia in 1860, which was due to the need of camels for exploration of Central Australia (Stevens, 2002). Before this Islam has step into Australia through Makassar tradesmen from Indonesia who traded seashells with the aborigines in Northern Territory in the early 1200's (Stevens, 2002).

The cameleers have contributed in exploring inland Australia from the ill-fated Burke and Wills expedition to other big expeditions. These cameleers

are also responsible in the development of rural Australia by laying the base line of transportation such as telegraph and train lines from Port Augusta to Alice Springs, thus making them very important in the society. However, the life and practices of cameleers were known within their profession and networks but little about their religion and how they portray their religion. Islam was first known as Mohammedan and mosques were called Mohammedan churches and mullahs as Mohammedan priests. They were known to pray at certain times of the day (Pamela, 2005) and avoid alcohol and pork. Mohammedan churches were always treated as any other churches but the function and relationship of this building to the cameleers were much deeper.

CITIZENSHIP

Citizenship is a modern concept, which was the product of the French revolution and its aftermath (Turner, 1993). Turner (1993) suggests that the concept of citizenship is a modern concept and continuous, and it was developed out of a peculiar conjuncture of cultural and structural conditions which may be peculiar to the west (Roche, 1987). This idea of citizenship was based on western idea of colonialism and monetarism. The expansion and colonializing lands has resulted into the introduction of citizenship in order to secure a place and its resources limited to certain few. The idea of citizenship was also mostly influenced by the rising bourgeois culture and urban civilization that was widely explored by Kalberg (Turner, 1993).

Citizenship can be divided into two major definitions. According to Turner (1993), citizenship is divided into Social and Political. Socially Citizenship is a modern binding of nationality and religion in the sociology perspective that also represents social identity (Turner, 1993). Social citizenship is based on institution of welfare state that buffer against the inequalities of marketplace and class system. Politically, and constitutionally, citizenship is a bundle of rights and duties relating to an individual as a member of a political community (Turner, 1993). These rights are usually dictated to one who is holding a passport or tax paying person of a state, which is under the dominant paradigm of Western social democracy (Turner, 1993).

The idea of citizenship in Australia was brought forth by the introduction of immigration restriction act 1901, which is also known as Australia white policy. This was in line with the announcement of independent Australia 1901. The newly formed government of six colonies decided to apply this new immigration law as a way of controlling resources, controlling population of non-Europeans and as to limit business competition between non-Europeans and Europeans traders in Australia (Humphrey, 2010). The method applied in the immigration act is to have a dictation test in any European languages lowering the chances of non-European speakers to achieve citizenship in Australia.

The immigration restriction act was based on the desperation of the six Australian colonies after the great drought of 1890 that resulted in violent industrial strikes (NSW Migration Heritage Centre, 2010). Furthermore by 1890, 70 percent of the population was born in Australia and growing nationalist sentiment pushing for the unification of the six colonies. The six colonies were more connected than before through overland telegraph line, submarine telegraph and ground transportation of goods that had gone beyond borders of the six colonies. The discovery of gold and precious metals in Australia had attracted Chinese prospectors into Australia resulting to head-on competition between them and the locals. With main ground transportation between major cities of Western Australia, South Australia and New South Wales dominated by the cameleers resulting in uneasiness to Europeans settlers and by uniting into one nation under one immigration law may restrict all the competition from migrating Asians.

Uniting six colonies was a huge task with many negotiations and disputes needed to be addressed. However the need of unification outweighs the differences. Many sessions of conferences and meetings resulted in the 1900 agreement for federation. Finally, on 1st January 1901, Commonwealth Australia was proclaimed in a grand ceremony in Sydney's Centennial Park. The proclamation of Commonwealth Australia however was limited to their own parliament but without control on foreign policy or defence. These two elements were exclusively controlled by Britain.

The Implications to the Afghan Muslim Cameleers and Immigrants

It is expressed that issues of sense of belonging is often associated with immigrants. The issues associated with sense of belonging have led the immigrants to experience hardship and struggle to fit in within a new environment (Nagel, 2011). The journey of the Afghans towards gaining the sense of belonging and citizenship has been an emotional journey. Starting from their establishment in Inland Australia as cameleers, Afghans were responsible in helping discovering and developing rural Inland Australia with their camels. Arriving in 1860 they served the country diligently for forty-one years until 1901 (Nagel, 2011). However, they were denied citizenship by the Australian 1901 immigration law.

TRANSLATION OF CITIZENSHIP STRUGGLE TO ARCHITECTURE AND THE ISLAMIC BUILT ENVIRONMENT

The implication of a mosque to the built environment is wide-ranging. From an urban planning point of view, 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, 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 networks, and promote community tolerance and to purport shared sense of social tolerance.

The translation of citizenship struggle 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. These elements are the driving forces behind the architecture that is erected in order to find approval of a way 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 researchers formulated a concept of social citizenship that impacted the architecture and the built environment as shown in Figure 5.

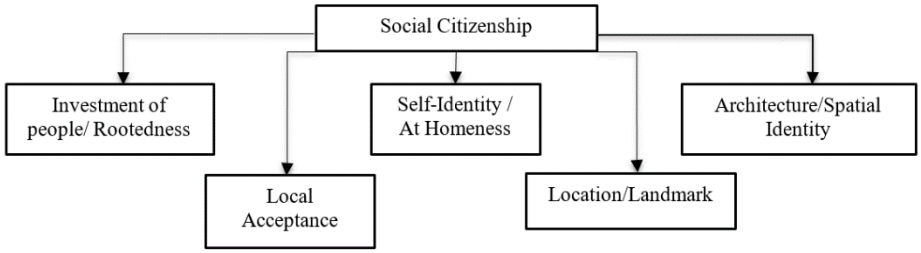

Figure 1: Concept of social citizenship
Source: Modified from Phillips (2014), Feldman (1990) and Gale (2004).

In Islam, a mosque does not require a specific edifice, as prayer can be observed anywhere as long as one faces Mecca (Erzen, 2011). A mosque may take any form as long as the core functionality stays the same. This was well practiced by the Afghan cameleers in Australia. However, there were exceptions in the case of the Afghan cameleers as the morphology of the mosque relates to the desire to establish citizenship and to create a sense of belonging in their community. Mosques in Australia started as simple rectangular plans with a *mihrab* facing Mecca using basic materials as to fulfil the need of congregational prayers (Schinasi, 1980). The architecture of the mosques was presented in a more utilitarian approach with a basic rectangular floor plan and a *mihrab* facing Mecca. This was well replicated in all inland mosques with variety of sizes, depending on the size of the congregation and location of the mosques. However, this had changed when the Afghans decided to enter the city. The expression of sense of belonging was poured physically towards the mosques. Tuan (1977) describes that the sense of attachment through monuments, shrines and buildings is a sign of identity and as an expression of attachment to the homeland. The Afghan cameleers had invested in creating mosques that invoked the sense of belonging by creating elements that reminded them of their homeland. The architecture of Adelaide mosque was well spelled out in creating a tangible realm that reflects the cultural image and expression of the characteristics that

symbolize the patterns and movements of social and personal life reflecting the sense of belonging (Tuan, 1977). The Adelaide mosque, even humble in nature, still installs the approach of the image of paradise in Islamic architecture. This image is represented by water features and vegetation symbolizing paradise as described in verses of the Quran that describe the enchantment of paradise to those who follows their duty to God (Erzen, 2011). This small touch of paradise in a humble building is a representation of the Afghans approach to architecture of the homeland and one-step to citizenship in Adelaide. Perth Mosque embodies a sense of architecture that is different from Adelaide mosque. The architecture of Perth Mosque uses the approach of Urban Sculpture. The Perth Mosque symbolizes a sculptural form that stands out in urban space (Erzen, 2011). The design and approach of Perth Mosque was highly sculpted with details that are non-ever applied in any mosque in Australia. Located in a prominent street in Perth, the mosque was intended to be a sculptural landmark of the area. Perth Mosque was built higher than ground, easily viewed even though located behind a wall. The sculpted small domes that crown the mosque are clearly visible from Williams Street, reflecting the landmark created by the Afghan cameleers. The style imposed on the design of the Perth mosque is a reference of guidance and creation of social reference creating a feeling of belonging to the Afghans and locals.

The architecture of mosques represented by the Afghans in Australia is morphology of sense of belonging represented through the changes of places. The architecture of mosques in inland Australia embodies simplicity and utilitarian as the sense of belonging was provided by the landscape similarity that reminds them of their place of origin. However, city mosques were of different approach as the urban scene has different landscape and the expression of sense of belonging can only be achieved through architecture.

CONCLUSION

Tracing the journey of the Muslim Afghan cameleers has brought an insight to the development of the inland Australia and how they have contributed to the establishment of mosques and the Muslim community. In particular, the establishment of mosques had marked a statement that Muslim community was well accepted and they had managed to place a landmark to signify an Islamic built environment as part of Australia. This research has also elaborated that the establishment of the mosques is part of the process for them to have sense of belonging, which later, help them claim the citizenship if not through the constitutional, but through social means.

As stated in the beginning of the paper, it is important to understand the journey of the Afghan cameleers in instituting a form of citizenship in Australia. The Afghans had contributed in the development of inland Australia since 1860 but were denied the right to naturalize by the constitution of Australia. The

hardship and struggles in establishing a form of citizenship as to symbolize their contribution to Australia and as a mark of existence of their people ever existed in Australia. It was only through the establishment of architecture in the form of mosques that they had the opportunity to associate themselves as part of the Australian community thus gaining social citizenship. Drawing from this narrative study, further exploration on the research is essential to capture the detail evidence of contact between Afghan Muslims and local community and the acceptance of the Afghans Muslims by the community. It is also important to illustrate the morphological changes of the mosques in relation to the changing of eras and location symbolizing the journey towards social citizenship.

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CITIZENSHIP

Citizenship is a modern concept, which was the product of the French revolution and its aftermath (Turner, 1993). Turner (1993) suggests that the concept of citizenship is a modern concept and continuous, and it was developed out of a peculiar conjuncture of cultural and structural conditions which may be peculiar to the west (Roche, 1987). This idea of citizenship was based on western idea of colonialism and monetarism. The expansion and colonializing lands has resulted into the introduction of citizenship in order to secure a place and its resources limited to certain few. The idea of citizenship was also mostly influenced by the rising bourgeois culture and urban civilization that was widely explored by Kalberg (Turner, 1993).

Citizenship can be divided into two major definitions. According to Turner (1993), citizenship is divided into Social and Political. Socially Citizenship is a modern binding of nationality and religion in the sociology perspective that also represents social identity (Turner, 1993). Social citizenship is based on institution of welfare state that buffer against the inequalities of marketplace and class system. Politically, and constitutionally, citizenship is a bundle of rights and duties relating to an individual as a member of a political community (Turner, 1993). These rights are usually dictated to one who is holding a passport or tax paying person of a state, which is under the dominant paradigm of Western social democracy (Turner, 1993).

The idea of citizenship in Australia was brought forth by the introduction of immigration restriction act 1901, which is also known as Australia white policy. This was in line with the announcement of independent Australia 1901. The newly formed government of six colonies decided to apply this new immigration law as a way of controlling resources, controlling population of non-Europeans and as to limit business competition between non-Europeans and Europeans traders in Australia (Humphrey, 2010). The method applied in the immigration act is to have a dictation test in any European languages lowering the chances of non-European speakers to achieve citizenship in Australia.

The immigration restriction act was based on the desperation of the six Australian colonies after the great drought of 1890 that resulted in violent industrial strikes (NSW Migration Heritage Centre, 2010). Furthermore by 1890, 70 percent of the population was born in Australia and growing nationalist sentiment pushing for the unification of the six colonies. The six colonies were more connected than before through overland telegraph line, submarine telegraph and ground transportation of goods that had gone beyond borders of the six colonies. The discovery of gold and precious metals in Australia had attracted Chinese prospectors into Australia resulting to head-on competition between them and the locals. With main ground transportation between major cities of Western Australia, South Australia and New South Wales dominated by the cameleers resulting in uneasiness to Europeans settlers and by uniting into one nation under one immigration law may restrict all the competition from migrating Asians.

Uniting six colonies was a huge task with many negotiations and disputes needed to be addressed. However the need of unification outweighs the differences. Many sessions of conferences and meetings resulted in the 1900 agreement for federation. Finally, on 1st January 1901, Commonwealth Australia was proclaimed in a grand ceremony in Sydney's Centennial Park. The proclamation of Commonwealth Australia however was limited to their own parliament but without control on foreign policy or defence. These two elements were exclusively controlled by Britain.

The Implications to the Afghan Muslim Cameleers and Immigrants

It is expressed that issues of sense of belonging is often associated with immigrants. The issues associated with sense of belonging have led the immigrants to experience hardship and struggle to fit in within a new environment (Nagel, 2011). The journey of the Afghans towards gaining the sense of belonging and citizenship has been an emotional journey. Starting from their establishment in Inland Australia as cameleers, Afghans were responsible in helping discovering and developing rural Inland Australia with their camels. Arriving in 1860 they served the country diligently for forty-one years until 1901 (Nagel, 2011). However, they were denied citizenship by the Australian 1901 immigration law.

TRANSLATION OF CITIZENSHIP STRUGGLE TO ARCHITECTURE AND THE ISLAMIC BUILT ENVIRONMENT

The implication of a mosque to the built environment is wide-ranging. From an urban planning point of view, 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, 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 networks, and promote community tolerance and to purport shared sense of social tolerance.

The translation of citizenship struggle 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. These elements are the driving forces behind the architecture that is erected in order to find approval of a way 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 researchers formulated a concept of social citizenship that impacted the architecture and the built environment as shown in Figure 5.

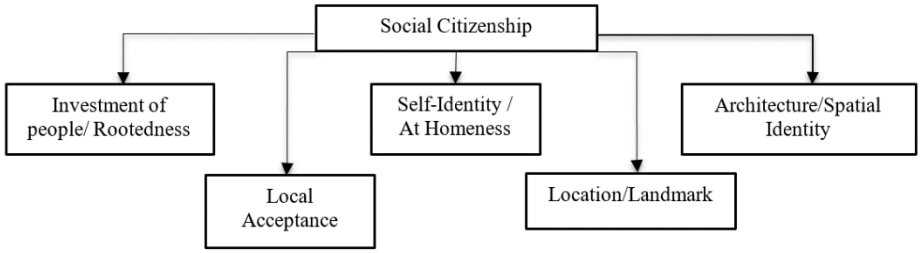

Figure 1: Concept of social citizenship
Source: Modified from Phillips (2014), Feldman (1990) and Gale (2004).

In Islam, a mosque does not require a specific edifice, as prayer can be observed anywhere as long as one faces Mecca (Erzen, 2011). A mosque may take any form as long as the core functionality stays the same. This was well practiced by the Afghan cameleers in Australia. However, there were exceptions in the case of the Afghan cameleers as the morphology of the mosque relates to the desire to establish citizenship and to create a sense of belonging in their community. Mosques in Australia started as simple rectangular plans with a *mihrab* facing Mecca using basic materials as to fulfil the need of congregational prayers (Schinasi, 1980). The architecture of the mosques was presented in a more utilitarian approach with a basic rectangular floor plan and a *mihrab* facing Mecca. This was well replicated in all inland mosques with variety of sizes, depending on the size of the congregation and location of the mosques. However, this had changed when the Afghans decided to enter the city. The expression of sense of belonging was poured physically towards the mosques. Tuan (1977) describes that the sense of attachment through monuments, shrines and buildings is a sign of identity and as an expression of attachment to the homeland. The Afghan cameleers had invested in creating mosques that invoked the sense of belonging by creating elements that reminded them of their homeland. The architecture of Adelaide mosque was well spelled out in creating a tangible realm that reflects the cultural image and expression of the characteristics that

symbolize the patterns and movements of social and personal life reflecting the sense of belonging (Tuan, 1977). The Adelaide mosque, even humble in nature, still installs the approach of the image of paradise in Islamic architecture. This image is represented by water features and vegetation symbolizing paradise as described in verses of the Quran that describe the enchantment of paradise to those who follows their duty to God (Erzen, 2011). This small touch of paradise in a humble building is a representation of the Afghans approach to architecture of the homeland and one-step to citizenship in Adelaide. Perth Mosque embodies a sense of architecture that is different from Adelaide mosque. The architecture of Perth Mosque uses the approach of Urban Sculpture. The Perth Mosque symbolizes a sculptural form that stands out in urban space (Erzen, 2011). The design and approach of Perth Mosque was highly sculpted with details that are non-ever applied in any mosque in Australia. Located in a prominent street in Perth, the mosque was intended to be a sculptural landmark of the area. Perth Mosque was built higher than ground, easily viewed even though located behind a wall. The sculpted small domes that crown the mosque are clearly visible from Williams Street, reflecting the landmark created by the Afghan cameleers. The style imposed on the design of the Perth mosque is a reference of guidance and creation of social reference creating a feeling of belonging to the Afghans and locals.

The architecture of mosques represented by the Afghans in Australia is morphology of sense of belonging represented through the changes of places. The architecture of mosques in inland Australia embodies simplicity and utilitarian as the sense of belonging was provided by the landscape similarity that reminds them of their place of origin. However, city mosques were of different approach as the urban scene has different landscape and the expression of sense of belonging can only be achieved through architecture.

CONCLUSION

Tracing the journey of the Muslim Afghan cameleers has brought an insight to the development of the inland Australia and how they have contributed to the establishment of mosques and the Muslim community. In particular, the establishment of mosques had marked a statement that Muslim community was well accepted and they had managed to place a landmark to signify an Islamic built environment as part of Australia. This research has also elaborated that the establishment of the mosques is part of the process for them to have sense of belonging, which later, help them claim the citizenship if not through the constitutional, but through social means.

As stated in the beginning of the paper, it is important to understand the journey of the Afghan cameleers in instituting a form of citizenship in Australia. The Afghans had contributed in the development of inland Australia since 1860 but were denied the right to naturalize by the constitution of Australia. The

hardship and struggles in establishing a form of citizenship as to symbolize their contribution to Australia and as a mark of existence of their people ever existed in Australia. It was only through the establishment of architecture in the form of mosques that they had the opportunity to associate themselves as part of the Australian community thus gaining social citizenship. Drawing from this narrative study, further exploration on the research is essential to capture the detail evidence of contact between Afghan Muslims and local community and the acceptance of the Afghans Muslims by the community. It is also important to illustrate the morphological changes of the mosques in relation to the changing of eras and location symbolizing the journey towards social citizenship.

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DISASTER RISK MANAGEMENT IN MALAYSIA: ISSUES AND CHALLENGES FROM THE PERSEPCTIVE OF AGENCIES

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Abstract

Disaster is a major threat that could jeopardise the development of economic, social and physical elements of a nation as well as the well-being of its people. The damage and loss of property and life caused by disasters are overwhelming and least desired by any country. Review of literature as presented in this research indicated that by having a good disaster risk management (DRM) plan and well-coordinated efforts and commitment among related disaster management agencies at all levels and local stakeholders, would potentially lead to disaster risk reductions, increase preparedness and response, and reduction of damage to assets and loss of life. With a long list of agencies and aid bodies that are currently involved in various stages of DRM, putting the idea into reality has proven to be highly challenging particularly on establishing good coordination between agencies and with other stakeholders for a more effective DRM process. This paper identified three major issues and challenges in DRM in Malaysia, particularly from the perspective of agencies. These issues and challenges include (1) disaster management planning imbalanced between top-down and bottom-up approaches, (2) lack of coordination in disaster management cycle, with greater focus only on the disaster emergency response stage and, (3) lack of planning of long-term recovery (post-disaster) process, which resulted in low level community and stakeholders' resilience to disasters.

Keyword: disaster risk management, issues and challenges in Malaysia, coordination, resilience

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INTRODUCTION

Gearing sustainable development goals (SDGs) into practice is essentially dependent, among others, on the planning and coordination of disaster risk management at various levels of administration. Therefore, the disaster management cycle as well as the top-down and bottom-up approaches have been established over the years and integrated into the disaster risk management (DRM) area (Coetzee & Van Niekerk, 2012). In Malaysia, management of disaster risks are regulated by Directive No. 20, under the auspice of the National Disaster Management Agency (NADMA). Concurrent with Malaysia's three-tier government administration system, the disaster management hierarchy is also regulated under three different levels, namely federal, state and district (Figure 1) (Chan, 2012; CEDMHA, 2016). Under Directive No.20, there are five (5) stages in the disaster management cycle consisting of prevention, mitigation, preparedness, response, and recovery which promotes practices and accommodates practitioners with multi-disciplinary backgrounds (CEDMHA, 2016). Even with the availability of such legally binding documents, there are pertinent issues that require further attention, as identified in this research. These issues are, (1) imbalanced of planning approaches in disaster risk management between top-down and bottom-up approaches, (2) lack of coordination in executing disaster risk management cycle and (3) lack of long-term planning (particularly for recovery / post-disaster) that resulted in low community and stakeholders' resilience to disasters.

MALAYSIA DISASTER MANAGEMENT STRUCTURE: AT A GLANCE

Malaysia is often considered as a country less prone to major disasters. However, as an equatorial climate country, Malaysia is vulnerable to risks such as flooding, landslides and mudslides (CFE-DMHA, 2016; Shaluf & Ahmadun, 2006). In 1997, the National Security Council (NSC) has formulated a national policy, management mechanism and disaster aid known as the Directive No.20. The NSC, as the leading agency, was given a mandate under the Directive No.20 to coordinate and execute appropriate actions during disasters. However, with the current magnitude of natural disasters occurrence in Malaysia, it becomes obvious that Malaysia may no longer spared from major natural disasters such as earthquakes, floods and tsunami (Khailani & Perera, 2013; Zahari, Ariffin, Asmawi, & Ibrahim, 2013). As a result, in October 2015 the federal government has agreed to establish a special agency, National Disaster Management Agency (NADMA), dedicated to DRM and/or other matters related to DRM. Under Directive No.20, all matters related to disasters are managed by three-tier committees namely; the Centre for Disaster Management and Relief Committee (CDMRC) (chaired by the Deputy Prime Minister) at federal level, followed by the State Disaster Management and Relief Committee (SDMRC) (chaired by the Secretary of State); and the District Disaster Management and Relief Committee

(DDMRC) (chaired by the District Officer) (Chan, 2012; CEDMHA, 2016; NSC, 1997) (Figure 1). Under the Malaysia disaster management structure, seven service themes were established including; (1) search and rescue, (2) health and medical services, (3) media, (4) support, (5) security control, (6) welfare, and (7) warnings and alerts. There are 79 agencies have been identified responsible for carrying out activities related to DRM both from a top-down and bottom-up perspective. This long list of agencies contained, among others, 38 federal agencies, 21 state agencies and 17 district agencies and 2 NGOs. These agencies might function on their own, and/or work together with other agencies to execute DRM projects at various levels. The following section discusses three main issues and challenges faced by agencies in DRM derived from the review of the literature.

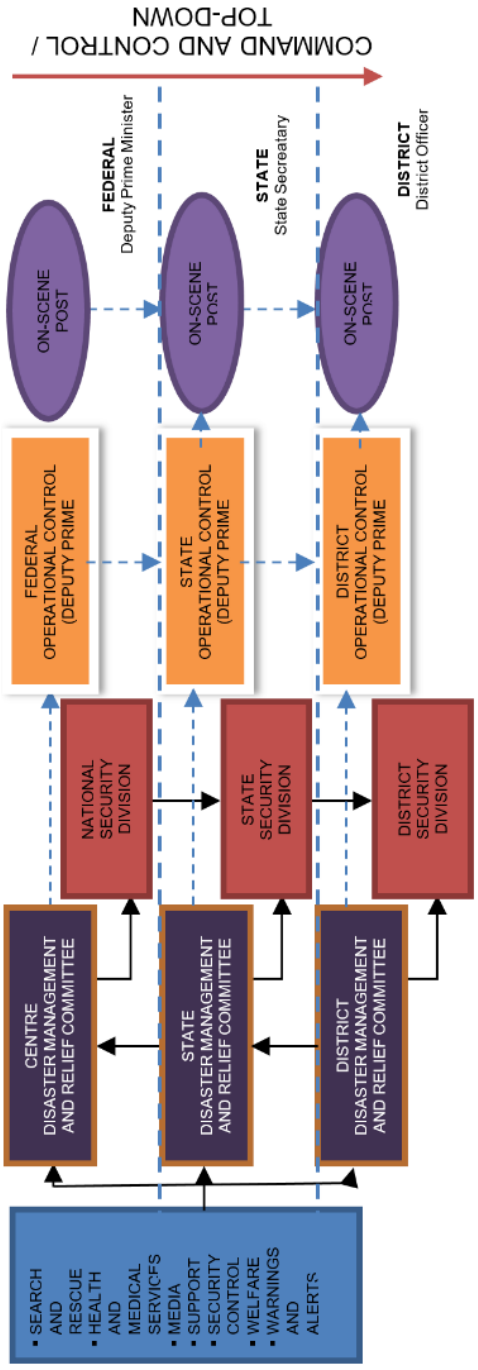

Figure 1: Malaysia disaster management structure
Source: Adapted from CFE-DHMA (2016).

ISSUES AND CHALLENGES FOR AGENCIES IN DISASTER RISK MANAGEMENT IN MALAYSIA

DRM Approaches Imbalance between Top-down and Bottom-up

According to Chan (1995), the Malaysian government approach for managing disasters is based on a top-down government-centric model where the NSC (under the Prime Minister's Department) will be responsible for matters related to policies on DRM. As mentioned earlier, the CDMRC was established at the federal level to manage and monitor progress and DRM programs at the national level. However, the NSC has three major roles in national security, which are (1) to defend national sovereignty and strategic importance, (2) management of crises and disasters, and (3) border management. With the magnitude of disasters that have occurred in Malaysia recently, it is crucial to have an agency particularly for disaster management. Hence, in 2015, the government established NADMA for managing and coordinating efforts in between various government agencies, host communities and NGOs.

As previously mentioned, there are 79 agencies involved in DRM. The authors then established categorization of the roles of all agencies in DRM into top-down or bottom-up planning approaches based on two main criteria namely (1) agency's compliment to seven themes of DRM services under Directive No.20 which are (a) search and rescue, (b) health and medical services, (c) media, (d) support, (e) security control, (f) welfare, and (g) warnings and alert; and (2) proactive roles and initiatives by agencies that reflected their role as a committee member of CDMRC, including drill exercises for creating public awareness, hazard mapping and zonation, and community-based disaster risk management (CBDRM).

Prior to the categorization process, 11 agencies have been identified as having no specific DRM-related activities that can be related to both criteria, hence be excluded from the list of agencies involvement with DRM cycles. In other words, only 68 agencies remain for further determination of their roles and responsibilities in DRM cycles (Table 1). Review of literature also identified only four agencies namely APM at federal, state and district offices, as well as MERCY possess an integrated bottom-up approach through the implementation of community-based DRM projects which taking into account local knowledge and community involvement in DRM. According to the Deputy Director of the Training Management Division of APM during interview in July 2017, a total of 200 registered members from 200 parliamentary constituencies in Malaysia, which were identified prone to disasters (particularly floods), have been included into CDERTC program. Due to limited capacity for appointing trainers and budget constraints, the training programs and appropriate uniforms which should be supplied to all members of community are still in progress (Director of Awareness and Social Development Division, NADMA, personal

communication, July 2017). Because of these limitations, agencies are having difficulties in upscaling DRM programs, particularly community-based disaster prevention trainings as well as the establishment of CDERTC for the whole country. Similar limitations are also experienced by MERCY i.e. the non-governmental agency responsible to provide response aid (health and medication) to any affected communities during and immediately after the disaster at the evacuation centre.

Lack of Coordination in Executing Disaster Management Cycle (DMC) between Agencies

A total of 68 agencies (with exclusion of 11 agencies from the original 79 agencies identified in literature review) have been further determined and categorised in terms of their roles in DRM cycles namely (1) prevention, (2) mitigation, (3) preparedness, (4) response, and (5) recovery. This categorization was carried out based on the ADRC detailed measures involved in each phase in DMC (Table 1 until Table 3).

Table 1: Summary of the roles and responsibilities of agencies according to DRM Cycle – federal level

List of agencies	DRM cycle				
	Pre-disaster			Post-disaster	
	Prevention	Mitigation	Preparedness	Response	Recovery
Agencies at Federal Level					
1. Malaysia Armed Force (ATM)			✓	✓	
2. Royal Malaysia Police (PDRM)			✓	✓	
3. Ministry of Finance			✓	✓	✓
4. Ministry of Women, Family and Community Development			✓	✓	
5. Ministry of Communication and Multimedia				✓	
6. Ministry of Tourism and Culture				✓	
7. Ministry of Health Malaysia			✓	✓	
8. **National Disaster Management Agency (NADMA)**	✓	✓	✓	✓	✓
9. Fire and Rescue Department Malaysia (JPBM)			✓	✓	

List of agencies	DRM cycle				
	Pre-disaster			Post-disaster	
	Prevention	Mitigation	Preparedness	Response	Recovery
10. Malaysia Civil Defence Force (APM)			✓	✓	
11. Malaysian Maritime Enforcement Agency (MMEA)				✓	
12. Federal Department of Town and Country Planning Department Peninsular Malaysia			✓		
13. Department of Broadcasting				✓	
14. Department of Information				✓	
15. **Public Works Department**	✓	✓	✓	✓	✓
16. Department of Environment			✓		
17. Department of Social Welfare			✓	✓	
18. Department of Meteorology Malaysia (METMalaysia)			✓	✓	
19. Department of Civil Aviation Malaysia				✓	
20. **Department of Irrigation and Drainage (JPS)**	✓	✓	✓	✓	✓
21. Atomic Energy Licensing Board				✓	
22. Mineral and Geoscience Department Malaysia			✓		
23. Volunteers Department of Malaysia			✓	✓	
24. Department of Occupational Safety and Health Malaysia				✓	
25. Department of Water Supply				✓	✓
26. Attorney General's Chambers of Malaysia				✓	
27. Malaysian Communications and Multimedia Commission				✓	

Source: Review of literature (Department of Mineral and Geoscience Malaysia, 2017; PLANMalaysia, 2016a & 2016b; Malaysia Drainage and Irrigation Department, 2017; MERCY, 2016; Mohamad, Razak, Ahmad, & Manap, 2015; National Security Council, 2012; National Security Council, 1997).

Table 2: Summary of the roles and responsibilities of agencies according to DRM Cycle - state level

List of agencies	DRM cycle				
	Pre-disaster			Post-disaster	
	Prevention	Mitigation	Preparedness	Response	Recovery
Agencies at State Level					
1. State Police			✓	✓	
2. Malaysia Armed Force (ATM)			✓	✓	
3. State Fire and Rescue Department (JPBM)			✓	✓	
4. State Civil Defence Force (APM)			✓	✓	
5. State Health Department			✓	✓	
6. Malaysian Maritime Enforcement Agency (MMEA)				✓	
7. **State Public Works Department**	✓	✓	✓	✓	✓
8. State Department of Social Welfare			✓	✓	
9. State Department of Information				✓	
10. State Department of Broadcasting				✓	
11. State Education Department				✓	
12. State Department of Environment			✓		
13. State Meteorological Office			✓	✓	
14. **State Irrigation and Drainage Department**	✓	✓	✓	✓	✓
15. State Mineral and Geoscience Department			✓		
16. State Volunteers Department (RELA)			✓	✓	
17. State Department of Occupational Safety and Health				✓	
18. State Department of Water Supply				✓	✓

List of agencies	DRM cycle				
	Pre-disaster			Post-disaster	
	Prevention	Mitigation	Preparedness	Response	Recovery
19. State Telekom Berhad				✓	✓
20. State Tenaga Nasional Berhad (TNB)				✓	✓
21. State Tourism Malaysia				✓	
22. Regional Office of Communications and Multimedia Commission				✓	

Source: Review of literature (Department of Mineral and Geoscience Malaysia, 2017; Malaysia Drainage and Irrigation Department, 2017; MERCY, 2016; Mohamad et al., 2015; National Security Council, 2012; National Security Council, 1997)

Table 3: Summary of the roles and responsibilities of agencies and non-governmental organizations (NGOs) according to DRM Cycle - district level

List of agencies	DRM cycle				
	Pre-disaster			Post-disaster	
	Prevention	Mitigation	Preparedness	Response	Recovery
Agencies at District Level					
1. District Police			✓	✓	
2. District Office			✓	✓	✓
3. District Fire and Rescue Department (JPBM)			✓	✓	
4. District Health Department			✓	✓	
5. District Social Welfare Office			✓	✓	
6. District Department of Environment			✓		
7. Malaysia Armed Force (ATM)			✓	✓	
8. Regional Malaysian Maritime Enforcement Agency (MMEA)				✓	
9. Local Authority			✓	✓	
10. District Civil Defence Force (APM)			✓	✓	

List of agencies	DRM cycle				
	Pre-disaster			Post-disaster	
	Prevention	Mitigation	Preparedness	Response	Recovery
11. District Information Office				✓	
12. District Education Office				✓	
13. **District Public Works Office**	✓	✓	✓	✓	✓
14. **District Irrigation and Drainage Office**	✓	✓	✓	✓	✓
15. District Volunteers Office				✓	
16. District Telekom Berhad				✓	✓
17. District Tenaga Nasional Berhad				✓	✓
Non-Governmental Organisation (NGOs)					
18. MERCY			✓	✓	✓
19. Malaysian Red Crescent (BSMM)				✓	

Source: Review of literature (Malaysia Drainage and Irrigation Department, 2017; MERCY, 2016; Mohamad et al., 2015; National Security Council, 2012; National Security Council, 1997)

The pertinent role and responsibility of various agencies in DMC is summarised and presented in Table 1, 2 and 3. It became obvious that majority of agencies (63 agencies) are involved in disaster response i.e. in the post-disaster phase in DMC. Activities in the response phase could include welfare (food and water), health and medication, and logistic and communication supports which requires preparation (such as in the preparedness phase). On the other hand, a total of 25 agencies are involved in preparedness (pre-disaster) and response (post-disaster) phases. It is worth to highlight that only NADMA, the Public Works Department (PWD) (at the federal, state and district level) and the Department of Irrigation and Drainage (DID) (also at the federal, state and district level) have involved in all five (5) phases of DMC. However, measures taken by the PWD, DID, and MERCY were only in DMC, especially for reconstruction phase (on critical infrastructure such as road, retaining walls and public amenities) whereas no particular measures were taken by these agencies to reconstruct individual assets, such as dwellings.

According to the Pengalaman PKOB Negeri Kelantan: Banjir 2014/2015 (Pengarah Pembangunan Negeri Kelantan, 2015), an estimated 2,805 dwellings were totally destroyed during the 2014 major flood. For undisclosed reason, the reconstruction of new dwellings only achieved 1,176 units based on the budget

allocation by federal government, state government and NGOs. This slow recovery progress shows that the affected communities might be highly vulnerable and not resilient towards disasters as they were not able to recover to their original state (i.e. before disaster strikes).

Agencies' Lack of Planning for Long-Term Recovery (Post-Disaster)

With reference to the roles and responsibilities of various agencies involved in DRM as presented in Table 4, it is worth mentioning that none of these agencies have actively involved by taking appropriate measures for improving livelihood and individual asset support of the affected communities. As detail out by ADRC, an appropriate and long term measures are needed in reconstruction phase. This is because livelihood support is important to ensure all affected individuals and communities can continue their daily life. In this sense, individuals and communities shall be involved in DRM as a bottom-up approach and to ensure their understanding of DRM cycle, hence able to play their role during disasters.

Table 4: Summary of agencies inclination in DMC - percentage (%) by DRM phases

Agencies Inclination in DMC (by phases)		**Number of agencies**	**% (estimation)**
Pre-Disaster			
1.	Prevention	**7**	10.30
2.	Mitigation	**7**	0.30
3.	Preparedness	**40**	**58.80**
Post-Disaster			
4.	Response	**63**	**92.60**
5.	Recovery	**16**	23.50
Pre-Disaster and Post-Disaster			
6.	Prevention + Mitigation + Preparedness + Response + Recovery	**7**	10.30
7.	Preparedness + Response + Recovery	**3**	4.40
8.	Preparedness + Response	**25**	36.80

Source: Authors in 2017

CONCLUSION

The establishment of NADMA in 2015 as a focal point agency for DRM has proven that the government has addressed the need for an appropriate disaster management agency. Various agencies that involve in DRM have been given mandate and responsibilities prior to their appointment as members in CDMRC, SDMRC and DDMRC to carry out measures and activities in DRM under the coordination of NADMA. Each and every agency listed as a disaster management agency shall utilise their resources and expertise for creating desirable impacts to communities affected by disasters. This research however has indicated that more attention are given on expert knowledge and top down approach which might undermine the importance of local knowledge and bottom-up community involvement in strengthening DRM process. Only four (4) agencies were identified as applying bottom-up approach i.e. engaging local communities as compared to over 79 agencies which strongly indicate the use of top-down approach. In addition, only few agencies have their roles and responsibilities clearly stated in DRM, while other agencies only function as committee members. Review of literature also indicated that it is not clearly stated how often the committee shall meet to discuss matters related to disaster management and pertinent issues. Between agencies, such as APM and JKM, they have produced their own standard operating procedures, which could jeopardise the effective coordination among agencies in DRM. With more than 90 percent of agencies focusing on the response phase and almost 60 percent on the preparedness phase, leaving only 30 percent or less for agencies involvement in other phases of the DRM.

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THE POWER OF ACCESSIBILITY TO LAND PRICE IN SEMARANG URBAN CORRIDORS, INDONESIA

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Abstract

Urban land demand tends to keep increasing as a result of economic and population growths. The high intensity of activity will bring changes to land value. The corridors of Semarang - Ungaran and Semarang – Mranggen have significant differences in land values despite being at relatively the same distance to city centre. Similarly, the rate of land price change in these two corridors are also different. The study aims to examine and prove the effect of distance to city centre toward land price in downtown areas by employing statistical correlation analysis and accessibility calculation. The result reveals that distance to city centre has no longer effect land prices. It was found that the farther from the city centre the land prices decreases gradually but increases at road nodes that connect to the trip generation points such as toll road gate, residential area and commercial area or shopping centre.

Keywords: distance to city centre, land price, accessibility

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INTRODUCTION

Urban land demand tends to increase as a result of economic development and population growths. However, the competition for urban land in a perfectly competitive market is determined by the land rent (economic land value) offered. Land use which offers high land rent is likely to win the competition. In the case of housing, the land price is affected by the existence of other surrounding land uses (Xiao, Orford, & Webster, 2015) such as transport infrastructure, urban configuration and location advantage over other urban land uses.

The existence of transport infrastructure will cause urban growth to be characterized by land value change and land use in along those lines associated with mobility and high degree of accessibility (Ball, Cigdem, Taylor, & Wood, 2014). Research about interrelation of accessibility change to land value has been undertaken in all main locations in developing countries such as Indonesia, which has demographic and cultural diversity. This research aims to determine and prove whether the proximity to city centre is correlated to land price. Land use changes will lead to the development of urban dynamics beginning with physical, functional, spatial, socioeconomic, as well as demographic changes.

Furthermore, urban accessibility change and housing prices used to estimate the change of location premium on the city structure over time (Gibbon & Machin (2005).

Changes in land value has also occurred in Semarang City, particularly in the Semarang-Ungaran and Semarang-Mranggen corridors. These two corridors have significant differences in the value land located at equal distance to the city centre. There are also differences in land price changes in both corridors, particularly at main centre of urban activities which has been observed intensively from 2012 to 2016.

Iacono and Levinson (2015) argue that the structure of transport network and accessibility are important determinants of land value and spatial structure of the city. Accessibility is in turned influenced by urban configuration of the city. In the case of Semarang-Ungaran and Semarang-Mranggen corridors, the provision of road infrastructure and urban facilities in both corridors are relatively balanced. This suggests that the differences in land value and land price changes in both corridors were due to spatial structure of the corridors. Thus, how is the urban configuration in these two corridors, what are the differences? This is the main focus of this research.

ACCESSIBILITY

In general, accessibility is an "opportunity" to move from one activity to another activity or land use. The value of access comes from the ability to reach places and people as determined by land use patterns and transport networks. Without access, the land has only value as far as the natural resources or building structures it has (Levinson & Istrate, 2012). Accessibility, therefore, is one of the

causes of land attractiveness, and it gives an economic opportunity and causes land value change.

The strong interrelation between urban form and travel pattern is the phenomenon of human activity dynamic (Lingzhu, Alain, & Yu, 2015). Thus it will create high intensity of human activities, which is a potential to develop other activities with economic benefits. The high intensity of human activities will bring land value changes in those location (Ha, van den Bosch, Quang, & Zuidgeest, 2011; Salonen & Toivonen, 2013). In this case, accessibility can encourage the development of socio-economic activities in a region or city. Accessibility can be seen from the dimension of convenience that includes distance and travel time, then it is represented in travel costs which have an implication to production and selling.

Definitions of accessibility involve the destinations, human activities and even travel resistance. Accessibility can be measured by the number of provision of public transportation infrastructure and road network to support the community movement in reaching their destination (Benenson, Martens, Rofe, & Kwartler, 2011). Wee (2016) explains that the more options available to reach travel destinations to meet activities, as well as the less durable of travel (time, cost, effort) will increase accessibility levels. Accessibility changes will determine land value change, which consequently affects the land use (Khisty & Lall, 2005), If the change occurred, then the rate of trip generation will change and result in changes throughout the cycle.

People or individuals are more satisfied with the level of accessibility in a region with various land uses and public facilities (Ho, 2011). This shows that network accessibility can describe the bi-centric urban configuration that related to property prices. Network interaction and conventional accessibility can bring positive and negative impact on housing prices at specific locations (Xiao et al., 2015). The high access on land encourages potential improvements to be developed. More development will result in additional movement. In addition, some researchers mentioned issues of land values, rents, and costs within the city, which are considered to be closely related to land use patterns or land configuration (Iacono & Levinson, 2011).

Accessibility is also a key concept in transportation policy. Public transport investments will increase accessibility in locations where users or residents are directly served by those investments, which is undertaken as part of the public transport network (Jain, Aggarwal, Kumar, Singhal, & Sharma 2014). Generally, the increased accessibility that occurs as the result in public transport investment is beneficial in raising land price, the process is called increasing land values (Du & Mulley, 2012). They found that increased accessibility is an important element in rising the land value, which can be obtained by the capital cost recovery of transport investment (benefit cost).

DISTANCE TO CITY CENTRE

The city centre is the dominant sites of the various metropolitan areas. Iacono and Levinson (2015) state that the city centre or CBD located in the centre of the environment in most cities tend to produce large activities, as well as the level of accessibility generated which cause the high land value. But, areas with stocks of buildings, the scarcity of vacant land, and the existence of surrounding land developments would have no significant change in the level of accessibility, even in the long term. As accessibility has been recognized as crucial term in determining urban land values, the value of non-urban land (exurban) decreases by distance from the city centre due to lower level of accessibility of the non-urban area. Efthymiou and Antoniou (2013) add that price and rent value are also influenced by the proximity to city centre.

Besides accessibility, land value changes are also affected by distance from downtown / CBD and the environmental quality of the area. Thus, in assessing various land values, land location functions, external factors and accessibility are the most important factors. Therefore, urban land reformation will affect different land value between city centre and sub urban due to land market (Lin, Allan, & Cui, 2015).

MATERIALS AND METHODS

This research uses positivistic approach with quantitative techniques including accessibility calculation and descriptive statistical analysis. The accessibility indicator was measured by the estimated travel time to the city centre, assessed from the road network as well as the main road. To compute accessibility, access was defined as the distance calculated from the distance to the destination. Travel time is referred to an appropriate accessibility measurement. Corridors of Semarang- Mranggen and Corridor Semarang - Ungaran were chosen to be the study areas since their time series data with periods of 1993, 2004, 2011 and 2015 were available.

DISCUSSION

The analysis result of 16 sub-districts in Semarang shows the highest level of accessibility located in Southern part of this city because the city centre or CBD, which attracts human movement are located in this area such as government institutions, offices, and trade and commercials areas. This is relevant with theory where downtown area provides the labour market, has high accessibility, with infrastructure provision and others (Du & Mulley, 2012; Iacono & Levinson, 2015). Furthermore, the second highest accessibility located in South Semarang and Gajah Mungkur respectively.

Table 1: Regional division in analysis of accessibility in Semarang

ZONE	Activity Centre	Accessibility Value
ZONE 1	Traditional Market	19,05
ZONE 2	Traditional Market	19,15
ZONE 3	Police Academy	26,95
ZONE 4	Central Business District	33,00
ZONE 5	University	22,11
ZONE 6	Traditional Market	19,75
ZONE 7	Modern Market and Mix Use	20,00
ZONE 8	Mix Use	21,32
ZONE 9	Traditional Market	21,43
ZONE 10	Traditional Market	26,36
ZONE 11	Business and office functions	33,45
ZONE 12	Industry Area	18,92
ZONE 13	Traditional Market	18,64
ZONE 14	Grocery Mall	22,66
ZONE 15	Mix Use	20,28
ZONE 16	Toll Gate	26,08

Figure 1 reveals that high accessibility level was found in West Semarang due to the residential areas and CBD. Urbanization and urban-rural interrelation have given big impact on national economic development, rural transformation and land use transition (Long, Li, Liu, Woods, & Zou, 2012). The accessibility level in corridor of Semarang-Ungaran is higher than corridor of Semarang-Mranggen. The existence of Jatingaleh toll gate and Banyumanik Toll Gate was one of the factors that make the accessibility value quite high. They provide easy access to major roads. The location factors have strong influence on urban property markets and accessibility (reachable) since transport infrastructure is a very important factor (Cervero, 2004; Gibbons & Machin, 2005; Iacono & Levinson, 2015).

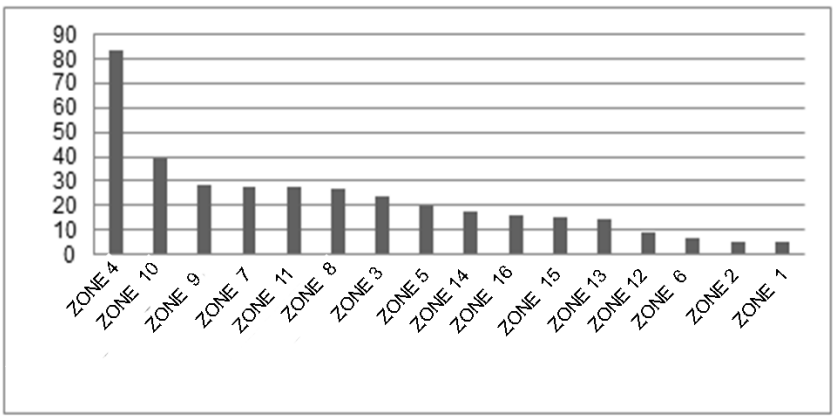


Figure 1: Accessibility level in the 16 sub-districts in Semarang

The second highest accessibility value was found at junction of corridor of Semarang-Ungaran with educational centre such as Diponegoro University. The accessibility values in two corridors were also not much different which both have accessibility between grades 8 to 23. The public facilities in both corridors can be seen below.

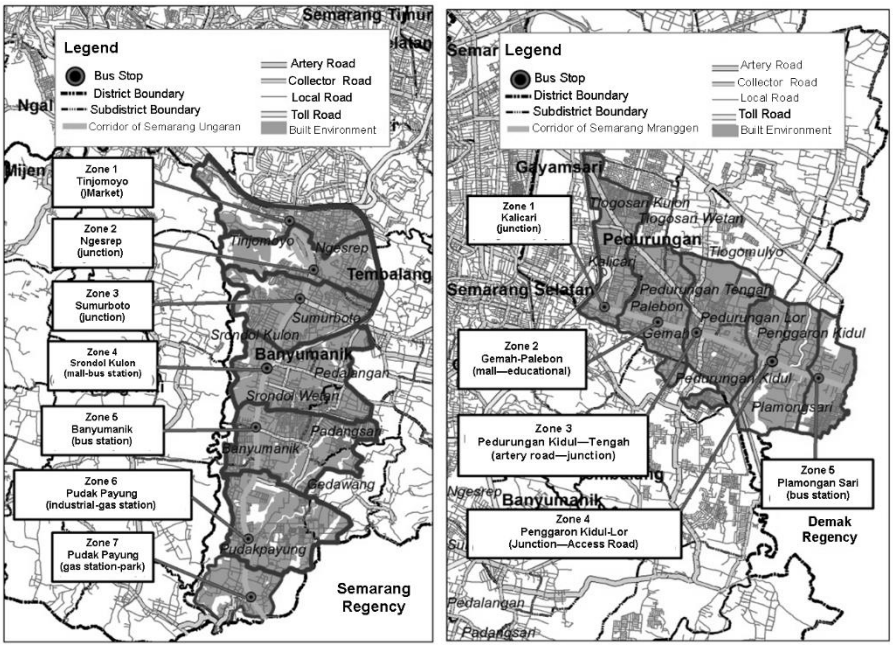


Figure 2: Delineation of service centre in corridors of Semarang-Ungaran and Semarang-Mranggen

Urban facilities such as bus station can attract human movement and generate some activities around the area. The high accessibility due to no road median enables easy access from and to the southern part of Semarang. The three urban regions whose high accessibility belongs to sub service centre located in Regional IV in Corridor of Semarang-Mranggen. Thus, the sub-municipal service centres tend to have high amount of activities with high density of settlements. The large numbers of population in those areas encourages demand for supporting facilities such as trading and commercial facilities (Simmonds, Waddell, & Wegener, 2013).

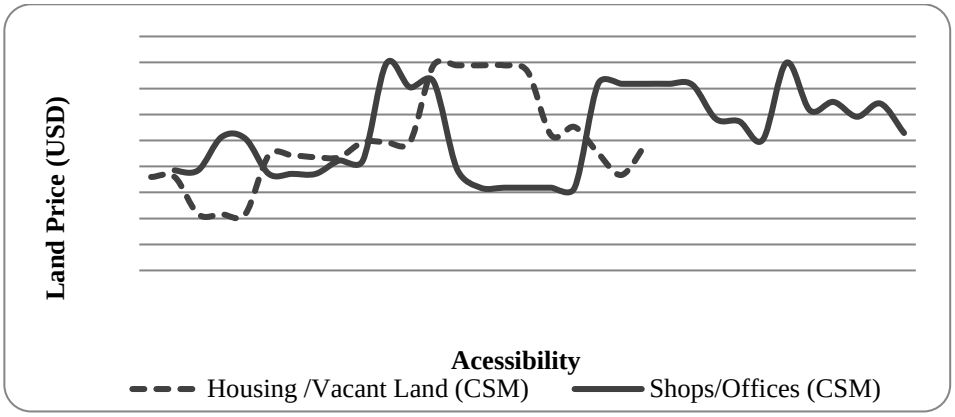
The high level of accessibility causes property land prices tend to be decreased due to noise and slightly access of median road (Table 2). Overall, most of zones within corridor of Semarang-Ungaran have higher accessibility compared to the zones in Semarang-Mranggen corridor. However, the land price

in Semarang-Ungaran was from 1.531 USD to 2.041 USD, while property land prices in Semarang-Mranggen was from 714 USD up to 1.531 USD.

Table 2: Accessibility and land price in corridors of Semarang-Mranggen and Semarang-Ungaran

Zona		**Total Time (Minute)**	**Accessibility Value**	**Land Price (USD)**
CSM 1	Mix Use and access Road to Residential	261,85	18,85	1.592
CSM 2	Grocery Mall and Mix Use	283,1	16,31	1.429
CSM 3	Mix Use and Ring Road	295,6	15,38	1.027
CSM 4	Mix Use and access Road to Residential	308,85	13,26	846
CSM 5	Bus Station and Mix Use	379,65	8,12	432
CSU 1	Mix Use and access Free Way	249,4	21,12	1.680
CSU 2	Mix Use and access Road to Residential	273,33	20,36	1.635
CSU 3	Mix Use and access Road to University	253,53	22,14	2.391
CSU 4	Grocery Mall and Modern Market	324,15	22,04	1.787
CSU 5	Bus Station and Mix Used	474,25	11,63	1.132
CSU 6	Mix Use and access Road to Residential	532,6	9,17	978
CSU 7	Mix Use and access Road to Residential	658,6	8,50	749

**CSU : Corridor of Semarang-Ungaran; CSM : Corridor of Semarang-Mranggen*



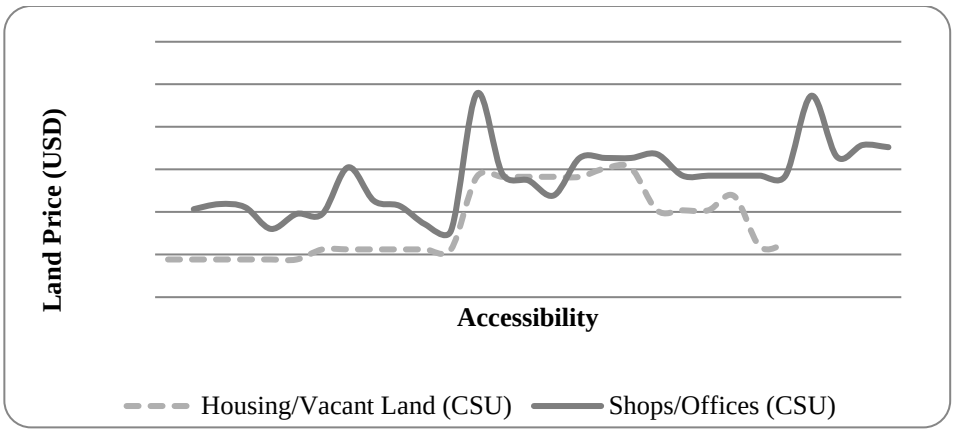


Figure 3: Accessibility Fluctuation toward Land Price

As is presented in Figure 3, the land prices in Semarang-Mranggen tend to steady with slight fluctuation. Furthermore, the corridor of Semarang-Mranggen also connects to CBD and Semarang hinterlands such as Demak/Grobogan Regency. There is artery road connects eastern and central parts of Semarang to the western parts of Semarang. Increased trip generation will lead to high levels of accessibility and land value. The increasing land value will eventually lead to the activities growth in accordance with the conditions of the region (Yang & Gakenheimer, 2007).

Figure 4 and Figure 5 show that both corridors have ahd land prices fluctuations on two types of property (shops/offices and vacant land/housing). This fluctuation is in accordance with the established theory that the more distance from downtown, land prices decline significantly but increase again at certain points. These increasing points are located on the radial roads and ring roads as well as crossroads or road intersections between radial roads and ring roads that will create local peaks of land values.

The rate of decrease of land price in Semarang-Mranggen did not differ much between land uses. The function of vacant land declined from Zone 2 to Zone 7 with the increase of land price at certain point in Zone 3 and 5, while for shop/office function has had fluctuation even though land decrease generally from Zone 2 to Zone 8 with improvements in Zones 3, 6 and 5.

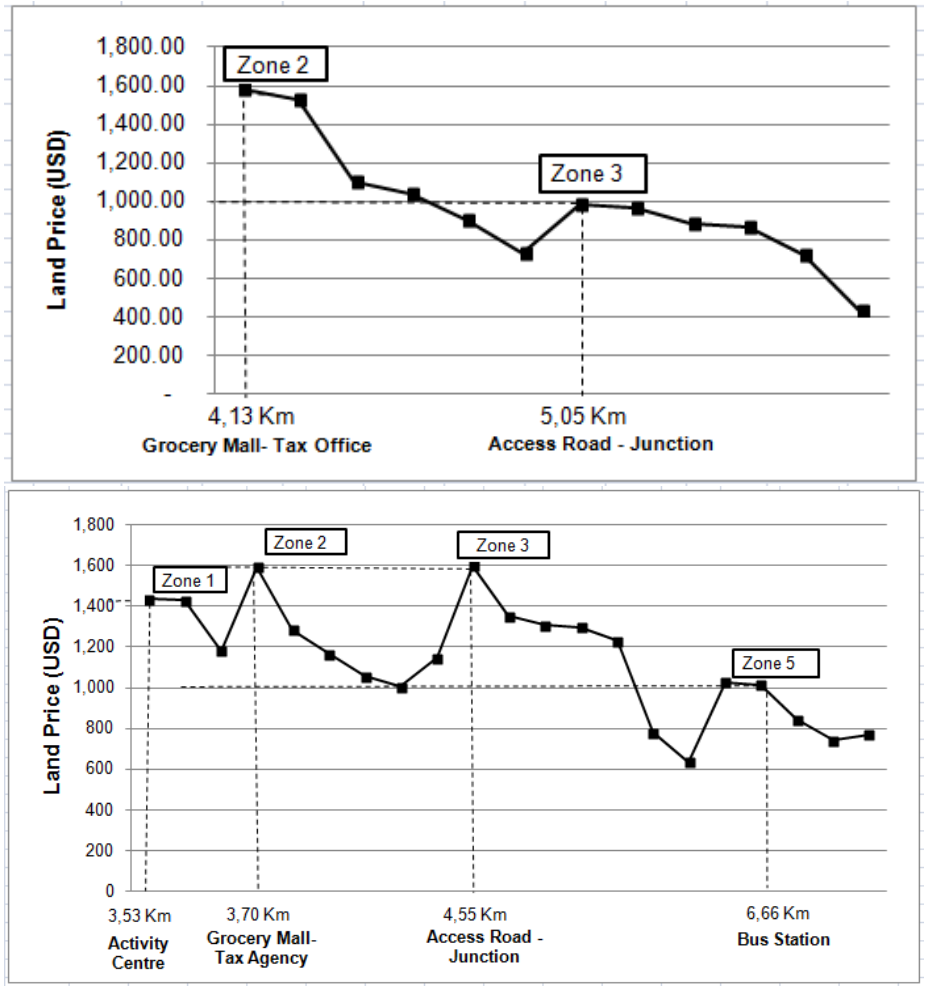


Figure 4: Land price fluctuation in relation to distance to CBD in 8 Zones in corridor of Semarang-Mranggen; (a) Vacant Land/Housing; (b) Shops/Offices

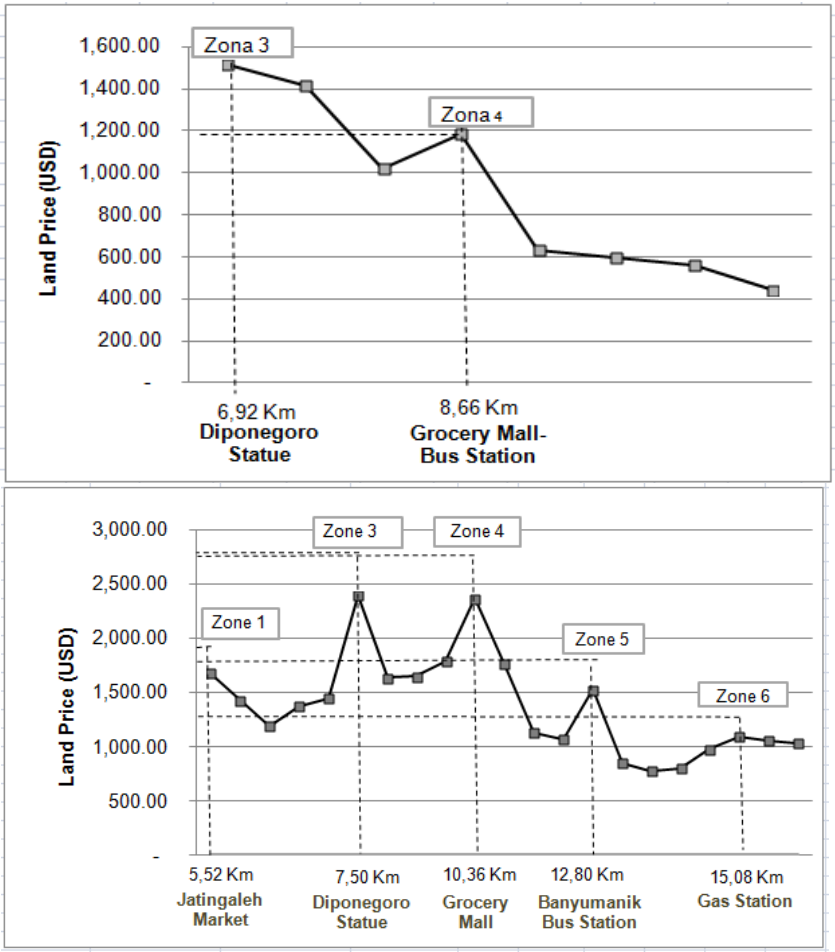


Figure 5: Land price fluctuation in relation to distance to CBD in 8 Zones in corridor of Semarang-Ungaran; (a) Vacant Land/Housing; (b) Shops/Offices

In Semarang-Mranggen, the land price decreased gradually due to the distance away from the city centre. The first point where land price increased again was located in Zone 1, close to city centre. In addition, the point also has proximity to traditional markets (Jatingaleh Market) and Jatingaleh toll gate. The second point of increased land prices located around Zone 2 where there were many activity centres affecting land prices such as Diponegoro University. Land prices increased gradually in Zone 4 due to the activity centre located in toll gate Banyumanik and Grocery Mall. Despite the farthest distance from the city centre, Zone 5 also has quite high land prices due to the influence of activity centres such as Banyumanik terminal and educational facilities.

CONCLUSION

The bid-rent theory suggests that the closer to the city centre the higher the land rent is. Nevertheless, the results of this study indicate that accessibility also plays a big role in influencing land prices in the study area. The high land price in this study were located at access road to universities and residential area as well as commercial centres. This shows that accessibility strength is greater than distance from the city centre which is a representation of transportation cost. Based on the results, it can be concluded that the peak of increased land price occurred in: the intersection with radial ring, access road to urban settlement, access road to university and shopping centre. The highest point of accessibility located at ring road and toll gate because the construction of highways and toll road network creates accessibility.

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AGEING IN PLACE FRAMEWORK AS REFERENCE GUIDE FOR HOUSING IN MALAYSIA: LANDED PROPERTY

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Abstract

The increasing ageing population due to improved quality of life from better healthcare services and lifestyle as well as development in technology calls for better support in the ageing process. Even though the aged population dramatically increases globally, surprisingly the construction sector and the housing system seem slow in adapting to the changing needs of the ageing population. Increasing evidence show that population ageing is a pervasive and unparalleled global phenomenon which presents many challenges towards social and economic growth. Therefore, this research focuses on the provision of better support services and facilities of landed property, as well as the creation of sustainable environment that is age-friendly and safe. Data were collected using semi-structured interviews, focus group discussion and document reviews. Findings from cross sectional content analysis and cognitive mapping could enhance the standard of living for senior citizens in Malaysia in the context of ageing in place. A foundation for developing a comprehensive guideline for elderly, particularly in the urban areas, is proposed to improve the health and welfare of senior citizens in Malaysia through the provision of better services, facilities and development in landed properties.

Keyword: ageing in place, housing, facilities and services, social factors

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INTRODUCTION

The ageing population is an effect from declining fertility rates as well longer life expectancy compared to previous decades (Lutz, Sanderson, & Scherbov, 2008). This is due to improved quality of life from better healthcare services and lifestyle as well as development in technology that support the ageing process. Finally, the ageing of "baby boomers", which means the large number of children born after World War II in the United States and paralleled by similar booms in different places of the world have also lead to an increase in the number of seniors (Bloom, Boersch-Supan, McGee, & Seike, 2011). Although it is deemed as a great achievement for mankind, population ageing also brings forward some of the greatest challenges faced by our current society due to its many consequences towards the economic, social and political wellbeing of nations.

Some of these challenges include a decline in economic growth due to a shrinking work force, issues in healthcare and pension systems, increase in dependency ratio, policy changes and a changing sector more focused towards the needs of the elderly (Bloom et al., 2011; Arshad & Ahmad Bhat, 2013). Furthermore, the old age group is increasing due to a very low population growth and a growing average life span of 71.7 years for males and 75 years for females (Samad & Mansor, 2013).

Consequently, there is a necessity to increase public awareness, construct the required infrastructure, and deliver various facilities along with accomplishment-oriented research in order to look after the aged population of Malaysia (Tey et al., 2016). Since the essentials of the aged population in Malaysia for housing strategies have not been well considered, this has caused major problems concerning the delivery of suitable shelters for the aged (Sulaiman, Baldry, & Ruddock, 2006).

Ageing in place has been seen as one of the ways to address the issue of ageing population. Although there is a growing emphasis on ageing in place in more developed nations, there seems to be a shortage of current researches and publications on this topic in Malaysia, especially with regards to the built environment (Syed Abdul Rashid, Mohd Yusuff, Hamid, Goh, & Hussain, 2006). Therefore, this study is significant as it contributes to the limited information regarding the current challenges faced by elderlies to age in place in Malaysia, particularly in urban area. This is in line with the efforts carried out by the government to improve the health and welfare of senior citizens in Malaysia through the provision of services, facilities, and suitable development (Syed Abdul Rashid et al., 2006). This research focuses on ageing in place in landed housing properties. It identifies the current challenges faced by elderly citizens in Malaysia, as well as it outlines the good practices for ageing in place. In the end, a framework is developed to serve as a reference in addressing ageing in place in Malaysia.

LITERATURE REVIEW

Definition of an Elderly Person

Ageing can be defined as a biological, sociological, economic and chronological phenomenon (Karim, 1997). In this research, the chronological definition will be used, which is in line with the United Nations' and Ministry of Health's recommendations. Meanwhile, "the elderly or ageing population" means people aged 60 years or older. Although at the moment there is no United Nations standard numerical criterion, but the cut off age of 60 years refers to the elderly population has been adopted by many developing countries (Juni, 2015). Similarly, in Malaysia, elderly people are described as people aged 60 years and over (Ministry of Health, Labour and Welfare, 2013; Mohammad & Abbas, 2012).

On the other hand, ageing can be described as an extensive concept which comprises mental capabilities and physical alterations, social characteristics, and psychological modifications to one's mind. Additionally, it takes into account the elderly person capability for his situation, self-care and position within family along with the social networks. These are related to their aptitude and capability to deliver on their behalf a suitable and pleasant life (Abdullah, Abdullah, & Al-Merbaw, 2013).

An ageing population is a domain that affects both developed and developing countries. Every month, one million people turn 60. Furthermore, the projected growth of elderly group will increase exponentially, and the need for resources to care for older individuals will, therefore, rise proportionately. This growth will also result in an increased incidence of degenerative diseases and disabilities. This will lead to the needs of generating knowledge how to care for this population (Abdullah et al., 2013). Accordingly, as the number and percentage of older population continue to increase, the need for extensive and current information regarding elderly persons are becoming increasingly important to be discussed (Wan-Ibrahim & Zainab, 2014).

Elderly Physical Environment

The importance of appropriate physical environment towards positively influencing the health and wellbeing of individuals, have been discussed by various authors (Netherlands Board for Healthcare Institutions, 2008; Lavin, Higgins, Metcalfe, & Jordan, 2006; Joseph, 2006). There are various environmental hazards which could increase the susceptibility of elderly persons to injuries and falls, which include poorly designed stairs and handrails, bad lighting conditions, stepovers, uneven walkways and more (Wold, 2011; Kirby, 2004; Stevens, Holman, & Bennett, 2001; Carter, Campbell, Sanson-Fisher, Redman, & Gillespie, 1997). These risks are often made worse due to the weakened mental and physical states of the elderly individuals, as some live

alone, and are isolated from friends and family in their homes. Thus, in order to make it safer for elderly persons to age in place, it is important to first create a safe physical environment for them to live in.

Todd and Skelton (2004) interpret the physical environment as a general definition which encompasses the home and community environment for an elderly person. This includes the housing options (own house, assisted living facility, nursing home and so on), public spaces (hospitals, supermarkets, parks and recreational spaces and more) and the spaces that connect these places together (public transport stations, pavements and walkways and so on). The National Council on Aging (2015) and Centre for Disease Control and Prevention (2016) report that one of the major risks from the physical environment for the elderly population is related to injuries from falls, which can result in lower self-esteem, reduced mobility, and serious injuries which require hospitalization. Furthermore, the barriers in the physical environment can cause mobility issues that will hamper active and healthy lifestyle habits and prevent access to much needed services and facilities within the community. Hence, it is important to develop physical environment that is suited for all community members regardless of their age and ability levels, as it will play a vital role in maintaining their quality of life.

Thus, the most recognized definition for the concept of ageing in place which has been extensively used in current studies is as follows:

> *"(Ageing in place is) the ability to live in one's own home and community safely, independently, and comfortably, regardless of age, income, or ability level". (Centre for Disease Control and Prevention, 2009)*.

METHODOLOGY

Accordingly, the research techniques used for main data collection process involved three approaches as follows:

Semi-Structured Interviews (Stakeholder 1 – Local Government)
The identified respondents were the Head of Departments who were involved with the welfare of elderly people and who were responsible to endorse the permission to renovate houses (landed property).

Focus group discussion (Stakeholder 2 – Community Group)
The identified respondents were the Residents Association Committee Members that comprised all three generations of family members; the parent – the children – the grandchildren. The justifications of ageing population are referred to the 'Generation X and Baby Boomers' age group type as below:

- The elderly (Baby Boomers – age group between 53-71 years old)

- Ageing people (Generation X – age group between 37-54 years old).

Document Reviews
During the case study phase, document review was also used as a supplementary technique of data collection to triangulate the data collected. Relevant government documents on elderly policy and welfare were reviewed. However, this is not be discussed in this article.

Data Analysis
The cross-sectional analysis was done on the results from focus group discussion and interviews. The data gathered from both techniques would provide a better result since all data were now converged. The validity of the result was compared and discussed through the findings from all case studies with the evidence from the literature review findings. This process helped the researcher to scrutinise the transcripts towards finding the emerging patterns. These were later listed as free nodes before the related child nodes (sub nodes) were clustered to the main nodes (main themes). The final result of the analysis was then presented using cognitive mapping diagram that served to identify the initial framework model for ageing in place guideline. The content analysis was done using five general data analysis strategies, namely data display, code identification, information reduction, frequency of code, and category for relations data matrices and pattern matching.

NVivo11 was used to analyse the data. In summary, the analysis of the focus group discussion and interview transcripts shown in Figure 1 are examples of the 'content analysis' using those five data analysis strategies. The analysis of the content was done by filtering the transcript and to capture (code) only significant statements that represent the idea or information that literally derived from the early literature work done (deductively). The analysis was also done in agreement with the construct of new information (knowledge) that helps to expand towards new literature. Accordingly, the detail analysis method shown only for Theme 1 – Housing Related Areas as reference, before the summary of the overall findings are presented. Figure 1 shows a summary of the analysis done for Theme 1.

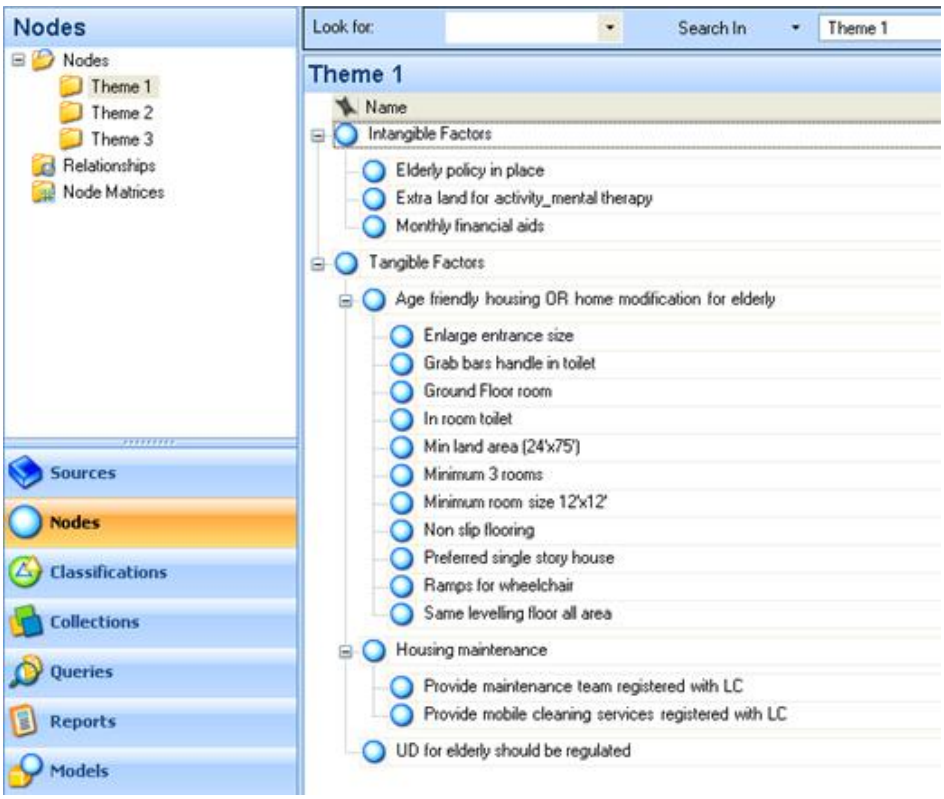

Figure 1: Summary of analysis done using NVivo11 – Theme 1

Figure 2 shows part of the analysing process for the cross-sectional content analysis for some of the factors under Theme 1.

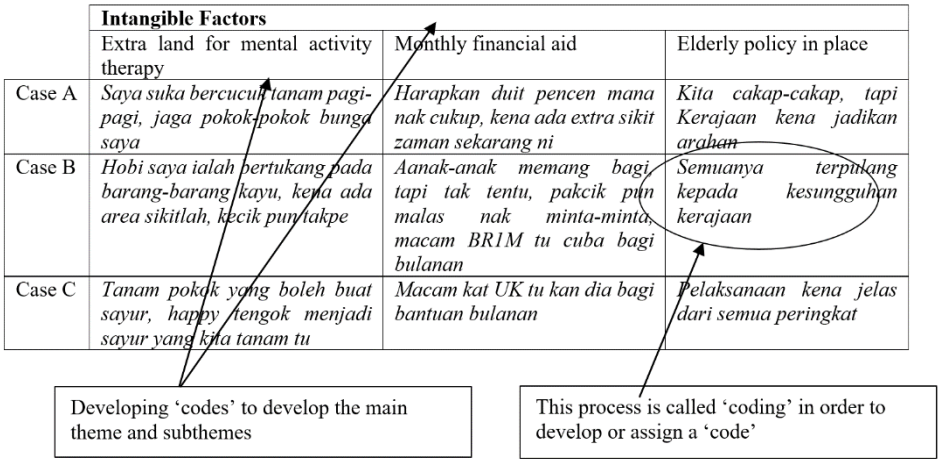

Figure 2: Example of the content analysis process – Theme 1

Cognitive Mapping using NVivo11

As derived from the detail analysis process of the content analysis, the cognitive mapping was drawn. This was to show the summary of the analysis on the illustrated figures. Accordingly, the cognitive mapping developed were based on each themes identified from this study.

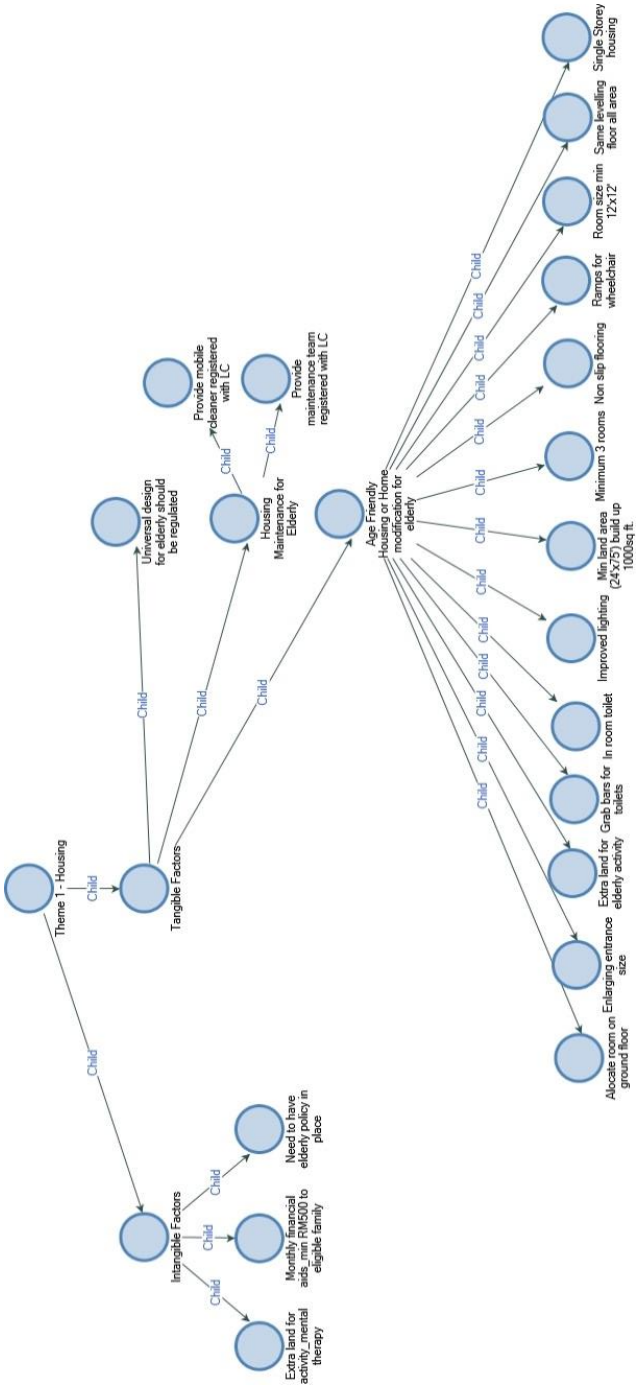

Figure 3: Cognitive mapping developed using NVivo – Theme 1

FINDINGS

At the final stage of analysis, it was appropriate to summarize the results from the cross sectional content analysis from all cases. This process helped to accomplish both literal replication and theoretical replication and the results would stand more robustly. The summary of the results is presented in Table 1 to Table 3, grouped under the related themes.

Table 1: A matrix for generating summary of cross sectional content analysis (Theme 1)

Theme 1 – Housing related area		
Intangible Factors	Extra land for activity (mental therapy)	
	Monthly financial aids (min RM500 to eligible families)	
	The need to have an elderly policy in place	
Tangible Factors	Age friendly housing or home modification for elderly	Allocate rooms on ground floor
		Enlarge entrance size
		Allocate extra land
		Grab bars for toilet
		Attached toilet
		Install Good lighting
		Minimum land area (24'x75')
		Minimum three rooms
		Minimum room size (12'x12')
		Non slip flooring
		Ramps for wheelchair
		Same levelling floor all area
		Single storey housing are preferred
	Housing Maintenance for elderly	Provide mobile cleaning services registered with LC
		Provide maintenance team registered with LC
	Universal Design (UD) for elderly should be regulated	

Table 2: A matrix for generating summary of cross sectional content analysis (Theme 2)

Theme 2 – Facilities and Services related areas		
Facilities	Activity Centre	Need to have periodic or scheduling activities
	Places of worship	Address different religion needs
Healthcare Services	Enough public ambulance is crucial	
	Caregivers and caretakers support	
	Health education and awareness program	

	Mobile clinic and mobile Doctor
	Nearest public clinic is essential
	Visit or routine medical check-up from the nearest hospital
Transportation and mobility	Increase the frequency of buses and local commuter trains
	Provide local transport to the community (for self-manage)
	Smaller transport such as mini buses, vans, and cars
	Various pick up points for public transport (that cover the inside area)

Table 3: A matrix for generating summary of cross sectional content analysis (Theme 3)

Theme 3 – Social related areas	
Community Safety and Security	Crime protection and security
	Periodic Police patrols
	CCTV at strategic locations
Dissemination of information	Encourage positive social interaction
	Sharing of knowledge and expertise
Financial Stability	Empowering the elderly for financial stability
Government and other agencies fund and support	Help under social welfare department
	Senior citizen aid and funding
Promote independence and self-empowerment	
Social Activities by Government, NGOs, and private CSR	As for now most activities are at mosque (*masjid*) or musolla (s*urau*)
	Community activities in group (involvement from all)
	Government and NGOs need to conduct activity that include (the elderly)
Social support from local community	
Stay close to family and relatives	

RECOMMENDATIONS

The Proposed Framework for Ageing in Place Guideline

The proposed framework to establish a guideline for ageing in place in Malaysia is derived from the results of the study and shown in Figure 4.

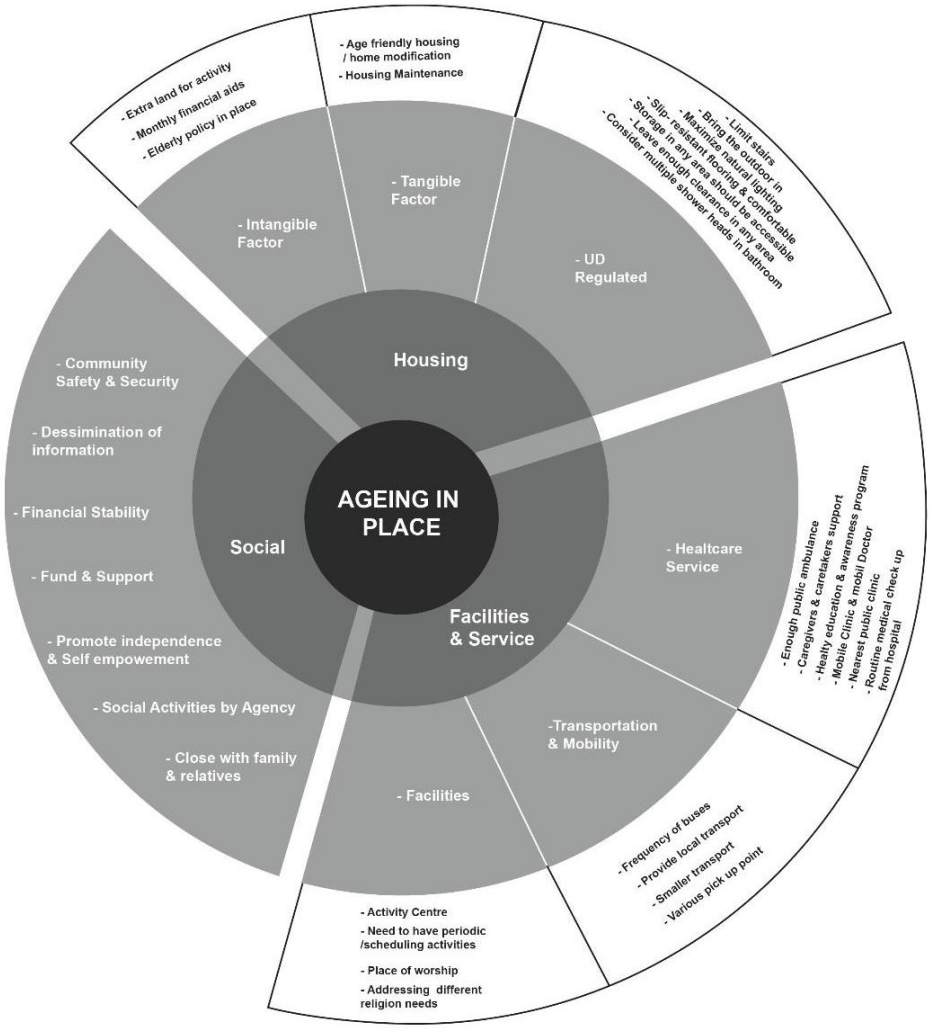

Figure 4: Framework for ageing in place guideline

The developed framework consists of the key themes and sub-themes that are related and complemented each other. Therefore, they should be used as a reference and consideration for both the policy maker and implementer before any development in relation with ageing community being undertaken. Having said this, the framework could be extended to other factors that contribute towards having a proper guideline for ageing in place in Malaysia so that the elderlies could live in age-friendly environment with age-friendly facilities and support.

CONCLUSION

This study has followed a rigorous research process by using multiple embedded case studies to gain an in-depth explanation through various measures, which have been done by using multiple data collection methods. However, there were limitations which were associated with limited stakeholders' involvement, towards seeking factors that contribute towards developing the proposed framework. The identified stakeholders came from two target groups, namely the community and representatives from local councils. Therefore, at this stage, the researchers were only seeking opinions and in depth understanding on the related area of focus in this study.

Further investigation needs to be done in order to improve and refine the findings before the final guideline can be developed. Future research can also examine other factors that can further refine the guidelines for ageing in place in Malaysia as shown in Table 4.

Table 4: Other related factors in developing the ageing in place guideline

Other related factors	Description
Technology	Technology that relates with ageing in place topic, would be the one that related to the mobility (high tech wheelchair) for the elderly that not able to walk anymore. It is also related to high health tech devices to monitor their health condition from remote.
Big Data and Internet of Thing (IoT)	The information from any devices will capture the related data and info to be used for a particular purpose or to improve the elderly conditions.
Disabled people	Explore the particular needs of disabled people.
House design output based on Universal Design (UD) principle	Design drawing referred to the Universal Design (UD) criteria, particularly for ageing in place

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SEGREGATED LAND USE SPRAWL: TOD APPROACH FOR MIXED-USE HOUSING DEVELOPMENT IN KUALA LUMPUR

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Abstract

Spatial analysis of current land use provides useful insight on urban development trend specifically in measuring sprawl growth. Remote sensing and GIS technologies were applied in this research to measure the phases of segregated urban sprawl growth, focusing on the aspect of mixed land use planning. The findings proved that Kuala Lumpur is currently facing segregated land use sprawl based on the measurement derived from one of LUGI component. This type of sprawl transpired within the residential zone in Kuala Lumpur city, demoting mixed-use development by unravelling different classes of land uses into single-uses, thus promoting high dependency on motorised vehicle and discouraging public and pedestrian modes of transportation. The transit-oriented development is one of necessary approaches to control segregated sprawl and promotes mixed-use development in housing areas within the city.

Keywords: segregated land use sprawl, urban sprawl, remote sensing and GIS, transit-oriented development, mixed-use development

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INTRODUCTION

Segregated land use typically consists of single use of land within a specific distance and is considered as sprawling by many researchers (Burchell & Mukherji, 2003; Burchell, Shad, Listokin, & Phillips, 1998; Enid, 2006; Ewing, 1997; Ewing, Pendall, & Chen, 2002; Galster et al., 2001; Haines & McFarlane, 2007; Hasse & Lathrop, 2003; Hasse & Kornbluh, 2004; Jiang, Liu, Yuan, & Zhang, 2007). The development of mixed-use residential zone within the city helps to reduce segregated sprawl growth in the area, provide a variety of affordable housing and reverse urban gentrification. Moreover, mixed-use housing area creates a safer and liveable environment for its residents.

Segregated land use sprawl reduces functionality and efficiency of diverse land uses and promotes high dependency on private vehicles to commute and access other land uses (Arbury, 2005; Hamidi & Ewing, 2014; Travisi, Camagni, & Nijkamp, 2009). Segregated land characterises urban sprawl where the area is dominated by automobiles (Haines & McFarlane, 2007). However, as mentioned by Arbury (2005), one factor alone cannot lead to urban sprawl, asserting that segregated, leapfrog or low density alone does not cause sprawl, but the combination of each factor with consideration of its effect on other factors are important determinants of whether an area is 'sprawled' or not. Yue, Zhang and Liu (2016) argue that low-density, single-use, and leapfrog development may result in the segregation of land uses. Therefore, measuring the degree of mixed land use is an important step to control segregated sprawl through effective land use planning implementation (Ewing et al., 2002).

The objective of this research is to measure segregated land use sprawl using remote sensing and GIS application, and to propose the Transit Oriented Development (TOD) approach to encourage mixed-use development in Kuala Lumpur sprawling housing area to reduce sprawl and negative impacts on the environment.

THEORIES AND DEFINITIONS

Mixed Use Development

Mixed-use development is the mixture of land uses within the same geographical setting of human interactions with the resource available (Nabil, Elsayed, & Eldayem, 2015). It is an optimisation of land availability into a broad segment of uses. It is widely adopted as land use approach in addressing the issues of zoning and segregated land uses. Land and property value of the area can be controlled, where adjustment of city system monitoring and planning implementation become more efficient. The compactness of land uses within effective and productive radius giving more profitable economic model of the area. Hence, the uniformity of population, residential and infrastructure are achievable (Vorontsova, Vorontsova, & Salimgareev, 2016).

Segregated Land Use Sprawl

There are quite a number of researchers who have expressed opinions that segregated land use sprawl is mainly the result of the land use and zoning policies adopted by the authorities. According to Arbury (2005), the disastrous analysis of mixing high-density housing and polluting factories in the nineteenth century industrialising cities led to the introduction of zoning laws that facilitate single-use development in the European countries. After years have passed, those policies have worsened the problems associated with sprawl where the local zoning policies can create the types of land use that seem to matter most to households but causing loss of other valuable land uses in the area (Nechyba & Walsh, 2004).

Despite this, several scholars have proposed that planners and policymakers could ensure that the development is best leveraged by supporting policies for mixed-use development (Ewing, Hamidi, Grace, & Dennis, 2016; Steil, Salingaros, & Mehaffy, 2007). Bart (2010), and Yaping and Min (2009) stressed on the need for better land use policies to stand against urban sprawl, which has caused chaotic situation to evolve, including lower quality of urban space, increasing social segregation, and environmental deterioration.

In this research, the segregated land use sprawl is defined as less than two types of urban land uses beyond the reasonable walking distance to other urban land uses. Barnes, Morgan, Roberge and Lowe (2001) describe segregated land use sprawl as the degree to which residential land uses are removed from employment-generating land uses such as commercial, administrative and industrial land uses. Farther separation between land uses is causing longer commuting distance. Therefore, this research accepts residential, commercial, industrial and institutional area in Kuala Lumpur as the main employment-generating land uses to measure the segregated urban sprawl growth in this city.

Transit Oriented Development

Transit-oriented development (TOD) can be defined as vibrant development concept that promotes seamless connectivity within transit distance with the compactness of land activities (Kimball, Chester, Gino, & Reyna, 2013). With the main development highlight of the walkable district, high density, transit, non-motorized dependency, shifting mode, mix use of land and dense network of street and path, TOD is the most effective approach of urban renewal to uniform the segregated land use sprawl of the city.

METHODOLOGY

Measuring Segregated Land Use Sprawl

The measurement of segregated land use geospatial indices sprawl in Kuala Lumpur housing area was carried out within the 400m walking distance radius

from new residential development patches. The new residential development patches were derived from Land Use Land Cover (LULC) change detection techniques using remote sensing satellite images from two different years (2005-2015). Through GIS application, the natural features such as water bodies, vacant land and forest reserve area were excluded leaving only human-made land use features to increase the accuracy of estimated mixed value. Arbury (2005) mentioned the harmful effect of mixing the residential and commercial use with industrial area due to the latter environmental effect towards the population in the former land use zones. Nevertheless, this research did not exclude the industrial area in Kuala Lumpur because of the existing planning guidelines in Malaysia have already outlined the types of industrial activities permitted for a particular location. Moreover, Kuala Lumpur City Hall (KLCH), through Kuala Lumpur City Plan 2020 (KLCP 2020), regulates and manage land use development in order to avoid inappropriate land use and activities so as to achieve a healthy and clean built environment where industrial land use were placed in zones according to their permitted land use conditions. As for primary city like Kuala Lumpur, the industrial areas consists of Small and Medium types such as Industrial zones for Small-Medium Enterprise (SME); mixed commercial and industrial land use; as well as Research and Development (R&D) like industrial parks. By referring to the previous research work, this research modified and developed a set of indicators for segregated land use sprawl as presented in Table 1.

Table 1: Segregated land use sprawl indicators

Grid Cell Categories	Parameters (No. of Land Use)	Annotation
A	≤ 2	Segregated Land Use Sprawl
B	= 3	Common Development
C	≥ 4	Smart Growth

Sources: Modified from Hasse (2004).

The land use segregation sprawl indicators were divided into three categories: category A (Segregated Land Use Sprawl Area consisting of two types of land use and below); category B (Common Development Area which equals to three types of land uses), and category C (Smart Growth Area where a grid cell consist of four types of land uses and more). The Common Development area in this research is being described as either prone to segregated sprawl or smart growth depending on the future instalment of proper planning in this field.

General measurement method includes the conversion of built-up land area within the six Kuala Lumpur Strategic Planning Zones (SPZ) into grid cells with 400 metres cells resolution using the GIS Spatial Analyst tools. By using the overlay analysis techniques, the Kuala Lumpur land use 2015 data layer was overlapped with the 400m gridded cells layer to determine the number of land use mix in each grid cells. Then, by using the query and geostatistical tools in

GIS software, the percentage of grid cells was calculated according to categories that were determined according to the defined segregated land use sprawl indicators. The calculation method for segregated land use sprawl in housing area was conducted by buffering the designated new residential patches in 2015 using the 400m radius and were converted into grid cells with 400m resolutions. The layer of the buffered residential patches was being overlaid with the gridded cells layer using the GIS spatial analyst tools. All grid cells outside the residential patches buffered radius were eliminated including cells that were being covered only by ¼ (25%) or less. After the data layer cleaning process, the final grid cells layer was overlaid with the Kuala Lumpur land use 2015 data layer to determine the parameters in each grid cell (refer Table 1). The query and geostatistical tools were used to calculate the percentage of the grid cells according to the category of the indicators.

The segregated land use sprawl (SL_{Res}) was calculated using the formula modified from Hasse (2004) as shown below:

$$(SS_{spz}) = \frac{\sum GC_x}{\sum GC_{Unit}} \times 100 \quad \ldots\ldots\ldots\ldots\ldots\ldots (2)$$

Where:
(SL_{Res}) = Residential segregated land use sprawl
(GC_{Ind}) = Number of grid cell to indicator categories consisting types of land use
(GC_{Unit}) = Number of grid cell units

RESULTS AND DISCUSSION

Findings of Segregated Land Use Sprawl

The findings from segregated land use sprawl measurement are presented in percentage value as shown in Table 2. Five SPZ in Kuala Lumpur scores high percentage of segregated residential sprawl, and the percentage of segregated sprawling in City Centre SPZ was equivalent to the percentage of common development (0.39%).

Damansara-Penchala SPZ scored the highest value of residential segregated land use sprawl with 20.31% proving this SPZ is having critical issues on segregated sprawl, followed by Sentul-Menjalara SPZ with 17.97% and Bandar Tun Razak-Sg. Besi SPZ (13.67%). The key finding from this research confirmed that Kuala Lumpur city is currently facing segregated land use sprawl indicating less mixed-use development within walking distance (400m) in the housing area.

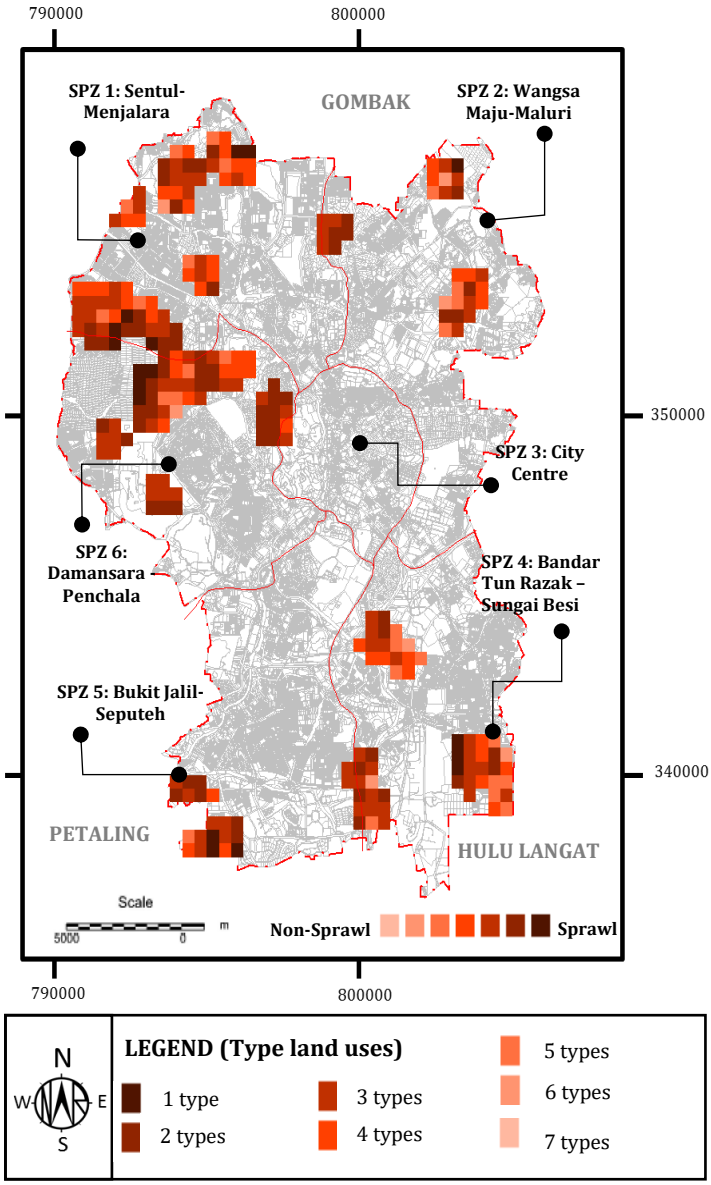

Figure 1: Segregated land use sprawl in Kuala Lumpur housing area

Table 2: Kuala Lumpur segregated land use sprawl in housing area

Kuala Lumpur Strategic Planning Zones		Segregated (%)	Common (%)	Smart Growth (%)	Annotations
1.	Sentul-Menjalara	**17.97**	9.38	3.13	Sprawl
2.	Wangsa Maju-Maluri	**8.20**	2.34	1.95	Sprawl
3.	City Centre	**0.39**	**0.39**	0.00	Common
4.	Bandar Tun Razak-Sg.Besi	**13.67**	3.91	5.08	Sprawl
5.	Bukit Jalil-Seputeh	**6.25**	1.17	0.39	Sprawl
6.	Damansara-Penchala	**20.31**	3.52	1.95	Sprawl
	TOTAL	66.80	20.70	12.50	Sprawl

Kuala Lumpur current land use pattern has been the result of previous development practices and trends which were based on single land use zoning (Kuala Lumpur City Hall, 2011). Changes in market forces, trends and focus, coupled with environmental and climatic concerns, require a new and integrated approach towards the diversified land use planning and spatial developments. Therefore, there is a need to look at a more flexible approach towards land use zoning and the manner in which developments are carried out within Kuala Lumpur. On first sight, it might seem implausible to argue that such compact and dynamic urban area like Kuala Lumpur is facing single-use urban sprawl. However, considering the fact stated by Kuala Lumpur City Hall (2011), most of the suburban areas in Kuala Lumpur are currently facing segregated types of sprawl due to the single land use zoning policies previously adopted.

In this research, the geospatial indices model of segregated land use sprawl distinguishes single-use development pattern (segregated land use) from mixed and common land use development pattern. However, rather than using single land use characteristic to denote this type of sprawl, this research ascertains less than two types of land use within specified walking distance as segregated sprawl. While the common development types are walking distance catchment area with three types of land uses followed by mixed development (four types of land uses and above).

The findings indicate that Kuala Lumpur experiences segregated sprawl, which is the result of the previous land use regulation and policies. This trend is not something peculiar since many countries are also facing segregated sprawl due to ineffectual planning policies. The deterring land use and building codes in cities have curbed housing construction which eventually affecting housing supply, leading to increasing housing costs and deepened inequality in urban centres (Florida, 2016).

Based on the findings of this research, segregated sprawl is lower in the city centre as compared to other SPZ. This is because KLCH has introduced many mixed-use zones in their city plan 2020 focusing on the city centre. Moreover,

most states in Malaysia have adopted a set of planning guidelines that caters for the provision of each type of land use according to its regulated proportion. This planning guidelines are seen as effort to discourage segregated sprawling. However, they do not cater for walkable distance, but focused more on big development area. There are many issues arisen from the execution of these guidelines.

TOD Approach to Segregated Land Use Sprawl

Segregation in the built environment has been studied from many different perspectives including physical land use pattern (housing supply, mobility, accessibility), socioeconomic (social, population income, employment, public health) as well as the environment (pollution, urban heat, carbon footprint, etc.). Nevertheless, the most dominant standpoints of the segregated sprawl development always related back to the spatial factors that shape the social, economic and cultural. Moreover, Wu (2006) states that the spatial heterogeneity of environmental amenities is shown to cause economic segregation across communities and the landscape, with high-income households living in areas with higher level of environmental amenity and better public services.

Poor connection and harmonization between land use elements may adversely affect property value. Uncontrolled population density from the segregation may generate more local traffic, congestion and crime that contribute to low quality of life and inefficient property management. Segregation also can reduce the availability of affordable housing when the divided segment of land are monopolized by private landowners. Additionally, inefficient distribution of land and failure to reduce space between and around developments lead to fragmentation of the habitats that are left after the development.

Segregated land use sprawl in Kuala Lumpur has encouraged traffic congestion and development of roads that lead to strip sprawl. This statement is supported by Bart (2010) when he asserts that the dispersal of home, work and leisure facilities have resulted in increased transport demand. Barnes et al. (2001) and Yue et al. (2016) state that poor accessibility and highly separated land uses causing longer commuting distances between homes and employment.

Kuala Lumpur is an old city, which was established before the instalment of proper planning practice. However, Kuala Lumpur also is a fast growing city in Malaysia, thus providing an opportunity for some of the modern planning concepts to be installed to encourage mixed land uses. The New Urbanism, which involves an attempt to create higher density in traditional settlements with a mix of land uses to promote community and transit use has been experimented and implemented in the United States. This planning concept can be implemented in earliest settlement area in Kuala Lumpur especially in the City Centre, Wangsa Maju-Maluri, and Sentul-Menjalara SPZ. This concept refers to the notion of urban renewal, which points up as a primary objective to ‘rebuild the city in the

city'. This urban policy comes exactly to stand against two logics: the non-controlled expansion of the cities and the deepening of social inequalities within spatial segregation. It also stands as a new model for the development of city, aiming at saving space and energy, regenerating the degraded urban territories and increasing social diversity. Additionally, mixed types of residential development also encourages less sprawl to the suburban area (leapfrog sprawl), provides housing with different level of affordability and reversing urban gentrification trend.

TOD is sprouting as a major solution to urban sprawl issues in city land, as it provides the optimum benefit of resource management. It is not only about arbitrary nodes which are represented by the 400m circles drawn around public transport stops or station, but also tend to support the use of public transport in the urban area. To ensure an urban transit system works effectively, transit stations should be planned to effectively increase the quality of the city by creating a vibrant mix of activities relating to its urban context. Furthermore, TOD concept prioritizes the non-motorized transport networks such as cycling that help in reducing carbon footprint. It provides high connectivity in which it creates dense networks of streets and paths such as pedestrian pathways, bus lanes, and bicycle lanes which are interconnected to give higher accessibility and connectivity to reach a destination.

Another related movement toward controlling segregated sprawling is the push to create a transit-oriented design in which high-density mixed-use developments are planned near transit stations. Less segregated area creates a safer environment which causes the area to be alive all the time. The TOD concept is able to increase pedestrian activity and provides 24-hour passive surveillance through mixed-use development. Kuala Lumpur is now enhancing its public transportation services with the expansion of LRT network and development of new MRT stations, thus, encouraging mixed development in TOD's area will help to lessen the segregated sprawl in Kuala Lumpur. Moreover, by promoting a wide variety of housing types, TODs have the potential to increase housing affordability within close proximity to the central city, reversing the trend of young working families being forced to locate far from the central city due to prohibitively expensive accommodation and therefore being forced into lengthy daily commutes (Arbury, 2005).

CONCLUSION

The application of earth observation technologies such as remote sensing and GIS is seen as a forerunner for measuring urban sprawl. It is an important step to measure urban sprawl since it is a problem that suffers from uncertainty. The use of such technologies have shown to measure sprawl in Kulala Lumpur has shown that segregated land use sprawl is common in many old and new towns in Kuala Lumpur. The degree of segregated land use sprawl identified in this study shows

around 13-20% of housing area in Kuala Lumpur has less mixed-development of land use within 400m walking distance. It is thus proposed that TOD application to be encouraged in Kuala Lumpur to alleviate growth of segregated urban sprawl and its impacts.

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COMMUNITY AWARENESS ON THE IMPLEMENTATION OF EARLY WARNING SYSTEM AT TENAGA NASIONAL BERHAD SULTAN ABU BAKAR HYDROELECTRIC SCHEME, LEMBAH BERTAM, CAMERON HIGHLAND

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Abstract

This article presents the community awareness on the implementation of Early Warning System (EWS) in a well-planned Integrated Community-Based Disaster Management (ICBDM) that covers all Tenaga Nasional Berhad's (TNB) hydroelectric schemes. In Cameron Highland, Lembah Bertam and further downstream villages were reported to have the highest occurrence of floods especially during monsoon season, which makes the area vulnerable. This study incorporates and synergizes three major stakeholders; the community; local authority; and TNB; gearing towards minimizing loss of life and property damages in the event of a dam related disaster. The aim of this article is to assess the level of awareness and perceptions of the directly affected communities towards the implementation of EWS. Their heightened awareness would help to reduce their vulnerability in the event of future disaster. This study opted for a quantitative approach, which included a questionnaire survey. The findings revealed that the demographic characteristics influenced community awareness regarding the implementation of EWS. Most of the respondents accepted the EWS positively and understood the importance of EWS. Thus, the community members have the right to know and understand the hazard they should be expecting so they can plan for themselves and make informed choices to reduce their vulnerability.

Keyword: community awareness, Early Warning System (EWS), disaster, vulnerability

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INTRODUCTION

Despite their many beneficial uses and value, dams also present risks to properties and lives of their surrounding communities. This is due to their potential to fail and cause catastrophic flooding. Dam break or failure is considered as one of the events of "small probability, large consequences", which has often lead to catastrophic loss of lives, as well as destructions of the social, economic and environmental components of downstream areas.

In Lembah Bertam, Cameron Highlands, indiscriminate land clearing for agricultural development in the upstream of Sultan Abu Bakar Hydroelectric dam has resulted in multiple flood events in the downstream areas of the dam. Considering that community's awareness can significantly reduce the vulnerability of the group, this research focuses on understanding the community's awareness on the implementation of EWS in order to reduce their vulnerability in the event of a disaster.

Early Warning System (EWS) is the representation of a set of capacities needed to generate and disseminate timely and meaningful warning information that enables at-risk individuals, communities and organizations to prepare and act accordingly, and in sufficient time to reduce harm or loss (UNISDR 2009). EWS can be categorised into community managed EWS and community based EWS. A community managed EWS refers to the system managed by community but they are not completely involved in the establishment of the system. Whereas, community based EWS is a system developed, operated and maintained by the community itself. While developing the system, the community would explore external support from different individuals, communities, organizations and institutions. It is necessary that the community develops and maintains close coordination and links with the stakeholders.

As EWS tends to focus on warning and monitoring on hazards and threats only, the vulnerability factor of the community is often neglected. Hazards and vulnerability should be assessed together to reduce risks. A community which is highly exposed to hazard also experiences a high level of vulnerability and needs a more heads-up warning. Thus, the objectives of this article is to assess community awareness and perceptions towards EWS implementation to mitigate risks due to any failure and probable failure of the TNB Sultan Abu Bakar HydroElectric Dam.

DISASTER MANAGEMENT CYCLE

Disaster management cycle provides the framework for disaster management. In Nepal, its disaster management cycle consists of two phases - before and after the disaster, and under this cycle is where the implementation of EWS takes place (Figure 1). EWS is part of Risk Management, which is before disaster occurs, and consists of preparedness, mitigation and prevention action. Whereas, the action of response, rehabilitation and reconstruction falls under the category Crisis Management, which is after the occurrence of a disaster.

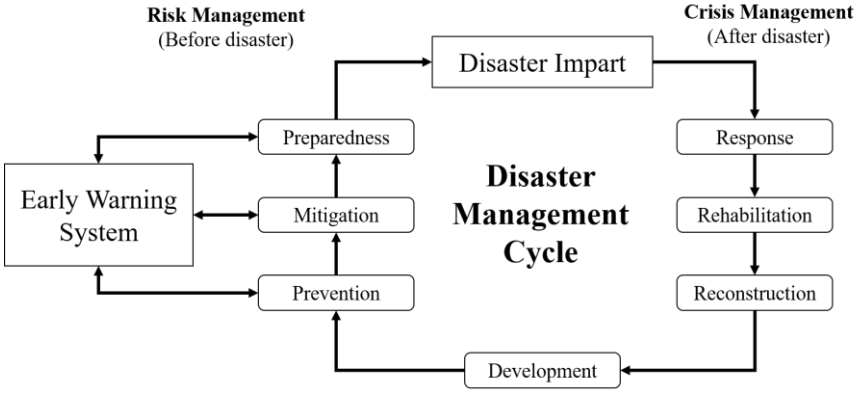

Figure 1: Nepal's disaster management cycle.
Source: Mercy Corps Nepal (2010).

Likewise, the disaster management cycle for Malaysia is also divided into two phases - risk management that focuses on protection and crisis management that focuses on recovery (Figure 2). The components under Risk Management (protection) are mitigation, preparedness, prediction and EWS. Meanwhile, the components under Crisis Management (recovery) are impact assessment, response, recovery and reconstruction.

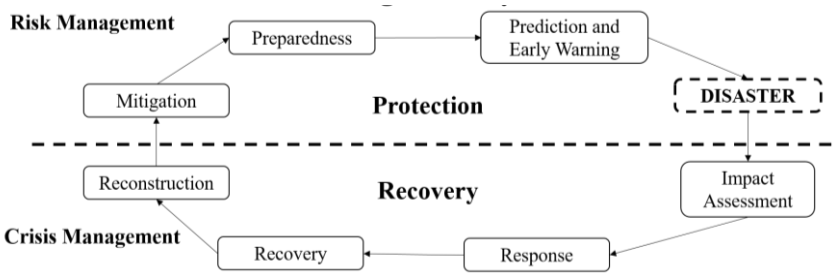

Figure 2: Malaysia's disaster management cycle.
Source: slideshow Disaster Management in Malaysia: Landscape Review, Challenges and Prospects

Based on the disaster management cycles of the two countries, it can be seen that both cycles consist of similar components but with a slight difference in their emphasis towards EWS. Nepal's disaster management cycle is more focus and more detailed in EWS compared to Malaysia's. In Nepal's, EWS is a main system that is being employed to integrate the other components under risk management. Whereas, in Malaysia, EWS is only one of the Risk Management components. The differences in the emphasis and utilization of EWS are what differentiate between the two countries' disaster management cycles and determine the success of the cycles.

COMMUNITY PERCEPTION AND DISASTER AWARENESS

The community, which is exposed to potential threat of disaster, is the most vulnerable between all the stakeholders. Vulnerable community needs to be aware of the potential threats and consequences that it has to endure in the near future. The concept of awareness has to be generated at local level (Newport & Jawahar, 2003), so that people can be prepared. In the context of disaster management, the role of the authorities is to implement disaster reduction programmes, but decision making should include the affected community. Without the awareness or involvement of local communities, such programmes often fail to yield results during disaster occurrences (Zhang, Yi, & Zhao, 2013). The involvement of community could fill the gap in the planning and implementation of disaster reduction programmes. The result of community based disaster reduction programme can only be apparent when the affected population has a deep understanding of the disaster risk levels, hazard distribution characteristic, participate in the hazard elimination and risk mitigation activities. (Zhang et al., 2013).

A community prioritized actions for disaster risk reduction could lead to the adaptation process for reducing the impact of disaster (Prashar, Shaw, & Takeuchi, 2013). The dissemination of disaster prevention knowledge can fortify public disaster prevention and reduction awareness (Zhang et al., 2013). According to Pearce (2003), the community members have the right to know and understand the hazard they should be expecting so they can plan for themselves and make informed choices thus reducing their vulnerability. The community involvement elates rural appraisal in the preparation of contingency plan that would fortify the community in response during disaster (Newport & Jawahar, 2003). The preparation of community for disaster can include various things such as their knowledge on which route to take during disaster occurrences, the prioritized action during time of distress, the preparation before disaster hits and what to expect. With the expected knowledge safely engraved in the minds of affected community, the panic probability could be reduced and the community would able to act independently in the time of distress thus reducing the number of casualties.

METHODOLOGY

This research employs mainly quantitative approach and added with interviews with some of the respondents. The major interest of this research was to assess the awareness and preparedness of the affected communities for any untoward incidents in their area, especially related to dam failures. For the primary data collection, a questionnaire survey was conducted among the community members of the surrounding of the TNB Sultan Abu Bakar Hydroelectric Dam in Lembah Bertam, Cameron Highlands. The questionnaire was designed to elicit the perceptions of the community of the implementation of EWS in the area. EWS has been proposed by the dam authority as a primary caution system that would alert the community in hope that it can reduce the number of casualties in the event of dam failure. Meanwhile, literature review and document analysis were employed to obtain secondary information regarding Lembah Bertam and also regarding EWS as proposed by the dam authority.

ANALYSIS AND FINDINGS

In total 500 respondents answered the survey regarding their perceptions towards EWS implementation. The analysis was divided into two main sections; i) community experience with disaster; and ii) community perceptions towards the implementation of EWS.

Community Experience with Disaster

A correlation test was conducted in order to identify the significance between some of the demographic characteristics of the respondents and their disaster experience. The cross tabulation analysis shows the characteristics of respondents in relation to their experience. In order for a community to act independently during disaster, the considering factors are including demographic, gender and livelihood of the affected community.

Cross tabulation analysis between gender and disaster experience shows male respondents (64.8%) have experienced disaster more than female respondents (35.2%) (Table 1).

Table 1: Disaster experience by gender

	Experienced disaster					
Gender	No	%	Yes	%	Total	%
Male	147	57.4	158	64.8	305	61.0
Female	109	42.6	86	35.2	195	39.0
Total	256	100.0	244	100.0	500	100.0

In terms of age group, majority of the respondents that have disaster experience belong to the 20-30 years old age group (20.9%) and the 31-40 years

age group (20.5%) (Table 2). Whereas, the least number of the respondents that have disaster experience belongs in the > 60 years old age group. However, the majority between all age groups that have no experience with disaster also belong to 20-30 years age group (25.8%), followed by those in the < 20 years age group (21.9%). This data could be due to the majority of respondents that answer the survey belong to the 20-30 years age group.

Table 2: Disaster experience by age group

	Experienced disaster					
Age	No	%	Yes	%	Total	Total %
< 20 years	56	21.9	40	16.4	96	19.2
20-30 years	66	25.8	51	20.9	117	23.4
31-40 years	53	20.7	50	20.5	103	20.6
41-50 years	23	9.0	38	15.6	61	12.2
51-60 years	40	15.6	45	18.4	85	17.0
> 60 years	18	7.0	20	8.2	38	7.6
Total	256	100.0	244	100.0	500	100.0

In terms of ethnicity, the cross-tabulation result in Table 3 shows most of the Chinese have experienced disaster (34.0%), while the majority of the Orang Asli Semai have not experienced disaster (60.9%). This result could be due to the distribution of the population where the Chinese are mostly located in Lembah Bertam area, which is the most vulnerable area to flood risk compared to other areas surrounding the dam.

Table 3: Disaster experience by ethnicity

	Experienced disaster					
Ethnicity	No	%	Yes	%	Total	Total %
Semai	156	60.9	72	29.5	228	45.6
Temiar	6	2.3	0	0.0	6	1.2
Malay	21	8.2	39	16.0	60	12.0
Chinese	55	21.5	83	34.0	138	27.6
Indian	10	3.9	13	5.3	23	4.6
Indonesian	4	1.6	29	11.9	33	6.6
Bangladesh	2	0.8	8	3.3	10	2.0
Others	2	0.8	0	0.0	2	0.4
Total	256	100	244	100.0	500	100.0

Community perceptions towards the implementation of EWS

Table 4 shows the cross tabulation result between gender and respondents awareness of EWS. When comparing between gender, it is apparent that male respondents know more about EWS (62.5%) compared to female (37.5%). The significant Chi square value was 3.684, df = 1 and p-value = .086. These show

that male respondents were more aware of the disaster mitigation effort compared to females.

Table 4: EWS awareness by gender

Know EWS x Gender							
	Male	%	Female	%	Chi square	df	p-value
No	27	49.1	28	50.9	3.684	1	.086
Yes	278	62.5	167	37.5			

Table 5 shows the cross tabulation result between age and respondents awareness of EWS. The result indicates that majority of the respondents who were aware of EWS belong to the 20-30 years old age group (22.0%). However, respondents from the same age group were also the majority without awareness of EWS (34.5%). For age groups 41-50 years old and > 60 years old, most of them were aware of EWS and only a very small number of respondent in that specific age groups were not aware of EWS. They show a better awareness of EWS compared to other age groups. The Chi square value was 10.057, df = 5 and p-value = .142.

Table 5: EWS awareness by age group

Know EWS x Age						
	< 20 years	20-30 years	31-40 years	41-50 years	51-60 years	> 60 years
No	13	19	11	1	7	4
%	23.6	34.5	20.0	1.8	12.7	7.3
Yes	83	98	92	60	78	34
%	18.7	22.0	20.7	13.5	17.5	7.6

Chi square= 10.057, df = 5, p-value = .142

Table 6 shows the cross tabulation result between ethnicity and respondents awareness of EWS. The result reveals that majority of the respondents that know about EWS were the Semai people (45.6%) and the least was other ethnicity (0.2%). The Chi Square value was 13.228, df = 7, p-value = .163. This shows that although most of Semai people were located at Kg. Leryar, which is farthest from the dam area, they were mostly aware of EWS.

Table 6: EWS awareness by ethnicity

Know EWS x Ethnicity								
	Semai	Temiar	Malay	Chinese	Indian	Indonesia	Bangladesh	Others
No	25	1	6	13	3	2	4	1
%	45.5	1.8	10.9	23.6	5.5	3.6	7.3	1.8
Yes	203	5	54	125	20	31	6	1
%	45.6	1.2	12.0	27.6	4.6	6.6	2.0	0.2

Chi square= 13.228, df = 7, p-value = .163

CONCLUSION

Based on the results from the statistical analyses, it can be concluded that majority of the respondents were aware of the implementation of EWS. The findings have revealed that majority of the respondents with awareness, in terms of gender were male, and in terms of age were those in the 20-30 years old group. Although majority of the respondents were from Lembah Bertam, Semai people who were residing in Orang Asli villages were more aware of EWS. The results have also suggested that people with disaster experience are more attentive towards EWS compared to those without. The findings are in line with those of Karanci, Aksit and Dirik's (2005), and Osuret et al.'s (2016) who find that the influencing factors in the disaster related cognition behaviours are very much related to socio demographic, previous disaster experience, anxiety and locus of control.

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DEVELOPMENT OF URBAN MARKET SPATIAL FOR HIGHEST AND BEST USE OF LAND PRODUCTIVITY AND SUSTAINABILITY

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Abstract

No less than 40% of around 70 traditional retail markets in Surabaya are located in the downtown area where the economic value of the location is high, but not being optimally utilized. Sustainable planning can be achieved if the area is not only able to stand and grow by itself but also contributes to the economic growth of the region and the surrounding trade. Based on its potential, urban land use is principally needed to be analysed on its capability in producing highest property value. This research develops adaptive and collaborative concepts on spatial configuration design and market economy value in urban area. It is found to be the best regional planning concept to support sustainable economic achievement. It also has the capability in minimizing failure of market development in urban areas as well as supporting success in structuring the city. Triangulation method was applied through qualitative and quantitative approaches, and using Highest and Best Use (HBU) analysis technique. The analysis began with an explorative study to explore alternatives of land use, which was then followed by a 5-stages analysis including determination of alternative use, regulatory compliance and permits, possibility and affordability of construction, financial feasibility, and maximum productivity of land.

Keyword: Urban, market, highest and best use, productivity, sustainability

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INTRODUCTION

The scope of market services has a significant impact on the reduction in the quality of space and the carrying capacity of the surrounding environment (Utomo, Rahmawati, Suhartono, & Negoro, 2015). These impacts, among others, are caused by the increasing number of traders and agricultural commodities that are not unloaded at designated space. These give rise to congestion in the area (Reed & Kleynhans, 2011). This situation has been partially addressed by the Surabaya City Government in 1980s by standardizing the markets' design and modernization that was oriented on the supplying more stalls. Nevertheless, the problem remains. Because of the behaviour and character of traders and consumers in the market location, large number of stalls remain empty while traders continue to operate by the roadside.

The existence of traditional urban market in Surabaya plays an important role as part of the logistics distribution network in Surabaya, especially to supply food items to the citizens. Therefore, it may be unwise for city government to relocate the market out of urban area in order to solve its associated problems. A better solution would be to revitalise the market. The goal of revitalization is to increase the value of land and buildings as well as to solve problems associated with urban market in order to support the development of the region and the development of the property sector in the region. A HBU analysis (Rattermann, 2008) was used to decide the best option for traditional market development in urban area.

LITERATURE REVIEW

One approach to determine the use of urban land is by looking at its highest and best use (HBU). The HBU is defined as the possible legal and logical use of an empty or upgraded property, which physically, reasonably, and financially feasible allowing it to deliver the highest value (The Appraisal Institute, 2001). HBU is a concept of appraisal that can be applied to land or building which is usually interpreted as land use which will maximize the wealth of the owner through the most profitable use of the land (Grissom, 1983).

The highest and best use rests on marketability analysis to identify the most competitive, most profitable use of the land or property. This use is shaped by a competitive boost in the area where the property is located and provides the foundation for a thorough investigation of the property position in the minds of market participants. Understanding market behaviour developed through market analysis is essential for the highest and best use concept.

The intended properties in this study were land and/or buildings. A building is defined as a technical construction planted or fixed permanently on land and/or water. Properties can be classified in five groups, which are: the first is residential property consisting of two types, which are: single family homes (freestanding homes, town homes) and multifamily homes (apartments,

condominiums, cooperatives, planned unit developments); the second is commercial property, which consists of office property, where the user of the building provides trade and services; the third is retail property, where the user of the building provides traded goods; the fourth is industrial property, that includes all land or facilities used for industrial activities including warehousing, consisting of industrial real estate, light manufacturing or assembly, storage or warehouse/ office/distribution; the fifth is special purpose property, that includes hotels, motels, club houses, resorts, cinemas, schools, campuses, government offices, places of worship (Kyle, 2005).

Land and building is one of the most popular areas of investment due to its ability to increase in value. The value generated is likely to increase over the years rather than decrease. In respect of asset value, land mastery is an essential part in the government's balance of capital. In this regard, determining land use is an important factor in good governance and it is important to determine the right added value due to planning in addition to the land's actual value. A land use is the arrangement on how a land is supposed or not supposed to be used, so it can be inferred that a used land means a land that has a specific purpose/designation and is owned by a particular individual or institutions. In land use arrangement, one must make the best choices and decisions to use the land for a particular purpose that can be achieved.

Land use is the use of space both above and below the ground. So the use of land can be a projection of the space function, including the distribution of space that indicates the function or activity of the city concerned. It is closely related to the system of inter-human activity up to the institutional level i.e. individuals, households, companies, and each has different interests (Chapin and Kaiser, 1979).

METHODOLOGY

This research uses qualitative and quantitative methods. Quantitative method was applied by implementing the principle of highest and best use (HBU). The determination of alternative building functions was done through stakeholder analysis. The analysis began with the determination of key stakeholders, whom were representatives of property management, Surabaya City Government, urban planning experts and 20 traders in traditional market who were sampled randomly. The quantitative method was applied for legal and physical analysis to get the maximum capacity of building. The quantitative approach was also applied for financial analysis using cash flow, market value, and productivity analysis.HBU process is usually done in sequence. Only alternative determination steps can be before or at the time of completion of legal receipts that are highly dependent on the decision whether illegal use is considered (Rahmawati, Utomo, Anwar, Setijanti, & Nurcahyo, 2014). The maximum productivity of a land is the use that results in the highest value of the difference

between the pre-use value and after use, or the highest and consistent residual value. The value of land is obtained by the market capitalization rate. Revenue earned from development is subtracted from net income from total property. The remaining income is land residual technique. With this method, the market value of the land can be known if the value of the relatively new building market can be known with certainty.

Some methods of measuring the value of buildings are by cost approach and market data approach in the context of cost estimation. The value of the property can be obtained from NOI (Net Operating Income) or NOI divided by the rate of capitalization obtained from the aggregation of expectations against the rate of return. Finally the value of the land can be obtained by subtracting the property value by the value of the building.

URBAN MARKET SPATIAL: A CASE STUDY

Keputran Market is a traditional urban market that plays an important role as part of the distribution network of logistics in the city, especially for the fulfilment of food needs of the citizens of the city. Due to its importance, relocating it to the suburb may not be the best solution to its associated problems. Hence, it should be revitalized. Due to the age of the building, it was in feasible conditions to be used. The building functions was not optimal when compared with its strategic location. Figure 1 shows the location of Keputran Market, the condition inside building and its environments.

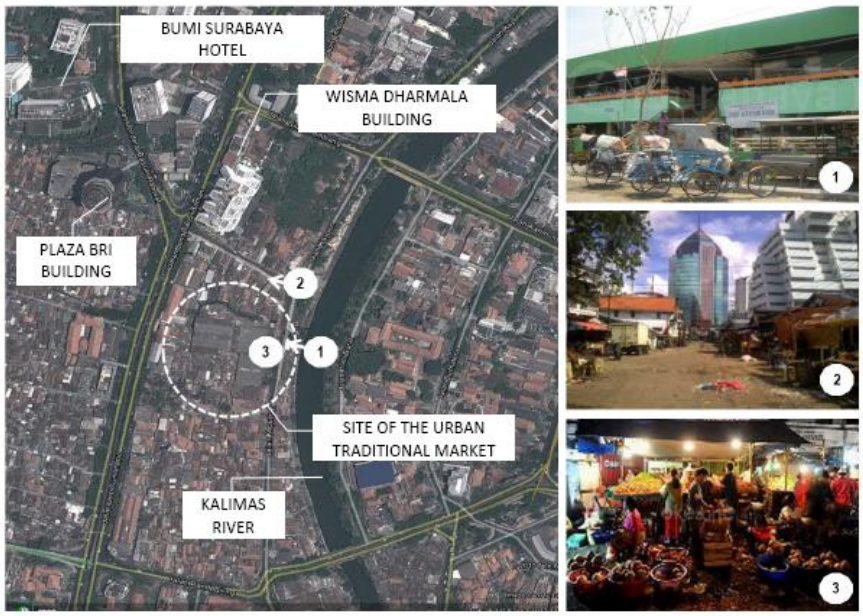

Figure 1: Keputran urban traditional market

Keputran Market is located in Keputran, Surabaya with a land area of ±7537.9m^2 and a floor area of ±8696m^2. It has 1,621 stall units, with total number of registered traders was 777. Land use in the Keputran area is predominantly residential, commercial and service activities, and public services (Table 1).

Table 1: Condition of existing spatial use pattern of Keputran area

No	Spatial Pattern	Area (Ha)	(%)
1	Public facilities	3.42	4.54
2	Residential	21.91	29.09
3	Trade and services	11.03	14.64
4	Open space	2.00	2.65
5	Cemetery	0.25	0.33
6	Others	37.22	49.41
	Total	**75.83**	**100**

Keputran is a developing area. In addition to the existing urban facilities neighbouring the Keputran Market, there is also a plan to build a super block, multilevel, mix-use facility that utilizes the land adjacent to Keputran Market. Keputran Market development plan is directed to adjust the growth of the surrounding area. Both in terms of linkages to traditional market activities as well as in terms of providing urban support facilities. Meanwhile, Table 2 presents the building and site intensity of the Keputran Market.

Table 2: Building and site intensity of Keputran Market

No	Aspect	Description
1	Micro site zoning	Keputran market is a Class 1 market, which a land area of ±8,696m^2.
2	Building coefficient	The building coefficient was in the range of 70%. With the density level and attendance of stand facility reached 50%.
3	Building floor coefficient	Keputran Market building floor coefficient reached 140% or equivalent to two floors.
4	Green coefficient	Green coefficient in the Keputran Market environment was not taken into account in land development. The green area was realized in the form of circulation and parking.
5	Border line/Building setback	10 meters (front), 5 - 8 meters (side).
6	Occupancy rate	From 1,621 total stalls, only 1,414 units were active, while the remaining 237 units were empty. The occupancy rate of 1st floor was 98%, while the 2nd floor was 35%.

RESULT AND DISCUSSION

The analysis involved two stages, which were determination of development alternatives through stakeholder analysis and stage of HBU analysis. The analysis phase to determine land use alternatives was done through interviews and questionnaire survey among the stakeholders who were directly involved in the utilization of Keputran Market land. Furthermore, to determine the alternative that will provide the highest and most economically profitable land market value, each of the alternatives was tested using the four criteria of HBU, which are legally permissible, physically possible, financially feasible, and maximally productive.

Result and Discussion 1: Stakeholder Analysis

Stakeholders are people, groups or entities that are impacted by a programme intervention (either positive or negative) or those that can influence the outcome of the intervention. Stakeholder analysis is an important tool in understanding the social and multi-social context of a programme, project, or policy. In this study, stakeholder analysis was undertaken with the aim to determine the selection of alternative development in accordance with the main activities of Keputran Market, which can provide basic information about (1) stakeholders who will be affected by a programme, (2) stakeholders that may affect the programme, (3) which individual or group needs to be involved in the programme, and (4) how and whose capacity needs to be built to empower them in participating in the programme.

The stakeholders were the Government (officials) as the policy makers as well as the owner of the traditional market, property managers as experts in providing analysis related to the asset development plan, urban planners as experts in giving consideration to the selection of alternative development plans and, traders as actors who were directly involved and will be affected by the development of Keputran Market.

From stakeholder analysis, it was found that stakeholders have different views and preferences regarding the market development (Table 3). Property managers, the Government and urban planners have influence and interest to traditional market development plan. And the rest of them, stakeholders who actively engaged in traditional market (Rahmawati et al, 2014), have interest to choose alternative to develop.

Table 3: Stakeholders preferences of alternatives

No	Alternatives	Stakeholders				Score
		Traders	Property managers	Urban planners	Government officials	
1	Market diversification	Yes	Yes	Yes	Yes	4
2	Parking building	Yes	Yes	No	Yes	3

3	Rental housing	Yes	Yes	No	Yes	3
5	Shopping centre	No	No	Yes	No	1
6	Office property	No	No	Yes	No	1
7	Hotel	Yes	No	No	No	1

Result and Discussion 2: Highest and Best Use

Stage 1: Legal Acceptance Analysis

The legal acceptance analysis evaluates feasibility of alternatives based on the provisions of prevailing regulations of an area. For this study, the legal acceptance analysis was performed against several legal criteria, which were private restriction, zoning, building codes, and environmental regulation. Table 4 shows the result of the analysis.

Table 4: Results of legal acceptance analysis

No	Legal aspect criteria	Alternatives		
		Market and diversification	Market and affordable housing	Market and building parking
1	Private restriction	Allowed	Allowed	Allowed
2	Zoning	Allowed	Allowed	Allowed
3	Building Codes	Allowed	Allowed	Allowed
4	Environmental regulation	Allowed	Allowed	Allowed

Stage 2: Physical Acceptance Analysis

The selection process for alternative land use considers the physical characteristics of the site. This physical characteristics will significantly influence the highest and best use of land. A piece of land may reach its highest and best use on a particular usage alternative but not suitable for other alternative uses. The ranges of physical characteristics that must be considered include size, shape, terrain, and the availability and capacity of public facilities.

In the case of the study area, with a building coefficient of 60% and a building floor coefficient of 300% or equivalent to 5 floors, it was calculated that the total area of the effective building floor area allowable would be 19,770.39m2, with market floor area of 9,478.23m^2, leaving 10,292.16m^2 for other alternative uses. Table 5 shows that based on the physical acceptance analysis, any of the three alternatives can be developed.

Table 5: Results of physical acceptance analysis

No	Physical aspect criteria	Alternatives		
		Market and diversification	Market and affordable housing	Market and building parking
1	Size, shape, contour of the land	Possible	Possible	Possible
2	Accessibility and public facilities	Possible	Possible	Possible

Stage 3: Financial Acceptance Analysis

Financial acceptance analysis looks at the investment by taking into account the cost of land preparation, construction costs (building costs and fixed equipment costs), professional service fees, administration fees, and other costs. The financial acceptance analysis was based on 10.75% capitalization rate of loan, and that the basic lending rate would remain the same, the results are as presented in Table 6.

Table 6: Results of financial acceptance analysis

Alternatives	Criteria of Capital Budgeting			Priorities	Feasibility
	BCR	NPV	IRR		
Market and diversification	2.41	0.5 Million USD	28%	1st	Feasible
Market and affordable housing	1.87	1.4 Million USD	22%	2nd	Feasible
Market and building parking	1.59	2.3 Million USD	19%	3rd	Feasible

Stage 4: Maximum Productivity Analysis

The maximum productivity analysis was used to measure how high the value of land would be after development. Using the residual value method, the value of land was determined based on gross development value, total development value, and minimum profit requirements. The productivity of land was estimated at approximately 60%-160% higher than traditional market without development.

The basis of the financial calculation was investment rate of return based on the financing source. The source were equity (30%) and loan (70%), while the costs of capital were 12.77% for equity and 10.75% for loan. Using weighted average cost of capital (WACC) method, the minimum attractive rate of return (MARR) investment was calculated at 11.36%.

Building capitalization rates were used to determine the estimated market value of the land as a benchmark for maximum productivity. If the market value of land after development was higher than the market value of land without

development, then the mix-use building is feasible to be developed. Based on the results of the maximum productivity analysis, there were two mix-used alternatives that have a high level of land productivity. These alternatives were the diversification of market businesses and the addition of parking building. Table 7 presents the calculation of the estimated market value of land for each mix-use development. The results show that the highest property value (USD 2,094/m^2would be attained by the development of diversified market businesses.

Table 7: Estimated property value

No	Variables	Mix-use Alternatives of Market Building		
		Diversification of market business	Rental affordable housing	Parking building
A	Market value (building)	USD 13,038,549	USD 125,26,169	USD 12,268,526
B	Capitalization rate (building)	11%	11%	11%
C	Net income (building) = (A) x (B)	USD 1,434,240	USD 1,377,878	USD 1,349,537
D	Total floor area (planned)	29,837.83m^2	26,663.14m^2	31,215.17m^2
E	Market value (building)/m^2 = (C) / (D)	4,806 USD/m^2	5,167 USD/m^2	4,323 USD/m^2
F	Net income (property) after tax	USD 3,187,356	USD 2,429,471	USD 1,883,832
G	Net income (land) = (F) – (C)	USD 17,531.15	USD 10,515.93	USD 5,342.94
H	Capitalization rate (land)	13%	13%	13%
I	Market value (land) = (G) / (H)	USD 13,485,505	USD 8,089,179	USD 4,109,958
J	Total floor area (effective)	6,590.13 m^2	6,590.13 m^2	6,590.13 m^2
K	Market value (land)/m^2 = (I) / (J)	USD 2,046	USD 1,227	USD 623
L	Property value /m^2 = (K) + (E)	USD 2,094	USD 1,279	USD 666

CONCLUSION

The HBU approach applied in this research is the best practice to determine the best use of traditional market land in urban area. This approach provides the most productive and sustainable land use warranty through five comprehensive approaches. While the traditional market still exists, the maximum productivity of the land can be achieved. The long-term goal of this research is to develop the application of adaptive and collaborative concepts on the design of spatial

configuration and market economic value in urban areas. Future research is necessary in term of framework of methodology for value-based decision for HBU. The methodology consisted of value-based process (Utomo, Idrus, Napiah, & Khamidi, 2009) and multi-criteria decision process. A value in function/cost is the basis for the methodology. On the value-based process, HBU function and development cost of land use are analysed. On multi-criteria decision-making, a satisficing option is used by correlating the function and cost to get the value of an alternative solution. Group decision in collaborative process (Rahmawati et al., 2014) using agreement options and coalition formation is also important because of multi-stakeholders nature.

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UNIVERSAL DESIGN IN URBAN PUBLIC SPACES FOR PEOPLE WITH DISABILITY. CASE STUDY OF TEHRAN, IRAN

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Abstract
Urban public spaces play important role in providing good quality of life to the people living in the city. This is in line with the social goal on sustainable development, which the purpose is to attain a higher social equity. According to the World Health Organization (WHO), 15% of global population are disabled. During the eight-year war between Iran and Iraq, many of the victims in Iran were left disabled. The war left many people injured and this has significantly increased the impairment rate. Amongst the problems faced by people with disability in Tehran are difficulty traveling in the city, lack of public facilities and accessibility to particular facilities such as urban public spaces. This study first sought a definition of urban public spaces and Universal Design, and then finding solution for increasing interaction of people with disability in urban public spaces through Universal Design approach. This research was based on applied theory and qualitative method of field observation was engaged. One of the city district in Tehran was chosen for a case study. Based on the findings, urban design methods and solutions were suggested to increase the interaction and comfort of disabled people in urban public spaces.

Keyword: universal design, urban public space, disabled people

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INTRODUCTION

More than 1 billion people, or 15% of the world's population, experience some form of disability (WHO, 2011). This group of population continues to increase, partly due to wars in different parts of the world (Azizi, Momeni, & Taghinia, 2011). During the eight-year war between Iraq and Iran, many of the people in Iran have fallen victims, resulting in disabilities (Eslami & Mahmoudi, 2016; Imami, 2014). Based on the National Population Survey in 2006, the population with disability in Iran was 2,514,744 people (Segherlou & Farzin, 2014).

As with normal people, those with disabilities are still required to work and live daily their lives. However, this can be a chore especially in a city which was built and designed for normal people (Ezzati & Shaghaghi, 2014; Rahnama & Heydari, 2013). This comes in the forms of facilities which were not built according to standards that are disabled-friendly, hence limiting accessibilities by the disabled.

The urban environment should be able to provide more services to vulnerable groups of the population so that they are not forgotten or marginalised. Properly and suitably designed public spaces could contributes in ensuring equal opportunities to all layers of society and help to increase urban mobility. Thus proper and suitable design should be a requirement in the provision of community facilities (Davarinezhad & Rahnama, 2015). Physical barriers would limit the use of the public space realm by the disabled, the elderly, people with disabled child, pregnant women, etc. (Yousefi & Fardi, 2016). Areas important for mobility, such as pedestrian walkway, must be free from barriers that can prevent the disabled from having enjoyable excursions on urban streets (Asadi-Shekari, Moeinaddini, & Zaly Shah, 2012; Sisiopiku & Akin, 2003).

By applying Universal Design concept in urban public spaces, people with disability could use the urban area and urban environment similar to other members of the society and they could continue their public life even without any help. Urban public spaces must meet the necessary and important needs of people with disability as part of the urban community. Thus, this study first seeks the definitions of urban public spaces and Universal Design before identifying some of the most important problems of people with disability in urban public spaces that could solve by applying Universal Design concept.

RESEARCH BACKGROUND

Urban Public Spaces

People's public life occurs in urban public spaces in a complex set of forms and functions. Accordingly, these spaces must be capable to contain diverse behaviour, uses and activities such as shopping, walking, conversation, using the facilities to entertain, relax or even passing the time as daily activities, and also periodic festivities and events (Jalaladdini & Oktay, 2012). The urban

environment should be able to provide more services to vulnerable groups of the population to avoid them from being marginalised and forgotten. Public spaces where people regularly meet their friends and conduct their daily activities play a critical role in people's lives (Low, 2000; Mehta, 2013).

Many of the previous studies have focused on the accessibility of specific groups in public spaces, such as women, the poor, specific racial groups, the disabled and the elderly (Mehta, 2013). This is because public spaces contribute significantly in shaping the quality of life of the people. This is akin to the social target of sustainable development, which aim is reaching a greater social equity (Reiter & Herde, 2011).

Universal Design

Universal Design is the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design (ESLAMI & MAHMOUDI, 2016). Universal Design is one approach that supports in maintaining social sustainability factors which giving fair distribution of wealth and services within and between generations (i.e. intra and intergenerational equity) as well as the distribution of rights to use environmental services contained within a given ecosystem (Rahim, 2012).

Despite initial perception, Universal Design has proved to be a new source of inspiration for designers in their quests to achieve designs that suits wide range of users. The Universal Design concept is defined as the design of space and applied equipment for most of people with any ability or age, consistent with their needs in the space (Imrie & Hall, 2001; Segherlou & Farzin, 2014). In other words, the main aim of Universal Design is not to make people fit to space but to make the space fit to people (Demirkan, 2011; Türk, 2014). The Universal Design concept promotes a shift to more emphasis on user-centred design by following a holistic approach and aiming to accommodate the needs of people with disabilities, including the changes that people experience in the course of life (Ginnerup, 2009).

According to Mustaquim (2015), the pursuit for Universal Design can be traced back to the year 1997 when a group of US designers and design educators from five research organisations developed the Universal Design principles. These principles are as shown in Table 1 below.

Table 1: The seven principles of Universal Design

Principle	Description
Equitable Use	The design is useful and marketable to people with diverse abilities.
Flexibility and Intuitive Use	The design accommodates a wide range of individual preferences and abilities

Simple and Intuitive Use	Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills or current concentration level
Perceptible Information	The design communicates necessary information effectively to the user, regardless of ambient condition or the user's sensory abilities.
Tolerance for Error	The design minimizes hazards the adverse consequences of accident or unintended actions.
Low physical Effort	The design can be used efficiently and comfortably and with a minimum of fatigue.
Size and space for approach and Use	Appropriate size and space is provided for approach, reach, manipulation and use regardless of user's body size, posture or mobility.

Source: Kadir & Jamaludin (2012)

The concept of Universal Design emerged primarily with people with disability in mind, in which Universal Design helps everyone with support and assistance needs including the elderly, pregnant women, children and people with a temporary illness or injury. Thus the benefits of implementing Universal Design are wide (AusAid, 2013).

According to Rahim (2012) and AusAid (2013), there are 4 categories of design requirement which must be considered in designing accessible environment within and between buildings and in outdoor environment (Table 2).

Table 2: Category of design requirement in Universal Design

Requirement	**Component**
Sensory	Tactile warnings, guide ways and information
Outdoor environment	Obstructions, signage, street furniture, pathways, kerb, ramps, pedestrian crossing, alarms
Horizontal areas	Doors, entrances areas and lobbies, corridors, handrails and railings, bridges
Vertical areas	Ramps, lifts and stairs

Source: Rahim (2012)

Disability

A disable person is someone who is disabled due to organ failure and has difficulty in performing his or her daily routine activities, as well as those suffering from congenital malformations or mental retardation, and diseases and injuries (Hosseini, 2008). Thus, disability includes various physical and mental

impairments that can hamper or reduce a person's ability to carry out his daily activities (Disabled World, 2017).

According to the WHO (2011), disability is a development issue because of its bidirectional link to poverty; disability may increase the risk of poverty and poverty may increase the risk of disability. An increasing body of research acknowledges that people with disability and their families are more likely to experience economic and social disadvantages than those without disability. In almost every sector of society, people with disabilities, with their physical differences, are to be found. This generates different attitudes in people towards people with disabilities in society, and these diverse attitudes hamper people with disabilities from fulfilling their social needs (Meshur, 2016).

Meanwhile, scholars observe that people with disabilities would experience the built environment in the form of a series of barriers (Yousefi & Fardi, 2016; Imrie & Hall, 2001). Disabled people encounter many problems, these vary according to the types of disability they have, in urban spaces and their social surroundings. In the case of disabled pedestrians, movement barriersrelate to their physical-movement characteristics and the lack of both infrastructure and facilities in urban areas (Asadi-Shekari et al., 2012).

METHODOLOGY

Similar to Shamsuddin, Hassan and Bilyamin (2012), this study employed observation as a means to assess the relationship between the actual practices and the respondent's feedback in the context of the study. In this regard Vali-Asr Street in Tehran, which is the largest street in the capital of Iran, was chosen as the case study area. One zone of the street was studied, which was the ValiAsr Junction. This place represents one of the major nodes in the city centre that have the highest pedestrian volume. ValiAsr Street is one of the famous streets in Tehran which connects the city's south and north sides. This street is considered as one of Tehran's main thoroughfares and commercial centres.

FINDINGS

The state of sidewalk has a significant impact on the quality of pedestrian environment. Based on observation, the condition of sidewalks along the Vali-Asr Street can be rated as average with potholes and cracked paving can be found in some of the areas. These make for uneven walking surface and poses risk of tripping for pedestrians, especially for people with disabilities such as the elderly, wheelchair users and the blind. The sidewalks were paved with non-standard and slippery pavement material after its reconstruction. The use of this material has caused pedestrians to slip especially during wet days.

Besides paving material, the presence of barriers and obstacles also have negative impact on the safety and quality of pedestrian movements. In the study area, many obstructions on the sidewalks and the roadway can be seen. There

were considerable number of manhole covers on sidewalks that are not at the same level with the pavement, creating bumps for pedestrians. Tactile paving, which can assist the visually impaired finding their way easier, were not used. The absence of tactile paving was also evident at zebra crossings. Only plastic bollards were used at some of the crossings, as temporary barriers, to provide some form of warnings to pedestrians.

Pedestrian crossings at traffic lights were not fitted with audible alarm and crossing timers. With high volume of pedestrians in the area, crossing street may become dangerous to the disabled without the presence of audible alarm and timer.

Signs and directional maps and other way-finding elements of streetscape can help pedestrians to navigate their way easier. In the study area, while the signage were suitable to most pedestrians, they did not meet the needs of the blind due to lack of Braille script on the signage boards. Figure 1 shows the map of Vali-Asr Junction and also the picture which are related to the assessed elements.

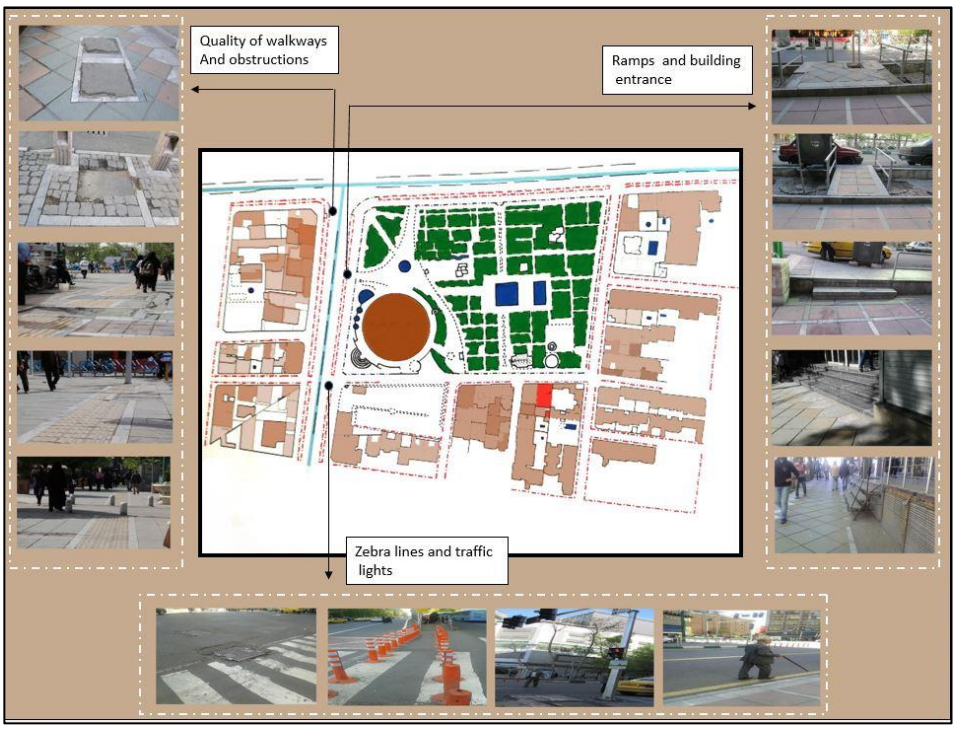

Figure 1: The condition of elements assessed in the study area

DISCUSSION AND RECOMMENDATIONS

The results indicate that generally the needs of the disabled have been ignored in the design of spaces in Vali-Asr Street. The poor quality of paving and potholes in the roadway created barriers, and making the disabled feel uncomfortable when using the street. The lack of audible alarm at street crossings also makes crossing the street dangerous for people with disabilities, especially the hearing impaired. Therefore, the suggestions to make the street accessible, safe and comfortable for people with disability are outlined below.

- Quality of walkways: Improve quality of sidewalk and roadway paving by using pavement which is resistant to changing climate such as rain, snow and hot summer weather. Good quality paving would make sidewalk surface more resistant to cracks and potholes, allowing for freer and smoother movement by the disabled.
- Obstruction on walkways: Clear sidewalk of any physical barriers that would impede movement of the disabled. Use of tactile paving can also improve the safety of the blinds in using the sidewalk.
- Quality of zebra crossing: Improve quality of zebra crossing by using tactile paving. Zebra crossing must also be clear from obstacles and street island.
- Traffic light: Install audible alarm and timer to provide safer crossing to the disabled. Timer length must consider the movement speed of the disabled to cross the street.
- Street sign: Install signage with Braille script and also with suitable dimension to allow the disabled to easily find their way in the area.

The following diagram shows some of the recommendations based on Universal Design concept which could be applied in Vali-Asr Street.

Figure 2: Suggestions for applying Universal Design concept in Vali-Asr Street

CONCLUSION

This study assessed the existing condition of public space, i.e. street and pedestrian walkway in ValiAsr Street. The results show that the use of sub-standard paving material, uneven surface, and lack of measures to enhance safety of pedestrians while crossing the street have hampered the safety and comfort of users of the street, especially the disabled. Thus, design recommendations, based on the Universal Design principles were suggested. The implementation of the proposed design recommendations would help to increase safety and comfort of users, especially the disabled.

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REVEALING URBAN MARKETPLACE IDENTITY: PUDU

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Abstract

The process of regenerating existing urban marketplaces should consider the components that make them special, as not to lose the delicate characters that give each marketplace distinctive identity and sense of place. This study focuses on identifying and evaluating urban marketplace by reviewing the definitions and concept of physical characters, and the experiential qualities of urban marketplace in Kuala Lumpur that contribute to the identity of a place. This study discovered that the marketplace physical surrounding and the activities that are happening are two of the elements which are associated with the place's identity. This study concludes that urban marketplace physical and experiential quality can be regenerated to reveal an identity with strong sense of place.

Keyword: urban marketplace, place-identity, physical & experiential quality

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INTRODUCTION

Rapid urban development has left Kuala Lumpur, in many respects, disjointed and lacked in visual and physical coherence. The street level has been neglected with inconsistency and piecemeal development has adversely affected the quality of streetscapes, which include the overall physical character and continuity of streets as represented by pavements, building frontages, street lighting and other forms of street furniture (KLCH, 20011). Consequently, there has been a decrease in the legibility of the city structure together with a certain loss of historical continuum and sense of identity.

The character and distinctiveness of districts and local precincts are important in providing interest, texture and structure to the urban form as well as increasing the sense of belonging. Urban marketplaces in Malaysia that have aged are vulnerable to the threats of modernization due to rapid development. At some point in time, the existing urban marketplaces will eventually be renovated or redeveloped in the course of the city growth. Recent development through urban regeneration has transformed places into new setting thus changing the meaning and identity of the area (Ujang & Zakariya, 2015).

RESEARCH BACKGROUND

This research focuses on evaluating urban marketplace in Kuala Lumpur by reviewing the definitions and concept of physical characters, and the experiential qualities that contribute to the identity of a place. Identity of a place is closely related to the presence of distinctive elements that must be identifiable, recognised and remembered by people (Shamsuddin, 2011). The objectives was to identify the physical characteristics and the experiential qualities that define urban marketplace and to outline the design criteria for a distinctive, recognisable and meaningful identity for an urban marketplace.

Marketplace: Throughout history, cities have been founded and exist for many reasons. Cities have expanded around marketplaces such as the *agora*. This is considered as one of the fundamental of urban typologies. A city without a marketplace might function, but still lacking in the platform where layers of the community could gather and socialise where tangible and intangible culture could be felt in its sense of place (Qamaruz-Zaman, Shaberi, Bakri, & Ahmad, 2014). Urban marketplaces can be described as spaces where goods, merchandise or products of the local community are traded in and often have a strong root to the local people (Ghapar, Zakariya, Harun, & Zen, 2016). As such, the market is also a place where localness is shown by the community lifestyle, culture and heritage. It is vital, healthy, diverse place where all of the most valued dynamics of an urban life are untold. A successful and vibrant marketplace is the heart and soul of the city itself, as it infused new energy, and social and economic activity, and it has more to offer to the urban environments (Shamsuddin, 2011). Marketplace

reveals that a successful urban place is more than its building, but the bottom line is the interaction between people and a place (Pottie-Sherman, 2011).

Place Identity: A place can be described as where a measurement shaped by people's relationship with physical settings, individual and group activities, along with meanings. Place attachment, place image and identity, and place dependence are the elements that define the value of people's relationships with a place, which is also known as the sense of place (Lekagul, 2002). Identity means to distinguish an object from other objects and accept that one as a part object (Lynch, 1960). The identity of a place is closely related to the presence of distinct elements, and the character is recognised and remembered by people (Shamsuddin, 2011). Place identity is defined as a component of personal and social identity, a "process by which, through interaction with places, people describe themselves regarding belonging to a specific place" (Bernardo & Palma-Oliveira, 2016). A place plays vital role in developing and maintaining self-identity and group identity of the people as its experiential process forms the identity and distinctive place character (Ujang & Zakariya, 2015). A place must have its identity as meaning to create a sense of attachment (Ujang, 2012). Sulaiman and Shamsuddin (2007) assert that a place (city/town) must have a strong character and identity so that it is known to the people. Thus, place identity can be grasped from its multiple components (spatial-physical and social) and the multi-place nature of individual and social place experience (individual and social meanings, feelings and experiences) as shown in Figure 1.

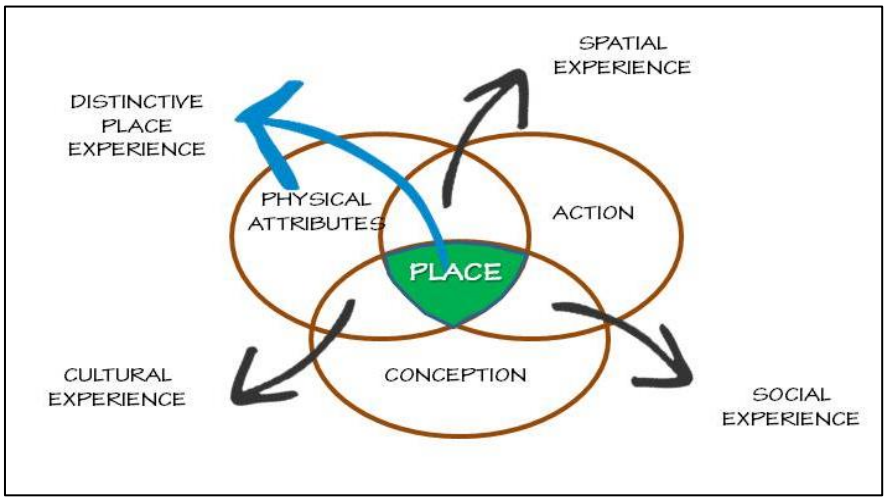

Figure 1: The proposed model for assessing the experience of place
Source: Adapted from Bernardo and Palma-Oliveira (2016)

Case Study Area: The selected case study area was based on one of the oldest surviving marketplaces in Kuala Lumpur city centre. Pudu, or previously known as Pudoh, is one of the earliest districts which began as a small village that was linked to the mining areas in Kuala Lumpur. In 1890, Kuala Lumpur had three markets, namely Central Market, Pudoh Market and North Market Street (Mohd Rus, 2005). The marketplace activities in the study area have been around for more than a decade as it started as a small outdoor open market in Jalan Sayur (PuduCAP, 2010) until the existing market building was constructed in 1956. The construction of the market building was completed on the 7th January 1957 and was identified as Pasar Road Municipal Market. Morphology maps indicating the formation of Pudu Marketplace from 1889 to 2016 is shown are Figure 2.

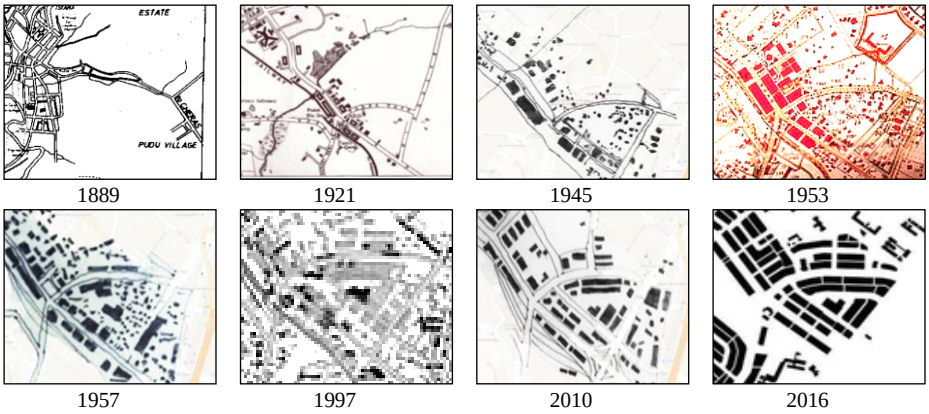

Figure 2: The morphology of Pudu Marketplace
Source: Sidhu (1978), Jabatan Pemetaan Negara, Authors (2016)

METHODOLOGY

There are three elements that contribute to the main city form, which are the structure of the city, the urban morphology and the townscape as the appearance of the city (Sulaiman & Shamsuddin, 2007). The elements of path, edge, district, nodes and landmark were also used to determine the structure of the place through visual survey method. Visual study through townscape appraisal technique is an art in establishing links between the elements that make up the urban fabric (Cullen, 1961).

The methodological framework of this study is shown in Figure 3. The distinctiveness of physical qualities was determined by analysing the urban structure identified through visual survey and townscape appraisal technique, while the meaning and association of experiential qualities were measured through behavioural observation.

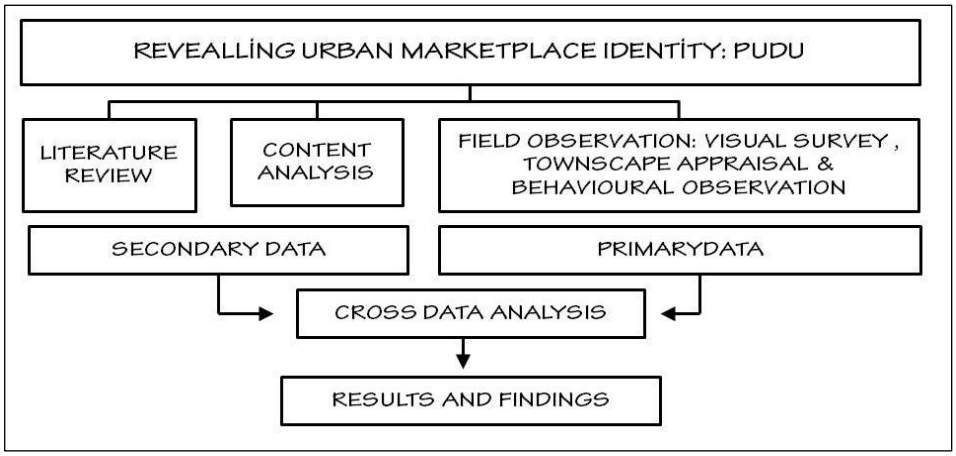

Figure 3: Study methodological framework

FINDINGS AND ARGUMENT

Urban Structure: The urban structure is the spatial arrangement of the major features common to all cities and how they influence the in place cognition that make up the identity of place (Shamsuddin, 2011). This element basically, contributes towards the concept of imageability that consists of identity, structure and meaning (Lynch, 1960).

Profile: The quality that provides the first overall impression of a townscape is known as the profile (Shamsuddin, 2011). It is about the setting of a town in relation to the overall landscape. Identity of the townscape will become more prominent if the profile was clearly established by the influence of the topography. Based on the visual survey, the profile of Pudu was influenced by the geographical setting of Kuala Lumpur. It has a very interesting landform of a basin-shaped valley due to the existing hills. The finding on the figure-ground analysis in 2016 revealed that Pudu skirted and meandered along the edges of the river and the slopes of the two nearby hills that influenced in forming the urban fabric. The profile of this natural setting was identified as affecting the development of Pudu as shown in Figure 4.

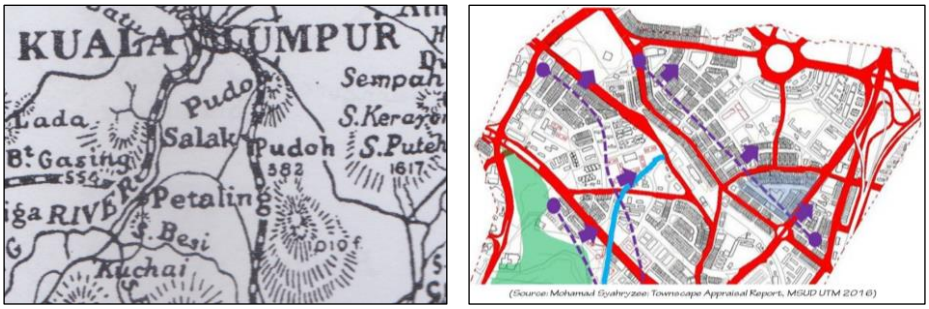

Figure 4: *Profile of Pudu* in forming the urban fabric that can be traced from the Map of Kuala Lumpur circa 1881
Source: Gullick (1955), Authors (2016)

Physical and Experiential Qualities: Visual analysis through field survey and recorded photograph of the *path* around the marketplace was undertaken. The series of main pathways, and numerous long and narrow sides and back lanes of the building blocks that intertwined the marketplace create accessibility to the marketplace as shown in Figure 5.

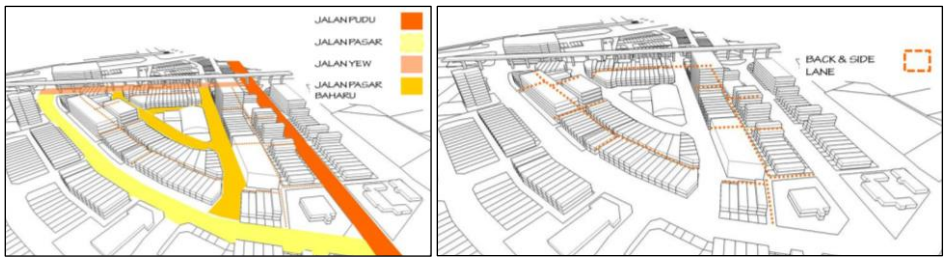

Figure 5: The accessibility and permeability of Pudu Marketplace
Source: Authors (2016)

The curvature of the Jalan Pasar creates a sense of deflection and the serial vision created by the series of existing *Angsana* trees with five-meter canopy diameter and ten-meter height had given the different quality of street views. This sameness of character of the streetscapes produced by the *Angsana* trees has resulted in a distinctive physical identity to the area as shown in Figure 6.

Figure 6: *The sense of deflection and distinctive elements of the path*
Source: Townscape Appraisal (2016)

The physical setting of the marketplace, which is the nodes, needs to be improved as the robustness of the place will support the main activities and increases the vibrancy and vitality of the marketplace. The legibility of the existing landmark needs to be increased as it will enhance the marketplace identity. Installation of portals to clarify the legibility of the marketplace can also help in structuring the area by increasing the visibility and create a sense of welcoming as shown in Figure 7.

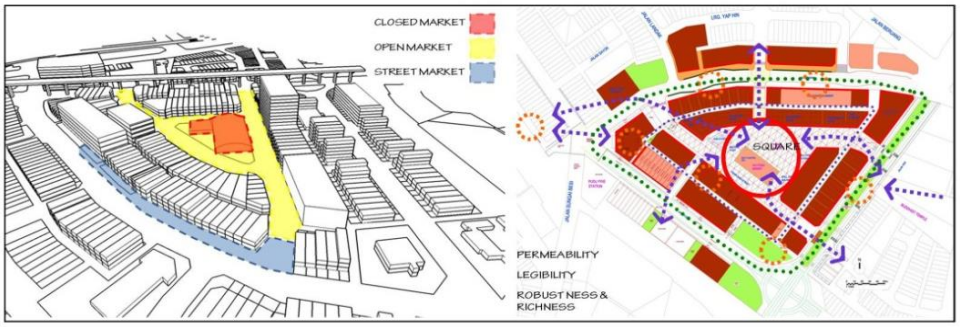

Figure 7: The Pudu Marketplace's identity is defined by regenerating the structure of the area.
Source: Author (2016)

The legibility of the marketplace will be influenced by the solid and void characters. By introducing a square as new public space will increase the vitality of the area in supporting the alternate activities. Nevertheless, new activities within the different time frame will add vibrancy to the marketplace. The new activity will create a new small node in supporting activities on a temporal pattern that can give a distinctive character to the marketplace.

The legibility of the streets around the market square needs to be increased by having a distinctive character as it contributes in helping people to recognise and remember the area of the marketplace. The hierarchy of the street

layout also needs to be improved by having distinctive unifying character of streetscapes. The unique *"kaki-lima"* (five-foot way) element should be one of the unifying elements for the marketplace.

The building facade of the marketplace helps in creating visual appropriateness and distinctive character in creating the identity. The differences of building frontage will create variety and redefined the grain. The building height must be improved to compose the visual quality focusing on the market square. The roofscapes, façade treatment and material usage of the existing building can be used to increase the harmonic visual experiences by applying the sense of rhythm and pattern.

Visual orientation can be used to achieve a visual balance of the elements within the marketplace. Colours are one of the syntheses of unifying elements that increase distinctive visual identity. Unity within variety needs to be addressed in identifying the sameness in character. The effect of visual experience of place recognition is very important for identification of an area. A visual stop should be introduced within the marketplace area by promoting vista on architectural detailing. The selected building will be the visual stop for cultural, place of worship and community function and these buildings carry meaning and association to the place.

The sense of enclosure of marketplace area needs to be increased as to enhance the spatial volume of the square which can determine the quality of perspective view of the area. Distinctive unifying streetscapes elements and landscaping of the *"Angsana"* will enhance the deflection effect of Jalan Pasar, increasing the imageability of the street, improving the visual continuity and also contributing to the tropical setting.

The results of interviews show that the familiarity of people's perception regarding Pudu is related to the marketplace activities. The old market building and its surrounding places act as a frequent sighting of physical elements and carry along the historical significance strata. Familiarity with physical elements in the area is closely related to the historical significance of the surrounding building within the marketplace being considered distinctive. The distinctiveness of streets is increased with the presence of old buildings where these buildings are a reminder of old and past time even though not because of its physical characters, but simply their presence evoke nostalgic memories as people tend to have an affinity towards those places due to their special roles in the past lives. As meaning is evoked by the physical form, the visual simulation in experiencing the place needs to be highlighted in the design. The creation of vista and emphasising on visual stimulation and appreciation will increase the visual memory of the place. The visual continuity of the activities between buildings and spaces will increase the sensory experience.

Name also has a strong influence on identity as change of name can lead to the loss of identity. When names and cognitive schemata coincide with their

physical equivalents, the environment becomes particularly clear and forceful (Shamsuddin, 2011). The original name of *Pudu* was *Pudoh*; in Hokkien dialect means "is a practice describing the ancestral worship of the Chinese", while in Cantonese dialect it describes the fruit of *Artocarpus integer* or locally known as *chempedak.* The usage of indigenous planting that relates to the origin of the place name will add the sensory experience and create historical linkage.

CONCLUSION

This study, through the townscape appraisal, historical, morphology and content analysis, has acknowledged that the presence of the old market building and the square created around the building as among the elements that can foster and strengthen the identity of Pudu Marketplace.

In defining the identity of a place, the social value of urban public spaces makes them significant within the cities due to people needs (Ujang & Zakariya, 2015). Identity is the sameness of character that can be seen from the physical and experiential qualities of a place. As the identity of a place carries the image of what people perceived; the visual and other senses stimulation through the physical and experiential qualities of the place is being evaluated to create meaning and association to the place. Without an identity, the place is "*placelessness*" (Relph, 2016). Therefore, the identity of the marketplace can be emphasised through the quality of physical and experiential elements. A strong image and identity of a place depend on the careful design and interactions between the three elements; districts, streets & square and that space, where life occurs, are places and these places are the result of relationships between actions, conceptions and physical attributes.

Pudu Marketplace, which is located in one of the earliest settlements and directly involved in the making of "Kuala Lumpur" is presently locked with attractive characters and a strong sense of identity. The urban marketplace is waiting to be enhanced by increasing the legibility and knitted together into a vibrant, coherent and highly imageable city form through the regeneration of its identity.

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FACTORS INFLUENCING THE WILLINGNESS TO WALK TO THE BUS STOPS IN PENANG ISLAND

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Abstract

This study, investigates pedestrians' 'willingness to walk' to Rapid Penang bus stops in Penang Island. Parameters, such as socio-demographics, walking distance and walking time, were examined to determine factors that influence 'willingness to walk'. Questionnaire surveys were used to collect the data from 400 participants. The data was analysed using multiple regression analysis through the 'Statistical Package for the Social Sciences' (SPSS). Analysis of determinant factors was split into two dependent variables. Firstly, the willingness to walk based on current condition, and secondly, the willingness to walk, if improvements to environment and infrastructure were made to the bus stops. The results showed that socio-demographic factors, such as walking distance, walking time and trip purpose would likely to influence the pedestrians' 'willingness to walk'. This study also identified the maximum, minimum, and average distances walked by a pedestrian to reach the bus stops (as well as the willingness travel time.) The outcome of this study will contribute to better planning of transportation system in Penang Island especially on the Penang Transport Master Plan (PTMP) projects.

Keyword: pedestrian, willingness to walk, walking distance, walking time, public bus service

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INTRODUCTION

To achieve sustainable city status, Penang State Government has focused on three issues, crime, cleanliness and traffic congestion ("*Penang Transport Master Plan"*, 2013). Penang State Government, through continuous effort, has delivered praiseworthy progress; the crime rate has decreased and the environment has seen some regeneration. However, traffic congestion remains a primary concern on Penang Island, due to economic growth and increasing numbers of tourists.

In 2013 the Transport Master Plan Strategy report, was adopted by Penang State Government in a bid to improve the transport system (Pejabat Setiausaha Kerajaan Negeri Pulau Pinang, 2013). The strategy outlines an integrated transit network, with the appropriate long-term capacity to increase public transport adaptation in Penang. The proposed transit lines are Bayan Lepas LRT, Ayer Itam monorail, Tanjung Tokong monorail, and tram services in the Georgetown heritage area. However, this study focuses on the Bayan Lepas LRT network from Kompleks Tun Abdul Razak (KOMTAR), to land considered most suitable for reclamation in the south, made up of 27 stations along a 30-km length network, as shown in Figure 1.

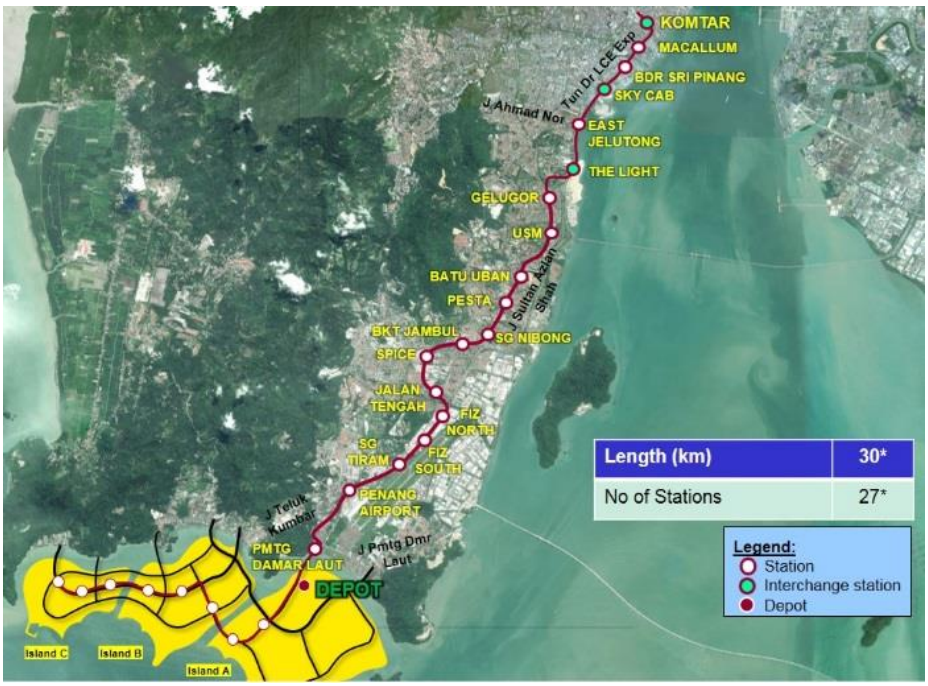

Figure 1: Proposed network of Bayan Lepas LRT line
Source: http://pgmasterplan.penang.gov.my

Links between future development of Bayan Lepas LRT and Rapid Penang bus routes have been investigated, finding Route 303 from Weld Quay Port to Persiaran Mayang Pasir to be the most parallel. Consequently, the study of walking accessibility to public transport was done on Route 303, which is expected to support accessibility to the proposed LRT lines. The Rapid Penang bus route is shown in Figure 2.

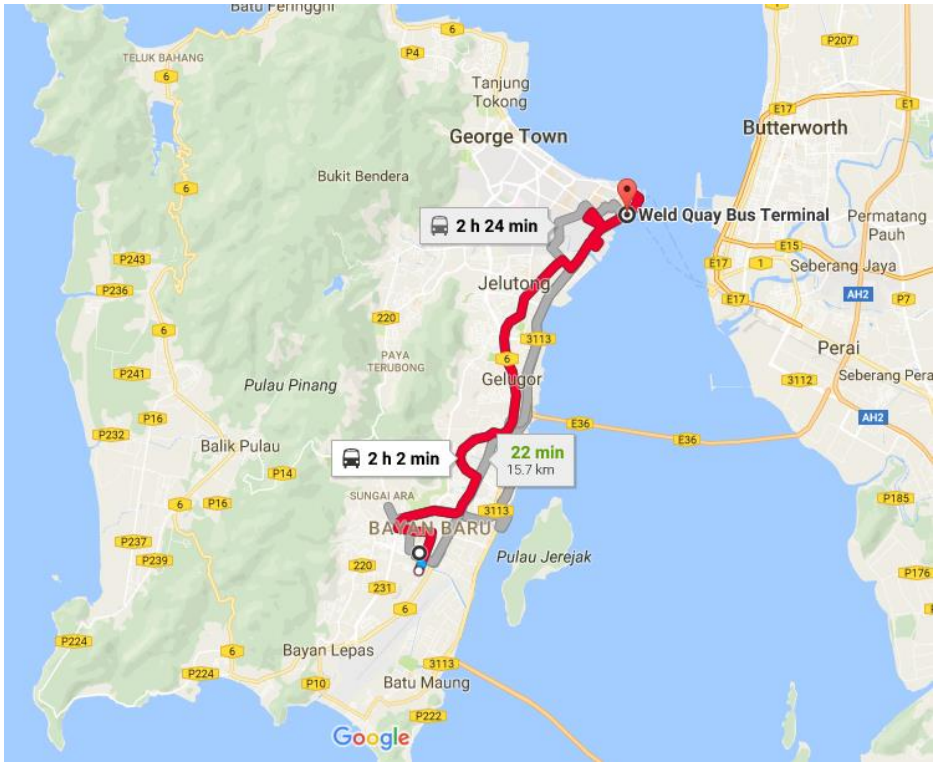

Figure 2: 303 Rapid Bus route
Source: https://www.google.com/maps. Rapid Penang Route 303

To gain insight on accessibility to the proposed transit network, the primary objective of this research is to identify acceptable walking distances to bus stops, while taking the origin and destination of pedestrians into consideration. The second objective is to analyse factors that affect a bus users' 'willingness to walk'.

RESEARCH BACKGROUND

This subtopic briefly explains factors that affect 'willingness to walk', as found in previous studies. Socio-demographics, such as walking distance, satisfaction level, and infrastructure conditions are all sighted.

Daniels and Mulley (2013) claim that the impact of socio-demographic factors, has mostly been studied in the context of differentiating factors for 'willingness to walk', and travel behaviour. Gender, age, marital status, income; education, and vehicle ownership were all factors. Corpuz, Hay, & Merom (2005) find that females in Sydney walked more than their male counterparts, those older and younger in age walked more, as did people with low car ownership. Moreover, Freeland, Banerjee, Dannenberg and Wendel (2013) state that those from lower income households, living in urban environments with greater access to public transport, were likely to walk more.

In addition, Burke and Brown (2007) used travel data collected from the 'single weekday travel diaries' of 10,931 Queensland residents, which included trips to schools, workplaces and shops. The study found 600m to be the average walking distance between homes and local public transport. Meanwhile, analysis of travel data from Sydney found that bus users walked for 50m to access bus services, while train users were willing to walk distances greater than 100m to access train services. The studies showed a marked difference in average walking distances, between users of train and bus services. Findings showed train users were willing to walk up to 2,000m to access services, while those using bus services were only willing to walk up to 1,900m (Daniels & Mulley, 2013).

In addition, Owen, Humpel, Leslie, Bauman and Sallis (2004) categorise three types of walking, including walking for exercise, walking to get to and from places; and total walking. These types of walking had environmental attributes. Pedestrians' were encouraged to walk when pathways were aesthetically pleasing, convenient, and safe. Walkability, access to public open spaces, and proximity to amenities also encouraged pedestrians to walk. Overall, understanding environmental influences on physical activities such as walking, is important if one wishes to encourage people to walk.

Satisfaction level, is another definitive characteristic when assessing the quality of public transport services (Brons, Givoni, & Rietveld, 2009). Evaluation of public transport user satisfaction, is also influenced by infrastructure, for example, fitted benches and cleanliness. In a study on the 'Kaohsiung Mass Rapid Transit' (KMRT) in Kaohsiung City Taiwan, a survey was conducted to collect data on perceived value, and overall user satisfaction with (KMRT) services (Lai & Chen, 2011). The results showed that factors such as service quality, perceived value, overall satisfaction and behavioural intention, had significant implications for public transit companies wishing to increase ridership; and reduce auto dependency. Vehicle safety, facility cleanliness, and customer services were also found to be key components of passenger satisfaction. A study by Efthymiou and Antoniou (2017) further clarify factors affecting user satisfaction. Comfort, staff' attitude and safety were all sighted.

Studies have shown that safe and convenient pedestrian pathways encourage walking, which in turn stimulates bus usage. However, Mitchell and

Wee (2010) observe that motorists and motorcyclist respectively, often parked or rode on accessible pathways, creating safety concerns; and a nuisance for pedestrians. The findings have shown that the provision of safe and comfortable walking environs, alongside thoughtful motorists and appropriate road use, do increase pedestrians' 'willingness to walk' and wait at bus stops.

STUDY METHODOLOGY

Data in this study was sourced using a questionnaire, which focused on Route 303s' bus stops. The total number of respondents targeted in this study was 400, however, only 392 questionnaires were entirely complete and suitable for analysis. The questionnaire was divided into two parts, Part A and Part B. To qualify the respondents' socio-demographic, Part A questioned the respondents on age, gender, race, nationality, level of education, status and monthly income. In Part B, respondents were asked how far and how long it took for them to walk to the nearest bus stop. Respondents were also asked how often in the course of a month they use public bus services. Respondents were also questioned on their 'willingness to walk' if improvements to pedestrian walkways were made.

Multiple regression analysis was employed to evaluate factors that affect 'willingness to walk', such as walking time and walking distance. The dependent variable used was the respondents' 'willingness to walk' to bus stops in present and future conditions, i.e. conditions after improvements are made. The independent variables for analysis were age, gender, nationality and race, status; level of education, monthly income, vehicle ownership, license ownership and satisfaction level; frequency of bus use, distance from home to bus stop, travel time from home to bus stop, existence of pedestrian walkways and trip purpose. The multiple regression equation is shown below (1)

$$\mathbf{Y = b_1X_1 + b_2X_2 + b_3X_3 + \ldots + b_xX_x + a} \qquad \mathbf{(1)}$$

Where,
Y = dependent variable
b = regression coefficient
X = independent variable
a = constant

RESULTS

The results of the analyses show that respondents in this study were 59.7% female, and 40.3% male; and 26.3% of respondents were aged 20 to 30. The youngest respondent was 13 years old, the most senior was 81 years of age. In total, 73.0% of respondents were Malaysian, while the other 27.0% were Indonesian, Bangladeshi, Nepalese; Indian, British and Burmese. Most respondents (41.1%) were Malay, 36.2% were local Malay and 4.9% were

Indonesian Malay. The Chinese made up 19.9% of respondents, Indians accounted for 17.1%, and other races, such as Kadazan and Melanau, totalled 21.9%.

In terms of marital status, 49.2% of respondents were married, 48.2% were single, respondents describing their status as other totalled 2.6%. Analysis of respondents' monthly income showed 27.8% had no source of income or were dependant on their pensions, 19.1% of respondents had a monthly income of less than RM1,000, 50.1% had a monthly income between RM1,000 and RM3,000, 2.0% had a monthly income between RM3,000 and RM5,000, and 1.0% had a monthly income of more than RM5,000. A total of 46.2% of respondents held SPM or STPM certificates, while respondents with a higher level of education were in the minority; 7.4% held diplomas, and only 5.9% held a Bachelor, Master or PhD. The majority (40.6%), were educated up to secondary school level; though some did not graduate secondary school at all. Further analysis showed 45.4% of respondents were daily users of the Rapid Penang bus service, and 19.6% of respondents used the service 4 to 6 days per week. Those using the bus service less than 4 days per week totalled 14.5%, those using the service only a few days per month accounted for 15.1%, and respondents reporting other frequencies of use totalled 5.4%.

The respondents that owned vehicles at home (23.7%) were less than the respondents that did not own any vehicles at home (76.3%). In detail, the respondents owned at least a car (17.6%), a motorcycle (9.9%) or a lorry/van (1.0%). Moreover, most of the respondents had no driving license either for car, motorcycle or lorry/van (68.1%) and only a few have driving licenses (31.9%). The results can be referred in Table 1 below.

Table 1: Descriptive analysis of socio-demographics

Variables		N	%	Mean	Standard Deviation
Gender	Male	158	40.3	1.60	0.50
	Female	234	59.7		
Age	Under 20	70	17.9	37.89	17.20
	20 to 30	103	26.3		
	30 to 40	64	16.3		
	40 to 50	53	13.5		
	50 to 60	55	14.0		
	60 to 70	31	7.9		
	Above 70	16	4.1		
Nationality	Malaysian	286	73.0	1.27	0.45
	Others	106	27.0		
Race	Malay	161	41.1	2.20	1.19

	Chinese	78	19.9		
	Indian	67	17.1		
	Others	86	21.9		
Status	Single	189	48.2		
	Married	193	49.2	1.54	0.55
	Others	10	2.6		
Income	No Income	109	27.8		
	<RM1000	75	19.1		
	RM1000 – RM3000	196	50.0	2.29	0.93
	RM3000 – RM5000	8	2.0		
	>RM5000	4	1.0		
Education	SPM/STPM/Certificate	181	46.2		
	Diploma	29	7.4	2.41	1.41
	Bachelor/Master/PHD	23	5.9		
	Others	159	40.6		
Vehicle	Yes	93	23.7	1.76	0.43
Ownership	No	299	76.3		
License	Yes	125	31.9	1.68	0.47
Ownership	No	267	68.1		

Table 2 shows a descriptive analysis of respondents walking distance and walking time to bus stops along Route 303. The farthest walking distance recorded was between 200m and 400m, reported by 37.2% of respondents. This was the same percentage recorded for respondents who walked less than 200m. However, 11.3% of respondents reported walking more than 1km to get to a bus stop; with the most in this category being foreign workers. In addition, 47.2% of respondents reported travel times of 10 to 20 minutes to reach the nearest bus stop, and 41.1% reported travel times of less than 5 minutes.

Table 2: Descriptive analysis of walking distance (meters) and walking time (minute)

	Variables	N	%	Mean	Standard Deviation
Walking distance (m)	< 200	146	37.2		
	200 – 400	146	37.2		
	400 – 700	38	9.7	2.15	1.282
	700 – 1000	18	4.6		
	>1000	44	11.3		
Walking time (min)	< 5 minutes	161	41.1		
	10 – 20 minutes	185	47.2	1.76	0.801
	20 – 30 minutes	24	6.1		
	>30 minutes	22	5.6		

In terms of questions asked regarding 'willingness to walk', Table 3 shows the comparative results between current and proposed future conditions; where future conditions assume improvements to infrastructure have been made.

Table 3: Descriptive statistic of willingness to walk based on distance and time

Infrastructure Condition	Current Condition		Future Improvement	
	Willingness distance to walk (m)	Willingness time taken to walk (min)	Willingness distance to walk (m)	Willingness time taken to walk (min)
Mean	423.04	13.24	543.62	17.58
Std. Deviation	314.150	10.105	348.449	11.285
Minimum	50	3	50	5
Maximum	2000	90	2000	90

Findings based on current conditions show that the minimum distance respondents were willing to walk was 50m, while the maximum distance was 2km. The average distance walked based on current conditions was between 400m to 500m. Respondents reported their preferred travel times as a minimum of 3 minutes, a maximum of 90 minutes, and an average time of 13 minutes. Foreign workers were found to be more amenable to longer walking distances and walking times. Findings based on future conditions, i.e. if improvements to pedestrian walkways were made, show respondents were willing to walk between 500m to 600m. Future conditions had no bearing on the minimum and maximum distances that respondents were willing to walk. Future conditions did have a bearing on walking time, with respondents reporting extended travel times of up to 18 minutes being agreeable, if improvements to pedestrian walkways were made.

To understand factors affecting 'willingness to walk' to bus stops based on current conditions, multiple regression analysis was applied, with walking distance as the dependent variable being considered.

Table 4: Multiple regression analysis of willingness distance to walk based on current condition

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	291.486	82.147		3.548	.000
Walking Distance	65.575	11.215	.268	5.847	.000

Nationality	-133.314	32.849	-.189	-4.058	.000
Home based Trip Purpose	-123.271	33.999	-.181	-3.626	.000
Pedestrian Walkway	92.556	30.916	.137	2.994	.003
Status	73.965	28.535	.118	2.592	.010
Gender	-63.919	30.017	-.100	-2.129	.034

Dependent Variable: Willingness to walk based on current condition, & considering distance

Table 5 shows the results of multiple regression analysis on 'willingness to walk', based on current conditions and considering travel time. Findings show that walking distance, nationality, type of trip, satisfaction level regarding pedestrian walkways; marital status and gender, are independent variables that influence 'willingness to walk'. Results indicate that respondents with longer walking times were non-Malaysian, satisfied with pathway conditions, involved with home-based trips, females; and those that are married, were also more likely to walk for a longer period of time. When analysed, both dependant variables were found to be similar.

Table 5: Multiple regression analysis of willingness to walk based on current condition & considering time

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	12.018	3.857		3.116	.002
Walking Time	2.081	.582	.165	3.575	.000
Nationality	-3.396	1.058	-.149	-3.208	.001
Pedestrian Walkway	3.056	.991	.141	3.084	.002
Status	3.320	.913	.164	3.635	.000
Home based Trip Purpose	2.887	1.113	.124	2.593	.010
Gender	-2.569	.964	-.125	-2.666	.008

Dependent Variable: Willingness to walk based on current condition & considering time

Respondents were asked to report what distances and travel times they would consider agreeable based on future conditions, i.e. when improvements to infrastructure were made. Table 6 shows factors affecting a respondents' 'willingness to walk', based on future conditions and considering distance.

Table 6: Multiple regression analysis of willingness to walk based on future conditions & considering distance

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	300.655	91.497		3.286	.001
Walking Distance	73.035	12.544	.269	5.822	.000
Nationality	-134.832	36.425	-.172	-3.702	.000
Pedestrian Walkway	113.706	34.206	.152	3.324	.001
Home based Trip Purpose	151.284	38.865	.188	3.893	.000
Gender	-76.769	33.322	-.108	-2.304	.022
Dependent Variable: Willingness to walk based on future conditions, & considering distance					

Table 7 shows factors affecting respondents' 'willingness to walk', based on future conditions and considering time. Results show that respondents who currently walk greater distances and have longer travel times, would be willing to walk further still, and adjust to even longer travel times, if improvements to infrastructure were made.

Table 7: Multiple regression analysis of willingness to walk based on future conditions & considering time

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	12.867	3.980		3.233	.001
Walking Time	2.845	.668	.202	4.257	.000
Pedestrian Walkway	4.165	1.136	.171	3.666	.000
Nationality	-3.208	1.193	-.126	-2.688	.007
Home based Trip Purpose	3.382	1.276	.130	2.652	.008
Gender	-2.511	1.100	-.109	-2.282	.023
Dependent Variable: Willingness to walk based on future conditions & considering time					

DISCUSSION

Collated data show respondents will walk an average distance of 600m to access bus services, with the average time travelled being around 20 minutes. The farthest distance walked by respondents to access bus services was 200m to 400m, where bus stops in areas where respondents live and work are on average only 100m to 500m apart.

Most respondents reported their nearest bus stop being between 10 to 20 minutes away. Respondents were willing to walk a minimum distance of 50m and a maximum distance of 2,000m. Respondents reported their preferred travel times as a minimum of 3 minutes, a maximum of 90 minutes, and an average time of 13 minutes. Walking distance and walking times were based on actual bus stop locations. Significant factors affecting 'willingness to walk' to bus stops were comparable, whether or not improvements to infrastructure were made. Study results indicate that (gender, nationality, marital status, current walking distance, current walking time, safe and accessible pedestrian walkways, types of trip and trip purpose) all affect 'willingness to walk'. Factors that do not significantly affect 'willingness to walk' are race, level of education, monthly income, vehicle ownership, license ownership, satisfaction level, frequency of bus use and distance from home to bus stop.

CONCLUSION & RECOMMENDATIONS

To conclude, several recommendations are made to underpin and further enhance the data obtained in this study. This research has not provided comparisons between regular and non-regular bus users. Findings have shown that regular service users would continue to use the service whether or not improvements to infrastructure were made. What this study has not shown was what effect the improvements to infrastructure may have on non-regular bus users. Thus, analysis of regular and non-regular bus users, based on future improvements should be carried out. An investigation of regular and non-regular service users' perceptions and opinions, based on current and future infrastructure is also recommended.

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INHERITING THE CITY: HISTORIC URBAN LANDSCAPE OF GEORGE TOWN UNESCO WORLD HERITAGE SITE

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Abstract

This research presents the value of historic urban landscape (HUL) elements in influencing the character of George Town UNESCO World Heritage Site (WHS), Penang, Malaysia. The values were perceived by the local community of different social-cultural groups that occupied the study area. The historic urban landscape elements constitute towards the protection of its townscape. The identification of the heritage elements influenced by the community interaction with their environment. This study also helps to define the character of a place, as well as reflecting its historical significance. The study adopted four techniques to gather both qualitative and quantitative data, including questionnaire survey, in-depth interview, visual survey and content analysis. In general, the local community has the capability in valuing the historic urban landscape values. The outcomes of their perceptions became the statement of the historic urban landscape values, which are expected to lead to the development of the areas. The community evaluation and perception can be expanded in implementing any development of the historic urban area by the authority.

Keyword: historic urban landscape, character, UNESCO World Heritage Site.

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INTRODUCTION

George Town and Melaka were inscribed as UNESCO World Heritage Site on 7th July 2008. These sites known as the "Historic Cities of the Straits of Malacca". George Town is the capital city of Penang. This city was the first British port town and the oldest British colonial town in South East Asia. It represents 18th century of British footprint development and different from other places in the East and Southeast Asia (UNESCO, 2008). George Town represents 200 years of multi-cultural trading exchange between the West and the East, in which have created a tangible and intangible heritage. These elements convey a multi-cultural identity to the city. The heritage values of George Town lies on the Outstanding Universal Values (OUV) inscribed by UNESCO. The values of its contemporary uses and functions need to be taken into account during the evaluation.

Historic urban landscape (HUL) approach defines four variables to be implemented on the heritage management, which are: attributes, values, stakeholders and strategies (UNESCO, 2011; Bandarin & Van Oers, 2012; 2015; Veldpaus, 2013). This research presented the attributes and values of HUL. Theoretically, the historic urban landscape values could unite the level of local practices by the inclusion of the individual (through his/her perception) and the community (through its value and genius loci). The community are the best sources of data in presenting the landscape issue and its values. They play an important role in illustrating the values and their associations. The visual aesthetic is the process and output of individual's perception towards the landscape. The heritage values of inheriting city are related to the notion of authenticity and integrity of the place. The values has a relation with the meaning and quality of the site, object or place (Jokiletho, 2007; 2006; 2005; 2002). The people's perception created the concept of landscape. In maintaining the heritage city, the policy makers need to consider community's perception in valuing these HUL elements. The heritage is the survival item that portrays the meaning and identity of the place. The significant value of the HUL provides lasting personal value as memories which capture and evoke the past event or nostalgia.

THE INHERITING VALUES OF GEORGE TOWN UNESCO WORLD HERITAGE SITE

The paper identifies four categories of values through study area, which are evidential, historical, communal and aesthetic. The character of this inheriting city was organized and remembered by selection of significant historic urban landscape (HUL) elements. There are four (4) factors that represent the historic values of George Town, which are: Historic character and identity; landscape and open space; heritage and townscape; and the meaning attached. The HUL elements that represent these four factors are: (i) landmark, edges, path/street, district and nodes; (ii) the parks and open space, the tree and street furniture; (iii)

architecture and buildings; the visual and scenery (the setting); (iv) functional and emotional meaning.

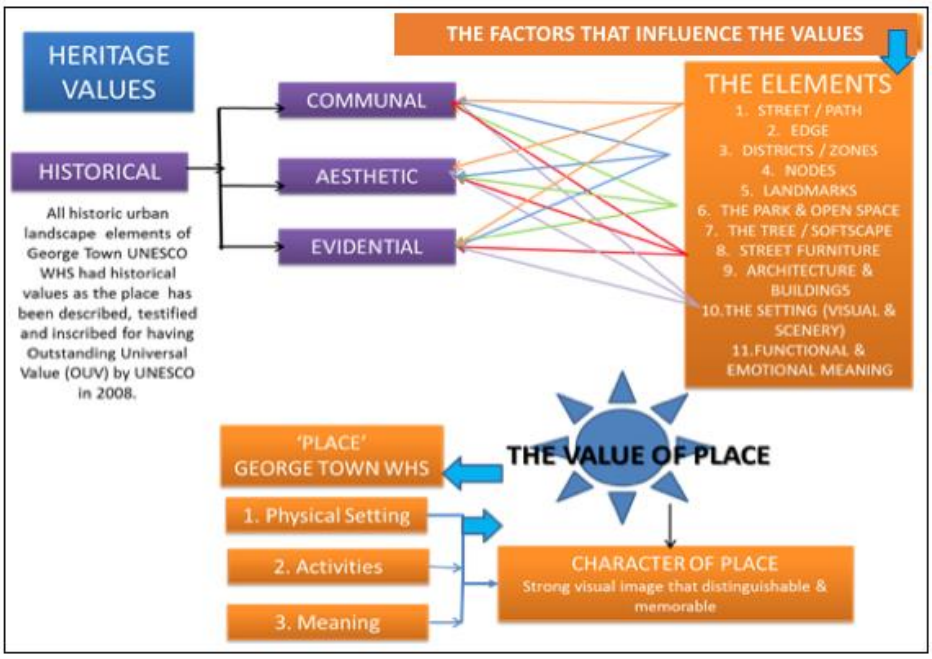

Figure 1: The value mapping of George Town UNESCO World Heritage Site
Source: Author, 2018

The values are the result of an interrelation between four factors (Figure 1) that influence the character of George Town. In the findings, the four values outlined are overlapping between each other. The landmarks such as a historical clock tower, religious buildings or historical setting are related to its historical value. These historical worshiping places and heritage buildings or institutions play a role in the development of the community. They also had aesthetic value, in which the architectural and design of the buildings and their setting embrace the form and qualities of aesthetic dimensions. Furthermore, the values overlapping with communal value that give the meaning and association towards the community. The historical development of George Town was portrayed by its evidential value of 200 years of historical existence.

Meaning of Inheriting City by Local Community

The meaning of the place is associated with the locals. They described it as the memories and experiences towards George Town. These experiences contribute to the place meaning and association. The locals described the emotions or feelings towards the place and how much it meant to them. The interpretation on

how people value the historic urban landscape suggests that the history and its cultural context based on personal and collective memories of the individual. The finding suggests (Figure 2) that personal history of the individuals are indicated through the memory of the historical events. It indicates communal and historical value of the George Town. These two values collaborate with the surrounding environments of the past and the present in which carries the aesthetic and evidential values of the city.

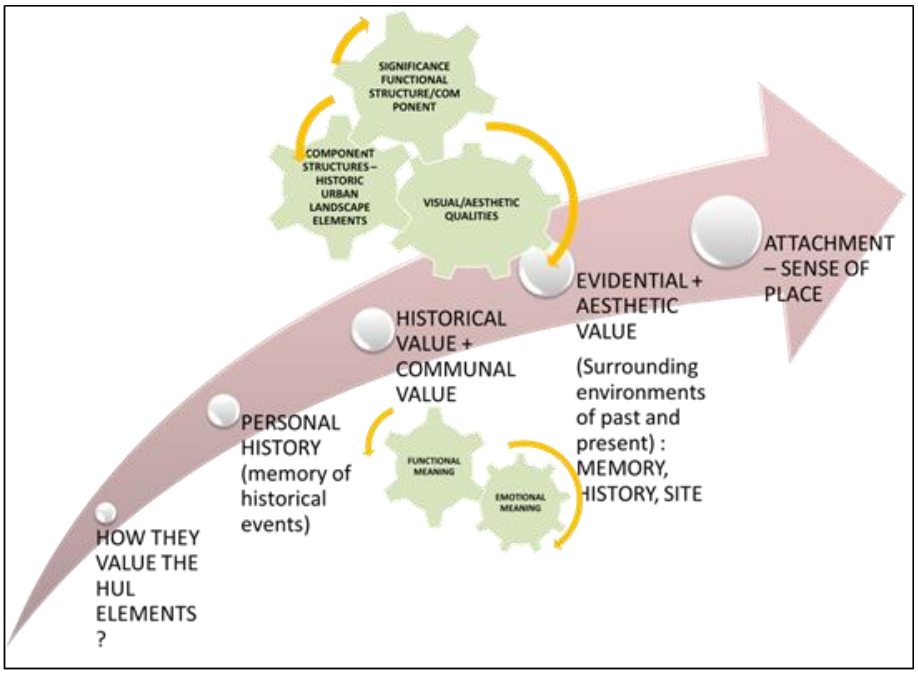

Figure 2: The value of place
Source: Author, 2018

The finding also posits the community associated the place with their childhood memories. It brought in-depth meaning to this city. The people may be comparatively modest, acquiring communal significance through the timeline as a collective memory of stories, which linked to them. They tend to gain value through the resonance of past events in the present, providing reference points for a community's identity or genius loci. They may have fulfilled the community function that has generated in-depth attachment, or shaped some aspect of community behaviour or attitudes. In the end, it will create the character of a place.

This study concurs with previous researchers' statements on the emotional feeling of an individual towards the physical location by defining the meaning of place through person-environment interaction process. In addition,

this research also agrees with Stephenson's Cultural Value Model that three elements contributed to the value of place, which are: (i) relationship – direct and indirect between the people and its surroundings; (ii) forms – the elements that contribute value to the place; and (iii) practices – the activities occur on place.

The values refer to the qualities of the heritage significance and the expressions towards heritage values of George Town WHS. These lead to the meaning and association of the place. The paper confirms that historic urban landscape (HUL) has its sense of place. According to the various concepts that have been discussed by the previous scholars, this research agrees that the identity or character of the place are the combination of tangible and intangible elements, activities and landscape setting. The people are experiencing and grasping the event and hold the memories of the place. This affective bonding called nostalgia, topophilia or genius loci by previous scholars.

CONCLUSION

The values emerge as significant elements that shaped the perceptions of the individuals in unique and different ways. It is clear that there is a multiplicity of possible values that heritage may represent for a different person with varies reasons. The findings suggest that tangible elements support the cultural intangible attributes in perceiving the meaning of the place. This research also establishes that the inherited values of the place and its tangible elements only support by the cultural attributes. The city without the people will contribute towards the loss of the character. The memories and the history of the place will be eroded. The character of George Town was symbolized by the personal value of the place. The representation and interpretation of the historic urban landscape elements are shared among the community. As a conclusion, the city that they inherited representing the meaning and attached to their lives' history. The landscape shapes the place by the activities, meaning and its significant historic urban landscape and its setting, which concur with the findings from the previous scholars.

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KEY ISSUES IN THE MANAGEMENT OF THE HUMANITARIAN AID DISTRIBUTION PROCESS DURING AND POST-DISASTER IN MALAYSIA

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Abstract

The humanitarian aid distribution process is a broad activity for helping disaster victims at the right time, with the right needs and at the right place during a disaster. However, there are always issues that could interfere with the humanitarian aid distribution process such as cases of food redundancy, uneven distribution of food supply to disaster victims, food insecurity issues, and volunteers' redundancy during and post disasters. These issues prove that there are weaknesses in managing the humanitarian aid distribution process within disaster management teams. Generally, these issues should be taken care of when the disaster management team was formed either from government agencies or non-governmental organizations (NGOs). Both work as the supporting team in giving aids and helping the disaster victims. Therefore, this research reviews the key issues in the humanitarian aid distribution process in Malaysian disaster management. Key findings show that there is no standard operating procedure (SOP) to explain the roles and responsibilities of NGOs that can be used by Government agencies to coordinate NGO contributions to a supporting team. There are five (5) categories of issues that can have a negative impact on the humanitarian aid distribution process and the disaster victims. The issues are information, communication, collaboration, cooperation, and coordination. All disaster management teams should emphasize these issues as they affect effectiveness in dealing with the humanitarian aid distribution process.

Keyword: disaster management, humanitarian aid distribution, NGOs, humanitarian aid planning, humanitarian aid process

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INTRODUCTION

The beginning of the humanitarian aid community concept has developed since the second world war (Oloruntoba & Gray, 2006; Thérien & Llyod, 2000). At first, it only included multilateral agencies such as the United Nations High Commission for Refugees (UNHCR) and the World Food Programme (WFP), which are supported entirely by voluntary contributions from both government agencies and non-governmental organizations (NGOs) (Oloruntoba & Gray, 2006). Since then, the role of humanitarian aid has spread out as a short-term relief goal in response to both man-made and natural disasters (Thérien & Lloyd, 2000).

On top of that, the role of humanitarian aid in disaster management, especially during disaster occurrence, is to lighten up the burden of disaster victims. According to Mastouri, Rekik and Fath (2017), humanitarian aid may consist of tangible products (food, medicine, blankets, and water) or services (infrastructure maintenance and restoration of power lines). Both products and services will be distributed by disaster management teams (either government agencies, NGOs or both) to the disaster area or, more specifically, to the evacuation centres. This is in line with the role of humanitarian aid as a medium to accommodate and protect the disaster victims during and post-disaster.

In Malaysia, the National Disaster Management Agency (NADMA) was established on October 2015. It is a special agency fully dedicated to Disaster Risk Management (DRM) (Omar Chong & Kamarudin, 2017). The roles and responsibilities of NADMA toward DRM are based on Directive No.20. Referring to the Directive No.20, Malaysia has established a Disaster Management and Relief Committee at federal, state and district levels in order to handle disasters effectively (Baharin, Shibghatullah, & Othman, 2009; National Security Council, 1997). All levels are responsible for policy, tactical and operational coordination (Baharin et al., 2009). Moreover, during a disaster, *Pos Kawalan Tempat Kejadian* (PKTK) will be established in order to manage humanitarian aid at the disaster area, which consists of seven service themes. Details on the service themes will be discussed in following subsection.

The content of this research is based on a systematic literature review of the humanitarian aid distribution process in order to explore disaster management teams, the issues that occur in managing humanitarian aid and the main factors that should be emphasized in managing humanitarian aid that are within the scope of Malaysia. All information was gained from Government reports, conferences and journal papers that have been published from year 2000 to year 2017. The next subsection of this research discusses the roles and responsibilities of the Malaysian disaster management team as well as issues in managing humanitarian aid and its effects on disaster victims.

ROLES & RESPONSIBILITIES OF MALAYSIAN DISASTER MANAGEMENT TEAMS

Disaster management teams, according to Asproth & AmcoffNystrom (2010), may be from Government agencies, NGOs and spontaneous helpers or volunteers, which comprise individual citizens or a temporary group of citizens. Each of them will vary widely in agility, competence, resources and endurance (Asprot & AmcoffNystrom, 2010). In Malaysia, on scene command post (PKTK) is established during disaster occurrences to ensure that disaster management is implemented in a holistic, coordinated and effective way (National Security Council, 1997). There are different types of agencies involved in PKTK, which are based on seven service themes: search and rescue, welfare, health and medical services, media, support, security control, and warning and alert (National Security Council, 1997; Omar Chong & Kamarudin, 2017). Those service themes are specifically for the scope of Government agency services during managing a disaster and humanitarian aid (National Security Council, 1997). The Government agencies in each service theme are supported by the private sector as well as NGOs. Figure 1 lists the Government agencies involved in the seven service themes.

Additionally, the role of NGOs during a disaster is also important to reduce the burden on Government agencies in managing the humanitarian aid distribution process. NGOs are also known as implementing partners for Government agencies in order to accommodate and protect the disaster victims (Abiew, 2012). Furthermore, the need for cooperation from NGOs as supporting teams is stated in Directive No. 20 (National Security Council, 1997). However, the roles and responsibilities of NGOs in supporting Government agencies in providing humanitarian aid is not clearly defined under current legislation (i.e. Directive No.20). The roles and responsibilities of NGOs are loosely defined under each service theme, which allowed the NGOs to make their own decisions in providing humanitarian aid in any disaster with limited information gained from social media. In addition, based on an interview session with a NADMA Official (2017), there is no particular mechanism or tools to coordinate all NGOs and their various strengths and capacities. Thus, there was evidence of several cases of food redundancy, uneven distribution of food supply to disaster victims, food insecurity issues, and volunteers' redundancy during and post the 2014 Mega Flood disaster in Malaysia (Husain, Abdul Rashid, Zainol, Syed Mohamed, & Ayub, 2014; Mat Taib et al., 2014; Yazid, Hussin, Wan Daud, Abdullah, & Salleh, 2014). The following subsection of this article will clarify the issues on the humanitarian aid distribution process and their effects on disaster management.

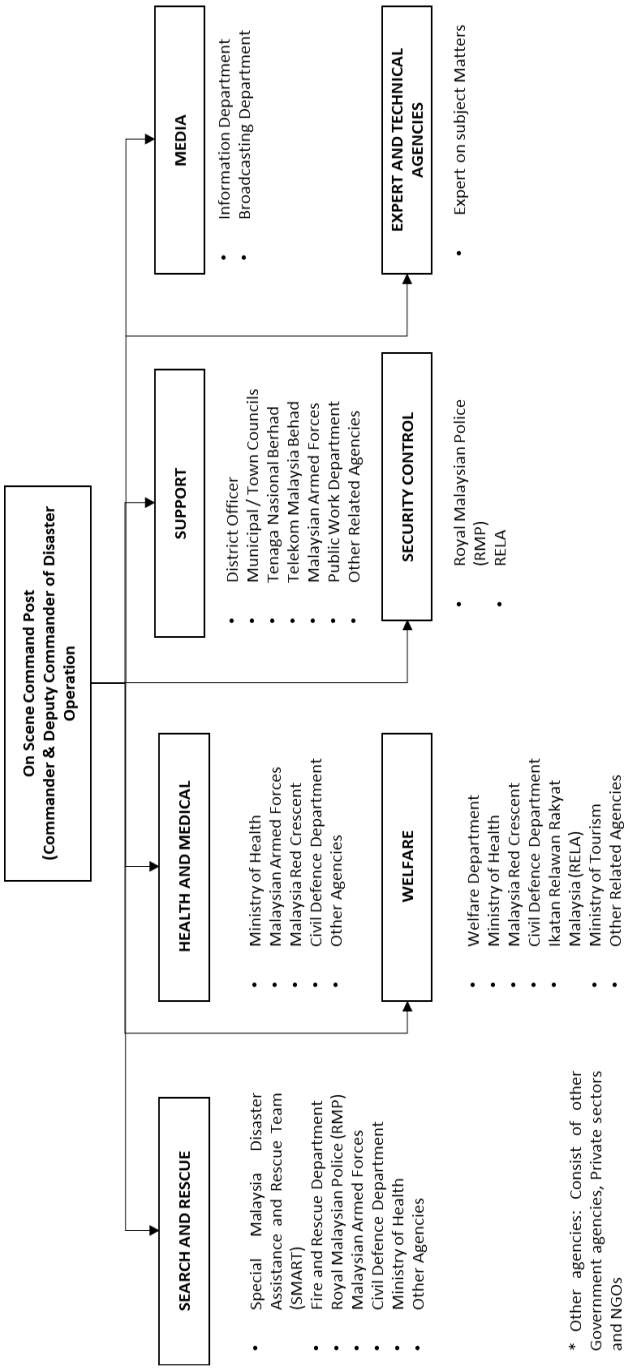

Figure 1: Agencies involved in PKTK during a disaster
Source: (National Security Council, 1997; Tan, Raswahan, Koh, Lim, & Ismail, 2013)

ISSUES WITH THE HUMANITARIAN AID DISTRIBUTION PROCESS AND THEIR EFFECTS ON MALAYSIAN DISASTER MANAGEMENT

This research identified five main factors that contribute to ensure that all disaster victims during the disaster occurrence are well managed. The factors are information (van der Laan, van Dalen, Rohrmoser, & Simpson, 2016; Yilmaz & Kabak, 2016), communication (Madianou, Longboan, & Ong, 2015; Martin, Nolte, & Vitolo, 2016), collaboration (Martin et al., 2016; Richardson, Leeuw, & Dullaert, 2016; Schniederjans, Ozpolat, & Chen, 2016), coordination (Martin et al., 2016; Nagurney, Flores & Soylu, 2016) and cooperation (Joshi & Nishimura, 2016; Martin et al., 2016). These are the main success factors to manage humanitarian aid in disaster management.

However, there are always issues (refer Figure 2) that could interfere with the humanitarian aid distribution process between the disaster management team and the disaster victims. These issues could result in adverse consequences on the process as well as on the victims. Figure 2 shows the contributing factors to the issues in managing the humanitarian aid distribution process and their effects on the disaster victims. These issues must be overcome by the disaster management team in order to avoid problems in managing humanitarian aid distribution process.

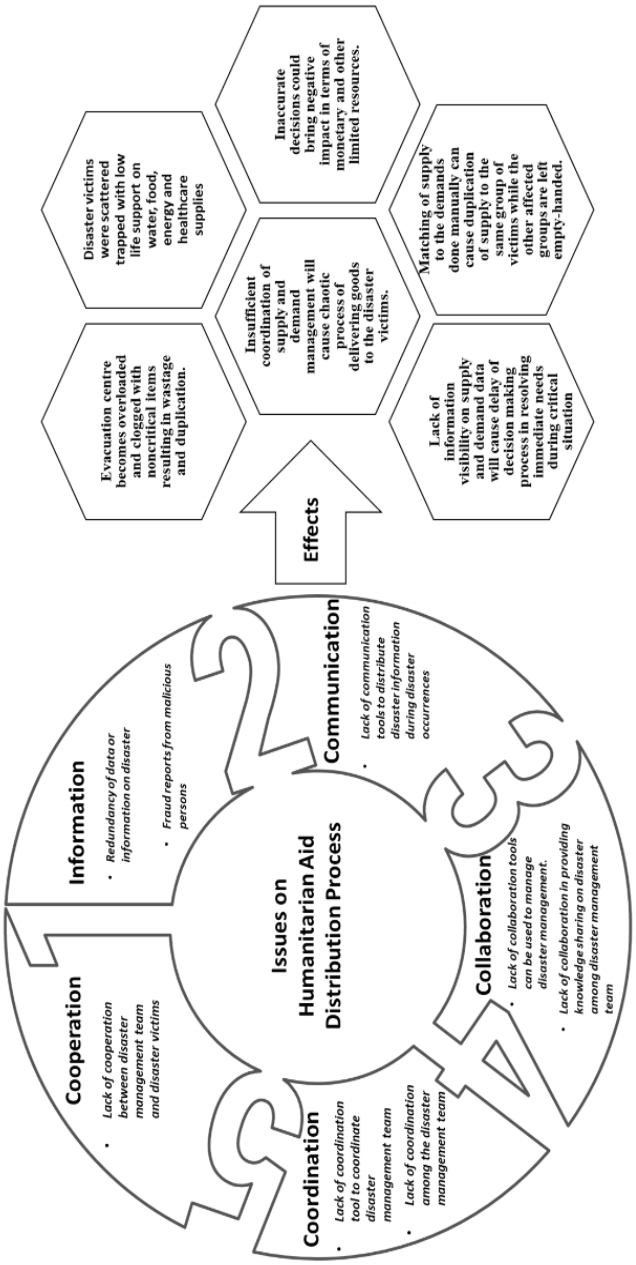

Figure 2: Issues within the Humanitarian Aid Distribution Process and their Effect on Disaster Victims

Source: Adapted from Baitenmann (1990); Gao, Barbier, Goolsby, & Zeng (2011); Gao, Wang, Barbier, & Liu (2011); Husain et al. (2014); Joshi & Nishimura (2016); Martin et al. (2016); Mat Taib et al. (2014); Mohd Rodzi, Zakaria, & Ahmad (2016); Nik Nazli, Sipon, & Radzi (2014); White, Plotnick, Kushma, Hiltz, & Turoff (2009); Yazid et al. (2014); Zakaria, Said, Ismail, & Samsuddin (2014).

Based on the five main factors aforementioned, literature review reveals several issues in managing humanitarian aid distribution process during a disaster. The occurrence of the issues reflects the weaknesses in managing the aid distribution process within the disaster management team. The issues are summarised as follows:

1) Information

- ***Redundancy of information on the disaster*** – The information on the disaster could come from various sources or the same person and the same location in a short time. So, the disaster management team, especially the NGOs, might respond to an individual request at the same time (Gao, Barbier, et al., 2011). This is important in order to avoid redundancy of tangible products (Martin et al., 2016).
- ***Data on the disaster might be fraudulent reports from malicious persons –*** Uncoordinated information could lead to fraudulent reports that could be retrieved by a malicious person for their own intentions (Gao, Barbier, et al., 2011; Ha, 2016).

2) Communication

- ***Lack of communication tools to distribute disaster information*** - Failures of communication channels, whether conventional phone lines, cell phone systems or radio channels, can severely harm the emergency response (Martin et al., 2016). Thus, this problem will lead to duplication of humanitarian aid between the NGOs (Baitenmann, 1990).

3) Collaboration

- ***Lack of collaboration tools that can be used to manage disaster management information*** – Most of the disaster management team, especially the NGOs, do not know how and where to share and retrieve the disaster information with or from others (White et al., 2009).
- ***Lack of collaboration in providing knowledge-sharing on a disaster within the disaster management team*** – The disaster management team have their own plan, SOP or activities in managing the humanitarian aid distribution process (Gao, Wang, et al., 2011; Nik Nazli et al., 2014).

4) Coordination

- ***Lack of coordination among the disaster management team*** – The current practices of disaster management are often unable to be harnessed effectively due to lack of coordination and efficient knowledge-sharing between the Government agencies and NGOs (Mohd Rodzi et al., 2016).
- ***Lack of coordination tools to manage real-time information on a disaster within the disaster management team*** – Real-time information is hard to deliver in a chaotic situation. There is a need for a tool that could coordinate disaster information despite the chaotic situation during a disaster occurrence (Gao, Wang, et al., 2011).

5) Cooperation

- ***Lack of cooperation between the disaster management team and disaster victims*** – One of the challenging issues faced by Government agencies is to achieve cooperation with the disaster victims in terms of relocating them to the disaster-proof areas, especially in relocation phases (Joshi *et al.*, 2016). Apart from that, the main reason to cooperate with NGOs is to avoid programme duplication, such as reconstruction of a permanent housing programme (Joshi & Nishimura, 2016; Martin *et al.*, 2016).

The issues discussed above have become major obstacles in managing humanitarian aid distribution process. These issues could not be ignored because they will lead to ineffectiveness and will disrupt the aid distribution process before, during and after a disaster in terms of the followings:

1. Evacuation centres become overloaded and clogged with noncritical items resulting in wastage and duplication (Husain et al., 2014);
2. A chaotic process of delivering goods to the disaster victims (Husain et al., 2014);
3. Delay in the decision-making process for resolving immediate needs during a critical situation (Husain et al., 2014);
4. Wastage and duplication of donated goods caused by improper inventory management (Husain et al., 2014);
5. Duplication of supply to the same group of disaster victims while other affected disaster victims are left empty-handed (Husain et al., 2014);
6. Disaster victims are scattered with low life-support on water, foods, energy, and healthcare supplies (Husain et al., 2014; Mat Taib et al., 2014; Yazid et al., 2014);
7. The negative impact in terms of monetary and other limited resources (Zakaria et al., 2014).

DISCUSSION

Improving the level of communication, coordination, collaboration and cooperation among the disaster management teams has been viewed as critical to optimise the flow of managing humanitarian aid distribution process during disaster. Yet, literature review shows that these are the weaknesses of the humanitarian aid distribution process in Malaysia. One of the factors that contributed to the issues is the absence of SOP in defining the roles and responsibilities of NGOs as supporting members in disaster management team. The SOP will have to comply with Directive No.20 and this is the gap that needs to be emphasized by NADMA as part of the disaster management policy. The SOP can be used by the Government agencies as a mechanism to coordinate the activities of NGOs during disaster. Previous studies have shown the importance

of a SOP as a guidance in planning and managing the NGOs during all phases of disaster management, with NADMA as the focal agency. This is important because the SOP is seen as a solution to the issues in humanitarian aid distribution process during a disaster.

CONCLUSION AND RECOMMENDATIONS

It is undeniable that humanitarian aid distribution process is an important activity in disaster management. The existence of the activity could lighten the burden of disaster victims by providing for their needs, shelters and emergency rescue. The establishment of a disaster management team in Malaysia shows that the Malaysian Government has striven to address disaster management issues. All roles and responsibilities of the Government agencies have been well defined in Directive No.20 but not those of the NGOs. There is a need to propose a SOP for the roles and responsibilities of NGOs as supporting members in managing humanitarian aid distribution process. Apart from that, there are issues occurring in managing the humanitarian aid distribution process that need to be avoided by the disaster management team. These issues could have significant effects on the humanitarian aid distribution process and on the disaster victims. However, the issues are seen as ones that can be resolved with the presence of a SOP. Therefore, further research will be needed to formulate a proposed SOP that will highlight the roles and responsibilities of NGOs as supporting members in humanitarian aid and developing systematic tools in order to address the issues in managing humanitarian aid distribution process.

ACKNOWLEDGEMENT

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MEASURING THE SWAY OF IMPERCEPTIBLE FACTORS IN SHAPING THE DISTINCT CHARACTER OF ANCIENT INDIAN ARCHITECTURE AND CITY PLANNING

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Abstract

In India, great obey to nature is evident in architecture, and the essence of life is fairly apparent in city planning. Human kind reflects his perception of life in architecture by locating the spaces within the dwelling in particular order to ensure great harmony with positive and negative forces of the cosmos. Modern architecture shaped by political and economic factors resulted in sameness among most of contemporary capitals or developments, ignoring farming and human needs that has caused decays in urban fabric, and resulting in high level of gas emissions in mega cities. By contrast, ancient architecture in India connects the occupants with surrounding environment and ensure harmony between humans and nature through many aspects, and scale is a great element being considered in space and city planning leading into the Mandala graph. In Indian philosophy, disproportion and detachment of mankind from nature and surrounding environment lead to disaster. Hence, the Mandala diagram addresses all the existence taking into account farming, human scale and needs. The purpose of this research is to examine the impact of intangible factors such as traditional beliefs and religions in shaping the astonishing character of Indian architecture. Furthermore, it delves ino many metaphysic theories to test their influences on evolving the Mandala diagram and the logic behind the distribution of functions within its parts.

Keyword: Mandala diagram, Vastu Purusha, five elements, the Vedika, responsive architecture

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INTRODUCTION

Every remarkable architecture reflects great conception and principles. The Greek conveyed their interests in literature and art through constructing marvel theatres and discerning architecture. While the Romans echoed their many achievements in sciences through establishing advanced water supply ducts and heating systems in public baths. Sewage systems were available in their cities and the invention of concrete led to vast spans in Italy. In Europe, great churches initiated glorifying and symbolized the dominance of religion authority, in the same way the Indian architecture progressed but with different influences. This research is an attempt to help students and researchers to understand how Indian philosophers provided different approaches in architecture by acknowledging other intangible forces such as divine forces and evil motivates.

Nowadays cities are similar, with buildings and skyscrapers in Dubai, Singapore and Kuala Lumpur are alike, and plants, trees or finishing materials may only look different in contemporary capitals. Mega cities diminish human peace and generated many problems for societies, such as traffic jam, pollutions and high level of crime. Harmony between individuals has also vanished.

Whereas ancient cities recognized human scale and sustainability where all building materials were local and settlements were safer with great harmony between settlers. Indian cities meet most of their resident's needs and addresses social cultural customs. The character of the blocks are different in Indian towns, but premises are in great harmony and the atmosphere is positive as villagers interact with each other. Moreover, everything can be reached within short distances.

In India many philosophies inspired scientists thinking and led to form distinct norms, among which is the appreciation of nature. Indian architects believe that nature is a crucial factor and affects mankind in various ways. It can influence us internally – *spiritually and psychology*, or externally –*physically.* Likewise, mankind shares the earth with many other existence including animals, plants and different forces that affect his cognizance. Hence, Indian architecture reflects every aspect of our universe. Evil and divine forces are also acknowledged, and consequently spaces in Indian premises are distributed in harmony with those forces to maintain positive level of energy. *"As human body is a combination of divine and evil forces, a site is also a combination of divine and demonic forces"* (Bubbar, 2005, p.25). This conception has led to numerous Mandala graphs, which are celestial diagrams addressing all existence and divided into sections representing various aspects including evil, godly forces, plants and animals. Mandala graphs are commonly used as guidance to locate spaces or buildings within the site according to specific logic, for instance kitchen is located in fire section in Mandala, and a farming or furnaces can be placed near god of sun Isha (Figure 1). Religion is another crucial contributor in shaping the

architecture of India, every aspect of life is controlled by various deities guiding rain, wealth, death justice, sun, moon and youth.

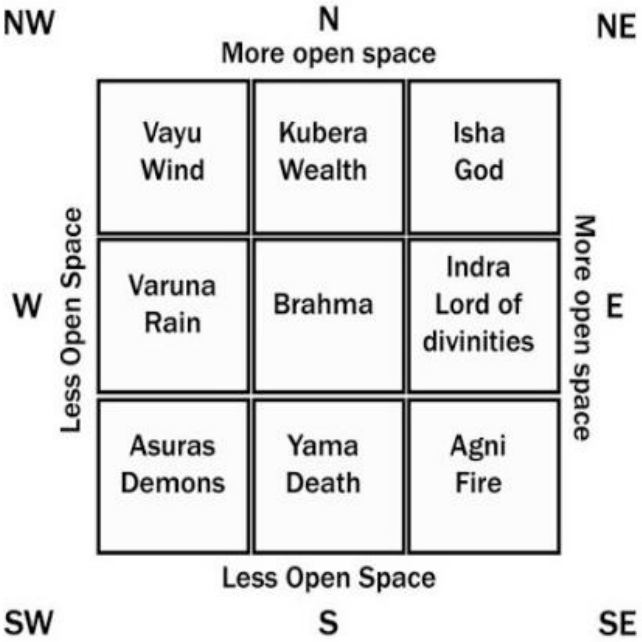

Figure 1: Location of gods in Indian Mandala graph

Most of goddesses are represented in Mandala graph and impact the setting of spaces or premises in city planning. In fact, locations of divinities in Mandala is determined by sun motion since it rises from east. Aditya god of sun, brightness, power and warmth divine forces are located in east quarter. Therefore, functions relevant to administration and power are usually located eastwards. The west is sun setting direction, which is cold and represent oceanic rainy side where Varuna god of water is situated in Mandala. Northwards is the arctic coolness, distant from sun path and associated with moon. North is also the place of Soma lord of wealth, moon, or light but cold light contradicting the warm rays of sun light. Hence, financial activities are positioned in this section. Whereas south is warm as sun voyages in this path therefore god of fire Agni is in southern quarter. Thus, Mandala's layout reflects the influence of religion, where each aspect of life is controlled by specific God and it is apparent locations of the goodness in Mandala related to sun path and the four cardinals. *" The Mandala distinguishes the areas belonging to cosmic forces - good and bad. The planner propitiates the forces needed for the project. The east is the rising of the sun, brightness in character. The west is ocean / water or setting of sun; the north is ascribed to the moon, cooler in character and the south is assigned to heat, warmer in character. "* (Bubbar, 2005, p43).

MANDALA GRAPH AND DISTRIBUTION OF FUNCTIONS

Mandala shapes are numerous, but square Mandala or rectangle are very common in usage, while triangle is rarely used and circular ones are common in worshipping or buildings with divine purpose. Hexagon, octagonal or sixteen sided shapes Mandala also exist but uncommon.

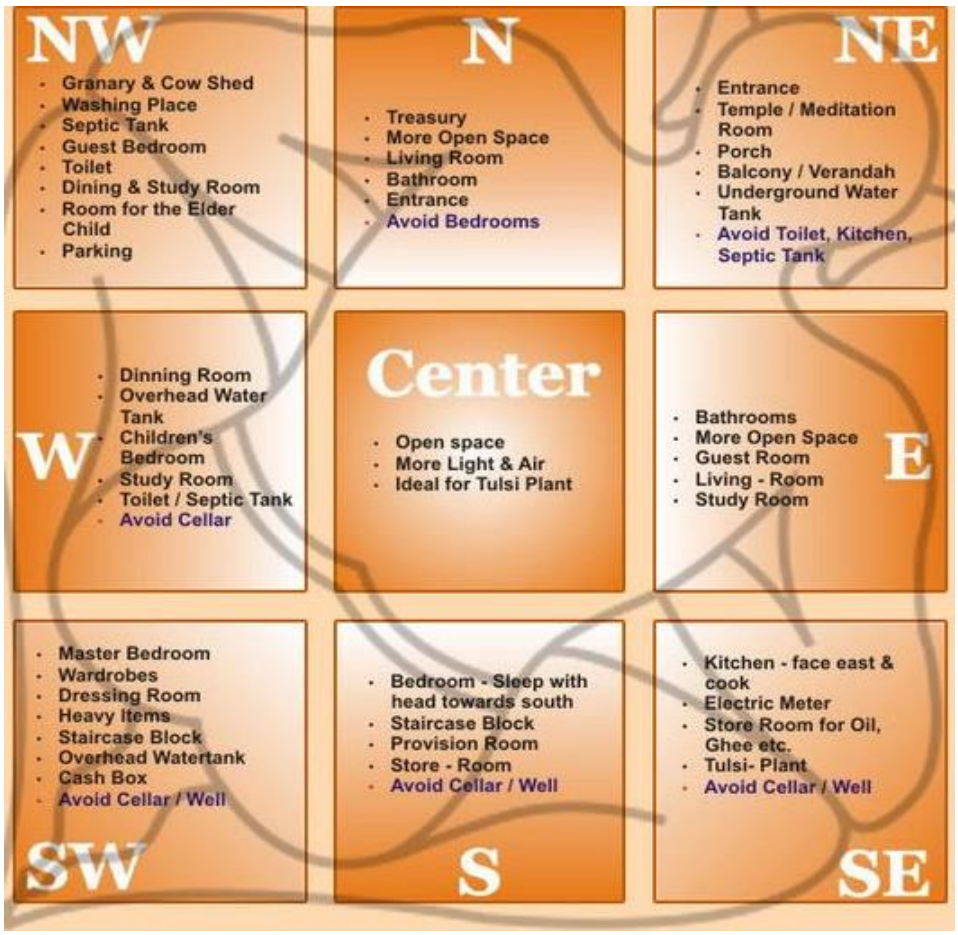

Figure 2: Ideal placement of spaces

There are 32 types of Mandala exist in India and many features are shared between them. For instance, on the east side of the graph is Adita or Isha god of sun, it is a divine force and commonly host worshiping activities, farming, orchids and dairy. Southern side is Yama the god of death and in command of justice and rules the death orders. It is regarded as divine demonic force, hence courts, jails, butchery, brothels and burial ground situated in this area. Western side is Varuna god of water or ocean, which is a celestial force and lodge traveling trading

activities, treasury, industry and defences academics. Finally, Soma the moon is in northern side and the central part is dedicated to goddess of earth and open to sky. There are Mandalas for site planning and also for dwellings. For instance, Pitha is simplest and the first sample consists of 3x3 sections with core open to sky and other parts are dedicated to divine forces such as fire, water, wind, ancestress, justice or death god. This basic diagram is suitable for domestic and public buildings. Furthermore, its layout was inspiration for other sophisticated Mandalas. *"The planning system, through the Mandala, takes into account the five basic elements of creation space, Air, Fire, Wáter, Earth and also the inherent of divine and demonic forces."* (Bubbar, 2005, p37).

In fact, any site is an amalgam of positive and negative aspects. Hence, Indian architects developed the Mandala to deal with such opposite forces and consequently the layout of the buildings reflect ecological forces and other balances. The five-element theory of life, air, fire, water and earth are recognized in Mandala layout and occupy the corners (Figure 2). For instance the northwest corner indicated Vayavya - air force symbolizing movement. Hence, it is preferable that transit activities are located in this area such as guest room, unmarried person room or a finished material storage where the items are subject to movement or delivery shortly. *"The northwest corner of Vayavya is represented by air and guarded by Paparakahashi. This is characterized by its movement. Therefore, it is ideal to place transit activities in this area"* (Bubbar, 2005, p41). Vayu is lord of wind and located adjacent to god of air. It represents divine forces, thus northwest quarter commonly occupied by activities that reflect law enforcement, distilleries and professional. Northeast corner dedicated to Isha god of sun and for locating worshiping spaces or buildings. Southeast corner represents Agneya - fire and commonly a kitchen, boiler room or bread furnace shop is ideal to be located here. "*The southeast corner or Angenya represent Angi- the fire and guarded by Vidari. It is characterises heat. Therefore, it is the ideal location for the kitchen"* (Bubbar, 2005, p41). The west south spot where Nairutya - earth force exists, and commonly physical functions such as massage room, dining or dressing, maternity room, hospital, jail or slaughter room are common in this area. Worshipping and ancestor's deity take place in two different sections, southwest or northeast corners. This variety allows the designer flexibility to locate the spaces according to site condition. *"The northeast corner or Isan is represented by water and is guarded by Charki. This corner of Isan is recommended as a place of worship"* (Bubbar, 2005, p41). Even the location of main entrance is determined by reference to specific theory. The door can be in one of the four directions, north, east, south or west. If the door is placing in north, it underscores the intellectual aspect and east for administrative while west for business and south for workers.

POSTURE OF VASTU PURUSH MODEL

As mentioned earlier the Mandala takes into account the five elements; life, fire, water, earth, wind, as well plants, animals, ancestors, demonic and divine forces. These elements should be balanced within the dwellings to enhance the flow of energy and consequently the occupant's health. Nature is in the core of Indian architecture. In various ways it influences dwellings layout and represented by a figure known as Vastu Purusha set within the Mandala graph. According to this notion, the torso of the figure is in the middle of the diagram and should be free from pain. Thus, the centre of dwelling should be free from columns and open to sky. *"Nature, the governing power of the cosmic processes in the universe, is omnipresent. Nature govern every piece of land and every dwelling. The scriptures refer to this as the presiding spirit. This spirit, in architectural parlance, is called the Vastu Purusha."* (Bubbar, 2005, p37). Location of courtyard is commonly in the middle, but it can also occupies the corners or the sides. The courtyard accommodates Vedika (sacrificial alter) for worshiping and family gathering or celebrating events. *"While designing, due care must be taken to ensure that the nerve centers or the vulnerable points of the Purusha are not put to pain therefore structural members like columns, walls, fire places or anything that can cause pain to the Vasta Purusha must be avoided."* (Bubbar, 2005, p39). Another crucial idea is the offering or oblation to fire which normally occurs in the courtyard. Fire maintains good eyesight and is life giving energy similar to sun that should not be extinguished or wane. Later, the Vedika replaced by basil leaf or different types of medical plants, which can be used to heal diseases. The beauty of nature apparent in mountains, flowing water features and frosts may not be available in every site, hence the courtyard compensates deficiencies of natural features and commonly accommodates plants and water elements. In fact, having an open space for gathering is replicated in city planning in ancient Indian cities. Settlements commonly accommodate numerous open zones woven within every district, allowing people from same background to socialize (Figure 3).

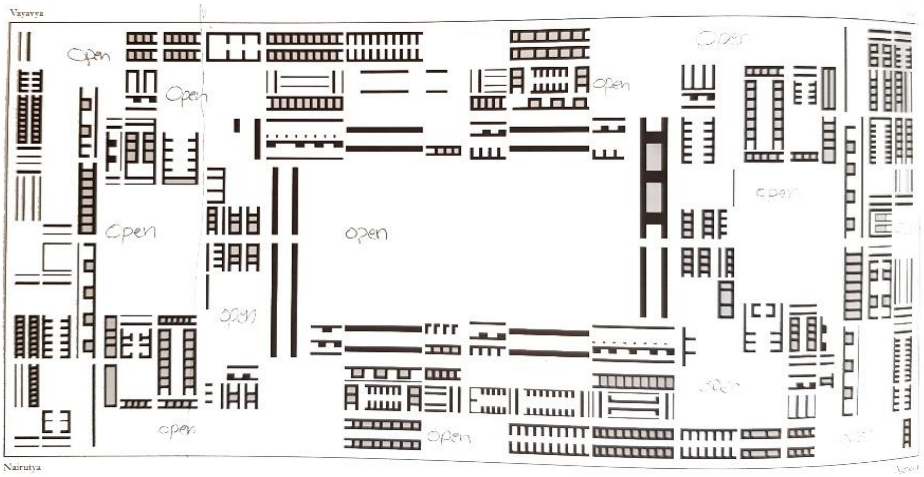

Figure 3: Open areas woven within the urban fabric

Likewise, settlements in India were shaped by particular rationality. Indian philosophers think that every society is usually divided into four sectors. The first one represents thinkers or planers who undertake the intellectual work and called Brahmin Cuna. They assist in maintaining the literary culture of society and when the intellectual falls it will lead to corruption and the nation will ruin. Second sector is in charge of administration and governing mission. Therefore, they are the politicians or rulers known as Kashatriya Guna. The third sector is the Vaishya Guna, which consists of traders and farmers. The final one consists of the Shudra Guna - the labourers and blue-collar workers who assist the other three sectors (Figure 4).

Ancient Indians were against admixture. They believed it would mess up the values in society and caused adverse progeny and create deep psychological tensions. People of same rank should live together and admixture can cause fear among settlers For instance, mother of children would not feel safe letting her children socialize and play with other youngsters coming from different caste. Hence, segregating is evident in Indian city planning and reflects social culture.

Ancient nations were aware of energy level radiating from earth and planned their buildings to benefit from positive energy. In China, proposed location of any settlement were investigated carefully by the ruler's officers and commonly cities were built at foot of mountains and nearby water body or frost to benefit from the energy radiating from natural landscape. Greeks took into consideration the earth energy field and designed their city Agors to benefit from such energy and similarly the ancient Greek urban planner Hippodamus of Miletus known by his methodology of using the grid iron patterns in city planning. The spaces within the grid lines are in the positive energy, therefore

suitable for blocks. Whereas, the intersections of grids lines are within the negative or low energy of earth and human activities are not placed in the nodes.

Every object radiates energy and the Lecher Antenna can be used to measure the radiation of energy and also the gems have powerful effect on energy level of humans. Similarly, the Mandala lowers the effect of negative energy of existing site and create or accentuate positive energy level. Therefore, the Mandala was a key factor in city planning or designing the buildings internally and externally. In fact, Bubbar (2005) stated that an experiment that took place in a flat located in Mumbai revealed how a geobiological test carried out in the flat in certain zone showed certain elements can reverse the negative energy to positive energy. According to high level of negative energy, then a conch cell was placed in the area and the test was repeated. Surprisingly the reading showed positive energy level. The same was repeated but with a lit lamp and gave the same outcome and in particular when the lamp was located in Northern corner Isan, the negative energy changed to positive. Therefore, the conch shell and lamp are fundamental elements in worshiping in India. The flame can diminish negative energy and turn it into positive.

In general, there are many graphs employed to design Indian settlements. However, the city is preferable to be established near water body, mountain or frost to utilize the energy coming from natural terrain. There are common features shared between those various Mandalas. The city should follow grid layouts, roads are perpendicular and the core of the city is open to sky for public, temples commonly in northeast in Isan corner, many open areas are accommodated as a public meeting points and matching ranked citizens gathered in certain zones.

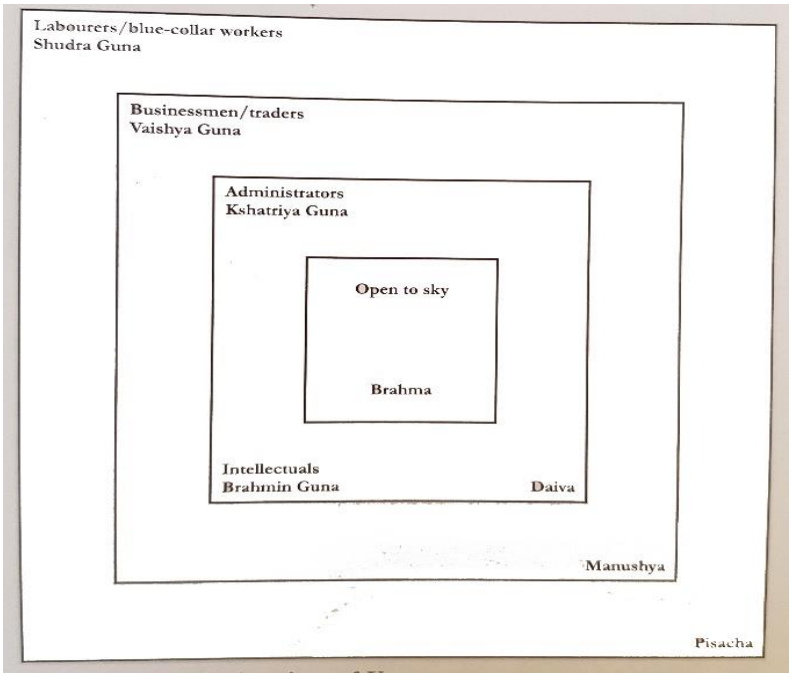

Figure 4: The divisions of Indian Society

CONCLUSION

The ancient Indian architecture is an amalgam of religion and traditional interpretations of how the decrees of nature affect mankind. Indian architects developed the Mandala graph which recognizes the principle of five elements. Within its components, the five elements are distributed according to sun path four cardinals or location of India on the planet earth. Among many planets in our galaxy, earth is the only sphere consists of these primary elements which are necessary to establish life. Thus, they are dominant in Mandala layout. Indian architects believe that the environment and occupant's wellbeing in any building or settlement can be enhanced by distributing the functions with great acknowledgment to divine and even evil forces. The acknowledgment of Indian norms and beliefs led into such distinct architecture which lasted since thousands of years and can be great inspiration for the coming generation. Furthermore, reviving our ancestor approach is a great tool to diminish similitude layout of nowadays capitals and creating long lasting architecture that never fade away over centuries.

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ASSESSMENT OF POTENTIAL LOCATIONS FOR BONUS ZONING IN BANDUNG

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Abstract

Despite being a common practice in other countries, bonus zoning is still relatively new in Indonesia. Bonus zoning is a zoning regulation tool that allows developers to increase density in exchange for the improvement or provision of public facilities. Bandung, in particular, has already designated areas for bonus zoning within its Local By-law No.10/2015 concerning Detailed Spatial Plan and Zoning Regulation. Its detailed mechanism however is not yet implemented. This research seeks to investigate a) the rationale behind the application of bonus zoning in Bandung; b) the carrying capacity of the areas where bonus zoning could be applied; c) the type of public space to be provided as development compensation; and d) the calculation for compensation. Content analysis was used to review literature and legal documents regarding planning and development in Bandung. This research expects to find which areas are suitable for implementing bonus zoning and come up with its compensation as the basis for sustainable planning in Bandung that not only benefits the developers but also the public as a whole.

Keyword: zoning regulation, bonus zoning, public space

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INTRODUCTION

Bonus zoning, or in some literature referred to as incentive zoning, is a measure of development and improvement provided to the developer in return for the provision of public facilities such as arcades, plazas, pedestrian ways, loading and unloading space off the street to avoid congestion in accordance with applicable regulations (Costonis, 1972; Homsy, Abrams, & Monastra, 2015; Johnston, Schwartz, Wandesforde-Smith, & Caplan, 1989; Kiefer, 2001; Seyfried, 2007). The practice of bonus zoning has been formally exercised in New York, USA since 1961 when public plazas were built by developers in exchange for supplementary Floor Area Ratio (FAR) for buildings in high-rise areas (Homsy et al., 2015; Smithsimon, 2008).

The City of Chicago makes FAR bonuses available through a single voluntary payment into a Neighbourhood Opportunity Bonus system (City of Chicago, 2017). Previous provisions in the zoning code were regulated by a 2004 regulation that identified a variety of on-site amenities, such as building setbacks, winter gardens, green roofs, and other design features. In 2016, the mayor introduced the following simplified equation for determining the bonus payment system:

Cost of 1 square foot of floor area = 80% x median cost of land per buildable square foot

As example, when a developer wants to build an additional 5,000 square feet beyond what is allowed under the prevailing zoning regulation in an area where the median price is $35 per square foot, the bonus contribution equation for neighbourhood reinvestment would be 5,000 square feet multiplied by 80% of $35 (which is $28).

5,000 sq ft x 80% ($35) = $140,000

A recent study by the Bandung City Spatial Planning and Human Settlements Office (2016) reported that Jakarta is the first city in Indonesia that has implemented bonus zoning by offering increased FAR from the initial 7 to 13 to a private developer that proposed a new high-rise building. As compensation, the developer provided around IDR 500 billion (approximately USD36 million) for infrastructure investments, which the Jakarta government allocated for the Semanggi Flyover Project as an effort to tackle traffic congestion. The project commenced in April 2016 and was completed in July 2017. The bonus calculation applied in Jakarta is based on Provincial Regulation of DKI Jakarta No.210/2016 as follows:

$$C = I \times \frac{A}{FAR_{base}} \times \text{taxable value of land}$$

Where; C = Compensation value (IDR)

I = Index (as set forth in DKI Jakarta Governor Regulation No. 251/2015 based on the location of the areas where exceeding FAR are allowed with index ranges from 0.6, 0.8, 1.0, 1.2, 1.4, to 1.8)
A = Additional floor area (m^2)

FAR_{base} = Allowed FAR in Zoning Regulation

Taxable value of land = Sale value on tax object/NJOP (IDR)

As bonus zoning is still uncommon in Indonesia, its implementation requires caution so it will not give the impression of business as usual where developers can build as much as they desire as long as they can afford the compensation value. The carrying capacity of aspects such as water, land, and road level of service must be carefully taken into account before allowing development beyond what is permitted. When applied correctly, bonus zoning can provide local governments with an additional source of funding to boost development, while maintaining the liveability of its area. Bandung urgently needs a well-defined mechanism and procedure of bonus zoning in order to control the overwhelming demand for developments.

BONUS ZONING: BANDUNG CONTEXT

Bonus zoning is one of the zoning regulation alternatives in Bandung that are accommodated within Local By-law No. 10/2015 on Detailed Spatial Plan and Zoning Regulation in addition to other regulatory techniques such as transfer of development rights (TDR), growth control, and overlay zoning concerning safe flight paths, northern Bandung, and heritage districts. Article 310 directs its application on City Centres (*Pusat Pelayanan Kota/PPK*), Sub-City Centres (*Subpusat Pelayanan Kota/SPK*), and City Strategic Areas based on economic interests, integrated areas based on the transit-oriented development (TOD) concept, public service centres with functions comprising traditional buildings and other functions, as well as the construction of public housing/flats for low-income communities by or in cooperation with private parties.

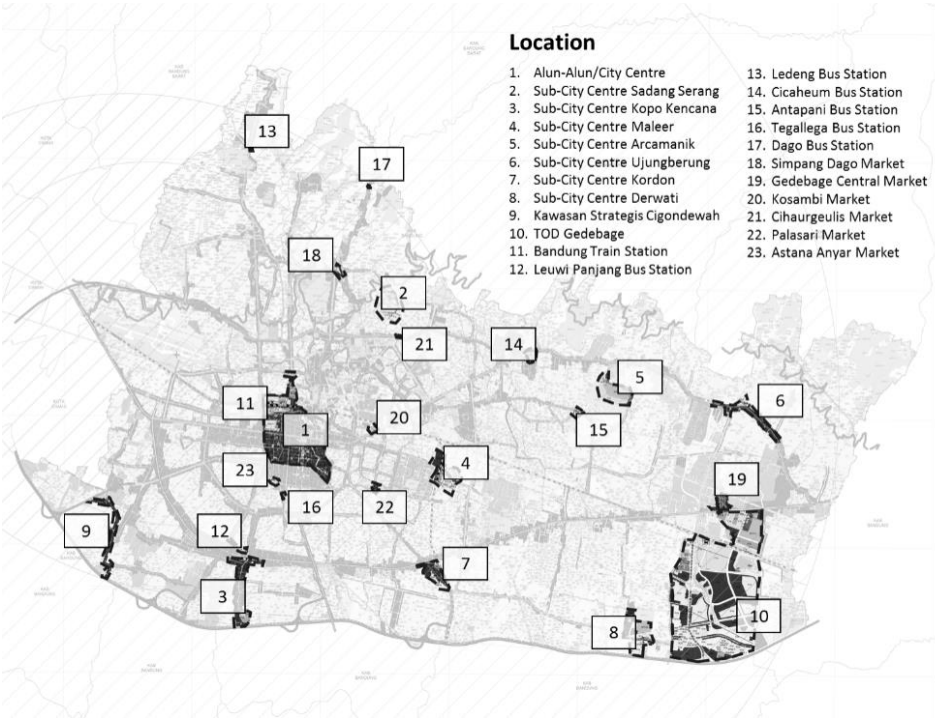

Figure 1: Bonus zoning designated area based on Bandung Local By-law No.10/2015 (Peraturan Daerah Kota Bandung No. 10 Tahun 2015)
Source: Adapted from Bandung Zoning Map within Local By-Law, 2015

This study consists of three sets of analysis. First, determining the implementation of bonus zoning in Bandung was carried out by further examining the designated areas in Local By-law No.10/2015 based on a) the carrying capacity that direct developments to the eastern part of the city; b) the main infrastructure such as road network and road class; c) development policies; d) designated areas for safe flight paths; and e) the possible impact of development such as traffic generation, air and noise pollution, and waste. Table 1 shows the scoring description, while Table 2 presents the scoring result based on these criteria.

Table 1: Score description

	0,5	**1,0**	**1,5**
Carrying Capacity	High density location	Medium density location	Low density location
Road Class	Local road	Collector road	Arterial road
Development Policy	Northern, Central, and Western Bandung	Southern Bandung	Eastern Bandung
Safe Flight Path	Within Safe Flight Path	Near Safe Flight Path	Outside Safe Flight Path
Development Impact	Negative	Neutral, under acceptable level of impacts	Positive

The distribution of locations can be seen in Figure 2 where the lightest shade indicates the highest priority; semi-dark indicates the medium priority; and the darkest shade indicates the lowest priority for additional development intensity – meaning that the dark areas are already high density areas.

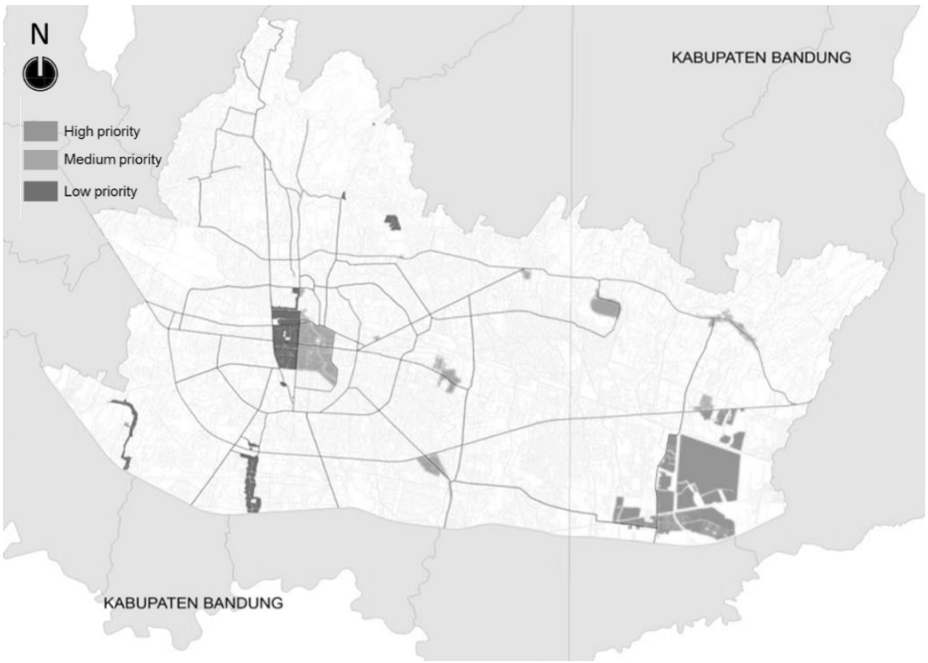

Figure 2: Bonus zoning priority level
Source: Adapted from Bandung Zoning Map, 2017

No	Location	Carrying Capacity	Road Class	Development Policy	Flight Safety Area	Development Impact	Average Score	Potency Rank
1	Alun-Alun (west)	0,5	1,5	0,5	0,5	1	0,8	Low
2	Alun-Alun (east)	1,5	1,5	0,5	0,5	1	1	Medium
3	Bandung central station	0,5	0,5	0,5	0,5	0,5	0,5	Low
4	Cigondewah strategic area	1	0,5	0,5	0,5	0,5	0,6	Low
5	Sub City Centre Kopo Kencana	1	0,5	0,5	0,5	0,5	0,6	Low
6	Sub City Centre Sadang Serang	1	0,5	0,5	0,5	0,5	0,6	Low
7	Sub City Centre Buah Batu	1	1,5	0,5	1	1	1	Medium
8	Sub City Cente Karees	0,5	1	1,5	1	1	1	Medium
9	Sub City Centre Arcamanik	0,5	1	1,5	1,5	1,5	1,2	Medium
10	Sub City Centre Ujung Berung	1	1,5	1,5	1,5	1	1,3	Medium
11	Sub City Centre Derwati	1,5	1,5	1,5	1,5	1	1,4	High
12	Central Market Gedebage	1	1,5	1,5	1	1	1,2	Medium
13	TOD Gedebage	1,5	1,5	1,5	1,5	1,5	1,5	High
14	Ledeng Terminal	1	1,5	0,5	0,5	0,5	0,8	Low
15	Cicaheum Terminal	0,5	1,5	1,5	1,5	1	1,2	Medium
16	Simpang Dago Market	1	1	0,5	0,5	1	0,8	Low
17	Tegallega Terminal	0,5	1	0,5	0,5	0,5	0,6	Low
18	Astana Anyar Market	0,5	1	0,5	0,5	0,5	0,6	Low
19	Palasari Market	1	1	0,5	0,5	1	0,8	Low
20	Cihaurgeulis Market	1	1,5	0,5	0,5	0,5	0,8	Low
21	Kosambi Market	1,5	1,5	0,5	0,5	1	1	Medium
22	Dago Terminal	1	1	0,5	0,5	0,5	0,7	Low
23	Antapani Terminal	0,5	1	1,5	1,5	1,5	1,2	Medium
24	Leuwi Panjang Terminal	1	1,5	0,5	0,5	0,5	0,8	Low

Table 2: Bonus zoning priority level location

Remarks:
Potency Risk Low = 0.5 – 0.8
Potency Risk Medium = 0.9 – 1,2
Potency Risk High = 1.3 – 1.6

The second part of the analysis established the typology of public space that can be distributed into on-site or off-site improvements, which will be ranked, based on the highest demand, for example parking spaces, parks, the improvement and/or widening of pedestrian pathways, and the provision of bike lanes. The final part was to formulate the FAR that can be given as bonus in Bandung.

As opposed to the method being applied in Jakarta where developers propose certain additional FAR in advance and then the local government calculates the compensation that must be paid, this research argues that the calculation method should be reversed. Instead, the developer must provide public amenities beforehand and then the local government would calculate the bonus FAR based on the type of public space the developer provided. This reversed method is important in order to control developers building as much as they desire just because they can afford the compensation.

At this stage of the study, the indication of public space demand in Bandung points towards the provision of parking spaces and green spaces. In addition, to create more walkable neighbourhoods in Bandung, the quality of pedestrian pathways must also be improved. The bonus FAR was tested using the following formula:

$$\text{Bonus FAR} = \frac{public\ space\ provided\ (sqm)}{development\ lot\ area\ (sqm)} \text{ x I x } FAR_{base}$$

The range of index (I) can be determined based on the type of public space that has been provided by the developer. The range between $0 < I < 1$ is prioritised with the following preference Table 3):

Table 3: Index range for public space provision

`	**Index**
Public plaza and pocket park	1
Through-block connection indoor	0.5
Through-block connection outdoor	0.7
Parking space	1
Sidewalk widening	1
Arcades	0.3

Suppose, a developer built additional parking space of 10,000 sqm in a development area of 15,000 sqm within a site with a FAR_{base} of 5. Based on the formula, the developer shall receive a bonus FAR of 3.

In addition to evaluating the proposed development sites to obtain additional density, the location of the compensated public space is also important to be taken into account. The compensated public space must meet the following conditions, a) meet the carrying capacity of the area, as an already dense location

would not be able to accommodate more activities caused by additional floor area; b) not located within a heritage conservation area/building; c) consider the existing availability and capacity of public infrastructure and utilities; and d) consider the standards for public facilities and infrastructure in demand.

CONCLUSION

The current stage of the study indicates that Transit Oriented Development (TOD) Gedebage and the Sub City-Centre of Derwati are the top two potential areas to be awarded bonus zoning in return for the provision of public space. However, the result would be different when variables are added, such as the taxable value of land. Changing the scores and indexes would change the result as well. Thus, additional simulations should be considered before a decision is made.

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VALUER'S BEHAVIOURAL UNCERTAINTIES IN PROPERTY VALUATION DECISION MAKING

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Abstract

Valuation is often said "an art and science". However, it is well known that valuation is more of an "art" than a “science” in which no two valuers could perhaps arrived at the same value. The disparities in the valuation variance pose a point of concern. This research attempts to identify the behavioural uncertainties during valuation decision making process. The finding reveals that there are six (6) elements of valuer's behavioural uncertainties, which include heuristic and bias, ethical conduct, client influence, valuer's experience and knowledge, availability and accuracy of market data, as well as negligence and professionalism.

Keyword: Valuer behaviour, decision making, behavioural uncertainties

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INTRODUCTION

The valuation outcomes (opinion of value) help property owners which may be corporate, institutional, or financial entities, as well as individuals to make decisions on a property including inheritance, asset sharing, asset allocation, property performance measurement, privatization and commercialization of assets, property sales and purchases as well as investment opportunities (Aluko, Ajayl, & Amidu, 2004). The complexity in valuation make valuers easily exposed to outside influences. For instance, valuers are often pressured by banks to inflate the value of a property (Agarwal et al., 2015; Gwin & Maxam, 2002). This, indirectly gives impact to the valuation practices around the world and valuers' credibility. Although certain valuation techniques and methods are used by valuers around the world to derive property values, valuation professionals constantly battle to find a consistency in conducting valuations and ultimately variances in the result or outcome of their valuations do exists (Havard, 2001). The "art" of valuation also creates certain behavioural traits or characteristics in valuer in conducting valuation process that could confound his judgment, which contribute to inconsistency or variance in values. According to Iroham, Ogunbaand and Oloyede (2014), there was evidence to suggest that property valuers are exposed to various assumptions and speculations, emotional uncertainty, heuristics and cognitive biases and errors, negligence (misconduct) and other behavioural issues, which result in their valuation decisions tend to follow trends and clients' influences. In attempting to identify the most significant behavioural uncertainties which affect valuer decision making behaviour, it is important to understand and address the general human behaviour in decision making process. Behavioural uncertainties greatly affect the value arrived at in the property market because they act as hindrances when carrying out valuation and transaction activities (Aliyu, Bello, Kasim, & Martin, 2014).

In addition, research from the field of cognitive psychology has provided an understanding of how human make decisions. Of particular to valuation is how decision-makers operate in complex environments (under pressure) where the outcome of the task is uncertain. In these situations, humans adopt cognitive short cuts, known as "heuristics", to ease the burden of information processing (Kahneman, Slovic, & Tversky, 1982). "Heuristics" refers to a situation where a valuer forms a preconceived opinion on the worth of the property being valued and then works to the preconceived answer (as it were) (Akinjare, Iroham, & Oloke, 2013). It is important to identify the use of heuristics from novice decision making behaviour in order to improve the efficiency of the decision making process (Hardin, 1997). This is due to the tendency of the use of heuristics may lead to biased or inefficient decisions. Another issue, which also may lead to inaccurate values, is valuers' set of knowledge and experience obtained throughout their career. Valuers may be biased by specific knowledge as well as familiarity related to the property, such as previous valuation or the actual

transaction price on the property. Babawale and Omirin (2012), and Havard (2001) agree that valuers' knowledge and experience, as well as familiarity with market are significant influences on valuation accuracy. The level of knowledge and experience significantly affects valuers' decision making behaviour in the valuation of properties. Hence, it is important to acknowledge that valuation is not merely a pure science, but the value is predominately derived from art or soft aspect compared to science (Warren-Myers, 2016), which has potential for inaccuracy, variation and bias on the outcomes.

Earlier studies acknowledged that lack of awareness of behavioural uncertainties of a valuer should be a point of concern because studies discovered that these cause "errors in valuation" (Akinjare et al., 2013; Kucharska-Stasiak, 2013; Wilkens, 2014; Iroham et al., 2014; Warren-Myers, 2015). Valuation is an art, hence the human judgement factor needs to be considered (Akinjare et al., 2013). Thus, this research attempts to undertake behavioural valuation research for local context to indicate the most significant elements of behavioural uncertainties towards valuation decision making.

This research can be a platform in behavioural and psychological knowledge and insights as well as guidelines to the valuation practice. The uncertainty of valuation is not being given much attention by local scholars. To date, only a few articles have been published, which points out the need for undertaking research in behavioural and psychological aspects of valuation practice. Earlier studies were only focusing on identifying the behavioural elements that exist in valuers' behaviour and how those elements affect valuation accuracy. On the contrary, this trans-disciplinary research of understanding valuers' decision making behaviour and what causes such behaviour as well as to curb and enable a different and extensive outlook on valuation practice especially in behavioural aspects. In short, this study provides deeper and wider set of knowledge concerning to how valuers arrived at valuation decisions from the behavioural and psychological aspects.

LITERATURE REVIEW

Valuation is the estimation of property value at a given point in time. This value reflects the transaction price of real properties in the open market. The role publicly ascribed to the valuer is to deliver a valuation report, which is used by both parties (buyer and seller) to set the sale price of a property at fair market value. Valuers should provide guidance to their clients on the fair market price of properties (Bartke & Schwarze, 2015). Valuers are supposed to take an objective and neutral stance when conducting valuation in order to determine fair market value. Unfortunately in reality, valuation outcomes are always exposed to uncertainties, which affects the fair market value of properties.

No two valuers are likely to arrive at the same value. However, valuers need to be responsible of their action in order to ensure that they arrived at

reasonable values that can predict variations in their values and finally may lead to a logical and reliable market situation. As mentioned earlier, one should accept that valuation involves human judgement. It is because each and every type of valuation, by nature, is unsure and uncertain (Aliyu et al., 2014). One of the causes to the existence of uncertainty in valuation is human behaviours (Kucharska-Stasiak, 2013). It is important to address what factors influence valuers decision making process because a reliable valuation depends on valuers' judgments. In order to identify the causes to the unwanted valuation errors (valuation inaccuracy), a consideration on how valuers make decisions and what factors influence their judgment to arrive at opinion of values must be taken into account The study of incorporating behavioural research in valuation accuracy research would permit an expansion of the research focus instead of incorporating the understanding of human judgment, bias and seemingly irrational behaviour, as well as to help in improving our interpretation of the way valuers make decisions and reach reliable CONCLUSION. Earlier studies learned that the critical elements of behavioural uncertainties include (i) heuristic and bias, (ii) ethical conduct, (iii) valuer's experience and knowledge, (iv) client influence, (v) accuracy and availability of market data as well as (vi) negligence and professionalism (Akinjare et al., 2013; Farlow, 2004; Hardin, 1997; Havard, 2001; Levy & Schuck, 1999; Wilkens, 2014). These are summarised in Table 1 below.

Table 1: The elements of behavioural uncertainties

No.	Elements of behavioural uncertainties	Description	Variables
1	Heuristics and biases	• Heuristic is the use of simplifying cognitive shortcuts in solving complex problems (Simon, 1978). • It is a cognitive short cuts to ease the burden of information processing (Kahneman et al., 1982). • The information usually obtained from valuer's experience and human capital. Limited time frame prompted valuers to adopt heuristics (Quan & Quigley, 1991).	• Kahneman et al., 1982 introduced three types of heuristics, (i) the representative heuristic, (ii) the availability heuristic, (iii) the anchoring and adjustment heuristic; whilst Evans (1989) introduced (iv) the positivity heuristic. • Scott, Stumpp & Xu (1999) categorised two general biases, (i) overconfidence and (ii) prospect theory. • Farlow (2004) discussed over-optimism bias as one of the most important

		• Biases are associated with heuristic (Salzman & Zwinkels, 2013). Conservatism bias leads to overestimate and underestimate of real market value, valuers avoid to absorb new information of relevant market situation. The use of heuristic often leads to bias decisions.	factors in real estate markets.
2	Ethical conduct	• RICS (2013), emphasizes the importance of professional ethics because it acts as an anchor to appropriate behaviours. It ensures consistency and clarity irrespective of changing factors such as the state of the economy or business practices in different marketplace. • Ethical behaviour is a human behavioural trait that would need to come from the professional valuers themselves. Ethics and credibility are the main reasons for most valuers not adjusting their values as requested by clients (Wilkens, 2014). • Ethics and integrity are important to fight corruption (Ssonko, 2010).	Five standards that should be demonstrated by valuers are (i) act with integrity, (ii) always provide a high standard service, (iii) act in a way that promotes trust in the profession (honesty), (iv) treat others with respect, and (v) take responsibility (RICS, 2013).
3	Client influence	• Uncertainty of valuation increases due to client influence (Kucharska-Stasiak, 2013). • Valuers make adjustments on the value after client interaction or pressure (Wilkens, 2014).	• Three ways of client influence on valuers; (i) reward power, (ii) coercive power, (iii) expert power and (iv) information power (Levy & Schuck, 1999).

		• Ethical issues associated to the willingness of valuers to adjust their value as requested by clients. Valuers with high integrity have low tendency to satisfy clients' interests (Levy & Schuck, 2005). • Client-business relationships urge valuers to satisfy clients interest (Shi-Ming, 2002). • Ethical codes recognize the existence of client influence and seek to prevent it (Akinjare et al., 2013). • Clients believe they have better knowledge about property value compared to valuers due to their experience in the property market and managing the assets (Achu, 2011).	
4	Valuer's experience and knowledge	• Valuer's knowledge and experience have significant influences on valuation accuracy (Babawale & Omirin, 2012). • Majority valuers in Nigeria are not well experienced to obtain an accurate valuations (Ayedun, Oloyede, & Durodola, 2012). • An independent, skilled and experience valuer provides reliable advice and guidance to clients (Orr, 2013). • Valuers need to continuously upgrade their knowledge in the	• Three important factors related to accurate valuations (i) age, (ii) experience and (iii) education, whilst skilled and independent valuers are important for reliable market value (Hoyt et al., 2002; Orr, 2013).

		valuation practice (Boyd & Irons, 2002).	
5	Availability and accuracy of market data	• Valuation accuracy greatly depends on the quantity and quality of available market data (Babawale & Omirin, 2012). • Valuation will be inaccurate when comparable data are limited especially in a sluggish market (Havard, 2001). • Lack of data can directly affect valuation process and cause valuation uncertainty (Ajibola, 2011; Aliyu et al., 2014). • The complexity to access and to analyse market information raises issue in estimating fair market value (Ilsjan & Kask, 2006). • Lack of reliable databank contributes to inaccurate professional valuation advice (Ajibola, 2011; Aluko, 2007).	• Factors contribute to difficulty to access market information data are (i) confidentiality constraints, (ii) lack of trust among professional valuers (tend to be secretive) and (iii) conservative attitude.
6	Negligence and professionalism	• Negligence is one of behavioural uncertainty that can be found in the valuation process (Hishamuddin et al., 2016). • Australian valuers are required to "exercise a reasonable standard of professional care" as the basis to assess negligence (Boyd & Irons, 2002). • All aspects of valuation exercise must be undertaken in a competent	• Negligence can occurr in two ways (i) error in surveys and (ii) error in procedures (Havard, 2001).

	manner to avoid negligence (Boyd & Irons, 2002). • Valuers unprofessional behaviour leads to overstate the defensible property values (Ayuthaya & Swierczek, 2014; Levy & Schuck, 1999).

RECOMMENDED BEHAVIOURAL APPROACHES IN OVERCOMING THE DISCREPANCIES IN VALUATION

Earlier studies have shown that major issues facing the valuation industry, especially in the behavioural valuation aspect, are the lack of guiding standards, the unavailability of databank consisting of analysed market information, lack of training courses for valuers such as continued professional development programmes, lack of standardisation of valuation methodology used, and lack of ethical guidelines enforcement in valuation practice. For the purpose of this research, the issues highlighted in property valuation are grouped into four main categories, which are (i) institutional, (ii) informational, (iii) technical, and (iv) ethical issues.

As mentioned by Kucharska-Stasiak (2013), in order to eliminate the valuation uncertainties, it is important to seek ways of eliminating the systematic (behavioural) ones. Academics and professionals have been striving to overcome the discrepancies in valuation, and several recommendations have been suggested to curb the issues. One should accept that the uncertainties in valuation practice must be openly acknowledged professionally and publicly. The inconsistency and uncertainty can be minimized if the professional institutions, member firms and the academics are willing to collaborate in curbing the issues facing the industry.

In order to ensure that valuers comply with the duty of reasonable care (as being practiced by Australian courts), it is essential that valuers continuously upgrade their knowledge and competency (Boyd & Irons, 2002). The professional organizations also need to play important roles by assisting the valuers to adhere to the standards of the professional practice. The organizations also should provide a continuing professional development programme to ensure the competency of members abreast with the best valuation practices (Bello & Bello, 2007). Mahoney (1993) concludes that the important role played by professional organizations and the valuers themselves is crucial. He highlighted that independent of valuers' opinion, honesty in delivering valuation exercise and competency are the elements that should be considered by both professional organizations and valuers to avoid negligence and client influence. Seminars, workshops or conferences can be alternatives to promote continuous education

programmes, particularly by those with specialist skills and knowledge. A more experience valuers may share their experience and knowledge with the participants. Besides, through the exposure of valuers to the opportunities for such structured knowledge development and experience, valuers will inherently progress to intuitive knowledge and creation of heuristics (Warren-Myers, 2016).

The lack of property market data and lack of standardisation of valuation practice are also causing unreliable valuation outcomes (Adegoke, Olaleye, & Oloyede, 2013; Ajibola, 2011; Narayan, Biswas, & Sahib, 2017). Therefore, there is a need to provide a good database and to develop computerised valuation technique. There is also a need to improve and consistently review the current national standards to ensure that they are in line with the international standards of best practices. An enforcement of high ethical standards, independence and professionalism are needed to reduce the valuers' exposure to claims of negligence.

The professional organizations are responsible to educate the valuers, mortgagers and the general public on the benefits of valuation standards, the need for their strict compliance, and adherence to normative valuation objectives (Amidu, Aluko, & Hansz, 2008). This is to ensure that parties who have interests in valuation exercise are aware and acknowledge the nature of valuation practice. It is important to enlighten the parties involved to avoid the influence (or pressure) of clients as well as to promote valuers to work independently because clients' lack of understanding of valuation principles is another contributory factor on the existence of client influence (Achu, 2011). Additionally, the regulatory bodies need to set up mechanism to constantly monitor the activities of valuers to ensure they strictly comply with the code of conduct (Amidu & Aluko, 2007; Shi-Ming, 2002). A more stringent policy on professional valuer entry qualifications can also help (Wilkens, 2014). Meanwhile, any valuers violating professional ethics and regulations should be held accountable and penalties should be imposed such as formal caution, note of warning, suspension of qualification and qualification withdrawal. All these should be established in standardised manner by the regulatory bodies (Aliyu et al., 2014).

CONCLUSION

This research has presented a review of behavioural aspects in property valuations. The issues of behavioural uncertainties in the property valuation need to be addressed because the disparity in valuation results become a problem to practitioners and the public (clients). This research has laid down the six elements of behavioural uncertainties that have significantly affect property valuation decision making. It has also outlined several recommendation on how this issue could be ameliorated.

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MEDIATION EFFECT OF SOCIAL ASPECT IN THE RELATIONSHIP BETWEEN ENVIRONMENTAL AND ECONOMIC ASPECTS: THEIR INFLUENCE ON THE VALUE OF GREEN COMMERCIAL OFFICE PROPERTY

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Abstract

The potential value of green buildings is generally attributed to attractiveness for occupiers due to the environmental aspect which brings an impact to the social action, which eventually influences the economic aspect. These three aspects of sustainability (environment, social and economic), which adopted from Concentric Ring model contained various attributes. These attributes may or may not have significant influence among them, thus act as an indicator in impacting the green commercial office building's value. Accordingly, it is substantial to identify which attributes of green commercial office property have significant relationship of sustainability and to what level of influence among them, including the role of social aspect as a mediator between environment and economic aspects of sustainability. In order to analyse the hypothesized relationships, this study collects quantitative data from the property holders and also end users (tenants and owner-users) of green commercial office building, as they experience the benefits of sustainability in the building. Data were analysed using confirmatory factor analysis (CFA) with IBM SPSS Statistics 20.0 and AMOS 19.0, respectively. The results show that all hypothesized relationships between environmental, social and economic aspects were supported and indicated significant relationships among them, hence become a fundamental of green commercial office property valuation framework development.

Keyword: sustainability aspects, green commercial office building, Structural Equation Modelling (SEM), AMOS, valuation

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INTRODUCTION

Sustainability aspects which consist of environment, social and economy, were recognized globally as among the factors that affect green property and potentially its value. They contain various attributes that may or may not have significant influence among them, thus act as indicators in impacting the green commercial office building's value. Therefore, it is critically prominent to distinguish which attributes of the green commercial office building have significant relationship of sustainability and to what degree of influence among them.

As green features study, which underlying the principle of sustainability consists of environment, social and economic aspects for property valuation purpose has yet to be conducted and practiced in Malaysia (Rahman, 2011; Lojuntin, 2014), it is significant to determine which factors and their attributes under the sustainability concept need to be addressed according to the hierarchy of importance based on Malaysian property market context. Accordingly, this research has utilized an internationally recognized green factors and their attributes for green commercial office property. However, the applicability of globally established features needs to be revised and tailored to Malaysian situation context, as according to RICS (2009), there are inconsistencies between the currently available metrics worldwide.

The globally recognized factors and attributes of green commercial office property are bound with several limitations like differences in geographical area (MD Darus & Hashim, 2012), water scarcity and variation in market uptake of sustainability (Runde & Thoyre, 2010; Babawale & Oyalowo, 2011). They are also strongly depends on regional and local market conditions, the property type, conventions and applied valuation method (Lützkendorf & Lorenz, 2011). Different rating system approaches also need to be considered due to the need to reflect local sustainability issues, environmental conditions (Ting, 2012) and also climate conditions (Samari, Ghodrati, Esmaeilifar, Olfat, & Shafiei, 2013). The differences between rating system approaches were based on certain criteria including launch date, rating scales, information gathering, assessment, third party validation, certification and labelling, update process, governance, required qualification of assessors, weightings for the criteria, different climate zones, and the lack of flexibility of the systems to be applied in other countries. Other limitations are due to the different building codes or building regulation standards that differ from country to country, the buildings types, application of government guidelines, sustainability measures range and the timing of the certification in a building's life cycle.

In addressing these limitations and due to the inadequate evidence of data into sales and lease transactions for green commercial office property that exhibit green features in Malaysia (Wan Ismail, & Abdul Majid, 2014), it is an essential for this research to identify the rank of importance of globally recognized green

factors and their attributes that affecting the commercial office property value. Several scholars have suggested that it should be obtained from the view point of the market players, namely occupiers, as they experience the benefits of sustainability in the building (Hemphill, Mcgreal, & Berry, 2002; Boyd, 2005; Myers, Reed, & Robison, 2007).

Thorough exploration is required leading to a clearer identification of the relationship among the factors and attributes of sustainability aspects for commercial office building in order to distinguish the extent of influence among themselves. This in turn will be incorporated into valuation exercise, as sustainability has a multiple relationship among their various variables that affecting the value (Lorenz, & Lützkendorf, 2008; Sayce, Sundberg, & Clements, 2010).

LITERATURE REVIEW

The connection between sustainability and its impact upon a building's market value is increasingly important to the investment community. Investors and occupiers need to know the extent to which sustainability is impacting property worth if they were to respond effectively to sustainability issues (Sayce & Ellison, 2003). This will require an analysis of how the market value is determined for green commercial office buildings. World Green Building Council (2013) in their report reveals that green buildings attract a financial premium in terms of rental and sales values through economic, environmental and social aspects.

Economic Aspect

The uptake of sustainability and sustainable practices in buildings would be accelerated if investors understood their direct impact on the value of property and portfolios. This is because the ownership of sustainable building results in multiple benefits to investors due to the various characteristics of such properties, ranging from lower operating costs to improved marketability, longer useful life spans, increased occupant productivity and well-being, as well as more stable cash-flows. As a result, economically quantifiable benefits (Kats, Alevantis, Berman, Mills, & Perlman, 2003) can be obtained through ease of sale and rent, high tenant retention and higher occupancy rates, which result in higher achievable rents and the potential of increasing the value of the property, and higher relative investment returns (Bowman & Wills, 2008).

The financial benefits of energy savings through reduced energy and water use, and waste reduction can be measured fairly precisely by using the energy performance certification, which specifies the total energy-related operating costs. This will lead to lower long-term operations and maintenance costs, and more efficient asset management and marketing advantage. A tenant with a net lease who rents space in a sustainable commercial building, with associated savings in operating costs, may be willing to pay a higher rent per

square meter if the tenant could identify long-term savings (Addae-dapaah, Hiang, & Yen, 2009).

Sustainable buildings should have a longer economic life due to less depreciation and lower volatility in market value due to less environmental and marketability risks, which logically result in lower capitalization and discount rates. Sustainability features have the ability, in varying degrees, to slow depreciation and obsolescence (especially physical, functional and/or economic obsolescence) in a commercial building over the long term. This leads to reduced risk premiums.

Social Aspect

The intangible factors that are often cited on the social side appear to support a positive relation between green workplaces and worker satisfaction, which can lead to higher staff retention, reduced absenteeism and better health (Heerwagen, 2000), and consequently resulted in the increased worth of an office building (Robinson, 2005). Based on the Office Tenant Survey by Colliers International, it was found that major companies perceived green buildings to offer not only cost savings through reduced energy consumption but also benefits such as increased productivity, decreased employee turnover, less sick leave and better morale (Blundell, 2010). These positive benefits of green buildings are frequently being emphasized as important justifications for a firm's shift to a green workplace.

Miller and Buys (2008) report that respondents in their research felt that to be located in a sustainable building would help staff morale and public perceptions. Through sustainability, companies can improve their competitive advantage in the recruitment and retention of talents. This is because health and comfort are becoming increasingly important with the growing concern about staff welfare. An extensive research conducted by Kumar and Fisk (2002) has claimed strong correlations between sustainable design features (e.g. natural lighting, thermal comfort, air quality, worker-controlled temperature and ventilation, etc.) and reduced illness symptoms, reduced absenteeism and significant increase in the measured productivity of the workforce.

Environmental Aspect

Sustainable buildings offer a lower level of environmental risk by helping to minimize the environmental footprint of the real estate industry on the environment. A longer building life cycle and a healthy environment for occupants are found to be some of the attributes commonly promoted as positive characteristics of a sustainable building (Ang & Wilkinson, 2008).

The sustainable attributes as highlighted by Schumann (2010) in the valuation process include location quality, competition analysis, building quality, architectural design, functionality, flexibility, and adaptability, user comfort,

infrastructure, quality of construction materials with regard to environmental/health, energy consumption, quality of building services, water and waste water consumption, indoor air quality, and transport costs. Other sustainable attributes also include usability by third parties, impact of subject site on neighbourhood, supply and demand of sustainable properties, analysis of current rent payment, analysis of operating costs and also any other value-influencing factors.

Haynes (2007) in Miller, Pogue, Gough and Davis (2009) established a model by incorporating seven distinct components to represent the concept of office productivity with the dimensions of both the physical and behavioural environment as follows:

1. Distraction (interruptions, crowding, noise, privacy, overall atmosphere)
2. Environmental services (ventilation, heating, natural lighting, artificial lighting)
3. Office layout (personal storage, general storage, work area, desk, overall office layout, position of colleagues, circulation space.
4. Interaction (social interaction, work interaction, physical security, creative physical environment)
5. Designated areas (informal meeting areas, formal meeting areas, quiet areas)
6. Comfort (decor, cleanliness, overall comfort)
7. Informal interaction points (position of equipment, refreshment areas)

DATA ANALYSIS

There were two stages of analysis: (a) CFA using IBM SPSS Version 20.0 and (b) SEM using AMOS 19.0.

Stage 1. The responses to the questionnaire were initially entered into the IBM SPSS Version 20.0 in order to conduct the CFA procedure. Prior to modelling the interrelationship between latent constructs in a SEM, the CFA should be conducted first in order to confirm their unidimensionality, validity and reliability. The unidimensionality assessment should be conducted first prior to assessing the validity and reliability (Zainudin, 2015).

In order to determine how fit is the model to the data in hand, there are several Fitness Indexes in SEM that should be fulfilled. There are three categories of model fit namely Absolute Fit, Incremental Fit and Parsimonious Fit (Zainudin, 2015). Zainudin (2015) also suggests the use of at least one fitness index from each category of model fit. The information concerning the model fit category, their level of acceptance and comments are shown in Table 1.

Table 1: The three categories of model fit and their level of acceptance

Name of category	Name of index	Level of acceptance
Absolute fit	Chi-square	P-value > 0.05. Not applicable for large sample size (more than 200)
	RMSEA	RMSEA < 0.08
	GFI	GFI > 0.90
Incremental fit	AGFI	AGFI > 0.90
	CFI	CFI > 0.90
	TLI	TLI > 0.90
	NFI	NFI > 0.90
Parsimonious fit	Chi-sq/df	Chi-sq/df <3.0

Source: Tuti (2016)

Stage 2. Since this study is a confirmatory research type with the development of a model with some underlying theory, SEM was employed during the analysis process. Therefore, after the issues of unidimensionality, validity and reliability have been addressed, the significant effects among environmental, social and economic factors and their attributes of green commercial office building were analysed through the development of structural model using SEM.

RESULTS

CFA

Table 2 indicates that all the standardized factor loading estimates for all three main constructs ranged from .69 to .99, exceeding the cutoff value of .05 unless item 8 and item 9 under main construct of environment. Both items were deleted due to low factor loading of less than .05. It resulting a new number of items for a total 49 measuring items. The AVE and CR estimates for all dimensions or sub constructs were above the cutoff value of .50 and .06 respectively.

Table 2: The CR and AVE for the all sub constructs in the model

Construct	Item	Factor Loading (above 0.6)	[a]CR (above 0.6)	[b]AVE (above 0.5)
Environment				
Indoor environment quality	1	0.72	0.913	0.612
	2	0.77		
	3	0.87		
	4	0.82		
	5	0.82		
	6	0.75		
	7	0.66		
Sustainable design features	1	0.76	0.905	0.705
	2	0.81		

	3	0.88		
	4	0.90		
Operational expenditure	1	0.86	0.783	0.633
	2	0.86		
	3	0.76		
	4	0.69		
Material and resources	1	0.81	0.888	0.664
	2	0.82		
	3	0.80		
	4	0.83		
Transportation	1	0.90	0.934	0.875
	2	0.97		
Locational factor	1	0.74	0.732	0.588
	2	0.78		
Air quality control	1	0.83	0.816	0.689
	2	0.83		
Social				
Productivity	1	0.76	0.851	0.544
	2	0.69		
	3	0.78		
	4	0.70		
	5	0.72		
Occupants' satisfaction and well-being	1	0.76	0.883	0.853
	2	0.81		
	3	0.81		
	4	0.85		
Marketing advantage	1	0.83	0.911	0.719
	2	0.88		
	3	0.84		
	4	0.84		
Economic				
Rental growth	1	0.93	0.900	0.694
	2	0.87		
	3	0.78		
	4	0.74		
Cash flow	1	0.86	0.922	0.703
	2	0.82		
	3	0.85		
	4	0.84		
	5	0.82		
Duration to sale	1	0.86	0.839	0.732
	2	0.84		

Source: Tuti (2016)

Note. AVE = average variance extracted; CR = construct reliability.

[a]CR: $\frac{(\Sigma_{i=1}^{n} L_i)^2}{(\Sigma_{i=1}^{n} L_i)^2 + (\Sigma_{i=1}^{n} e_i)}$ where L_i represents the standardized factor loading of *i*th items with a total of n items. ei refers to the error variance of *i*th term.

[b]AVE: $\frac{\Sigma_{j=1}^{n} L_j^2}{n}, L_j$ where L_i i represents the standardized factor loading n with *i*th item with a total of n items .

AMOS Output: The Unstandardized Estimate

In unstandardized estimates, the results show the regression path coefficient or regression weights for the model in this study. This indicates the estimate of beta coefficient, which measures the effects of exogenous construct and mediator construct on the endogenous construct.

In order to explore the relationship among the main construct, together with their underlying factors and attributes, this study tested the main hypotheses as illustrated in Figure 1.

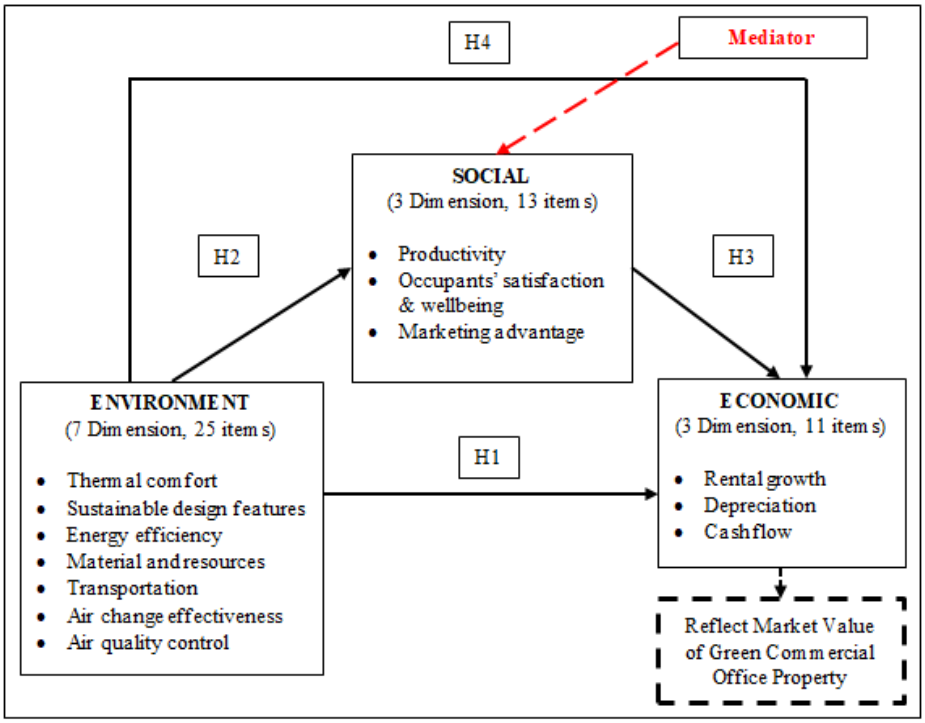


Figure 1: The hypothesized link under the respective hypothesis
Source: Tuti (2016)

DISCUSSION

H1: Environmental Aspect Has a Significant and Direct Influence on Economic Aspect

The SEM analysis of the first hypothesis indicates that the environment aspect has a significant and direct influence on economic aspect (Table 3).

Table 3: The path analysis of SEM for Hypothesis 1

Construct	Path	Construct	Estimate	S.E.	C.R.	P-Value	Result
Economic	<---	Environment	0.543	0.152	3.582	0.001	Significant

Source: Tuti (2016)

The environmental aspect consisted of seven factors with 25 attributes underlying each factor, while the economic aspect consisted of three factors with 11 attributes underlying each factor. The results show that environmental factors and their attributes positively correlated to all economic factors and attributes. Similarly, RICS (2005) also find that the environmental factors and their related attributes positively correlated to economic aspect of sustainability. For instance, sustainable design feature has a theoretical linkage to value in terms of improved marketability, reduced ongoing maintenance cost, higher sales/rent, absorption and re-tenanting. Charles et al. (2004) reveal that certified "green" commercial buildings exhibit higher real-estate values, presumably reflecting expectations for reduced operating costs, and improved organizational productivity through better indoor environments for employees.

The factor of indoor environment quality (IEQ) through the attributes such as indoor air quality, thermal comfort, and reduction contribute to the reduction of risk, greater marketability, faster sales and let, and also resulting in higher net operating income (NOI) and return on investment (ROI) (RICS, 2005). Previous studies undertaken on certified green buildings have determined that a rental rate premium exists in many cases through lower operating costs and enhanced marketability. This is attributed to the attractiveness of green buildings to prospective tenants in terms of their superior indoor environment.

From valuation perspective, the locational characteristics of a property are some of the most important factors considered when assessing asset value potential (Brandon, 2009). The rationale for mentioning the importance of locational characteristics in this discussion is that it is extremely difficult to separate and quantify locational attributes from other property specifics when analysing value. Locational factor is often the greatest determinant in an investor's decision to purchase a particular property. A property's specific location relative to its competition, its access to major transportation arteries and public transport, and overall visibility are critical factors in assessing the marketability of a property.

H2: Environmental Aspect Has a Significant and Direct Influence on Social Aspect

The result of SEM analysis, as shown in Table 4, indicates that the second hypothesis of this study was supported. The hypothesis was environment aspect

has a significant and direct influence on social aspect. All factors and attributes of environment were found positively correlated with all three factors and 13 attributes of social aspect.

Table 4: The path analysis of SEM for Hypothesis 2

Construct	Path	Construct	Estimate	S.E.	C.R.	P-Value	Result
Social	<---	Environment	1.062	0.142	7.466	0.001	Significant

Source: Tuti (2016)

Several studies have reported positive correlation between building's internal environment (e.g. ventilation, its indoor air quality, better lighting, natural light, clean and fresh air) and employee health and productivity (Wargocki, Wyon, Baik, Clausen, & Fanger, 2004). Indoor environmental conditions affect the prevalence of several very common health effects. These health effects lead to health care costs plus the costs of sick leave and reduced performance during periods of illness (Fisk, 2000). Similarly, extensive research conducted by Kampschroer and Heerwagen (2005) identified strong correlations between sustainable design features (e.g. natural lighting, thermal comfort, air quality, worker-controlled temperature and ventilation, etc.) and reduced illness symptoms, reduced absenteeism and significantly increases of measured productivity of workforces. Meanwhile, World Green Building Council (2013) argues that green design attributes of buildings and indoor environments have social impacts on worker productivity and occupant health and well-being. These two elements of productivity and health benefit contribute to any added capital costs for green buildings, as well as any increases in market value or rental premium, which lies in the realization of occupancy-related benefit.

H3: Social Aspect Has a Significant and Direct Influence on Economic Aspect

The result of SEM analysis on the third hypothesis also shows that the hypothesis was supported (Table 5). Enormous cost savings are being made in 'soft benefits' such as increased productivity, better health and well-being, improved morale and reduced absenteeism. In commercial office buildings, employee overhead is the highest cost, thus improving their productivity and reducing turnover and absenteeism may be a green building's most significance economic performance indicator (Davies, 2010). Reed & Wilkinson (2005) highlighted that increased staff productivity include lower staff absenteeism can be achieved in an energy efficient building and converted into a monetary saving.

Table 5: The path analysis of SEM for Hypothesis 3

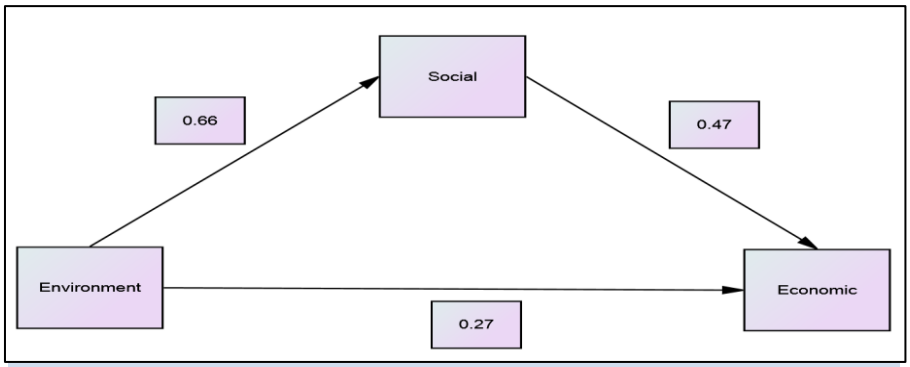
Construct	Path	Construct	Estimate	S.E.	C.R.	P-Value	Result
Economic	<---	Social	0.573	0.100	5.747	0.001	Significant

Source: Tuti (2016)

The owner of green building can also find that its image is seen much more positively. This helps to attract and retain tenants, employees, clients and suppliers, and, arguably, make green buildings more attractive to owner-occupiers and shareholders (Davies, 2010).

H4: Social aspect mediates the relationship between environment aspect and economic aspect of green commercial office property.

The social aspect was considered as a mediating variable in this study. The goal of mediation analysis is to clarify the nature of the relationship between the independent variable (IV) and dependent variable (DV). The results of the analysis as depicted in Figure 2 show that social aspect does mediate the relationship between IV (environment aspect) and DV (economic aspect). The type of mediation is called 'Partial Mediation' since the direct effect of environment aspect on economic aspect is still significant after social aspect enters the model. In this case, even though environment aspect has a significant direct effect on the economic aspect, it has also a significant indirect effect on the economic aspect through the mediator variable namely social aspect.



- The indirect effect = 0.66 x 0.47 = 0.310
- The direct effect 0.27
- The mediation occurs since indirect effect > direct effect
- Therefore, the type of mediation is **partially mediation** since direct effect is still significant after the mediator enters the model

Figure 2: Testing for mediation effect in a model
Source: Tuti (2016)

The concept of direct and indirect effect could be applied in the determination of green building's value. The value of green is defined as the net additional value obtainable by a green building in the market compared to conventional or non-green properties. The value is due to the financial benefits which are influenced by direct and indirect effects as argued by Lorenz & Lützkendorf (2008).

CONCLUSION

The findings of this study have overwhelmingly pointed to green commercial office property enjoying various advantages, which translate as an attribute of the property. All of those 49 identified attributes, through a CFA analysis have been divided into 13 factors, which belong to sustainability aspects of environment, social and economic.

Through the identified factors and attributes of green commercial office property that affecting their value, this study has also managed to prove that there are significant relationships among the sustainability aspects, namely environment, social and economic. Therefore, it can be suggested that all of identified factors and attributes of green commercial office property might be incorporated into valuation exercise, as sustainability aspects have been proved to have a significant relationship among their various variables that affecting the value of green buildings.

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IDENTITY, TRADITION AND THE CITY: DICHOTOMIES AND REALITIES OF CREATING AN URBAN LANGUAGE OF THE MALAY PALACE

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Abstract

This paper highlights a case study, its critical issues and the processes encountered in the evolution and development of its urbanised grammar. In deriving a localised language in which traditional forms are fused and transmuted into masonry architecture, the case study of the "Istana Negara" Palace is a case in point. The issues triggered within the design process, including how to represent a universal Malaysian identity reflecting Malay Asian character with Islamic vocabulary are explored. The difficulties and realities of transmuting and integrating such vocabulary to express and configure public masonry buildings are discussed. As an icon for the city, the palace must reconcile its scale with a clear localised vocabulary to fulfil the symbolic nature of the design. The conflicts and dichotomies encountered include three aspects: 1) The dome vs pitch form as an icon for the city (from afar) and the need for a strong roof silhouette 2) the local grammar and language including the pedestal and architrave vocabulary and elements 3) the difficulty of proportionate form. The research points to the necessity and urgency of developing a set of compositional rules and elements of the language of Malay urban architectural identity derived from the essences of tradition and regional form.

Keyword: Malay architecture, Istana Negara, identity, urban, tradition

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INTRODUCTION

Malay architecture and identity are disappearing in cities, as it is a form of traditional language and construction which predominantly arises from timber construction, detail and craftsmanship. Modern cities in Asia including Malaysia are predominantly are using concrete, steel and glass, whereby, its legacy of timber architecture is often no longer relevant in many urban sites. This scenario is strongly related to the urbanisation process faced by Asian cities (Kamarul Syahril Kamal, Lilawati Abdul Wahab, & Asmalia Che Ahmad, 2004). In the past, the palace not only represents both the ruler's domain, but it is a node and administrative building for the people of the Malay region and its districts (Sherif, 2015). It is also the highest expression of the aesthetics of Malay identity. The rich variations of the Malay identity are a representation of Malay architecture, which is primarily houses, mosques and palaces (E. Hosseini, 2012). The palace is one of the examples, clear rules of space and order, based on a generic archetypical form – which based on the notion of the 'classical' in Malay literature and nationalist discourse (Shireen Jahn Kassim, 2017).

Hence it is not surprising that, in his critique of the monuments of Putrajaya, King (2007) observes that "…there is nothing identifiably Malay in the styling and its antecedents. There is no trace of the (Malay) Southeast Asian Great Mosque tradition with its tiered pyramidal roof forms, open walls and preoccupation with air movement*".* King represents an external observer of a new modern city and master plan in Malaysia which is at the heart of the Malay world but with no discernible, dominant, recognisable identity and language characteristic in a South East Asian tradition - particularly in this large master development. Historically, the core of Malay settlements and as part of its manifestation of tropical cities of the past, the Malay palace is as described by Yuan (1997), "… the heightened refinement of Malay cultural form, traditions and language and the 'urban' and monumental version of the Malay vernacular house, being the first building built before the settlement grows."

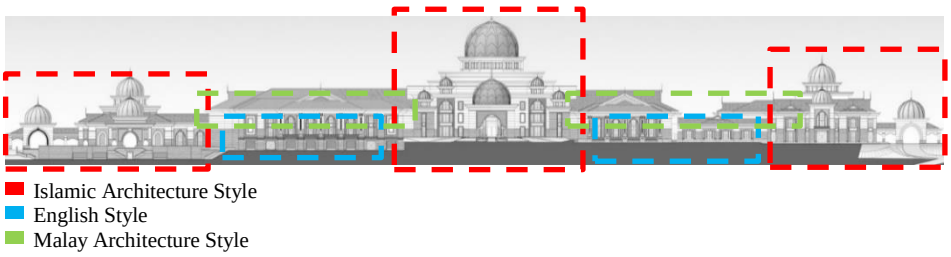


Figure 1: Front elevation of Istana Negara, Kuala Lumpur
Sources: Kumpulan Senireka, 2017. Dotted line by authors

The difficulty is in defining universal rules from the complexity and variation neighbouring countries, through trades, origins of the owner or Malay colonial and local influences the character of the different states (Moser, 2012). The research first looks at the problems encountered in an actual design process and scenario of translating identity in large and complex modern scale of a project with masonry elements. Figure 1 showed the ultimate hybrid form of the language, styling of columns, roof forms, decorations of facades and lifted structure of the Malay palace, for example, Istana Negara. The paper describes difficulties were found based on frontage elements of vocabulary stylistic analysis. The difficulties arise among other essential elements of architectural language such as (i) roof form, (ii) façade; windows, doors, walls and architraves, (iii) columns; bracket and pedestal, (iv) raised floor, (v) ornamentations and (vi) balustrade and railings.

CASE STUDY DESCRIPTION

Based on interviews with the architect and group of designers, the following is a compilation of their intentions, which led to their process and their particular ideas and design brief. There is definite Malay intention in the essential internal planning of the 'istana' as there was a high reference to the traditional Malay houses of the península. Analysis conducted from a random comparison layout of the *Istana Negara* and traditional Malay houses where the author found that *Istana Negara* layout is closely similar to the traditional layout. The *Istana Negara* layout has three different entrances which separating three main building functions, which each of the entrances marked by the existence of the domes.

Space Layout and Planning

The layout plan of the ***Istana Negara*** initiated by the significance of *tiang seri* in a traditional Malay house. '*Tiang seri'* is the first column to be built on site. The design of the Istana has an axial and strong symmetrical form which similarly to Istana Seri Menanti Layout. Figure 2 shows the essential hierarchy and axial form of Istana Negara. '*Rumah ibu'* in this context is referred to the main lobby. The main lobby is assumed to have a '*tiang seri'* which positioned in the centre of '*rumah ibu'* and capped by a central dome which house the *Balai Rong Seri*. As a summary, '*Tiang seri'* is symbolised by the grand dome at the centre while '*rumah ibu'* is the main lobby. On the *Hulu* side, Royal Wing exists as an isolated unit for special occasions, such as the arrival of foreign ambassadors. Abstract application of the spatial organisation of Istana Negara much related to traditional Malay house – *Hulu* side contains private quarters for '*tuan rumah*'. The adaptation of the Malay house might have similarity with the Royal Wing entrance. '*Tuan rumah*' is referred to Yang Di-Pertuan Agong, the official residence of our Majesty. Women visitors in the abstract adaptation of Istana Negara referred to foreign ambassadors. Foreign ambassadors enter the Royal

Wing to sleep over in Istana Negara. While *East* Wing on *hilir* side become the normal entrance for the public, neither VIPs nor Ministers. The spaces on this side accommodated for occasions, such as Tea Party, become public affairs with other guests. Adapting to the concept of *'hilir'* in traditional Malay houses – it is spatially reflecting the spaces of traditional houses for "anak bujang" or bachelors and guests at '*pangkal serambi*' or veranda.

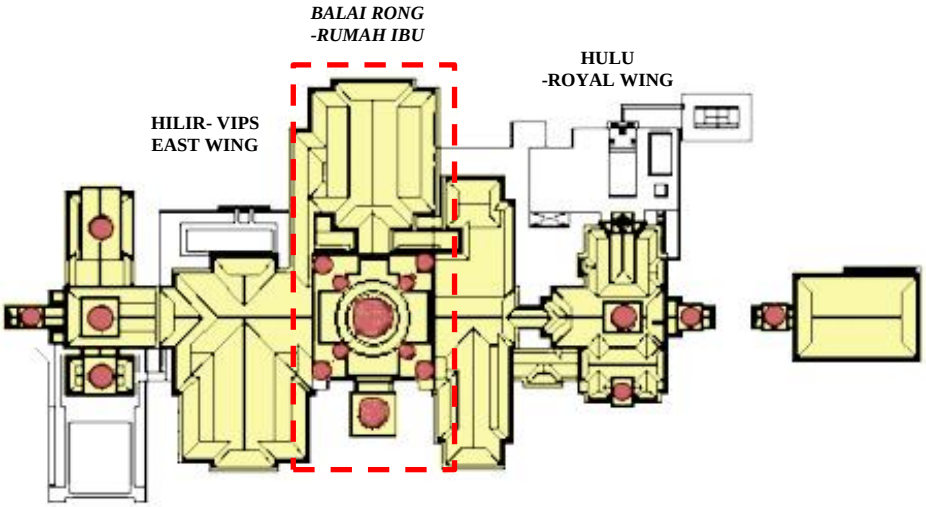


Figure 2: Shows the essential hierarchy and axial form of Istana Negara
Sources: Kumpulan Senireka, 2017. Dotted line by authors

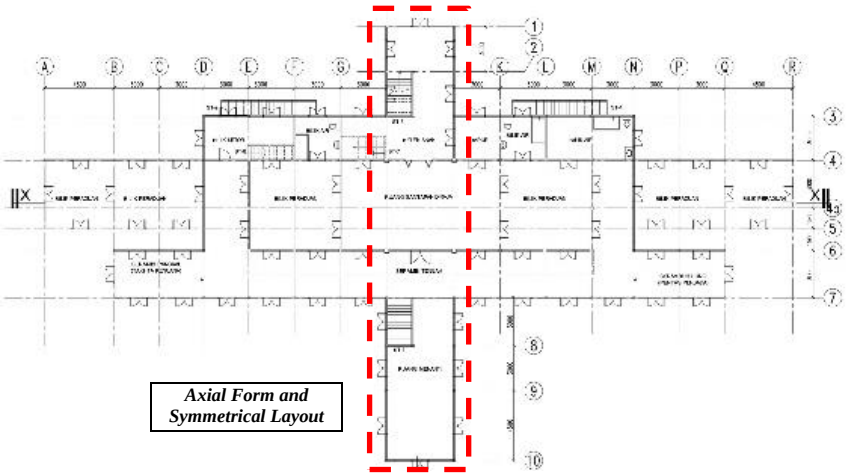


Figure 3: An axial form and strong symmetrical layout of Istana Seri Menanti
Sources: Kumpulan Senireka, 2017. Dotted line by authors

The grand entrance - paralleled to Royal Banquet Hall is the Prime Minister and other Ministers as well as VIP guests entrance. It has a reception lounge called the "*Bilik Mengadap*" for receiving audiences by His Majesty, where traditionally referring to the visitor's especially male guests are to be greeted and entertained at '*hujung serambi'* and '*rumah ibu'*, so-called mother of the house. The traditional Malay houses layout planning dictate the *Istana Negara* layout to follow the social mores of the Malays, such as the provision of a private space for the womenfolk and a public space for the entertaining of Malay guests. Social segregation and the observance of the court behaviour in respect to hierarchy dictated the spatial organisation. The apparent difference found in the traditional Malay house and Istana Negara are the physical barriers. Traditional Malay houses are known for its congenial aspects – openness, the absence of partitions or solid ceiling-height walls separating the different areas. The houses divided into areas, rather than rooms for various social and household activities, while in Istana Negara, the establishment of barriers is the public and private domain which marked the territories for royalty and commoners. The elevation reflects a combination of '*bumbung panjang',* and Islamic vocabulary in 'Classical' proportion also contradict with the norm of traditional Malay style. Comparing Figure 4, 5 and 6; it can be argued that the Istana Negara be a fusion of the axial typology and dual- symmetry typology of the Malay traditional palace form (Tengku Anis, 2017). The Istana Negara also reflect the 'bumbung panjang' form as in figure 5 while at the same time having an axial massing (a layout with an axis or strong vertical or horizontal line at the centre of a massing) as in Figure 6.

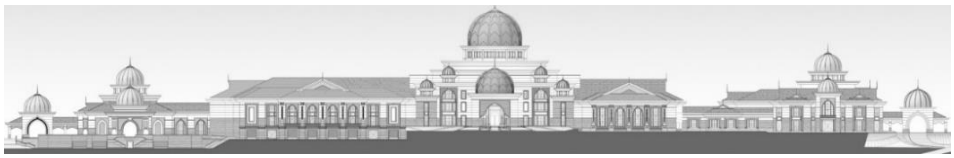


Figure 4: Istana Negara front elevation
Source: Kumpulan Senireka Sdn. Bhd., 2017

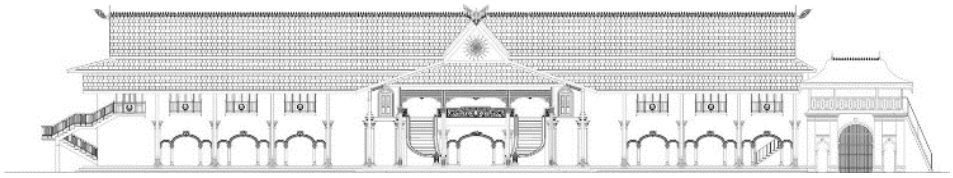


Figure 5: The Royal Audience Hall, Kedah – Elevation showing syncretism of Colonial and Malay form dominating the overall expression
Source: IIUM KAED Heritage Center, 2017

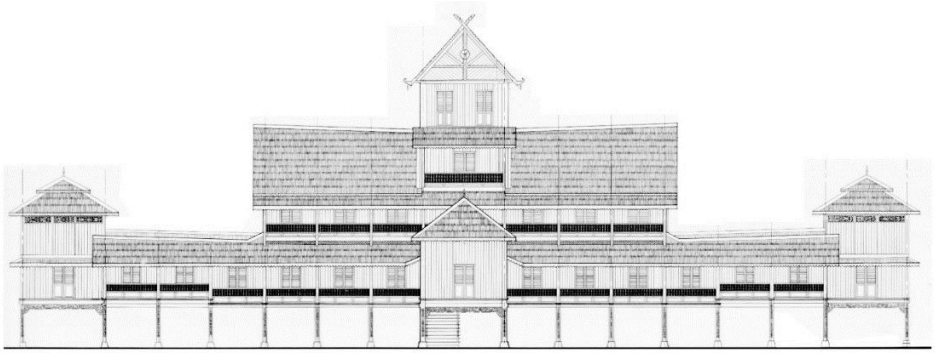


Figure 6: The Istana Seri Menanti, front elevation
Source: KALAM, UTM, 2017

Elevations and Façade Treatments

There is an intuitive system of proportion used as the basis of elevation design of the Istana Negara as shown in Figure 7, which classical orders, repetition and hierarchy expressed. The proportions of the dome, roof, door, pillars, windows, arches, and the row of upper windows governed by simple division of an underlying grid. The walls form a cuboid, while the height of the dome corresponds to the traditional roof and height of the pillars. Designs for Istana Negara facade based on the rectangular block which features a central section, the grand entrance at Royal Banquet Hall, balanced on either side by wings of almost similar dimension and appearance. It is further enhanced by an array of the '*limas*' roof, row of pointed arch and rectangular windows, pillars and pilasters, as well as various sizes of domes.

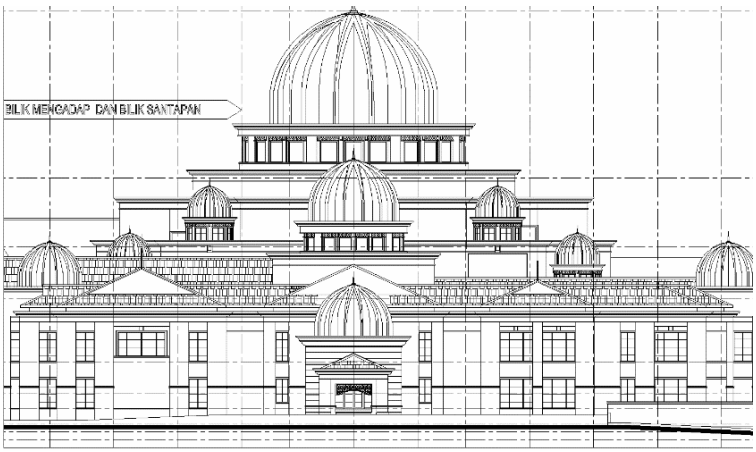


Figure 7: Symmetry adds balance and rhythm in Istana Negara façade. The massive dome surrounded with semi-domes. The domes create a form that reflect hierarchy.
Source: Kumpulan Senireka Sdn. Bhd, 2017

Based on an interview conducted with its principal architect Ar. Nik Arshad, there was not only an intention to express Malay identity alone but also to uphold Islamic identity as this was requested officially by the government. To meet such national objectives and agenda, the dome was utilised as a device for symbolic purposes. Its centrality creates the verticality of the central space and makes it essential. A new system of space was created by the hierarchy of the central dome and the semi-domes. The design of the domes is based on the plan that shows the 14-ribs, symbolising the number of states in Malaysia. These dichotomies are related to the formality needed and in this case, these are resolved through the infusing Classical, Neo-Classical and Palladian language of architecture. Figure 8 shows how; 1) the triangular pediment was fused with Malay roof language (to adorn the roofscape), 2) to embellish the frontage the use of Classical 'orders' was slightly mutated but based on the tripartite system of the base, column, and capital.

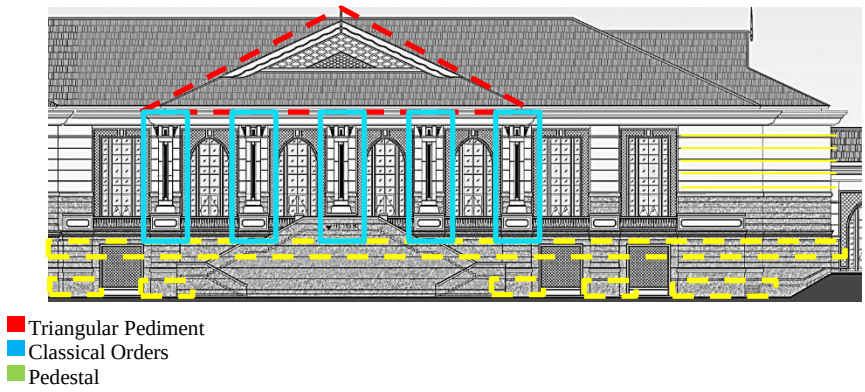


Figure 8: Infusion of Classical, and Palladian language of architecture of Istana Negara
Sources: Kumpulan Senireka Sdn. Bhd, 2017. Dotted lines by authors

FINDINGS AND ARGUMENT

The Istana Negara – dichotomy in design process

Roof Forms

While the typical expectation is to surmount the masonry body with an iconic Malay pitch roof, there were essential dichotomies in a symmetrical domed structure exposed in the middle due to the scale and size of the Istana Negara. As described by Sherif (2015), '…The systems of proportions governing the elevation of this building and the dimensions of the building elements are all governed by simple division of the basic grid' which can be seen in Figure 11 From an aerial viewpoint as per Figure 9, the '*bumbung limas'* or '*bumbung*

panjang' dominates the roof surface area, however when viewed from the ground and afar, the Malay '*bumbung limas'* appear to be subdued and less dominant compared to the occasional domes that mark the entrance area of the palace. Conventionally, Figure 10 indicates that the domes are relatively higher than Malay traditional-style roofs. Hence, the hierarchy of massing as expressed through the Istana Negara form seem to be expressed by variations in the dome levels rather than the traditional Malay roof.

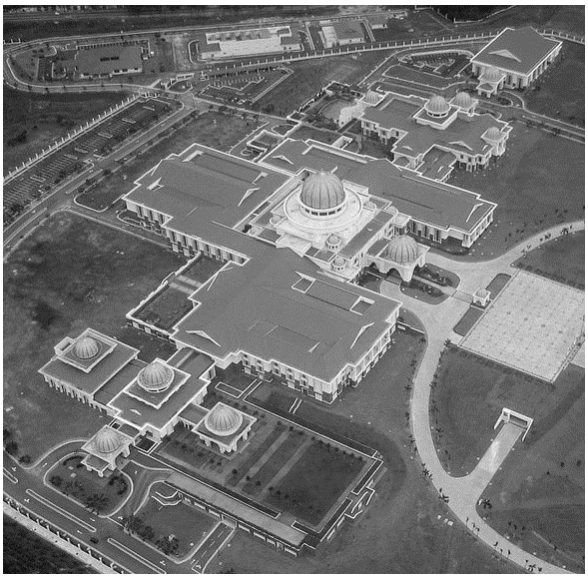


Figure 9: From aerial viewpoints of Istana Negara, the 'bumbung limas' or 'bumbung panjang' are dominated more than 90% of the roof surfaces.
Sources: http://www.panoramio.com/photo/74835458, 2017

Domes

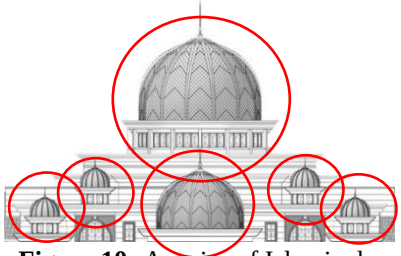


Figure 10: A series of Islamic domes was used to express the symbolic nature of the roof for Istana Negara.
Sources: Kumpulan Senireka Sdn. Bhd, 2017. Circled by authors

Bumbung Limas

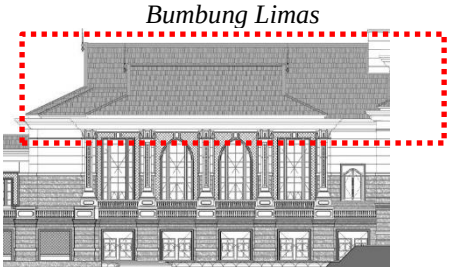


Figure 11: The Limas roof surfaces in Istana Negara are using 'Bumbung Limas' but still appear subdued.
Sources: Kumpulan Senireka Sdn. Bhd, 2017. Ddotted lines by authors

Gable - end /'*Tebar layar'*, Facia Board '*Papan manis'* and '*Tunjuk Langit'* are the attempts made by the architects to enhanced the Malay Architecture Features. Figure 12 shows the '*Tebar layar'*, Facia Board '*Papan manis'* and '*Tunjuk Langit'* in *Istana Negara* which the author's find identical features in Baitul Rahmah, Perak in Figure 13.

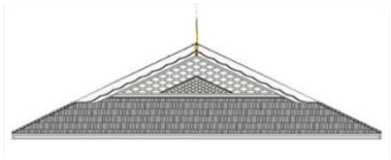


Figure 12: Gable end/ *'Tebar layar'* , facia board and '*Tunjuk Langit'*
Sources: Kumpulan Senireka Sdn. Bhd, 2017, Circled by authors

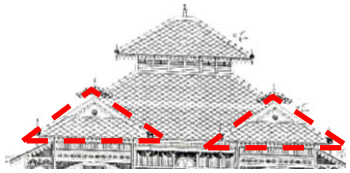


Figure 13: The front façade of Baitu Rahmah that shows the gable end roof.
Source: IIUM KAED Heritage Center, 2017. Dotted by authors

Windows and Doors

The windows and doors appear in two shapes: one comprised rectangular windows with two different grille styles and the other high-length pointed arch windows with ornate 'Glass Fibre Reinforced Concrete' (GFRC) frames. Figure 14 shows the window and door designs in Istana Negara were inspired by European styles where keystone was placed at the middle, while Figure 15 shows the other types with the pointed arches recalling Islamic identity.

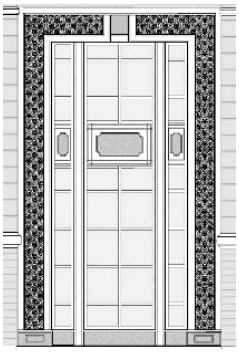


Figure 14: European styles of door and window where keystone
Sources: Kumpulan Senireka Sdn. Bhd, 2017

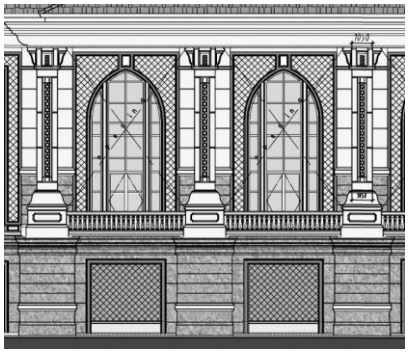


Figure 15: Pointed arches recalling Islamic identity of door and window
Source: IIUM KAED Heritage Center, 2017

Walls and Architraves

As one of the most challenging elements as there is no immediate precedent in Malay Architecture of the form, the architrave and pedestal designs referred to simple classical forms and motifs. These are particularly crucial as these elements help the façade design look less 'empty' as an attempt by architects for Istana

Negara as Figure 16. Though many have criticised the Arab-eclectic of the Istana, yet evidently, there is an essential difficulty in any direct translation, transposition, and transmutation of Malay-timber based construction with materials as these needed a rescaled composition.

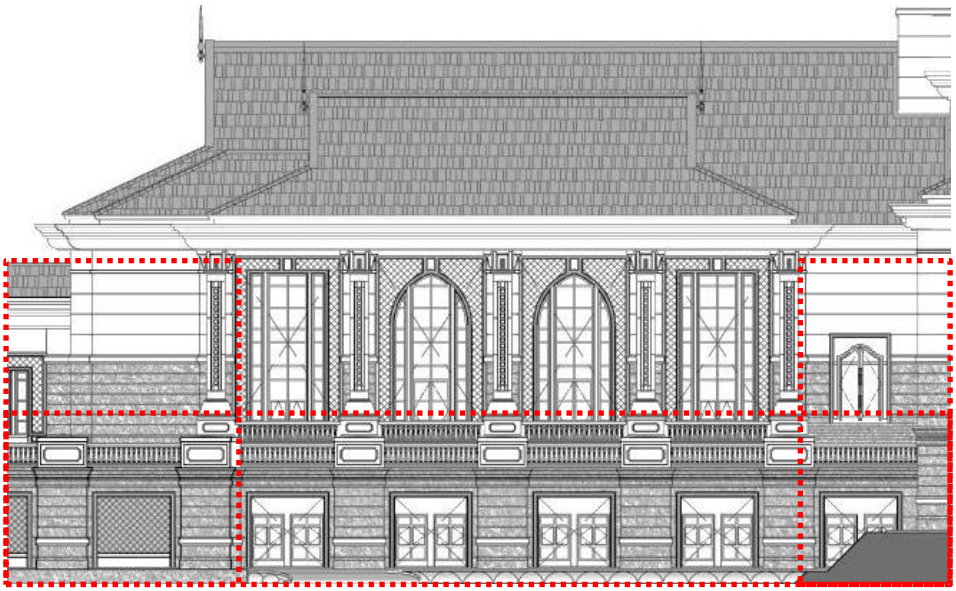


Figure 16: Architraves and façade pedestals
Sources: Kumpulan Senireka Sdn. Bhd, 2017. Dotted lines by authors

Columns

The character of Malay columns has been said as thin and slender (Shireen Jahn Kassim, 2017). The Malay character observed in traditional column styles can be typically distinguished by unadorned capitals and bases, unfluted columns, plain entablature, resting on a square plinth but with ornate brackets. Here the cornice is composed by an ovolo. Table 1 shows the ovolo mouldings are modularised look-alike '*sesiku*' or bracket elements.

Table 1: Comparisons of sesiku (Bracket)

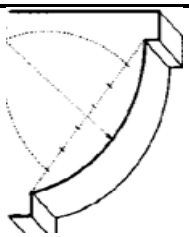
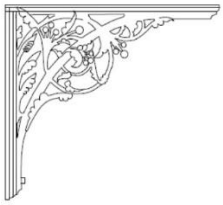
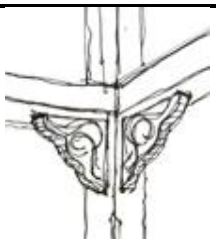
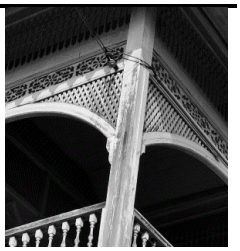
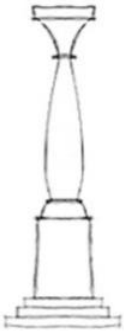
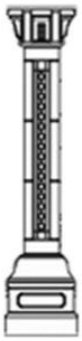
Classical Style	Balai Besar Kedah	Masjid Kampung Laut	Baitul Rahmah, Perak
			
The ovolo mouldings -quarter-round by European woodworkers.	'*Sesiku'@*, Balai Besar Kedah *Source: IIUM KAED Heritage Center, 2017*	'Sesiku' bracket, Balai Besar Kedah	'Sesiku' bracket, Baitul Rahmah, Perak.

Table 2: Comparisons of columns

Classical Column (8^{th}- 9^{th} B.C)	Column, Istana Jahar, Kota Bharu (1855)	Column, Istana Negara, Kuala Lumpur	Column, Istana Baitul Rahmah, Perak (1911)
			

A distinctly organised and compositional system was cultivated. There is no immediate Malay-based vocabulary for masonry elements like pedestals, yet local vocabulary reflecting Malay-Classical form and functions is found in the '*lapik tiang'* in 1800's era at Istana Jahar, Kota Bharu and Baitul Rahmah, Perak. Table 2 shows a comparison of the different columns and identical elements that syncretise the old and new tradition by mutating a variation of the column in Istana Negara. Figure 17 and 18 reflects the eventual shape of the Istana Negara column which is a trapezoidal form of pedestal found in many palaces including Istana Seri Menanti, Negeri Sembilan.

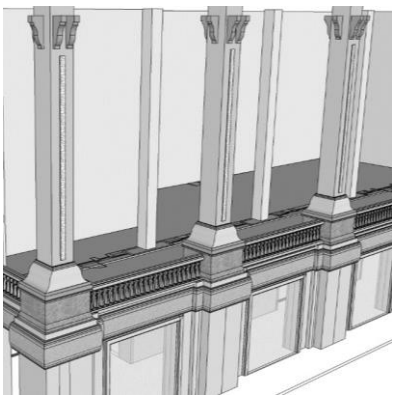


Figure 17: Columns and pedestals Istana Negara
Sources: Kumpulan Senireka Sdn. Bhd, 2017

Figure 18: Columns and pedestals At Istana Seri Menanti, Negeri Sembilan

Raised Floor and 'Lapik Tiang

The characteristic form of Malay hybrid architecture comprises two levels, rests on series of square columns - composed of ovolo mouldings and high square bases. The upper levels are wide-open verandas, giving an impression of a basic concept of raised floor in traditional Malay houses. In the past, pillars had no longer buried in the ground like in the existing original Malay houses (Nasir, 1997). Figure 19 and 20 shows that the concrete bases are higher and the pillars are slender.

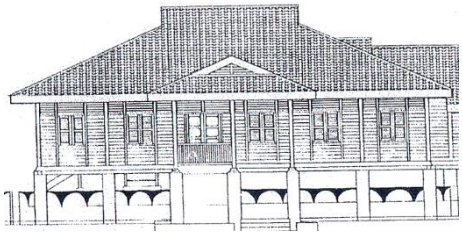


Figure 19: Most of Malay houses with pedestal called 'lapik tiang' (base of the post) or 'alam tiang'.
Source: KALAM, UTM, 2017

Figure 20: Most of Malay houses with pedestal called 'lapik tiang' (base of the post) or 'alam tiang.'

Ornamentations

A constant issue during the design process is which traditional motif can be universally accepted as a national symbol and language. Eventually the architects decided to use the '*Bunga Raya'* motif which was abstracted into five petal form and universally applied as window frames and transoms. Figure 21 and 22 of the Bunga Raya motif was repeated into transoms as an emblem in the window and door panels which the input of experienced Malay craftsmen. In Istana Negara,

natural elements like hibiscus are used as a motif on the G.F.R.C grille design. There are many varieties of hibiscus, but the five-petalled hibiscus Rosa Sinensis as per Figure 23 and 24 was chosen by Tuanku Abdul Rahman in 1960 as used - the national flower of Malaysia.

The terms 'Bunga' in Malay means flower, while 'Raya' means grand. In an attempt to base national unity, the hibiscus motif was used throughout the embelishments of the G.R.C grilles. Auguste Perret, who attempted to create a localised yet modern classical language using reinforced concrete in Perret's Rue D Apartment in Paris, France. Figure 25 shows how interestingly Perret's design treatments on wall while figure 26 indicates the edges of columns with decorative finials which similar to the buah buton of Malay Asian timber based tradition.

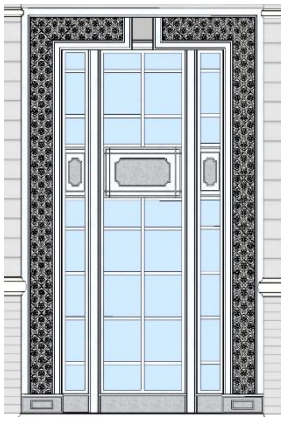


Figure 21: Window and door decorated with GFRC of hibiscus patterns.
Sources: Kumpulan Senireka Sdn. Bhd, 2017

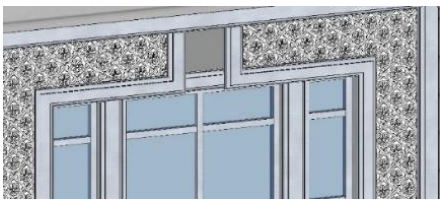


Figure 22: Hibiscus motifs decorating window frames and transom
Sources: Kumpulan Senireka Sdn. Bhd, 2017

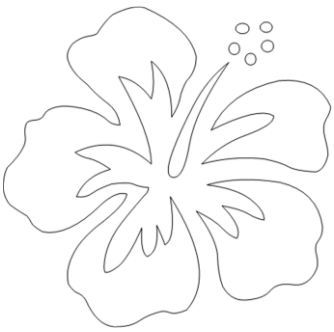


Figure 24: The hibiscus Rosa Sinensis is the national flower of Malaysia
Sources: Kumpulan Senireka Sdn. Bhd, 2017

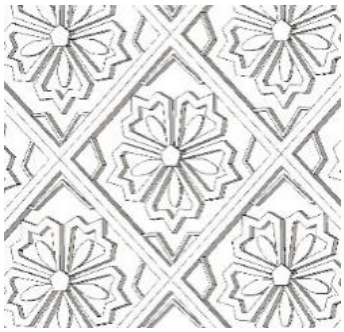


Figure 24: A motif simplification of hibiscus turns to GFRC
Sources: Kumpulan Senireka Sdn. Bhd, 2017

Figure 25: Perret's Rue D Apartment France, flower motifs used to decorate empty surfaces of concrete walls

Figure 26: The decorative finials which similar to the buah buton Malay Asian timber based tradition.

Figure 27: Conceptual modelling by the architect of the balustrade
Sources: Kumpulan Senireka Sdn. Bhd, 2017

Figure 28: The 'keris' form incised on the balcony's railings and balustrade elements.
Sources: Kumpulan Senireka Sdn. Bhd, 2017

Balustrade, Railings and Fencing

Balustrades in Malay traditional architecture range from timber forms such as in figure 27. Due to the difficulties in designing balustrades that reflect national identity, the decision was to use the local yet universal symbol of the *'keris'* to evoke Malay identity. The *'keris'* form is incised on the balcony's railing elements as per figure 28.

CONCLUSION

There is still exist a gap in the formulation of a language in the context of the urban development of cities which can be derived from the traditions of the past including the Malay palatial architecture, and to learn from its principles and vocabulary. The distillations of such Malay architectural language are critically needed as these would not only reflect the regional identity and present a symbolic expression of urban buildings but a path towards sustainability. Without such forms, there is a tendency to copy and evoke Western or Arab elements in public buildings because lack of local grammar of masonry buildings. Some may think that the traditional Malay architecture arec rooted the past and such forms may not be relevant or fashionable enough to the modern world. Hence, there are examples related to the urban language which relate to the sustainability of the city which requires an in-depth study of tectonic elements that can be derived from the intrinsic values and forms of traditional architecture in urban contexts. Secondly, efforts of deriving national identity at national and international levels should be studied and understood. The issues for Malaysian architects, clients and government bodies are the application of Malay architecture values and design in contemporary administrative buildings. More analysis need to be done on masonry elements of traditional palaces such as to pave the path forward. The resolution of Malay architecture language is crucial for the stability, identity, socio-culture development and maturity of the nation.

ACKNOWLEDGEMENT

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HUMAN INTERDEPENDENCY FOR SUSTAINABLE WELL-BEING: STRUCTURAL INVARIANCE ACROSS SETTLEMENT AREAS

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Abstract

This survey research examined the underlying structure of subjective sustainable well-being (SSWB) discovered in the relationships of (i) Human Interdependence with other Humans (HIH), (ii) Human Interdependence with the Environment (HIE), and (iii) subjective well-being (SWB). The objectives of the empirical analysis were (i) to assess the causal relationship between human interdependence and SWB which instituted the SSWB structural model, and (ii) to evaluate the settlement areas-invariant of the causal structure of SSWB. The data was collected from self-reported questionnaires administered to 4315 working Malaysians. The findings of the structural equation modelling supported the adequacy of SSWB. The results also found that settlement areas, in particular the urban, sub-urban and rural areas, appeared to moderate the structural relationships of SSWB.

Keyword: subjective sustainable well-being, human interdependency

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INTRODUCTION

An increasing number of studies in the growing movement of positive psychology discovered new and potent determinants of subjective sustainable well-being [SSWB], called human interdependency. Human interdependence focuses on the change in one's well-being that is reciprocal to the change in others' well-being due to one's contribution. In return, the contribution that one's intentionally or unintentionally imparted to others positively influence one's subjective well-being [SWB]. Two recognized contexts of human interdependency are (i) human interdependence with other humans [HIH] and (ii) human interdependence with the environment [HIE]. Based on extensive literature reviews, there were four HIH dimensions and four HIE dimensions (Table 1). The structural model of SSWB was represented in the causal structure between human interdependency and SWB. This research also intends to examine the differences in causal effects of human interdependency on SWB across urban, suburban and rural areas in Malaysia.

Table 1: HIH and HIE dimensions: Definitions and manifestations

	Dimensions	Definitions	Manifestations
HIH	Personal Empowerment	Adjusting self to develop self-awareness (understanding strengths and limits) and self-esteem (confidence) to fulfil potentials and achieve realistic goals	self-determination, opportunity to exercise control, voice and choice
	Positive Relations	Level of understanding in personal relations enacted and received through acceptance and inclusion, motivation and assistance, and forgiveness and self-regulation.	positive experience of trusts, nurturance and affection
	Organizational Opportunity	Positive leadership, wellness of individual and teamwork, positive emotions and prevention of anti-social behaviours at work that foster autonomy, relatedness and motivation.	inclusions, learning and horizontal structures
	Community Movement	Active participation through full commitment to communal initiative and effective leadership to create favourable conditions of economic and social progress.	social supports and availability of supports throughout life cycle
HIE	Personality and Lifestyle	The organized developing system within an individual, manifested in patterns of feelings, thinking and behaving that represent the collectivistic actions.	Lifestyles, life values and personal qualities
	Interaction with Nature	An interpretation of involuntary and voluntary relationship with nature that demonstrate attitudes towards nature and the mental abilities in the attitudes.	The need to interact with nature, norms and skills relating to natural environment
	Attitude & Pro-Environmental Behaviour	Positive and responsible behaviour towards environment enacted in behaviour intention, attitudes and behaviour, subjective norms, and social and moral values.	Environmental sensitivity, knowledge, attitude, skills and behaviour
	External Condition	Contextual and situational factors referring to economic constraints, policy and legal actions, social pressures, collective preferences, availability and market supply.	Convenience, legalities, physical context, cultural roots and social values

Source: Bakar, Osman, Bachok, Ibrahim, & Abdullah (2015).

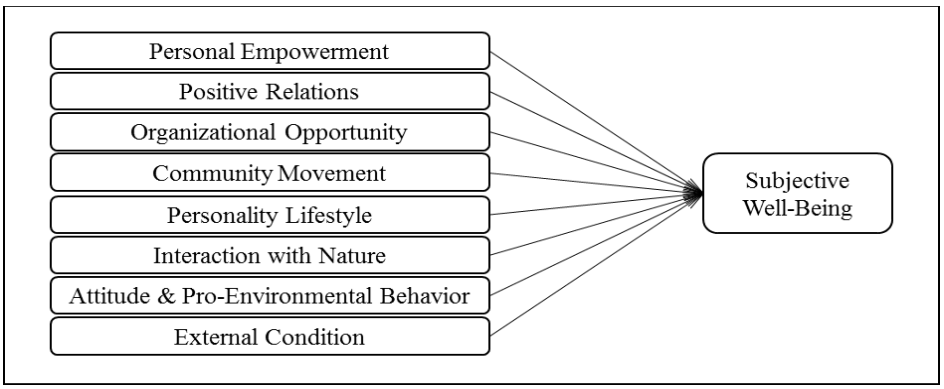

Figure 1: Theoretical framework of SSWB

Based on theoretical underpinnings, the research hypotheses were posed:

H_1 *SSWB was a multidimensional construct comprising of nine interrelated constructs*

H_2 *The measure of multidimensional SSWB is construct-valid*

H_3 *Human interdependence has a direct and positive causal effect on SWB*

H_4 *Settlement areas (urban, sub-urban and rural areas) significantly moderate the relationship between human interdependence and SWB*

METHOD

The data collection method employed for the research was survey questionnaires. Structural Equation Modelling [SEM] was used to analyse the causal effects of HIH and HIE on SWB.

Sample

A survey questionnaire was conducted across Malaysia from December 2015 to February 2016, targeting at working Malaysians aged from 18 to 65 years old. Originally, the samples totalled to 4450. After data screening process, 135 samples were omitted. The minimum samples for the analysis procedures was satisfied, with final sample of 4315, providing a ratio over 40 cases per variable.

The samples were equally distributed across gender, male (50.5%) and female (49.5%). Majority of the respondents were youth, aged from 18 to 30 years old (57.1%); while the remaining respondents were in their middle age, 31 to 59 years old (42.6%); and retirement age, 60 years old and above (0.3%). The Malays made up the majority (77.5%), while the rest were Chinese (9.1%), Indians (2.9%), others (10.5%). Over half of the respondents had higher education level (63.3%), while the rest of the respondents had secondary education level (23.8%), primary education level (10.5%), and others (2.4%). Additionally, 32.9% of the respondents were working in the government sector, 46.7% of the respondents were working in the private sector and 20.5% of the respondents were freelancers. In terms of household income, 39.6% of the respondents'

earned below RM 3,000, while the rest of the respondents earned between RM 3,000 to RM 7,000 (41.7%) and over RM 7,000 (18.7%).

Measures

The survey was a self-reported 100-item questionnaire measuring HIH, HIE and SWB. Respondents rate their level of HIH, HIE and SWB on 11-point Likert Scale measures. Twenty of the items measure the SWB. The SWB items were selected from the Satisfaction with Life Surveys [SWLS] (Pavot & Diener, 2008), the Flourishing Scale [FS] (Diener et al., 2009) and the Questionnaire for Eudaimonic Well-Being [QEWB] (Waterman et al., 2010). The remaining 80 items were primarily drawn from extensive literature review, and were used on previous studies concerning HIH (40 items), and HIE (40 items). As such the items had been empirically tested prior to being selected for the study. Every HIH and HIE dimensions were measured by 10 items. The dimensions were (i) personal empowerment (PE), (ii) positive relations (PR), (iii) organizational opportunity (OO), (iv) community movement (CM), (v) personality and lifestyle (PL), (vi) interaction with nature (IN), (vii) attitude and pro-environmental behaviour (AP), and (viii) external condition (EC). Table 2 displays examples of self-reported items from each dimension of HIH and HIE.

Table 2: Examples of self-reported items for each HIH and HIE Dimensions

	Examples of Self-Reported Items
PE	'*I would still work hard to achieve the easy goals in life*', '*I work hard to make sure that people are comfortable with me*', and '*I tackled problems efficiently in unexpected conditions*'.
PR	'*I am aware and eager to know how others are doing in their lives*', '*I make sure others are engaged in decision making processes*', and '*I am conscious when I make mistakes and quickly apologize*'.
OO	'*I clearly understand the tasks and my role at work*', '*Ideas and suggestions by my co-workers are valuable to me*', and '*I willingly share my skills and knowledge with my co-workers*'.
CM	'*I actively participate in the organized activities*', '*I usually take a short time to adjust to new social environment*', and '*I can influence the decision made by the community*'
PL	'*Good relationships are important than personal achievement*', '*I do not mind if I cannot afford to buy the things I like*', and '*I always think about the destruction we are doing to the environment*'.
IN	'*My health and well-being depends on the outdoor environment that I live in*', '*I can see and hear what others usually miss in the natural environment*', and '*I spend time planting at home*'.
AP	'*I turn off taps when I brush my teeth*', '*I separate rubbish at home (plastics, cans, papers, etc)*', and '*I purchase products that are organically grown produce*'.
EC	'*My family cherish pro-environmental behaviours*', '*The price of environmental-friendly products are affordable*', and '*The civic amenities functions favourably in maintaining conducive environment*'.

Source: Bakar, Osman, Bachok, Ibrahim, & Abdullah (2016a; 2016b).

ANALYSIS

Exploratory Factor Analysis

Principal Axis Factoring with Promax rotation were conducted to explore the underlying structure of the responses. Due to large sample size and number of items, multiple EFA procedures were undertaken to carefully examine the underlying factor structure of the 100 items. Factoring the optimum number of factors involved two-step attempts. In the first attempt, the EFA was generated separately for each dimension of HIH and HIE as well as SWB using force-factor extraction method. The EFA yielded three factors for each HIH and HIE dimensions and six factors for SWB. The second attempt generated an EFA solution for all 100 items. Thirty factors were extracted and items loaded on their strongest affiliated factors (loadings >.6) reflecting the first step. Scree test was generated and the scree plot supported the extracted nine second-order factors (eigenvalue > 2.0) and the extracted 30 first-order factors (eigenvalue >.6). The 30-factor solution achieved convergent validity ($\bar{x}$ loadings > .7) and discriminant validity (inter-factor correlations < .7) at the EFA stage. The thirty factor structure solution achieved factorability requirements (χ^2 (4950) = 389404.645, p =.001, KMO Measure of Sampling Adequacy =.975). The R-matrix indicated for each item, there were no less than 10 items correlated at least .3, and none of the correlations were above .9, indicating reasonable factorability of all items and that items were not largely subjected to multicollinearity. The diagonals of the anti-image were over .5, justifying the inclusion of all 100 items in the EFA. The communalities were between .4 and .8. The total common variance shared was 75.67%. The EFA output showed that (i) there were common variances shared between items, (ii) none of the items were outliers, and (iii) statistically interpretable factors were extracted.

Confirmatory Factor Analysis

In light of the EFA findings, the CFA also found that the measurement model was best identified with 30 first-order constructs, explained by nine second-order constructs. Unidimensionality and construct validity were achieved. Yet model fit was still marginally weak. After re-specification procedures, model fit indices satisfied the critical cut-scores (χ2 (4703) = 20911.161, p = 0.001; RMSEA = 0.028; GFI = 0.958; CFI = 0.958; TLI = 0.958; NFI = 0.947; relative chi-square = 4.446), along with substantial unidimensionality (all factor loadings > .7) and construct validity (CR ≥.7; H ≥.8; AVE ≥ .5; AVE > MSV; Inter-construct Correlations < .85). Final tests were conducted to screen for (i) common method bias, using Common Latent Factor, (ii) multicollinearity issues, using Variance Inflation Factor and (iii) influential outliers, using Cook's Distance. The assessment confirmed that the measurement model (Figure 1, left), treated with

free parameters (covariate errors) based on modification indices was not subjected to the mentioned issues.

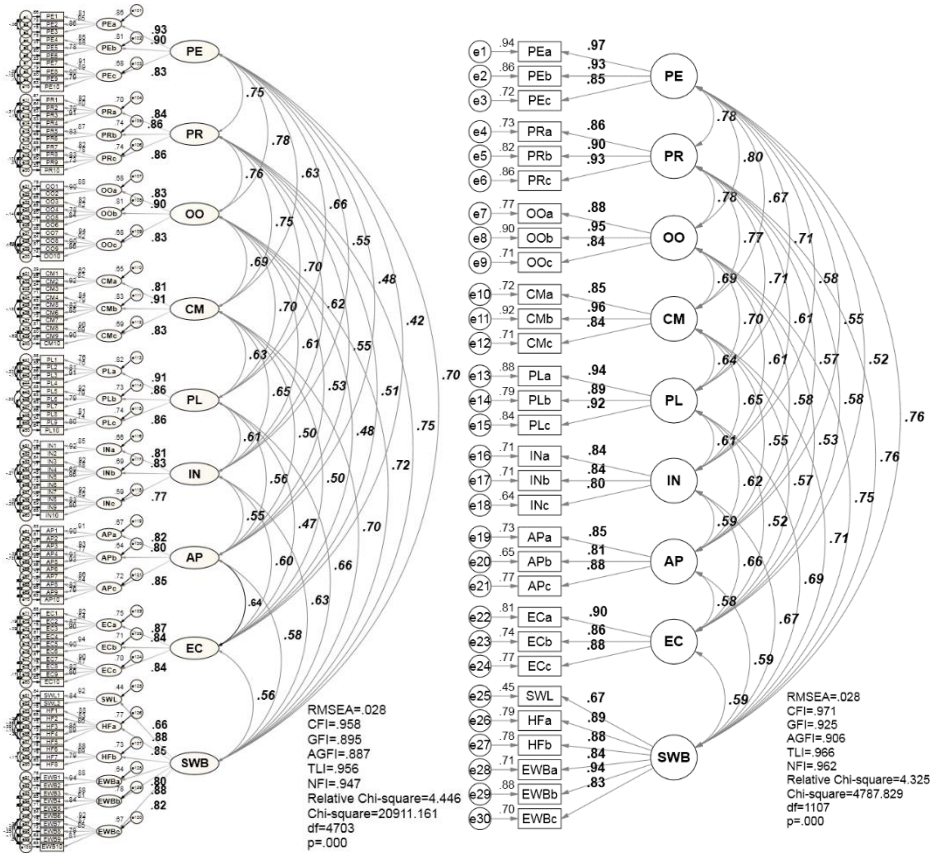

Figure 1: SSWB multidimensional measurement model (left),
imputed measurement model: configural invariance among settlement areas (right).

The CFA confirmed that SSWB was a multidimensional construct comprising of 30 interrelated first-order constructs and nine interrelated second-order constructs. The measure of SSWB was also a construct-valid. There was no evident that the measurement model was incorrect (Figure 1, left). The factor solution was imputed using the regression imputation. In other words, the observed items were regressed into the 30 first-order constructs. Hence the 30 first-order latent constructs became the observed variables, explained by nine latent variables (Figure 1, right).

The imputed measurement model was assessed for invariance across urban (n = 1590), suburban (n = 1654), and rural (n = 1071) areas. The configural invariance (Figure 1) satisfied the model fit requirement, $\chi 2$ (1107) = 4787.829, p = 0.001; RMSEA = 0.028; GFI = 0.925; CFI = 0.971; TLI = 0.996; NFI = 0.962; relative chi-square = 4.325. The factor structure concerning (i) the factor patterns, (ii) the number of factors, and (iii) the specifications of free and fixed patterns of factor loadings were equivalent across settlement areas. The metric invariance was assessed using critical ratio of differences. Partial metric invariance was achieved across settlement areas. The result indicated that at least one item loading from every latent factor was invariant across settlement areas (CR < 1.96). The settlement areas-invariant tests evidenced sufficient measurement invariant to proceed to multi-group analysis in structural model

Structural Model

The SEM of HIH and HIE dimensions→SWB showed consistency between the hypothesized causal relationships and the data, ($\chi 2$ (4703) = 20911.161, p = 0.001; RMSEA = 0.028; GFI = 0.958; CFI = 0.958; TLI = 0.958; NFI = 0.947; relative chi-square = 4.446). The analysis revealed that collectively the eight the exogenous constructs (PE, PR, OO, CM, PL, IN, AP and EC) significantly explained 68% of the reported SWB (Figure 2). Post hoc power analysis was employed to determine if the model was strong enough to detect the significant effects. At 99% probability level, the observed statistical power was 0.99 (> 0.80), sufficient to claim that the exogenous constructs had statistically significant direct and positive effect on SWB. All parameter estimates of the hypothesized model were free from offending values. Additionally, all of the path coefficients of the causal structure were statistically significant at 0.001 level, and of practical importance. Table 3 displays the path coefficients.

The beta coefficients indicated that (i) PE contributed 0.14 unit increase, (ii) PR contributed 0.20 unit increase, (iii) OO contributed 0.11 unit increase, and (iv) CM contributed 0.14 unit increase in SWB. In addition, (v) PL contributed 0.06 unit increase, (vi) IN contributed 0.05 unit increase, (vii) AP contributed 0.06 unit increase and (viii) EC contributed 0.08 unit increase in SWB. The HIH and HIE dimensions were significant drivers of SWB. The results revealed that human interdependence contribute to increased well-being.

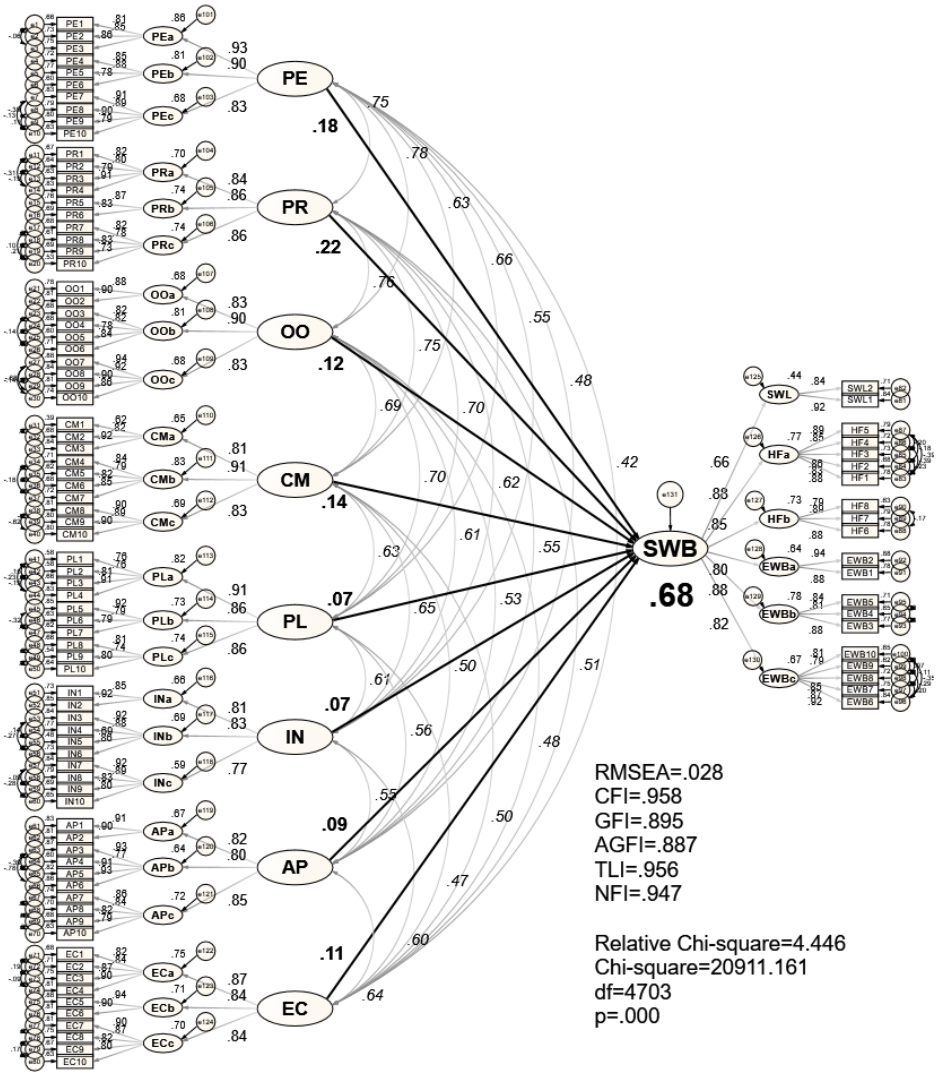

Figure 2: SSWB structural model

Table 3: Causal effects

Path			Estimate of Regression Weights		S.E.	C.R.	P	Result
			Unstandardized	Standardized				
PE	→	SWB	.141	.176	.018	7.913	.001	Significant
PR	→	SWB	.202	.224	.025	8.161	.001	Significant
OO	→	SWB	.109	.124	.022	5.004	.001	Significant
CM	→	SWB	.141	.144	.021	6.710	.001	Significant
PL	→	SWB	.063	.069	.018	3.516	.001	Significant
IN	→	SWB	.056	.067	.016	3.455	.001	Significant
AP	→	SWB	.064	.088	.013	4.955	.001	Significant
EC	→	SWB	.082	.012	.013	6.386	.001	Significant

Since HIH and HIE were a multidimensional construct, the HIH and HIE dimensions should not be interpreted independent from each other as to positively influencing SWB. A respondent with high score in PR may not score as well in IN. Such respondent may perceive their level of PR as high, yet report poor level of IN. Therefore each dimension of HIH and HIE should be examined and interpreted both individually and collectively. Otherwise, important causal relationships may be overlooked.

Multi-Group Analysis for Moderation Effects

The multi-group moderation analysis using chi-square difference test was conducted on the causal model drawn from the imputed measurement model (Figure 1, right). The multi-group analysis yielded significant change in Chi-square values between unconstrained and constrained models, for all comparison groups (Table 4). The settlement areas was a significant moderator. Hence, the path coefficients varied significantly across settlement areas.

Table 4: Results for multi-group analysis using chi-square for difference tests

Comparison Groups	Models	$\chi2$	df	$\chi2$ change	df	P	Invariant?
Urban and Suburban areas	Unconstrained	3456.063	738	42.751	29	.048	No
	Constrained	3498.814	767				
Urban and Rural areas	Unconstrained	3062.978	738	82.344	29	.001	No
	Constrained	3145.322	767				
Suburban and Rural areas	Unconstrained	3056.598	738	97.249	29	.001	No
	Constrained	3153.847	767				

Path-by-path comparisons were assessed to determine which paths were significantly different across settlement areas. The path coefficients of interests to be compared across settlement areas were the structural paths from the exogenous variables to SWB. Regression imputation was implemented on the causal model prior to path-by-path comparisons (Figure 3).

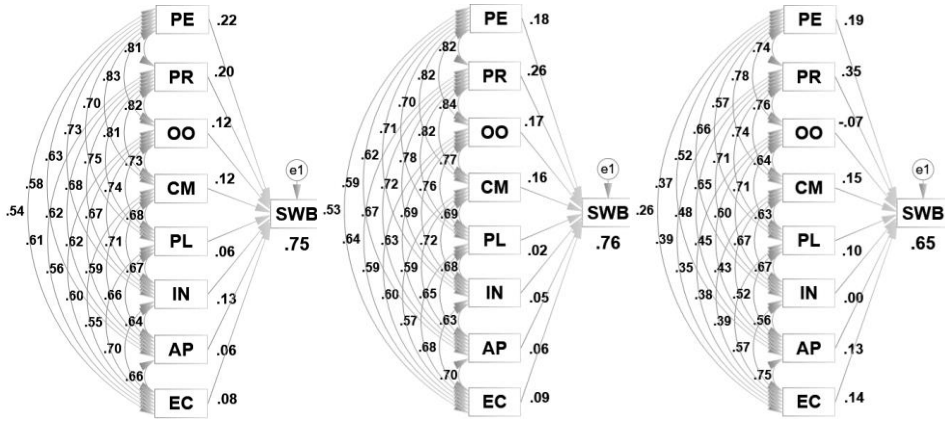

Figure 3: Imputed structural model path by path comparisons across settlemet areas

Table 5: Path-by-path comparisons using critical ratio for differences

Paths	Urban		Suburban		z-score	Urban		Rural		z-score	Suburban		Rural		z-score
	Est.	P	Est.	P		Est.	P	Est.	P		Est.	P	Est.	P	
PE → SWB	.176	.000	.142	.000	-1.235	.176	.000	.154	.000	-0.693	.142	.000	.154	.000	0.374
PR → SWB	.180	.000	.233	.000	1.444	.180	.000	.324	.000	3.433***	.233	.000	.324	.000	2.15**
OO → SWB	.107	.000	.148	.000	1.262	.107	.000	-.060	.045	-4.409***	.148	.000	-.060	.045	-5.519***
CM → SWB	.116	.000	.155	.000	1.223	.116	.000	.146	.000	0.805	.155	.000	.146	.000	-0.257
PL → SWB	.053	.000	.021	.277	-1.172	.053	.008	.099	.000	1.293	.021	.277	.099	.000	2.255**
IN → SWB	.111	.000	.046	.009	-2.508**	.111	.000	.001	.968	-3.378***	.046	.009	.001	.968	-1.410
AP → SWB	.048	.000	.044	.000	-0.229	.048	.000	.094	.000	1.774	.044	.003	.094	.000	1.962**
EC → SWB	.061	.000	.074	.000	0.596	.061	.000	.097	.000	1.453	.074	.000	.097	.000	0.941

Notes: *** p-value < 0.01; ** p-value < 0.05

The path-by-path comparisons were identified using critical ratio for differences (Table 5) and later confirmed with chi-square difference tests. The analysis yielded significant differences in beta coefficients between urban and suburban areas for (i) IN → SWB ($\chi2$ (1) = 6.285, p = .001; z-score = -2.508). Additionally, the analysis yielded significant differences in beta coefficients between urban and rural areas for (ii) PR → SWB ($\chi2$ (1) = 11.751, p = .001; z-score = 3.443), (iii) OO → SWB ($\chi2$ (1) = 19.353, p = .001; z-score = -4.409), and (iv) IN → SWB ($\chi2$ (1) = 11.381, p = .001; z-score = -3.378). The analysis also yielded significant differences in beta coefficients between suburban and rural areas for (v) PR → SWB ($\chi2$ (1) = 4.616, p = .001; z-score = 2.150), (vi) OO → SWB ($\chi2$ (1) = 30.249, p = .001; z-score = -5.519), (vii) PL → SWB ($\chi2$

(1) = 5.077, p = .024; z-score = 2.255), and (viii) AP → SWB ($\chi 2$ (1) = 3.845, p = .049; z-score = 1.962). The following points summarized the findings:

i. Settlement areas moderated the causal relationship between **positive relationships** and **subjective well-being**, such that for rural residents, the positive effect was stronger (β = .324) than urban residents (β = .180) and suburban residents (β = .233).
ii. Settlement areas moderated the causal relationship between **organizational opportunity** and **subjective well-being**, such that for rural residents, the effect was negative (β = -.060). However, the effect was positive for urban residents (β = .107) and suburban residents (β = .148).
iii. Settlement areas moderated the causal relationship between **personality and lifestyle** and **subjective well-being**, such that for rural residents, the positive effect was stronger (β = .099) than suburban residents (β = .021).
iv. Settlement areas moderated the causal relationship between **interaction with nature** and **subjective well-being**, such that for urban residents, the positive effect was stronger (β = .111) than suburban residents (β = .009) and rural residents (β = .001).
v. Settlement areas moderated the causal relationship between **attitude and pro-environmental behaviour** and **subjective well-being**, such that for rural residents, the positive effect was stronger (β = .094) than suburban residents (β = .044).

RESULTS AND DISCUSSION

The underlying structure of SSWB were portrayed in the causal relationships between (i) human interdependency, represented by dimensions of HIH and HIE and (ii) SWB, represented by SWLS, FS and QEWB. Four hypotheses were posed prior to the statistical analysis. Table 6 summarized the findings.

Table 6: Summary of findings

	Hypothesis Statements	**Results**	**Remarks**
H_1	*SSWB was a multidimensional construct comprising of nine interrelated constructs*	($\chi 2$ (4703) = 20911.161, p = 0.001; RMSEA = 0.028; GFI = 0.958; CFI = 0.958; TLI = 0.958; NFI = 0.947; relative chi-square = 4.446)	H_1 Supported
H_2	*The measure of multidimensional SSWB is construct-valid*	Factor loadings >.7; CR >.7; H >.8; AVE >.5; AVE>MSV; Inter-construct r < .85).	H_2 Supported
H_3	*Human interdependence has a direct and positive causal effect on SWB*	**R^2 =.68** (RMSEA =.028; CFI =.958; cmin/df =4.446); PE, β =.141, p <.05; PR, β =.202, p <.05; OO, β =.109, p <.05; CM, β =.141, p <.05; PL, β =.063, p <.05; IN, β =.056, p <.05; AP, β =.064, p <.05; EC, β =.082, p < .05.	H_3 Supported

H_4	*Settlement areas significantly moderate the relationship between human interdependence and SWB*	Urban and Suburban, $\chi2(29) = 42.751$, $p < .05$; Urban and Rural, $\chi2(29) = 82.344$, $p < .05$; and Suburban and Rural, $\chi2(29) = 97.249$, $p < .05$.	H_4 Supported

The CFA evidenced that SSWB was a multidimensional construct comprising of nine interrelated second-order constructs, explained by 30 interrelated first-order constructs. The CFA also confirmed that the measure of multidimensional SSWB was construct-valid. SEM found that PE, PR, OO, CM, PL, IN, AP and EC had significant direct and positive causal effects on SWB. The HIH and HIE dimensions explained 68% of the reported SWB. Finally, it was discovered that settlement areas was a significant moderator to the SSWB model. The path coefficients varied significantly across settlement areas. Further assessments revealed that the strengths of the structural paths (i) PR → SWB, (ii) OO → SWB, (iii) PL → SWB, (iv) IN → SWB, and (v) AP → SWB significantly differed across urban, suburban and rural settlements.

From the urban and suburban residents' viewpoints, the causal effects of (i) OO and (ii) IN on SWB were stronger in comparison to the rural residents. The results suggested that contributing in the working environment strongly improved the well-being of the urban and suburban residents. At the same time, the voluntary and involuntary contact with natural environment significantly and positively influenced the well-being of the urban and suburban residents. On the contrary, the causal effect of positive relationship on SWB for urban and suburban residents was significantly weak compared to rural residents. Urban and suburban residents had lower well-being improvement compared to the rural residents, through investing in personal relationships.

From the rural residents' viewpoint, the causal effects of (i) PR, (ii) PL and (iii) AP on SWB were strongest compared to suburban and urban residents. However, rural residents had the weakest causal effect of interaction with nature on SWB compared to suburban and urban residents. The rural residents also had negative causal effect of organizational opportunity on SWB. The working environment for the rural residents did not contribute to their well-being, compared to urban and suburban residents. Additionally, natural environment did not appealed to the rural residents as much as the suburban and urban residents. Perhaps, being acclimated to natural environment of the countryside had outgrown the need to interact with nature. On the other hand, investing in personal relationships, developing collectivistic lifestyle and contributing in environmental behaviours had strongly improved the well-being of the rural residents compared to urban and suburban residents.

CONCLUSION

The discovery of human interdependence plays a big part in the architectural psychology as there exist a new set of criteria in understanding the dynamics of sustainability and SWB. This study expanded the existing body of knowledge on SSWB. The results substantiated the psychometric adequacy of the measure of SSWB. The underlying structure of SSWB were demonstrated through the causal relationships of human interdependency on subjective well-being. The study discovered that social and environmental context of human interdependence highly explained SWB. The study also found that the causal relationships of human interdependency and well-being vary across urban, suburban and rural settlements.

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SYMBOLISM IN TRADITIONAL MALAY BOAT CRAFTING IN THE EAST COAST

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Abstract

The culture in the East Coast are rich in visual arts and performing arts inherited over time immemorial. The art is also found to have similarities in three different states, despite their geographical gap. The similarities are shared in dialects, languages, presentations, builds, and past legacy artefacts. The Malay craftsmanship is also dominated by the Malay community in the East Coast and it is also produced in the form of art and fashion. Artefacts such as boats, houses, and furniture are still visible until now and they have high artistic value. This research is aimed at displaying symbols produced by the Malay community on the craft of the boat. This art can be seen in the carvings and paintings produced on traditional Malay boats in the East Coast. This art does not only serve as an ornament and for its aesthetics, but also has its own symbolism. The decorative art produced shows that the three main aspects necessary in Malay art are function, aesthetics, and ethics. The belief in the existence of supernatural powers – which preserve and safeguard their safety at sea and their ability to get income from marine products – underpins the craft of this decoration art.

Keywords: symbolism, environment, boat, crafting

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INTRODUCTION

Water transport is one of the most important features in Malay-Polynesian culture. The Malay community's knowledge in sailing and activities related to the ocean has long been dominated by the Malay community. According to Nik Hassan Shuhaimi (2002), since the Neolithic period (especially in the late Neolithic) people in the East Coast have learned to build boats and are skilled in using them. In the Malay culture in the East Coast, boats are used in daily activities; hence, their communities have produced various types of boats that can be customized to their function and usability. For example, a small line boat is used in river and coastal areas, the payang boat used by deep-sea fishermen, and the jokong boat is used to transport heavy goods. The various production of these types of boats is also owed to the easy access to tropical timber resources and their geographical location, which is in the East Coast and is close to the South China Sea. The ocean has also provided a great source of livelihood to the fishermen community in the East Coast. The rapid and lucrative income has attracted the attention of many East Coast residents to get involved in fishing.

Arts and craft in the Malay culture in the East Coast are well-known and unique. This art can be seen in the construction of Malay houses, ironwork, brass, songket weaving, batik making, boat crafting, and many other arts produced by communities in the East Coast. In the production of boats in the East Coast, the decoration aspect is strongly emphasized by the fishermen. The boats produced by the Malay community are decorated with attractive engravings and paintings. Among the ornaments embodied in the boat are carvings and paintings on linggi, bangau (stork), *okok*, *caping*, *sangga tengah*, *sangga kemudi*, *cagak*, and *koyang*. However, most of the traditional Malay boats are in danger of extinction due to the presence of the modern boat, which is easier to maintain rather than wooden boats. According to Sheppard (1963), since 1945, fishermen in the East Coast have preferred to use engine in place of sail, which also resulted in a major change to the traditional Malay boat decoration.

PROBLEM STATEMENT

The use of traditional Malay boats among the fishermen in the East Coast is increasingly diminished due to the pressure of modernization, the difficulty in obtaining timber resources, and higher boat maintenance costs compared to that of glass fibre boats. This situation has resulted in a lack of traditional boat booking requests and loss of income among traditional boat entrepreneurs. Nowadays, it is difficult to see traditional Malay boats still in use by fishermen, except for several places in the states of Kelantan and Terengganu. Nik Hassan Shuhaimi (2010) suggests that there should be an in-depth study of the traditional Malay boats to ensure the preservation of the richness of the Malay maritime tradition of Malay culture and the knowledge of the Malay sailing boats, as well as to educate the current generation of its importance. This boat decoration study

was also conducted by Coatalen (1990). In the research paper, it highlights the discussions on the symbolism and relevance inherent in the traditional components of the Malay traditional boat.

This study was conducted qualitatively based on the artefacts obtained from the National Museum collection, Kelantan Museum collection, collection of Pekan Pahang Water Transportation Gallery, Terengganu Museum collection, and several boats that are still in use in Kampung Gajah, Kota Bharu, Kelantan. Interviews with several fishermen, boat makers, and local wood carvers were also held to obtain relevant information. The collection of these data will be analysed based on the forms, motives, and relevance inherent in the traditional Malay boat decoration components.

MALAY TRADITIONAL BOAT CRAFTING

This Malay traditional boat is often used by fishermen to catch fish, carry merchandise, and as a means of transportation. According to Firth (1990) there are 9 types of boats used by the coastal fishermen in Kelantan and Terengganu. Whereas, Alfred (1997) lists 12 types of boats used by the coastal fishermen in Pahang. Studies on this type of boat were also carried out by other researchers, such as Smyth (1902), Gibson-Hill (1954), and Mohd Yusof Abdullah (1999). These traditional Malay boats mostly have wood carvings and paintings modelled on *linggi*, *bangau*, *okok*, *caping*, *koyang*, *cagak*, which are displayed on the paddles and the boat body as in Figure 1 below.

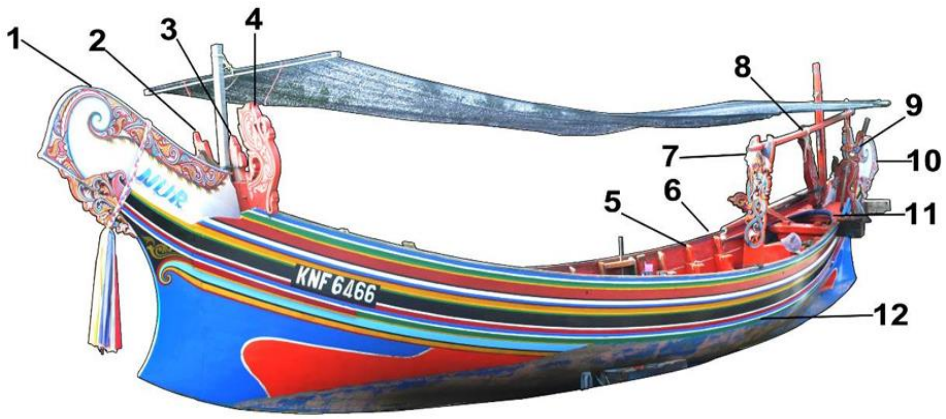

Figure 1 The structure of the decoration components on Western Boat

1. *Kepala*
2. *Okok*
3. *Caping*
4. *Bangau*
5. *Kong*
6. *Papan Leper*
7. *Sangga Tengah*
8. *Koyang*
9. *Sangga Kemudi / Cagak*
10. *Ekor*
11. *Papan Edek*
12. *Papan Tua / Papan Timbal*

The decoration component is produced by boatman and some of them are made by the owner of the boat. This component has its own function and is crafted

carefully and artfully. For example, the *bangau* serves as a mast and a long pole that are used by fishermen to sail and set the nets. *Okok* or *anak bangau* are used as an instrument for the anchor rope. Usually, the fishermen will remove the *bangau* and *okok* when the boat is landed. The *caping*, which is located at the middle between the *bangau* and *okok*, serves as a *bangau-okok* holder. Fishermen will put the *bangau* in front of the *caping* when they descend to the sea. The *caping* is permanently installed with boat keel and covered with *papan edek*. The decoration component is well maintained and preserved neatly and with great care as not to cross any taboo-related boundaries. The *koyang* is used to support the boat rowing paddle. The *sangga* is also used to support the long pole used by fishermen. These components are carved and painted with a variety of motifs and symbols that are closely related to the old traditional beliefs from previous generations.

THE USE OF MOTIFS ON BOAT DECORATIONS

In this study, some forms resembling pre-Islamic images are found on the boat decoration component. Images such as the *makara* can be seen on the head and tail of the boat, while the engraving of the motifs can be found at each end of the *bangau*. This *makara* statue can be seen at the front of the entrance of the temple, which serves to safeguard the fishermen from evil spirits. According to myths and beliefs of Hinduism, the *makara* is a type of sea animal used by the God Vishnu during his travel at sea (Mohd Sabrizaa, 2008).

Figure 2: *Kepala perahu*

Figure 3: *Bangau*

Figure 4: *Makara*

The dragon image is also evidently used on many components of the boat decoration on the East Coast. Images of the dragon are often found in the *linggi* part, with the shape of the *bangau* (along with the motifs on it, *okok* and the paintings on the body of the boat. The dragon is a creature that lives in the water, and in the Malay community, the dragon is a symbol of saviour and keeper of the earth. It also represents fertility, as the dragon keeps the balance of water and thrives in it. The dragon is also regarded as the guardian of the fishermen's safety while they are at sea. The use of this dragon image is often present in the *bangau* carving, where the dragon's carvings are combined with plants motifs.

Figure 5: Dragon I

Figure 6: Dragon II

Figure 7: Dragon III

Figure 8: Dragon IV

Caping is a piece of wood that is shaped like an oval betel and carved full with creeping plants motifs. It is also described as the ficus tree (*pohon beringin*) or the bodhi tree, which is considered sacred to the Malay community. The *caping* is permanently installed on the boat and cannot be moved. Much like the ficus tree, the *caping* stands firm, strong and is unshakeable. The lush and tall ficus tree is a place of shelter for various types of birds and animals. In ancient Malay belief, the ficus tree is the home of guardians and supernatural creatures. During the previous generation's practice, the shaman will conduct a ceremony honouring the spirit of the boat with a spell. In the process, the areca nut, coconut blossom, and paan are placed on the *caping* (Mohamad, 1989). The fishermen community considers the *caping* part as the most important part of a boat as it serves as a guardian of the fishermen's safety.

Figure 9: *Caping* I

Figure 10: *Caping* II

Figure 11: *Caping* III

Bird images are often used in Malay art, especially on the head of *keris*. In Hindu myths, birds are used by the God Vishnu as a mode of air transportation. Birds are also associated with animals that are loyal and strong, like the Petalawati Bird character in the Hikayat Ramayana story. According to Siti

Zainon (1985) in the Malay community, birds represent spirit, strength, and pride. Birds are also a form of transportation, which are also associated with the symbol of sustenance. The image of the *bangau* is also associated with the characteristics of a stork that is capable of observing and catching fish. Bird motifs are widely found on the *linggi, bangau, okok, koyang, sangga* and boat body.

Figure 12: Some of the bird images of boat decoration

The discovery of some forms and motifs on this traditional Malay crafting art can be concise, as shown in Table 1. The creation of these forms and motifs are the continuity of the arts inherited from previous generations. The motifs of geometry, cosmos, flora, and fauna are an artistic feature in the East Coast. The selection of this motif is also based on the ethics that has long existed in the fishermen's culture. It is also associated with taboo and ritual practices that fishermen are obliged to do before and during their work.

Table 1: Types of motifs used in decoration components

Decoration Component	Shape and Motifs Used
Linggi	*Makara*, dragons, birds, geometry and plants, currents themes such as scenery.
Bangau	Birds, Flowers, Plants, shadow puppets, dragons and *makara.*
Okok	Flowers, Birds, plants, shadow puppets & dragons.
Caping	Flowers, Birds, plants, shadow and ficus trees.
Koyang	Birds, dragon and shadow puppet character.
Sangga	Birds, dragon and plants.
Dinding Perahu	Geometry, dragons, birds, flowers, plants, fish and scenery.

CONCLUSION

The art produced in traditional Malay carpentry is mainly founded on the three main areas of function, aesthetics, and ethics. The production and use of decoration on the boat is highly regarded by coastal communities in the East Coast. The fishermen community believes that the oceans are another being inhabited by other creatures and they deserve to be respected. Based on the findings of some of the images that are symbolic of boat decoration, motifs of animism and pre-Islamic beliefs were widely used. The production of craftsmanship on the traditional boat gives its own meaning and philosophy. It is also blended with the belief in external power that can provide security and fortune to the fishermen. Symbolism and the symbolic aspect form a working environment that is harmonious for the fishing community; however it does not adhere to the principles of Islam. When Islam was introduced to the coastal communities in the East Coast, the awareness and understanding of the society of Islamic arts are required. Belief and confidence in external power other than Allah SWT has since been abandoned. Based on religious consciousness, many changes have been made by boatmen and craftsmen on the traditional boat decoration. The use of forms and motives such as herbs, Islamic calligraphy, geometry, and abstract patterns that do not contradict with Islamic values have been used in traditional boat craft arts. The discovery of non-Islamic images is not to accuse the Malay community for its past practices and beliefs, but it can provide an example and awareness to the present community of Malay art.

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PERCEPTUAL STUDY ON CONVENTIONAL QUALITY OF LIFE INDICATORS

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Abstract

Quality of life (QOL) is both individual and collective attributes. Quality of life should encompass both objective and subjective measures whilst promoting for balance in every aspect of human existence. The objective of this study is to assess the QOL of the population in Malaysia by using Selangor as a case study. 600 samples from four districts in Selangor were selected through random sampling method. From literature review, 9 main components of QOL were identified and included in questionnaire form. Relative importance index (RII) equation was then used to report on the analysis of QOL components. Results from the survey indicated that majority of the respondents were likely to perceive QOL components as moderate and highly satisfied. Overall, respondents claimed that they were satisfied and enjoying their lives and at the same time satisfied with their current quality of life. The results indirectly show that each of QOL component was interrelated with each other in creating the satisfaction on quality of life of the people. This is in line with the findings on the three basic human relationships with Allah SWT, with other human and with nature in protecting their faith (*din*), human self (*nafs*), intellect (*`aql*), posterity (*nasl*) and wealth (*mal*) through establishing justice, eliminating prejudice and alleviating hardship by promoting good and preventing harm to self and others.

Keyword: Quality of life, *maqasid al-shariah*, population well-being.

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QUALITY OF LIFE INDICATORS

Improving the quality of life (QOL) of the citizen has always been the main focus of the Malaysian government and it has been one of the main agendas in the 11th Malaysia Plan 2016-2020. Generally, QOL is about the extent to which human needs are fulfilled in relation to their perception of subjective well-being. Thus, it is the role of policy makers and professionals to provide opportunities for the people to be able to meet their desired well-being (Costanza et al., 2005).

The World Health Organization Quality of Life group defines QOL as 'individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns' (Phillips, 2006, p.23). Similarly, several authors (Zainal, Kaur, Ahmad, & Khalili, 2012; Gilgeous, 1998) see QOL as the satisfaction of people over various dimensions including material, education, security, physical and living environment that affected by their perception on what they refer as ideal life.

Worldwide, QOL is the subject of academic debate in various fields particularly in economics, field of happiness studies, a research area shared with psychologists and sociologists (Costanza et al., 2005). Moreover, the discussion on QOL also become increasingly popular over the past two decades in the area of education, security as well as in fulfilment of enjoyment of the aesthetic and spiritual needs (Pajaziti, 2014; Omar, 2009). Yet, the measurement of QOL varies and depend neither on the subjective experience of people nor on the fulfilment of their wishes (Yahya & Selvaratnam, 2015; Diener, Suh, Lucas, & Smith, 1999).

In Malaysia, numerous studies (Idris et al, 2016; Mohit, 2014; Ibrahim et al., 2013) have been conducted to measure the QOL of the population. Several authors concur that QOL is one of the biggest challenges to government especially to reduce gap that exists between various groups and communities in the country (Idris et al., 2016). Meanwhile, other studies found quality of life has increased positively with improvement in environment, including physical and natural surroundings, education, health status, age, culture, safety as well as economic development level (Yassin et al., 2012; Skevington, 2010). Yet, progress on human well-being and development has bypassed groups, communities or societies, resulting in the problem of human deprivations to persist (UNDP, 2016).

Quality of life is both an individual and collective attribute (Phillips, 2006), in which adequate and suitable tool to measure the quality of life is still inadequate (Mohamad et al., 2014). Empirical research on quality of life have been emphasising on material well-being, without the association of spiritual and non-material aspect of life. This has been proven to provide negative or decline in subjective well-being of population (Chapra, 1993).

The well-being of Malaysian has been annually measured in Malaysia Quality of Life Index (MQLI) from 1999 to 2011. Since 2012, this has been replaced by Malaysia Well-Being Index (MWI). The MQLI included 38 indicators categorized under 11 components of QOL. However, the new MWI expanded to include 14 components of well-being to represent economic and social well-being of Malaysia. The components under economic well-being are transportation, communication, education, income distribution and working life. Meanwhile, components of social well-being are housing, leisure, governance, public safety, social participation, culture, health and environment. As shown in Table 1 below, the measure of well-being representing the quality of life for population in Malaysia are quantifiable and driven by objective measurement.

Table 1: MWI 2000-2012

MWI Component	**Index**			
	2000	**2010**	**2012**	**2000 - 2012**
Economic well-being		**124.2**	**133.3**	**33.3**
Transport	100	126.3	136.9	36.9
Communications	100	120.6	136.2	36.2
Education	100	128.6	132.9	32.9
Income and distribution	100	124.2	131.8	31.8
Working Life	100	121.5	128.6	28.6
Social well-being		**117.2**	**121.0**	**21**
Housing	100	137	136.9	36.9
Leisure	100	126.1	131.4	31.4
Governance	100	122.6	128.1	28.1
Public Safety	100	116.2	125.6	25.6
Social Participation	100	110.6	120.6	20.6
Culture	100	117.6	120.3	20.3
Health	100	110.3	114.1	14.1
Environment	100	106.9	107.3	7.3
Family	100	107.3	104.6	4.6

Source: EPU, 2013

Note: Base Year: 100

However, as discussed by numerous authors (Pajaziti, 2014; Noll, 2002), quality of life should encompass both objective and subjective measures. This is in line with the objectives of the *shariah* or the *maqasid al-shariah*, which is to promote the well-being of all mankind through protection on faith (*din*), human self (*nafs*), intellect (*`aql*), posterity (*nasl*) and wealth (*mal*) through establishing justice, eliminating prejudice and alleviating hardship by promoting good and

preventing harm to self and others (Syed Ali & Hassan, 2014; Dusuki & Abdullah, 2007).

Maqasid al-shariah covers not only the objectives of the divine law (*shariah*) but also every aspect of human existence including the general well-being of every individual. Generally, it provides an outline of "what should" and "should not" be done in Islam (Abdullah & Furqani, 2012). This is as important as the three basis for Islamic concept as discussed by Hanapi (2015) that emphasised on the relations between humans and Allah SWT as mentioned in Surah al-'Ankabut (29:62-63), Yunus (10:31) and al-Zukhruf (43:87). Those verses specified all Muslim should adhere to the laws of Allah and subscribe to the true teachings of Islam. By obeying Allah SWT, one has to follow His command and not use only emotions as a measure for own actions. In this study context, satisfaction over quality of life can be referred to a good life and success in achieving happiness in life as a Muslim. Therefore, in redefining what measure the quality of life in line to *maqasid al-shariah* goals, ones have to believe (*aqidah*) towards Allah SWT as the Creator. Thus, all human are responsible in the fulfilment of the basic needs for all as it is considered the ultimate human rights in Islam.

The second Islamic worldview as mentioned by Hanapi (2015) is the relation among humans. From *maqasid al-shariah* context, Muslims should abide to high morality not only in their actions, but also in interactions with society and others in protecting the five fundamental aspects of *shariah*, which are the religion, life, mind, lineage and property. Islam provides an outline for human to interact with each other in full responsibility, trust, morality and ethics in fulfilling our duty as a vicegerent of Allah SWT. Through practice on equitable income distribution among the vulnerable poor to eradicate poverty, provision of material and non-material needs such as freedom, equity for people, excellence in moral, safety and economic capacity for society as a whole, the *maqasid al-shariah* concept can be realized. In principle, Islam obligates promoting social justice and at the same time alleviating poverty which could be channelled through *zakah*, *waqaf*, *hibah* (gift), *sadaqah* and charity that would encourage the building of a strong bond among community. As elaborated by Yusuf al-Qaradawi (2011), Islam prohibits extravagance, and ordains moderation and sometimes thrift, thus, helping others is necessary to provide an adequate and suitable standard of living and to help Muslims remain above the poverty level.

The third Islamic worldview concept is the relations between humans and nature. Allah SWT has entrusted human in accordance with their roles as a vicegerent of Allah SWT to harmonise with the world as mentioned in Surah al-Isra' (17:70). In referring to the *maqasid al-shariah*, Muslims are entrusted to manage and utilize the natural resources but bound by the regulations and restrictions determined by Allah SWT. As Wahbah Al-Zuhaily (1994) discusses, *maqasid al-shariah* focuses on the three goals, which are to achieve goodness

(*maslahah*), avoid evilness (*mafsadah*) and remove calamities to mankind in this world and hereafter. Ultimately, Muslims are obligated to avoid from getting involved with dangerous or careless acts that would cause harm to themselves or others.

Islam in principle is concerned with the total well-being of human beings. Consequently, as Malaysia is a country where Muslims make up the majority of the population, the application of *shariah* law is encouraged. Thus, this indicates there is a need to blend religious aspirations and objectives i.e. the *maqasid al-shariah* on measure of QOL in Malaysia. Hence, the objective of this research is to assess the perception of Malaysian on the conventional QOL indicators by selecting Selangor as a case study for the research and to assess whether the level of QOL is in line with the *maqasid al-shariah*.

ANALYSIS ON QOL INDICATORS: A CASE STUDY OF SELANGOR

Questionnaire survey was selected as method for data collection for the research. Statistical Package for the Social Sciences (SPSS) was used to analyse the quality of life of population involved in the research.

Sample

By using the Yamane (1976) formula, sample size in the study was originally determined at 400 samples and the age range of the respondents should be between 18 to 65 years old. Taking into considering the probability of error and bias in data, the number of target sample was increased to 600 samples. The distribution of sample was focused in four districts namely Petaling Jaya, Sepang, Klang and Gombak, as these districts are considered as the major growth areas for the state of Selangor. Following data screening process, only 500 samples were found to be valid for analysis. The samples are made up of 55.6% male and 44.4% female respondents, of which 76.2% Malay, 12.4% Chinese and 11.4% Indian. The samples were equally distributed across income level, whereby 43% respondents were with income below RM3,000, 32.8% between RM3,001-RM6,000 and 24.2% earned more than RM6,000 monthly. Additionally, respondents aged below 40 years old made up the majority with 80.8% of respondents, while rest were aged between 41 to 60 years old (16.8%) and more than 60 years old (2.4%). Over half of the respondents (56.8%) had secondary education, while the remaining of 43.2% had higher education.

Measure

Questionnaire survey was conducted to collect primary data on QOL from target respondents. 9 QOL components consisting of several items to measure QOL of population in Malaysia drawn from various literature reviews were used in the questionnaire and measured by 10 scores, 0 as ‘Don’t know’ until 10 as the highest score representing ‘Extremely satisfied’. The Relative Importance Index

(RII) analysis was undertaken to determine the rank of items from each QOL component perceived as important by respondents. The RII formula indicates that;

$$\mathrm{RII} = \frac{\sum W}{A * N}$$

Where, W is weight given to each statement by the respondents and ranges from 1 to 10; A representing the Higher response integer and N is the total number of respondents.

Analysis on QOL

From the literature, 9 main components were identified. Then, all the factors associated with the QOL components were calculated using the relative importance index (RII) equation above. In this study, the RII was used to compare and rank each of QOL components based on the degree of frequency and severity of respondents' preferences over the same scales. Result of the RII analysis is shown in Table 2 below.

Table 2: RII of QOL components

No.	**QOL Components**	RII	Rank
	1) Economic Capacity		
1.	Current job/occupation	0.662	1
2.	Amount of current household income	0.616	2
3.	Cost of commuting every month	0.608	3
4.	Amount of personal monthly income to live comfortable life	0.591	4
5.	Ability to buy/own properties	0.390	5
	2) Transportation Capacity		
1.	Owned transport	0.841	1
2.	Often use public transportation in daily life	0.380	2
3.	Preference on using public transportation for daily activities	0.360	3
	3) Living Condition		
1.	Current living place	0.739	1
2.	Neighbouring with foreigners	0.551	3
3.	Strategic location of current house	0.654	2
4.	Provision of facilities for PWDs	0.419	4
	4) Environment		
1.	Air quality	0.742	2
2.	Water quality and provision	0.751	1
3.	Crowding and noise level	0.657	4
4.	Protection and preservation of natural elements	0.637	6

5.	Overall landscape	0.644	5
6.	Overall cleanliness	0.715	3
	5) Social involvement		
1.	Social interaction with residents of the neighbourhood	0.627	3
2.	Support from neighbours	0.631	2
3.	Interracial relation	0.664	1
4.	Involvement in club/association in neighbourhood/ work place	0.527	5
5.	Overall satisfaction with interactions	0.590	4
	6) Public safety		
1.	Safe walking alone in neighbourhood in day time	0.787	1
2.	Safe walking alone in neighbourhood at night time	0.653	6
3.	Availability of police protection for 24 hours	0.674	4
4.	Presence of fire bridges for 24 hours	0.655	5
5.	Provision of street lighting in neighbourhood	0.746	2
6.	Overall satisfaction with safety condition	0.723	3
	7) Health and physical well-being		
1.	Satisfaction on health condition	0.841	1
2.	Feel energetic waking up every morning	0.782	4
3.	Require monthly/weekly/daily check-up	0.485	7
4.	Have enough sleep everyday (7-9 hours)	0.738	5
5.	Physical health allows me to perform daily activities	0.806	3
6.	Never experience unstable mood such as despair, depression, anxiety in a week	0.721	6
7.	Comfortable with physical appearance	0.811	2
	8) Daily activities		
1.	Always plan my daily activities	0.577	2
2.	Regularly recorded daily activities	0.399	5
3.	Always do beneficial activities	0.635	1
4.	Regularly plan my activities a week beforehand	0.476	3
5.	Regularly plan any activities a month before hand.	0.446	4
	9) Educational Satisfaction Level		
1.	Satisfaction on current educational background	0.710	2
2.	Intend to further study to another level	0.608	4
3.	Always supportive if children, spouse or siblings intend to further study at another level	0.919	1
4.	Malaysia's educational system generate students with ideas	0.685	3
	Overall satisfaction		
	In general, how much do you enjoying your life?	0.771	1

Overall, how would you rate your quality of life?	0.742	2

Generally, results in the Table 2 show that majority of the respondents were likely to perceive QOL components as moderate and highly satisfied. Among the 9 components, the highest RII value is 0.919 ranked representing the component related to educational satisfaction level. Meanwhile, the lowest RII value is 0.360 indexes on satisfaction towards the respondents' preference in using public transportation for daily activities.

For economic capacity aspect of QOL, most of the respondents ranked satisfaction on current job as the highest with RII of 0.662, while majority of them were likely felt dissatisfied with ability to own or purchase properties (RII=0.390). On the other hand, majority of respondents were likely to be satisfied with the water quality (RII=0.751) and air quality in their neighbourhood (RII= 0.742). However, QOL aspect on the protection and preservation of natural elements was ranked as the lowest with RII only 0.637. This shows that there is an issue perceived by respondents related on the environmental protection and preservation matters.

Contrarily, there was a high RII value of 0.787 on QOL safety component related to safe walking alone in neighbourhood in day time. This is followed with respondents moderate and high satisfaction on the provision of street lighting to prevent crime (RII=0.746) and satisfaction on safety condition in the neighbourhood (RII=0.723). On matter related to health, most of the respondents were likely felt satisfied with their current health condition (RII=0.841), and comfortable with their physical appearance (RII= 0.811).

Overall, respondents claimed that they were satisfied and enjoying their life (RII=0.771) and at the same time satisfied with their current quality of life with RII of 0.742 representing by indexes greater than 0.5. In addition, the results suggested that improvement on respondents' environment including health status (RII=0.841), education level (RII=0.710), safety elements (RII=0.723), transportation (RII=0.841) and income (RII=0.616) literally had positive impact on respondents QOL satisfaction level. The results indirectly showed that each of QOL components was interrelated with each other in creating the satisfaction on quality of life of people. This is in line with the findings on the three basic human relationships with Allah SWT, with other human as well as with nature in protecting their faith (*din*), human self (*nafs*), intellect (*`aql*), posterity (*nasl*) and wealth (*mal*) through establishing justice, eliminating prejudice and alleviating hardship by promoting goods and preventing harm to self and others.

Scientifically, the interrelationship of human development and the quality of life is proven to affect not only human physical development, but also human development and social health (Kilimova, 2016). However, QOL being a complex matters and addition to the growing theories and approaches to measure

human well-being has making it imperative to improve the lives of population as a whole.

Malaysia goal to achieve foster in sustainable economic well-being encountered weakness in several areas including educational attainment and skills mainly on labour productivity growth, personal earnings as well as healthcare particularly on healthy life expectancy and access to quality medical services. This requires policy makers, professionals and related stakeholders to further increase the quality and sustainability of development in addressing areas of social protection, education, clean energy and inclusive growth (OECD, 2016).

Studies by numerous authors (Abdul Razak, Hamid & Ya'kob, 2013, Mohamad et al., 2014) that focus on QOL found that Maslow's hierarchy of needs has failed to completely cover and fulfil the measurement required for quality of life. Thus, this is where the combination of policy, objectives and goal of life with the divine Islamic law would be essentials to fill in the huge gap in measuring not only the needs and wants aspects but also subjective measurement of the quality of life that deals with the feeling of happiness and individual satisfaction with life.

Nevertheless, adequate attention in addressing a suitable approach to measure quality of life as well as in defining what directly and indirectly constitutes quality of life is important. Inappropriate measures and incorrect information would mislead the authorities to identify the significant aspects of quality of life that should be given more attention in order to improve the quality of life of the people as a whole.

CONCLUSION

In summary, all the five components of *maqasid al-shariah* are interrelated in creating balance and promoting well-being to human life. Through the integration of the *maqasid al-shariah* components in the measurement of quality of life in Malaysia, the needs and wants of the people can be achieved. The concept of *maqasid al-shariah* has the dimension of individual, community, and the creator and this clearly shows that a person's is accountable on his/her action to the creator, to him or herself and finally to the other people effected by the actions. Therefore, it is hoped that an effective and inclusive measure of QOL could be strengthened to promote for more harmonise and sustainable well-being.

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XRD AND XRF ANALYSIS OF THE ANCIENT BRICKS FROM CANDI KAMPUNG BARU, KEDAH

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Abstract

XRD and XRF analysis on the ancient bricks were conducted to identify whether the raw materials to produce the bricks originate from the site. Candi Kampung Baru is recorded as one of the temple that used bricks as the main construction material. This site is suggested to be built between the 8th to 10th centuries AD based on the size of the bricks and imported ceramics associated with the structure. The position of this *candi* that is facing to the north is a major indication that the *candi* in Kampung Baru Site is one of the many Buddhist *candi*s that have been found in Bujang Valley. This study used X-Ray Fluorescence (XRF) and X-Ray Diffraction (XRD) analysis techniques to identify the composition of the major and trace elements and minerals found in the bricks. The results of the analysis on the ancient brick of Candi Kampung Baru revealed that the mineral content contained in the brick samples consists of quartz, muscovite, microcline and sanidine. Minerals found suggest that open burning technique was used during the brick making process with the local raw clay sources were used to produce the bricks. The results therefore implied that the participation of the local communities in Old Kedah Kingdom contributed to the prosperity of this region.

Keyword: x-ray fluorescence (XRF), x-ray diffraction (XRD), candi Kampung Baru, Bujang Valley, old Kedah kingdom

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INTRODUCTION

The Kampung Baru site was discovered during the Muda River exploration work which was conducted in 2010 until 2011 by a group of researchers from The National University of Malaysia (Ramli & Nik Abdul Rahman, 2012). This site is located on the bank of Muda River in Kampung Baru, Kota Kuala Muda, Kedah and the distance between this site and the Muda River is about 100 metres and the archaeological excavations that have been carried out on this site have also found various types of artefacts such as earthenware, glass, metal and other ceramics such as c'hing-pai and celadon (Mohd Nasir, Ramli, & Hassan, 2017).

The study of the ancient brick from the *candi*'s found in Kedah has formerly been carried out by scholars. However, there is a contradiction between scholars and researchers about the Old Kedah *candi*'s builders and the sources of building materials besides each one of them has their own arguments and evidence. Similarly, the source of raw materials used to build a temple at the Kampung Baru Site is still unknown, therefore, the scientific analysis of the ancient brick at Kampung Baru Candi is necessary to identify the composition of the brick. XRF and XRD analysis have also provided new data on the origin and technology of prehistoric pottery manufacturing in Malaysia (Treloar, 1978; Chia, 1997), glass beads (Ramli, Nik Abdul Rahman, & Samian, 2011; Ramli, Abdul Rahman, Hussin, Sayed Hasan, & Mohamed Dali, 2017), bronze drum (Jusoh, Sauman, Abdul Rahman, & Ramli, 2012), as well as ancient bricks (Ramli, 2012; Ramli, Nik Abdul Rahman, Jusoh, & Hussein, 2012; Ramli et al., 2013; Sabtu, Mahat, Mohd Amin, Price, & Bradley, 2015). Whereas Yahaya, Hussein, Ramli, and Zakaria (2005) conducted a physical analysis on the bricks found in Kuala Muda, Kedah. The study focused on the brick pressure force tests and also by looking at the physical size of the brick. Even closer study has also been conducted at the Panggung Drama Building, Kuala Lumpur which combines the analysis of the content and physical composition of the building materials (Hussein, Ramli, & Yahaya, 2004).

The Kampung Baru site located near Kampung Sungai Mas site was the centre of government and the port of Old Kedah. The study on the Kampung Sungai Mas site was initiated in 1979 by Jane Allen and Jan Wisseman Christe in collaboration with the Bujang Valley Archaeological Museum and the Department of Geography, University of Malaya to conduct research on "Trade transportation and tributaries: exchange, agriculture and settlement distribution in early historic-period Kedah, Malaysia". Subsequently in 1980 a team of researchers from Universiti Kebangsaan Malaysia led by Nik Hassan Shuhaimi Nik Abd. Rahman has conducted an archaeological survey at the Kampung Sungai Mas Site (Nik Abdul Rahman & Mohd Yatim, 1992). In 1981, Nik Hassan Suhaimi and his team conduct the first trial excavation at the Site 33 (Abdullah, 2013). Drawing to this activity, in 1985, another site identified as Kampung Sungai Mas (Site 32/34) was selected for the 2nd Intra-ASEAN Archaeological

Excavation and Conservation project of Bujang Valley, Kedah, Malaysia in 19858. Discovery of foreign ceramics, building materials, glass, pottery, beads, and stone have become significant findings at that time.

Compositional analysis of the ancient brick used in the construction of the candi in Kampung Baru is carried out in order to determine the mineral content besides the major and trace elements contained in the brick samples. Data obtained from the subsequent brick analysis will be compared with the composition data of clay material around the Bujang Valley area, Kedah. It is important to carry out material composition analysis of the ancient bricks of this site because the analysis can determine the raw materials used to produce the bricks whether it locally made or not, because there are scholars who think that the candis found in Old Kedah was built by the Indian traders (Jacq-Hergoualc'h, 1992; Treloar, 1978; Wheatley, 1964). Besides that, the bricks that were found at this site also have different sizes and shapes (refer figure 1 until 4 below).

Figure 1: Brick 5 (top view)

Figure 2: Brick 5 (side view)

Figure 3: Brick 28 (top view)

Figure 4: Brick 28 (side view)

METHODOLOGY

A total of 20 brick samples were taken from the Candi Kampung Baru Site and then taken to the lab for cleaning and labelled with the names KB 1, KB 2, KB 3, KB 4, KB 5, KB 6, KB 7, KB 8, KB 9, KB 10, KB 11, KB 12, KB 13, KB 14,

KB 15, KB 16, KB 17, KB 18, KB 19, and KB 20. The analysis was conducted to determine the mineral content in the ancient brick samples. Samples weighing 0.4g were refined and heated up for one hour at a temperature of 105o C and mixed until homogenous with the flux powder of a type of Spectroflux 110 (product of Johnson and Mathey). These mixtures were baked for one hour in a furnace with a temperature of 1100o C. The homogenous molten was moulded in a container and cooled gradually into pieces of fused glass with a thickness of 2mm and a diameter of 32mm. The samples were 1:10 dilution. Samples in the formed of fused glass were prepared for analysis of major elements such as Si, Na, K, Ca, Fe, Al, Ti, Mn, and Mg. Pressed pallet samples were prepared for analysis of trace elements such as As, Ba, Ce, Cr, Cu, Ga, Ni, Pb, Rb, Sr, Th, V, Zn, and Zr. These samples were prepared by mixing 1.0g of samples together with 6.0g of boric acid powder and then the pressure of 20 psi was applied by using hydraulic pressure equipment. The samples of the fused pallet and pressed pallets were then analysed by using the Philips PW1480 equipment. Samples in the form of very fine powder were put into the pellets (sample holder) and then analysed by using the X-ray Diffraction instrument (D500 Diffract meter SIEMEN).

A scatter plot diagram of MgO versus TiO2 and lead versus copper was then performed to demonstrate the differences among the group and analysed using Microsoft Excel software. The main purpose is to see the distribution of the samples in the group and subsequently to compare with the clay elements. The applicability of the analytical methods for the multi-elemental analysis by XRF of the glass beads is evaluated by the analysis of certified reference material, 315 Fire Brick (Calibration: G-FBVac28 mm) for major elements and certified reference materials, SY-2 (Calibration: Trace Element P-20) for trace elements. The CRM was also used as the quality control material of the analytical procedure.

RESULTS AND DISCUSSION

The results of the analysis showed that the mineral content contained in the brick samples consists of quartz, muscovite, microcline, sanidine. Besides, there was no kaolinite mineral in the brick sample but based on the physical appearance it was found that the brick did not have complete oxidation (refer Table 1). This showed that open burning techniques were used during the bricks making process. The burning temperature of the brick samples from this site was believed to be between 600°C to 800°C.

The major element contents contained in the ancient brick samples of Kampung Baru Candi in detail can be referred to Table 2. The analysis showed that the ancient brick samples contained percentage of dry weight quartz elements between 70.00% to 83.66%. The percentage of dry weight of titanium was between 0.07% to 0.96%. The iron element contained a dry weight percentage of

1.81% to 3.68%. The percentage of dry weight of aluminium was between 13.95% and 22.54%. The manganese element contained a dry weight percentage of 0.01% to 0.04% while the calcium elements contained a dry weight percentage of 0.05% to 0.34%. The percentage of dry weight of magnesium and sodium was between 0.18% to 0.99% and 0.07% to 0.42%. Potassium and phosphorus elements contained dry weight percentage ranging from 0.46% to 2.15% and 0.11% to 0.85%.

Elements such as silica, aluminium, and iron are elements containing a high percentage of dry weight for brick samples at Kampung Baru Candi. The percentage graph of the dry weight of SiO2 and Al2O3 (refer Figure 5) and also the percentage graph of the dry weight of MgO and TiO2 (refer Figure 6) for brick samples from Candi Kampung Baru and clay in Bujang Valley have been plotted to observe the results of the comparison between the samples of brick and clay based on its primary source. Based on the graphs, the composition of the major elements of the brick sample of Kampung Baru Candi was found to be similar to the composition of the major elements of clay in the Bujang Valley. These raw materials were obtained from the Sungai Muda basin, the Bujang River basin and the surrounding Mukim Merbok and Mukim Bujang. In fact, this study also found that the raw materials used at this site were obtained from various sources compared to the raw material used to produce bricks candi in Kampung Sungai Mas (Site 32/34) that only used raw materials found in Muda River and Bujang River.

Table 1: Minerals content in bricks sample from Candi Kampung Baru

Site	Sample	Mineral Content
Kg. Baru, Kota Kuala Muda, Kedah	KB 1	SiO_2 Quartz $KAl_2Si_3AlO_{10}(OH)_2$ Muscovite 1M $K_2O.Al_2O_{3.6}SiO_2$ Microline
	KB 2	SiO_2 Quartz $KAl_2Si_3AlO_{10}(OH)_2$ Muscovite 1M
	KB 3	SiO_2 Quartz $KAl_2Si_3AlO_{10}(OH)_2$ Muscovite 1M $KAlSi_3O_8$ Microcline
	KB 4	SiO_2 Quartz $KAl_2Si_3AlO_{10}(OH)_2$ Muscovite 1M
	KB 5	SiO_2 Quartz $KAl_2Si_3AlO_{10}(OH)_2$ Muscovite 1M $KAlSi_3O_8$ Microcline
	KB 6	SiO_2 Quartz $KAl_2Si_3AlO_{10}(OH)_2$ Muscovite 1M $K_2O.Al_2O_{3.6}SiO_2$ Microline
	KB 7	SiO_2 Quartz $KAl_2Si_3AlO_{10}(OH)_2$ Muscovite 1M $KAlSi_3O_8$ Microcline
	KB 8	SiO_2 Quartz

	$KAl_2Si_3AlO_{10}(OH)_2$ Muscovite 1M
KB 9	SiO_2 Quartz
	$KAl_2Si_3AlO_{10}(OH)_2$ Muscovite 1M
	$KAlSi_3O_8$ Microcline
KB 10	SiO_2 Quartz
	$KAl_2Si_3AlO_{10}(OH)_2$ Muscovite 1M
	$KAlSi_3O_8$ Microcline
KB 11	SiO_2 Quartz
	$KAl_2Si_3AlO_{10}(OH)_2$ Muscovite 1M
	$K_{0.47}Na_{0.43}Ca_{0.10}Al_{1.1}Si_{2.9}O_8$ Sanidine
KB 12	SiO_2 Quartz
	$KAl_2Si_3AlO_{10}(OH)_2$ Muscovite 1M
KB 13	SiO_2 Quartz
	$KAl_2Si_3AlO_{10}(OH)_2$ Muscovite 1M
	$KAlSi_3O_8$ Microcline
KB 14	SiO_2 Quartz
	$KAl_2Si_3AlO_{10}(OH)_2$ Muscovite 1M
KB 15	SiO_2 Quartz
	$KAl_2Si_3AlO_{10}(OH)_2$ Muscovite 1M
KB 16	SiO_2 Quartz
	$KAl_2Si_3AlO_{10}(OH)_2$ Muscovite 1M
	$KAlSi_3O_8$ Microcline
KB 17	SiO_2 Quartz
	$KAl_2Si_3AlO_{10}(OH)_2$ Muscovite 1M
KB 18	SiO_2 Quartz
	$KAl_2Si_3AlO_{10}(OH)_2$ Muscovite 1M
KB 19	SiO_2 Quartz
	$KAl_2Si_3AlO_{10}(OH)_2$ Muscovite 1M
	$KAlSi_3O_8$ Microcline
KB 20	SiO_2 Quartz
	$KAl_2Si_3AlO_{10}(OH)_2$ Muscovite 1M

Table 2: Dry Weight (%) of major elements in Candi Kampung Baru Brick Samples

Sample	**Dry Weight (%)**									
	Si	**Ti**	**Fe**	**Al**	**Mn**	**Ca**	**Mg**	**Na**	**K**	**P_2O_3**
KB 1	70.00	0.49	3.21	13.95	0.02	0.14	0.44	0.19	1.40	0.22
KB 2	72.83	0.93	3.37	21.47	0.01	0.05	0.20	0.10	0.73	0.15
KB 3	77.96	0.42	3.05	12.98	0.03	0.25	0.90	0.42	1.96	0.45
KB 4	72.97	0.96	2.85	21.76	0.01	0.04	0.22	0.09	0.72	0.12
KB 5	76.81	0.52	3.07	14.14	0.04	0.30	0.98	0.19	1.62	0.28
KB 6	73.86	0.53	3.27	16.62	0.02	0.30	0.99	0.31	2.12	0.85
KB 7	75.08	0.54	3.68	16.06	0.02	0.30	0.84	0.25	1.96	0.32
KB 8	75.62	0.70	1.81	20.33	0.01	0.03	0.18	0.07	0.58	0.13
KB 9	76.05	0.46	2.77	14.72	0.02	0.29	0.80	0.28	1.30	0.38
KB 10	76.59	0.49	3.04	14.43	0.02	0.25	0.97	0.27	1.73	0.33
KB 11	76.58	0.49	2.92	15.07	0.03	0.24	0.67	0.32	1.93	0.61

KB 12	73.88	0.80	2.49	21.41	0.01	0.09	0.22	0.11	0.68	0.14
KB 13	74.94	0.51	3.31	15.14	0.04	0.34	0.86	0.51	2.15	0.44
KB 14	83.66	0.07	1.93	21.20	0.01	0.04	0.28	0.07	0.46	0.11
KB 15	73.27	0.68	3.50	18.97	0.01	0.10	0.59	0.20	0.83	0.34
KB 16	71.40	0.93	3.59	22.51	0.02	0.09	0.21	0.11	0.80	0.28
KB 17	73.80	0.95	2.82	20.48	0.01	0.07	0.26	0.10	0.58	0.19
KB 18	71.72	0.91	3.40	22.54	0.01	0.05	0.21	0.08	0.74	0.13
KB 19	76.75	0.51	3.71	14.5	0.02	0.24	01.01	0.24	1.62	0.29
KB 20	77.22	0.62	1.72	18.65	0.01	0.03	0.20	0.07	0.62	0.14

The content of trace elements (Table 3) showed the content of more than 100 ppm for the elements such as barium, cerium, chromium, vanadium, and zircon. Other elements were quite low concentration namely less than 100 ppm. The barium element content was between 638 ppm to 835 ppm while the cerium was between 468 ppm to 625 ppm. The content of rubidium and chromium elements was between 56 ppm to 205 ppm and 67 ppm to 111 ppm while vanadium and zircon elements had a concentration between 79 ppm to 140 ppm and 165 ppm to 430 ppm. Figure 7 is a graph plotted to see the distribution of copper elements against the lead to brick samples at Kampung Baru Temple where the concentration of the two elements was between 14 ppm to 20 ppm and 41 ppm and 57 ppm. The result showed that the raw material used to make the brick is a local raw material.

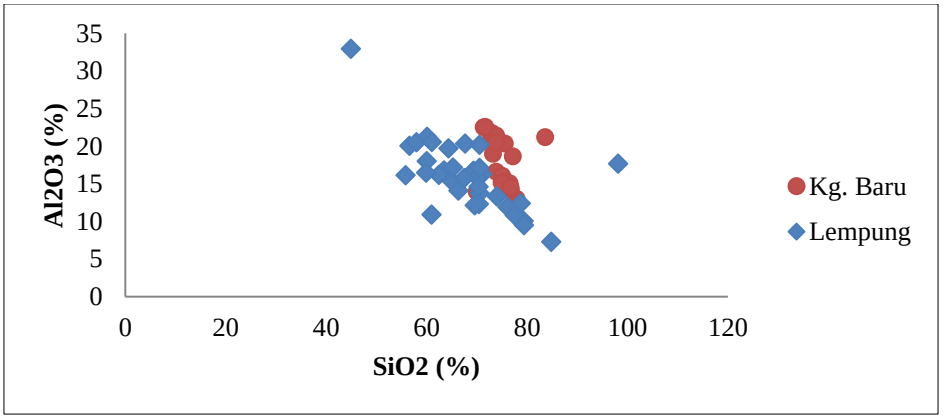

Figure 5: Scatter plot of SiO_2 and Al_2O_3

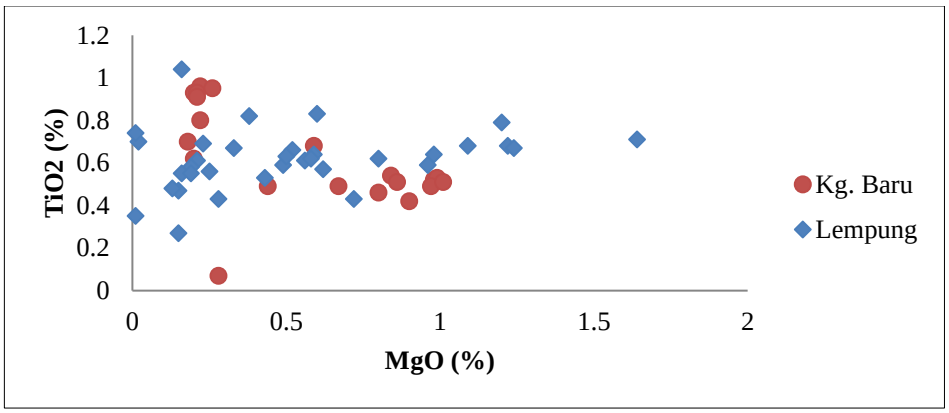

Figure 6: Scatter plot of MgO and TiO2

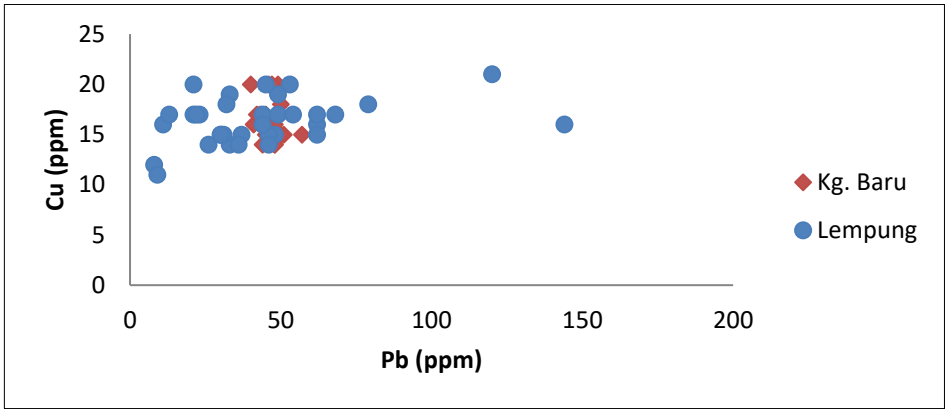

Figure 7: Scatter plot of SiO2 and Al2O3

Table 3: Content of trace elements (ppm) in bricks sample from Candi Kampung Baru

Sample	ppm													
	As	**Ba**	**Ce**	**Cr**	**Cu**	**Ga**	**Ni**	**Pb**	**Rb**	**Sr**	**Th**	**V**	**Zn**	**Zr**
KB 1	19	747	574	81	20	17	46	49	132	31	23	88	76	170
KB 2	16	696	584	100	14	27	26	48	66	9	24	125	45	332
KB 3	18	835	468	67	17	15	32	45	187	62	19	79	81	220
KB 4	17	710	600	100	15	26	27	51	59	11	28	134	48	417
KB 5	15	721	553	77	16	18	31	41	173	53	23	89	90	241
KB 6	17	818	566	81	20	19	39	46	192	53	24	89	105	278
KB 7	17	755	608	85	17	20	34	43	184	58	24	94	98	173
KB 8	10	706	569	74	15	24	28	46	56	8	13	105	45	349
KB 9	17	747	538	72	15	17	29	45	195	58	20	82	83	165
KB 10	14	768	599	80	17	18	29	42	171	44	22	88	64	189
KB 11	18	801	509	71	20	18	31	47	195	51	24	84	96	202
KB 12	15	749	586	93	18	26	30	50	66	11	23	112	50	281

KB 13	18	745	535	76	14	18	34	44	205	59	25	87	78	269
KB 14	9	727	617	79	16	23	35	47	57	8	12	103	42	315
KB 15	18	689	590	88	16	24	30	48	88	26	19	106	76	279
KB 16	24	664	502	109	15	28	29	57	66	10	27	131	65	430
KB 17	15	750	614	94	14	26	28	48	60	10	27	123	42	382
KB 18	15	781	625	111	15	28	29	50	60	9	24	140	53	348
KB 19	16	638	469	86	20	20	36	40	159	52	26	89	94	199
KB 20	11	761	559	76	15	22	29	47	58	5	12	97	42	320

CONCLUSION

The study on the material composition of the ancient bricks of Candi Kampung Baru shows that the bricks have an almost similar material composition as the clay in Bujang Valley, Kedah which is based on major and trace elements which are similar to compositional of clay samples. The mineral content present in the ancient brick samples consists of quartz, muscovite, and microcline. The results of the study also found that the open burning technique was used in the production of the candi's bricks because some of the bricks have an indication of low firing burning process. The dry weight percentage graph of silica and aluminium and magnesium and titanium, as well as the lead and copper concentration graph, indicate that the raw materials used to produce the ancient bricks are local raw materials and these materials were obtained from the Bujang River and Muda River Basin in Kedah. Therefore, local community was directly involved in brick making industry where the industry was the main supplier for the construction of several structure or monument made from bricks located in Old Kedah Kingdom.

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PROFILING INTERCITY BUS DRIVERS OF MALAYSIA

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Abstract

This research presents a qualitative research output of a profiling study conducted on intercity bus drivers in Malaysia. Some 1200 respondents were approached at one of the main bus termini in Kuala Lumpur, with a set of questionnaire. The analysis focused on describing and elaborating the socio-demographics characteristics of drivers, their working environment and their perception of the current remuneration systems. Investigating these profiles is important as it will contribute to better understanding of this segment of labour market within the transportation industry as well as the examination of factors contributing to drivers' behaviour and its relationships with incidents, accidents or road crashes.

Keyword: profiling, intercity bus

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INTRODUCTION

The study on bus drivers' socio-demographics has been scantily published in Malaysia. It is essential that an extensive research on bus drivers' well-being be undertaken in a wider setting to explore, explain and interrelate with some of the events and occurrences such as incidents and accidents involving public transportation vehicles. Not only bus drivers are the first reference points when it comes to investigation of road crashes, they also might be the victims traumatised by such happenings. Public transport vehicles monitoring and regulating have been widely studied elsewhere regionally, globally as well as in Malaysia. However, the drivers, their behaviours, attitudes, perception, actions and aptitudes are not so much elaborated and associated with more positive outcomes of the public transport industry. More often than not, this is an aspect of the transport industry that received the most criticisms, especially when discussing traffic incidents and accidents statistics. Stigmatised by negative perception, lack of positive evaluation and esteem, as well as lower quality working environment, these bus drivers may be reacting, expressing and retaliating against many positive initiatives, policies and schemes introduced the regulatory bodies and agencies. It is therefore, appropriate and timely that a nationwide profiling of bus drivers be made in order to understand, appreciate and propose positive way forwards to improve and upgrade the well-being of bus drivers in Malaysia. In effect, in their hands lay the lives of many public transport and road users.

In recent development of transportation strategies in Malaysia, one of the initiatives were to improve and upgrade the intercity services of buses in the nation. An important facet to such service delivery is the human capital development, which includes training and upskilling of drivers. Intercity services regulating and monitoring lie within the responsibility of an agency under the Prime Minister's Department, known as Land Public Transport Commission (LPTC). Land Public Transport Commission or in Malay, Suruhanjaya Pengangkutan Awam Darat Malaysia (SPAD) is an established agency with numerous jurisdictions and responsibilities related to bus operations under Malaysia Transportation legistlations.

There are several related statutes that govern the industry as a whole and more specifically the sector of bus operators and drivers. These include: Suruhanjaya Pengangkutan Awam Darat (SPAD) Act 2010 (Act 714), Land Public Transport Act 2010 (Act 715), Commercial Vehicles Licensing Board (Amendment) Act 2010 (Act A1376) and Road Transport Act 1987 (Act 333). These were supported by various rules and regulations such as Road Transport Rules (Compilation of 47 rules). Some departments and agencies like the Malaysia Institute of Road Safety Research also provided standard operating procedures for road safety purposes known as Safety, Health and Environment Code of Practice (SHE COP) (MIROS, 2017).

The relevant provision ranges from regulating, monitoring, enforcing and prosecuting bus drivers for various reasons such as recklessness of driving, causing death, causing injuries and others. The main ideas were the protection of life, ensuring of safety and security of passengers, penalty for causing harms and the disobedient against rules and regulations governing the public transport operation and road usage. Detailed discussion of the matters is not, however, within the ambit of this research.

Nevertheless, it is worth to point out that regulations on drivers and driving include that limitation of driving duration (8 hours) i.e. Rule 10(B) of Road Traffic Rules 1959, resting durations between two driving shifts/rotations and on-road operation to address driver fatigue, excessive cognitive efforts, circadian rhythms, risk taking behaviours, road rules violation, road safety violations, driving under influence, tailgating, overtaking at prohibited area and speeding. However, none of the provision has been concerned with remuneration, health and medical well-being as well as demoralisation, absenteeism and assaults on drivers by a third party.

It is not purpose of the paper to present statistically significant testing of contributing factors of accidents or crashes with the demographics of these drivers. However, it is the objective of this study to explore, highlight and describe the type of workers who are driving the passengers on the Malaysian road network, their working environment and the type of well-being provided by the companies operating the bus services. Hence, most data presentation and analysis will be only of qualitative and descriptive nature. Nevertheless, the future direction of the industry can be envisaged and forecast through this perspective. In essence, improvement and upgrading of the personal and working life of the bus drivers can be positively promoted so as to increase the drivers' self-esteem, uphold the positive attitude and aptitudes towards passengers' safety and well-being and also to revise the most important factor influencing human capital resources performance, namely remuneration packages.

PREVIOUS RESEARCH

Profiling bus drivers are essential in explaining the existence and quantum of the effect of their socio-economic and demographics characteristics upon awareness, knowledge, aptitude, attitude and behaviours towards incident and accident involving public transport vehicles and other road users.

Previous studies conducted on the relations of driving behaviours and incidents or accidents varied in explaining the primary and mildly contributing factors. Factors such as road geometry, road conditions, weather, opacity, vehicles conditions (interior and exterior), driver behaviours and other road users' behaviours have been discussed by many researchers (Mohamed et al., 2009; Mohd Soid, Isah, & Liew, 2016; Tse, Flin, & Mearns, 2006). Even though various factors played contributing roles, many researchers also argued that the

determinant of many bus crashes and incidents was predominantly drivers' behaviours (Yamada et al., 2008; Biggs, Dingsdag, & Stenson, 2009). Hence, it is vital that bus drivers be profiled in order to identify possible influence of these characteristics upon awareness and knowledge levels, perception, job satisfaction, aptitude and attitude and most importantly driving behaviour.

In essence, it is also a concern of this research to highlight the statistics of road incidents due to their nature, quantum and impacts on the society; physically, economically and socially.

Table 1: General road accident data in Malaysia (1997 – 2016)

Year	Registered Vehicles	Population	Road Crashes	Road Deaths	Serious Injury	Slight Injury	Index per 10,000 Vehicles	Index per 100,000 Population	Indeks per billion VKT
1997	8,550,469.00	21,665,600.00	215,632.00	6,302.00	14,105.00	36,167.00	7.37	29.10	33.57
1998	9,141,357.00	22,179,500.00	211,037.00	5,740.00	12,068.00	37,896.00	6.28	25.80	28.75
1999	9,929,951.00	22,711,900.00	223,166.00	5,794.00	10,366.00	36,777.00	5.83	25.50	26.79
2000	10,598,804.00	23,263,600.00	250,429.00	6,035.00	9,790.00	34,375.00	5.69	26.00	26.25
2001	11,302,545.00	23,795,300.00	265,175.00	5,849.00	8,680.00	35,944.00	5.17	25.10	23.93
2002	12,068,144.00	24,526,500.00	279,711.00	5,891.00	8,425.00	35,236.00	4.90	25.30	22.71
2003	12,819,248.00	25,048,300.00	298,653.00	6,286.00	9,040.00	37,415.00	4.90	25.10	22.77
2004	13,828,889.00	25,580,000.00	326,815.00	6,228.00	9,218.00	38,645.00	4.52	24.30	21.10
2005	15,026,660.00	26,130,000.00	328,264.00	6,200.00	9,395.00	31,417.00	4.18	23.70	19.58
2006	15,790,732.00	26,640,000.00	341,252.00	6,287.00	9,253.00	19,885.00	3.98	23.60	18.69
2007	16,813,943.00	27,170,000.00	363,319.00	6,282.00	9,273.00	18,444.00	3.74	23.10	17.60
2008	17,971,907.00	27,730,000.00	373,071.00	6,527.00	8,868.00	16,879.00	3.63	23.50	17.65
2009	19,016,782.00	28,310,000.00	397,330.00	6,745.00	8,849.00	15,823.00	3.55	23.80	17.27
2010	20,188,565.00	28,910,000.00	414,421.00	6,872.00	7,781.00	13,616.00	3.40	23.80	16.21
2011	21,401,269.00	29,000,000.00	449,040.00	6,877.00	6,328.00	12,365.00	3.21	23.70	14.68
2012	22,702,221.00	29,300,000.00	462,423.00	6,917.00	5,868.00	11,654.00	3.05	23.60	13.35
2013	23,819,256.00	29,947,600.00	477,204.00	6,915.00	4,597.00	8,388.00	2.90	23.10	12.19
2014	25,101,192.00	30,300,000.00	476,196.00	6,674.00	4,432.00	8,598.00	2.66	22.00	10.64
2015	26,301,952	31,190,000	489,606	6,706	4,120	7,432	2.55	21.5	9.6
2016	27,613,120	31,660,000[e]	521466[a]	7152[a]	NA	NA	2.59	22.6	NA

Source: Malaysia Institute of Road Safety Research, 2017

From the Table above, number of crashes has been on the increased annually since 1998, with total death rates fluctuating from 1998 and 2000, but increasing ever since (peaking at 7,152 deaths in 2016). Supporting this trend are two other research by MIROS (2017), indicating that fatality involving bus crashes are on the rise, whereby some 236 deaths were recorded in 2006, 41 bus incidents involving deaths (2007 and 2008), 131 bus incidents with 62 of them with death cases (2012) and among the most tragic one being the 2014 case where 37 deaths occurred in a single trip at Genting Highlands.

DATA COLLECTION AND ANALYSIS

This research was carried out on some 1200 intercity bus drivers, having an origin or a destination of the trip at the Terminal Bersepadu Selatan (Southern Integrated Bus Terminal), located in Kuala Lumpur, Malaysia. The geographical routes and paths of buses were conveniently selected and therefore would not be discussed

as these are not within the ambit of the research. A survey questionnaire was carried out on the bus driver (if single driver) or the main bus driver (if and when there existed two or more drivers per unit of bus), similarly based on convenient sampling.

The questionnaire was divided into four main parts namely, demographics, work or job details, remuneration and other benefits as well as comments or remarks made on the current working conditions.

Profiling the Demographics of Bus Drivers.

The majority (99%) of the drivers were male, aged between 41 and 50 years old (35%). Most (88%) were Malay drivers with 10% Indian and some 2% percent were of Chinese ethnicity. The majority (55%) were secondary school leavers or SPM (Secondary Education Certificates) holders, (54%) earning on average between RM2000 – RM2999 (USD 450 – 750) monthly.

Work Environment

A large (51%) proportion of the respondents were on average, having a driving duration less than 8 hours, excluding commuting hours to and from their homes. On average too, (35%) many drivers were having between 6 to 10 years driving experiences. Analysing the turnover rate data, it can be deemed that the loyalty towards a company/firm is not a policy among these drivers because as many as 822 (69%) of them have changed employers in the course of their employment history. Some 122 (10%) even had changed employment three times or more.

In observing the 10B rules, companies were allocating at least 30-minutes rest in between shifts or rotations for most drivers (97%), however, wages or salary structure is not supporting the economic well-being of these drivers. In many cases they were forced to play catch up with as many trips as possible since salaries are based on these structures (63% monthly based, 11% daily based). Further investigation revealed that the 63% of monthly based remuneration was actually monthly-trip combination based.

Remuneration Packages

Nevertheless, some (45%) the companies or operators provided commission allowances and other additional incentives (21%). These additional incentives ranged from employee's provident fund (90% of respondents reported to have received this), Workplace Occupational Hazards and Impairment benefit (90%), Family benefits upon one's Death (35%), School benefits for employee's children (26%), medical benefit (39%) and other types of benefits (1%) including: *umrah* (non-obligatory pilgrimage to Makkah), hotel, insurance, uniform, medical, goodwill fund. Some drivers (43%) did not receive any of these benefits from the employers.

Prior and during employment, many drivers received some forms of training. For instance, 60% of them went through drivers' training courses and safety courses (62%). While the majority of drivers indicated in the earlier paragraph that driving duration was within the stipulated regulation of Rule 10B, it was a surprise to find that some 5% of drivers were working more than 12 hours a day, presumably on double shifts or due to overtime or even for replacing absenteeism. Drivers have been making remarks that the industry was losing many employees due to unattractive remuneration system and low quality work environment, not to mention the negative perception that the government agencies and the public have on their persons and personality. Their words, "we are not criminals, we are drivers", "we are not criminals, please understand us" are some of the examples of how stigmatised are the job and the persons undertaking the job. Of the 34% drivers approached who complained about their well-being, the majority issues raised were remuneration, benefits in cash and in kind, absence of health and other insurance, poor road, vehicle and working conditions, antagonistic government agencies or unsympathetic employers, passengers' rude and inappropriate behaviours, difficulties of obtaining necessary permits as well as stingy employers when dealing with cash advancement for trip expenses. These 408 drivers also complained about the need for speeding, and the pre-conceived notion that drivers were the culprit for many bus accidents.

Turnover rates were gloomy for this industry. With the current company, drivers' service duration can be categorised as follows: 0 to 7 years (75%), 8 to 17 years (20%), 18 to 27 years (0.4%), 28 to 37 years (0.06%) and one driver even has started working since 1959.

Drivers surveyed reported that company hopping was a norm in the industry. 91% drivers were working with one single company, but only 29% have stayed more than 10 years with the same employer. Some 32% had until currently been working for two companies, those staying with the same employers for 10 years or more were only 4%. Some 10% drivers had been working under three different companies during different time frame, and only 0.06% stayed with the same employer for more than 10 years.

DISCUSSION

There is a plethora of research focusing on profiling, but most are foreign based, especially in the developed countries. For example, in the United States, drivers were also majority male (74%), with a mean age of 47, having a mean driving experience of 8 years, married (65%), possessing only high school education certificates (44%), having a mean driving hours per week of 37.14 hours, driving schedule being divided into (62%) daytime, (9%) night time and manning a vehicle aged an average of 9.5 years (D'Souza & Maheshwari, 2013). When facing assaults or harassment, some employers trained drivers in martial arts, for instance, Aikido.

In the United Kingdom, a similar profiling was gathered. Drivers were of the average age of 46 years old, majority (93%) male, having an average length of service of 10 years, working on a weekly 39 hour basis, did not consider the job was good for their health (74%) (Jones, Haslam, & Haslam, 2014). Both studies reflected the labour market situation of this segment of the industry, which fits the Malaysian profiles too.

Rusco and Walls (2005) argue that remuneration package of drivers were determined by level of economic development, people's income, region and passengers' population. They asserted that salary influenced behaviour, while behaviour influenced safety and quality of services. Various remuneration structures were identified for these developing cities. Hanoi has a fixed salary plus bonus payment for fuel consumption structure, Yangon adopted the share of fare revenue, fixed salary plus bonus system based directly on bus fare revenue structure, Bangkok subscribed to fixed salary plus bonus based directly on bus fare revenue structure, Jakarta used the fixed percentage of total fare revenue, fixed salary plus bonus based directly of bus fare revenue structure and finally Santiago adopted the fixed percentage of total fare revenue structure (Htun, Nakamura, Okamura, & Wang, 2012). None of these structure resembles that of Malaysian bus drivers' packages. In Malaysia, trip basis was more superior than passenger counts.

Rusco and Walls (2005) propagate that remuneration has various effects on behaviour: lack of quality remuneration would lead to symptoms of poor driving quality, aggressive driving behaviour, caused by weakness in enforcement of regulation and inadequate penalty system. Additionally, poor safety standard, shortage of skills, poor educational standard of drivers, limited training facilities are also the features of many developing cities' bus drivers' working environment. It was recommended that revenue control procedure (based on number of passengers) be placed, as well as a revamp of training and appropriate incentives (Rusco & Walls, 2005). Malaysian case study possesses many of these features and may learn from the best practice examples cited in the literature.

Yamada et al. (2008) profiled bus drivers in Chiba, Japan. 100% bus drivers were male, with an average age of 40.2 years old, having a duration of service 4.5 years. They highlight that there existed 10 job stresses: the lack of worth doing the job, the declining feeling of aptitude for the job, the bad environment in a bus, the bad environment in a company, the trouble in human relations, the difficulty of taking rest or holidays, the inappropriate salary or promotion, the punctuality of timetable, the low evaluation from company and the complaints from passengers (Yamada et al., 2008). They argue that fatigue and sleepiness led to accidents. It was recommended that improved reward system, positive work evaluation and increased private time with family and friends would motivate bus drivers (Yamada et. al, 2008). The Malaysian case

study has exhibited the same complaints by bus drivers. Therefore, it is also appropriate to subscribe to the recommendations made by Yamada et al. (2008).

On the local front, Mohamed et al. (2009) found that accidents peaked at 0300-0500 and 1400-1500 hours, indicating fatigue and sleepiness as contributing factors to crashes. In an interview of 16 drivers, Mohamed et al. (2009) found that drivers were of age ranged between 40-59 years old, possessing experience of 5 to 30 years, drove long distance of more than 300km, 60% of the them were driving in the wee hour (12midnight to 6 am). Further investigation discovered that drivers earned a basic salary of RM300 to RM700 (USD 75 – 180), with an allowance of RM70 to RM91 (USD 18 – 23) per trip and were making 15-18 trips per month. Average monthly salary was RM1,500 to RM2,000 (USD375 – 500), which increased during the festive month to around RM2,500 - RM3,500 (USD 600 – 850), with 50% of the remuneration coming from wee hour trips. There was no resting place provided and parking lot were haphazardly provided that drivers were often slapped with parking tickets at the end of a trip (Mohamed et al., 2009). It was recommended that salaries be revised to compensate for income loss, accommodation be provided for wee hour trips, parking lots be provided for buses (Mohamed et al., 2009). The authors also found that 15% accidents occurred due to fatigue or falling asleep. Sleep deficiency resulting from extended the work day by as much as 3 hours are taking the tolls on safety and work quality (Biggs, Dingsdag, & Stenson, 2009). Similar complaints have been made by some of the 1200 respondents of this study. They were compromising their rest and sleep time in order to make the possible maximum trip number per day to compensate for any loss of income due to other reasons.

In a more recent study, Mohd Soid, Isah and Liew (2016) profiled bus drivers as 100% male, (34%) aged between 46-55 years old. They also found that some 31% were with a driving experience less than 5 years, 24% were with more than 20 years (24%). Majority (82%) drivers had 4 to 6 days working in a week, (72%) possessed only secondary school certificates, (85%) were driving hours 8 hours or below while a small percentage (15%) was driving between 9 to 16 hours (Mohd Soid et al., 2016). The authors recommended that bus companies or operators provide drivers' training, agencies to tighten the enforcement, employers to provide more direct incentives and cash rewards. They observed that speeding behaviours among drivers were rampant if no enforcement officer was on board, or if the bus departed beyond the scheduled/published departure time (Mohd Soid, Isah, & Liew, 2016).

On the international front, Tse, Flin ad Mearns (2006) argue that drivers were made liable to suffer ill health as a result of the job. As a result, the industry faced over a billion dollars lost a year to unscheduled absenteeism (for medical reason). The authors defined burnout as high absenteeism, sick days, healthcare costs, negligence on the job, lowered morale and poor customer interactions which are currently faced by many bus drivers in the global context (Tse, Flin, &

Liew, 2006). Similar remarks have been made by some of 1,200 respondents of this research.

To conclude, the job of a bus driver in Malaysia is an inferior one, manned by unskilled labourers, with lower education levels and simultaneously lower disposable income to bring home. Even though is not categorised as 3D job (Dirty, Difficult and Dangerous), the responsibility that each bus driver is holding is as heavy as those of the former, due to the number of passengers and the risks upon livelihoods while making that trip on that particular public transport vehicle. It is a job of last resort, with lack of security, low cash and fringe benefits, high turnover rates, low morale and low levels of loyalty among workers towards the bus operators/companies. Carrier development is definitely absent in this industry and negative views by the public may be realistically perceived by the drivers.

Unless the following recommendations are heeded, many of these drivers will leave the industry as quickly as they enter this sector of job market. Those remained will be of lesser than the required quality and almost essentially demotivated to stay put in the industry for the longer term benefits.

RECOMMENDATIONS

It is not the aim of this research to detail out the panacea for the bus driver industry, but rather a targeted remedial actions that can be mooted in both the shorter and medium terms. The recommendations focus on the review and improvement of the followings in ensuring the socio-economic well-being of the drivers are safeguarded:

1. Remuneration packages and loyalty',
2. Cash incentives and direct rewards,
3. Training and retraining especially regarding road safety rules and regulations,
4. Driving duration and interior bus condition,
5. Enforcement of road rules and regulations by physical presence/appearance of an officer, road marking, shared penalty burdens among drivers and companies, and
6. Medical and health insurances, and other benefits in kind.

Details remuneration packages, cash and incentive rewards have been discussed in the previous section. However, training packages, traffic safety, road rules and regulations are all included in the SHE COP prepared by MIROS (2017). It left medical, health insurance and other benefits for the drivers' well-being as the new areas to be explored, opening up for wider research horizon in the future.

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HOUSE PRICE MOVEMENT FOR PRIMARY AND SECONDARY MARKETS: EVIDENCE FROM SELANGOR, MALAYSIA

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Abstract

The aim of this study is to determine the trend of escalation for both primary and secondary housing units. This research applies the desk study approach which uses secondary data from statistical format, which is the property market report (PMR) from the year of 2004 to 2014. Data from the PMR was analysed by using descriptive statistics method which provides a general overview of the house price movement. The observation only focuses the house price movement from the (9) districts in Selangor state. Results show that even though the volume of transactions decreases, the prices of residential properties are steadily increasing which also indirectly escalates the secondary market price.

***Keywords*:** house price, price escalation, primary market, secondary market

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INTRODUCTION

Dwelling is the most important asset for every individuals to develop social and family activities. Dwellings can generate income through rental, lease and investment. These activities lead to the stability of the market from the real estate perspectives. Rising house prices will provide high returns to investors but also leave negative impacts on buyers who want to own their dream houses. With current economic situation and strict terms from financial providers, it is getting difficult for individual to own their dream house.

The balance between the supply and demand for housing is important in dealing with price stability in the residential property market (Haron & Liew, 2013). The price for house units will remain low if the county develops excessive new development, while for not-so-new development, it will lead to a rise (Glaeser, Gyourko, & Saks, 2005). However, the growth in the residential property market is important to the national economy (BNM, 2013). The growth of population increases the demand for housing especially in the Klang Valley (C H Williams Talhar & Wong, 2014). This scenario creates urbanization and subsequently affect house prices (Hashim, 2000). The transportation routes and easy accessibility influence the prices of residential properties (Adair, McGreal, Smyth, Cooper, & Ryley, 2000). Additionally, neighbourhood facilities such as the recreational and shopping areas also affect the house price (Ding & Knaap, 2003; So, Tse, & Ganesan, 1997).

In this research, the movement of the residential property prices were analysed based on the primary market transactions set up by the developers and secondary market transactions which were recorded by the National Property Information Centre (NAPIC) from year 2004 to 2013. Primary market is the price which was set by the developers, which means that the transaction is between the developers and first house buyers. It represents the first transaction for the new development. On the other hand, the secondary market refers to sub sale, which indicates that the price is set by individuals based on the current market transaction. It can be the second, the third or later subsequent of transactions in the market (NAPIC, 2014).

The scope of the research only focuses Selangor as it is the state with the highest population in Malaysia. According to 2014 Property Report by Zaki and Partners, Selangor is one of the most attractive and developed states besides Kuala Lumpur and Johor. The researchers will observe the movement of prices and volume of transactions by district and type of residences for the year 2004 to 2013.

SELANGOR HOUSING MARKET

Selangor has the highest population in Malaysia, with approximately 5.46 million people. With an area of 7,900 square kilometres with a density of 526 persons per square kilometre, Selangor became a favourable place for migration. According

to the 2010 statistics from the Department of Statistics, 20 to 29 years group of ages constituted the largest group, which represents 23% of the total population in Selangor. This is most probably due the job opportunities, educational centres and other activities that attract such young group of people.

The attractions have led to the increased numbers of density in Selangor, along with the residential development. The increasing commercial activities such as shopping complexes, industrial and trading also influence the increased number of migration to Selangor. Thus, demand for residential is gradually increasing to fulfil the needs for dwelling. Figure 1 shows the state-by-state of-immigrant population for the 2012 to 2013 and the 2013 to 2014.

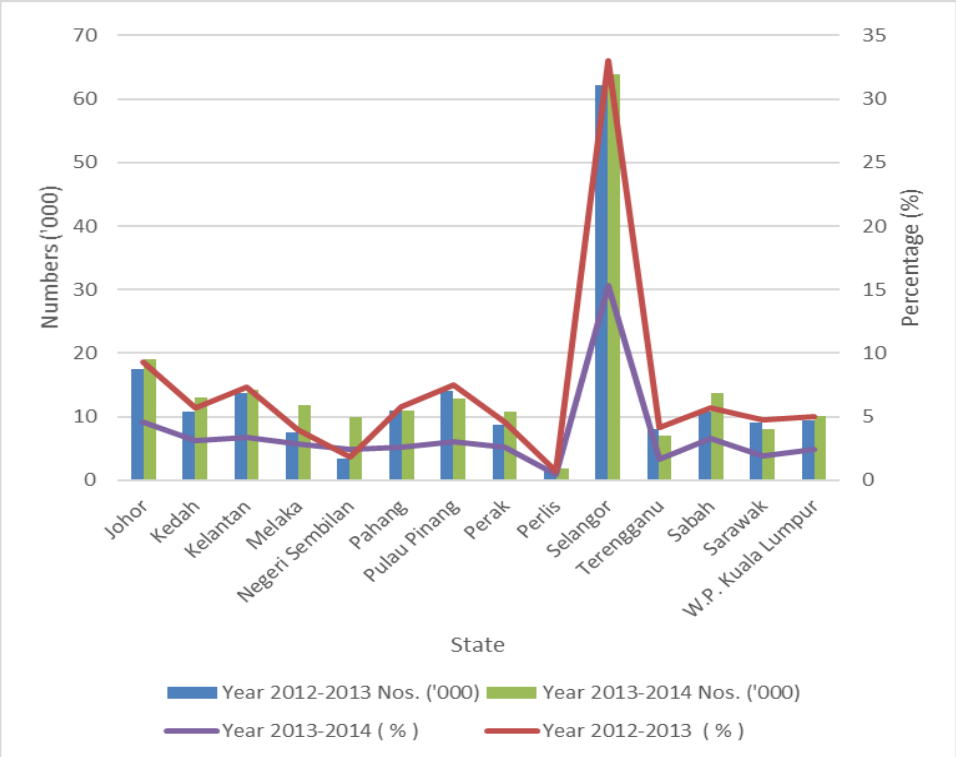

Figure 1: Immigrants by state, Malaysia, 2012-2013 & 2013-2014
Source: Jabatan Perangkaan Malaysia (2015)

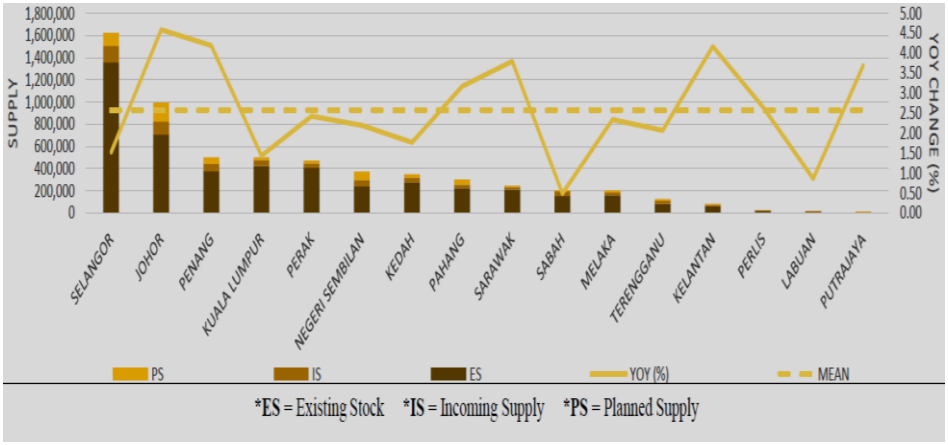

Figure 2: Supply compilation of residential properties in Malaysia, 2013
Source: NAPIC (2014)

Figure 2 shows that Selangor was the highest existing stock of residential properties (1,358,054:29%), also with the highest number of incoming supply (149,644:21%) and second highest number in planned supply (116,881:19%). In terms of the property market, the state of Selangor had recorded 64,269 units of transactions comprising of 26.1% of the residential sub-sector in Malaysia (NAPIC, 2014). Figure 3 shows the breakdown on property transactions by all states for 2013.

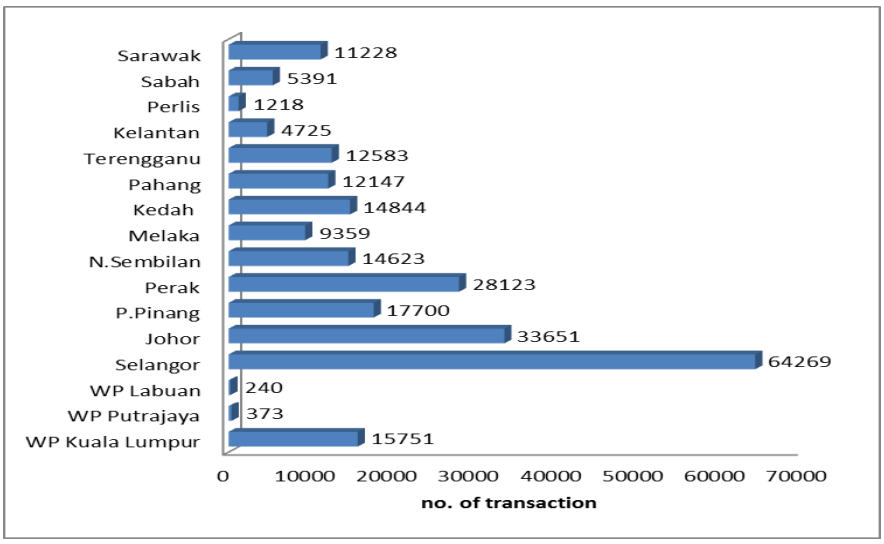

Figure 3: Breakdown on volume of transaction by state, 2013
Source: NAPIC (2014)

According to NAPIC (2014), house prices generally remained unchanged for the year 2014, as new housing estates proliferated around neighbourhood amenities such as the KTM commuter stations, Rawang Bus Terminal, Rawang AEON and TESCO hypermarkets, and around highways such as Shah Alam Highway (KESAS), New Klang Valley Expressway (NKVE), New Pantai Expressway (NPE), Lebuhraya Damansara-Puchong (LDP) and the Federal Highway. However, house prices are expected to rise along with the increasing costs of raw materials and lands which then led in the increase of development costs. Moreover, primary market price will keep rising and this scenario will have certain impact to the secondary market price. Market analysts involved in the real estate industry anticipate that house prices in secondary market will continue to rise if the supply of affordable houses is decreasing as developers prefer to provide high-end products with high marginal return.

METHODOLOGY

Data Collection

This research applies the desk study approach which use secondary data from statistical format, which is the property market report (PMR). The word statistical refers to official statistics collected by NAPIC to provide information on market transacted house price. For this research, the researchers use reports of property market transaction from year 2004 to 2013. The researchers intended to observe the house price movement of (9) districts in Selangor state. The PMR presents two sets of data, i) primary residential houses transacted price and ii) secondary residential houses transacted price.

Data Analysis

Data from the PMR will be analysed by using descriptive statistics method which provides a general overview of the house price movement. The data is presented in the form of tabulation such as the bar charts, pie charts and graphs.

FINDINGS ON THE MARKET EVIDENCE

Selangor comprises nine (9) districts, namely Gombak, Hulu Langat, Hulu Selangor, Klang, Kuala Langat, Kuala Selangor, Petaling, Sabak Bernam dan Sepang. From the analysis, the districts of Petaling, Klang and Hulu Langat are active in buying and selling residential properties. Petaling is the prime area of the city centre and known to have high population density.

Figure 4 shows the percentage of transaction for the year 2013 by District in Selangor. The Petaling district is the most active area with 37.1% followed by the district of Hulu Langat (22.5%), Klang (14.4%) and Gombak (11.9%).

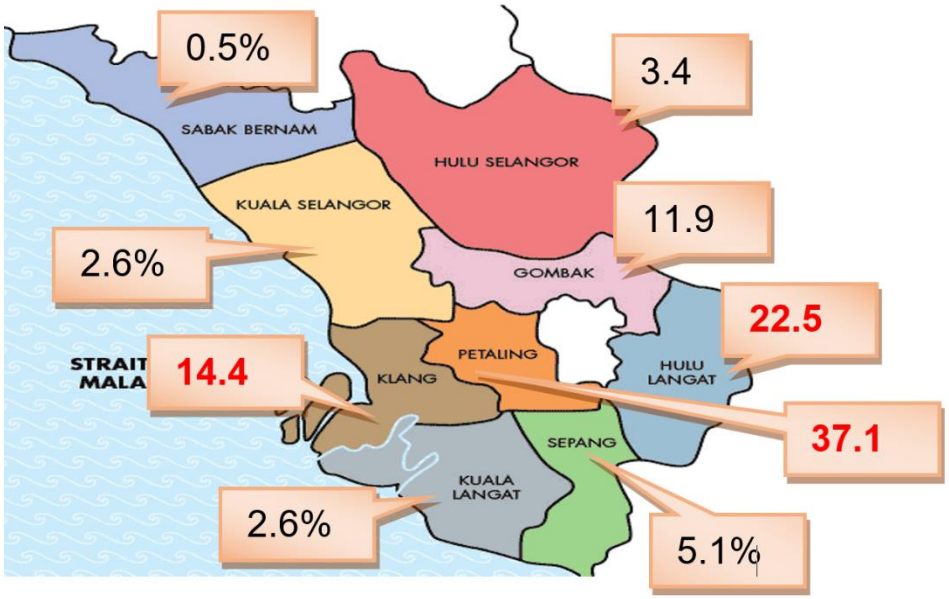

Figure 4: Breakdown of the percentage of transaction by district in Selangor
Source: NAPIC (2014)

Volume of Transactions by District

Figure 5 displays the uncertain volume of transactions in the primary market. The primary market comprises of the housing schemes newly developed and launched, and prices set by the developers. Supply of new units slackened in year 2007 and took an even greater deceleration in year 2008 before bouncing back in year 2010, a phenomenon attributable to the global economic crisis. The district of Hulu Langat was affected badly from year 2009 to year 2010 but subsequently showed some progress in year 2011 and year 2012. Records also showed significant reduction for most of the districts in the year 2013.

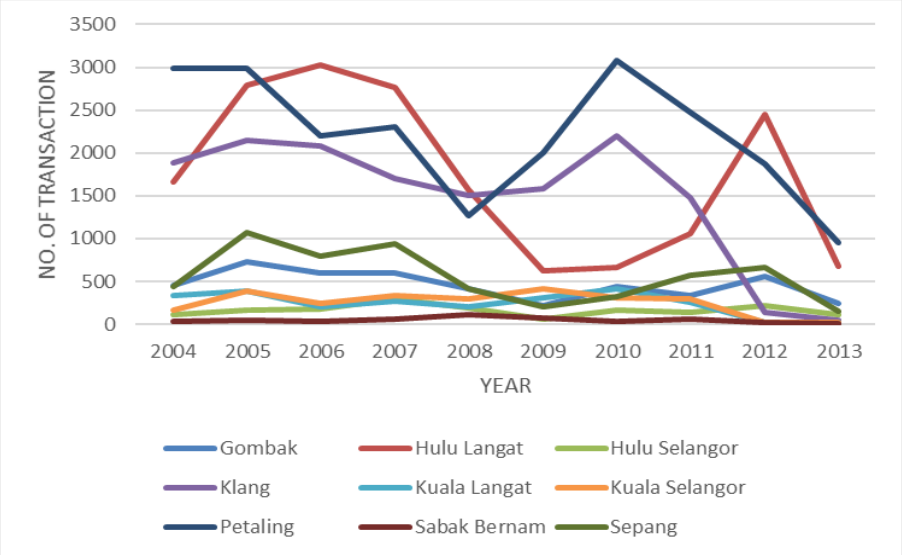

Figure 5: Volume of transaction of primary market

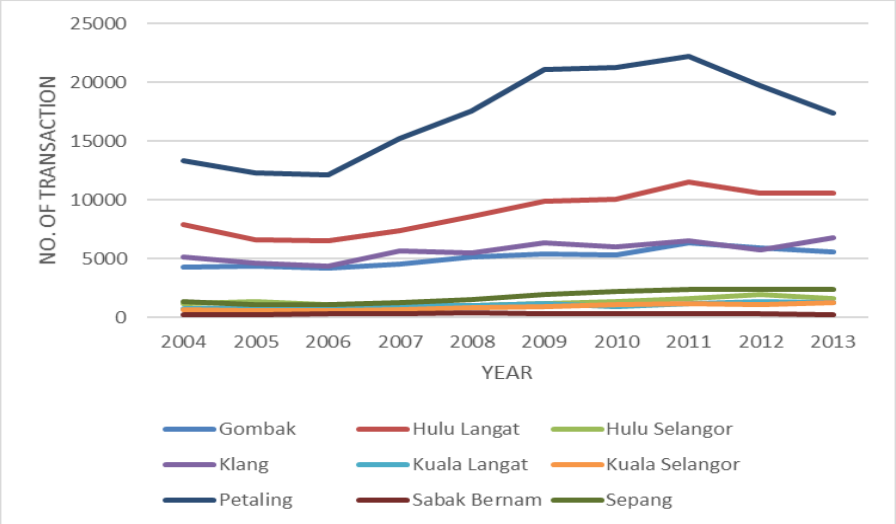

Figure 6: Volume of transaction of secondary market

Equally important, the primary market graph showed quick decrease and increase from year 2008 to year 2010. The conditions was because of the two economic packages that were introduced in November and March 2008 (Hashim, 2010). These packages had been allocated mostly to infrastructural projects including the building of low and medium-cost houses.

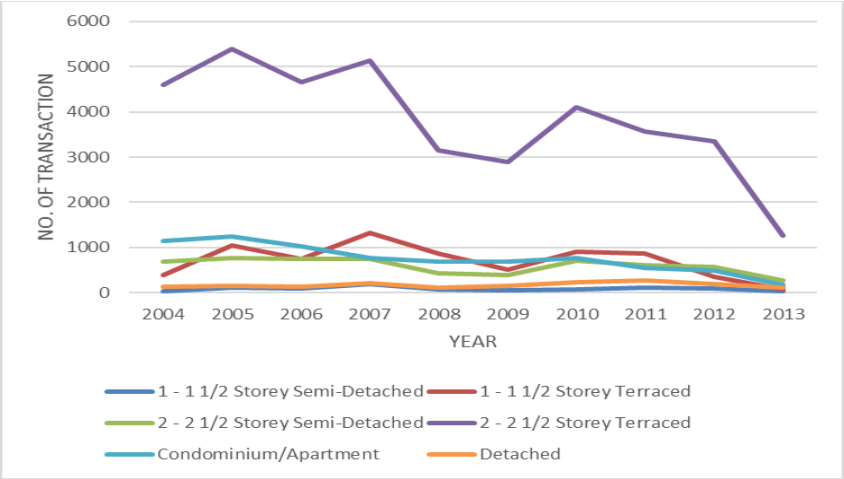

Figure 7: Movement of primary market transaction by type of residential property

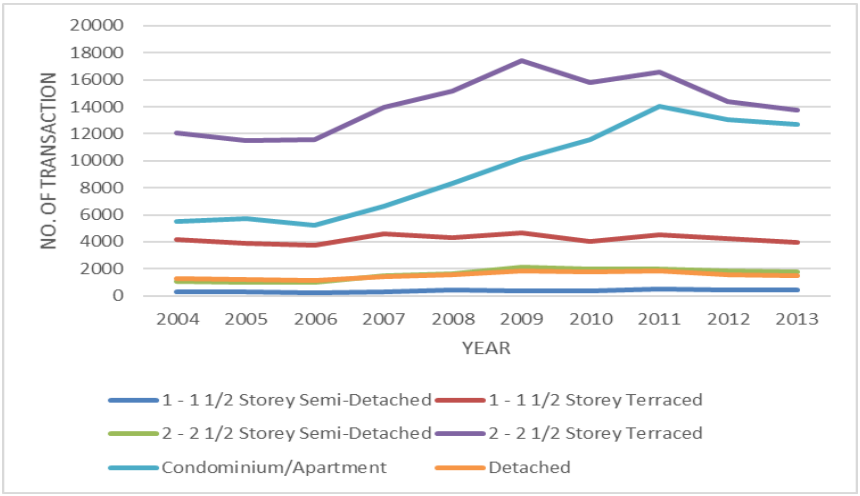

Figure 8: Movement of secondary market transaction by type of residential property

The construction sector was most likely to benefit from the stimulus package. As a contradiction, the secondary market of buying and selling homes, also known as sub sale, or the flow of its transactions showed a slight decrease in year 2005 and year 2006. The market shows rapidly increased in year 2007 and onwards until year 2012. The increase was due to the exemption of Real Property Gain Tax (RPGT) which took effect on 1 April 2007. There was an exception for newly launched products and the exemption of the RPGT would only affect the secondary market. However, this exercise would spur more activities of profitable property transactions.

Both graphs showed that the volume of transactions on the secondary market was not affected regardless of the uncertain flow for the primary market. As compared to the primary market, the secondary market in Selangor remained active with an upward movement observed in the transaction volume of the properties.

Volume of Transactions by Type of Residential Property

For the primary market, the residential terrace houses of 2-2 ½ storey represented the highest transaction in the year 2004 and year 2013 which also applicable for the secondary market. Although more attractive and relatively affordable condominiums were being launched in the market, landed residential properties remained the preferred choice of accommodation by the Selangor residents.

Despite of that, multi-storey dwellings such as condominium and apartment showed a significant rise in the year 2008-2011 for secondary market although the movement was expected to be static in the primary markets. Huge escalation in prices of landed property may serve as the main reason and lead buyers to purchase condominiums or apartments.

In relation with migration, most of whom were young and in a small number of families and categorised as a middle-income earner. The multi storey residential was the suitable type for them to reside. Economic crisis was also one of the factors which financial institution bit stringent in providing financial support to the youngsters. Percentage of migration which most of whom were middle-income earners become a primer to purchase multi-storey dwelling. Aside from that, incentive from financial institution and huge reduction in supply of landed properties may also be one of the reasons. Developers also took advantage by delaying the constructions of landed property and focusing on developing high rise residential property.

Volume of Transactions for Double Storey Terrace House

Within residential market, transaction activity is generally higher for 2-2 ½ storey terrace houses compared to other types. The chart showed that the volume of transactions for the secondary market was higher than the primary market. This might be due to the availability of secondary houses in the market compared to primary houses which were subject to supply and completion by the developers. During the economic crisis in 2007, transaction activity in the secondary market continued to grow while the transaction for the primary market was seen to decline.

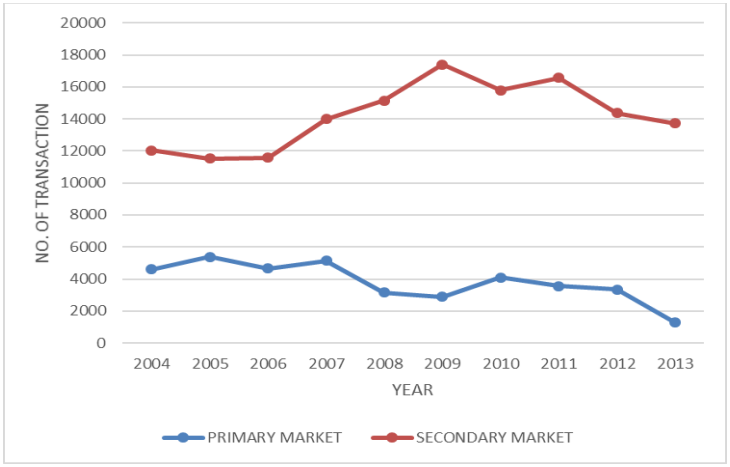

Figure 9: Movement of volume of transaction for double storey terrace house

Price Movement – Type of Property

Based on the analysis, three types of houses with active escalation in prices observed comprised of detached, 2-2½ storey semi-detached and 2-2½ storey terraced houses.

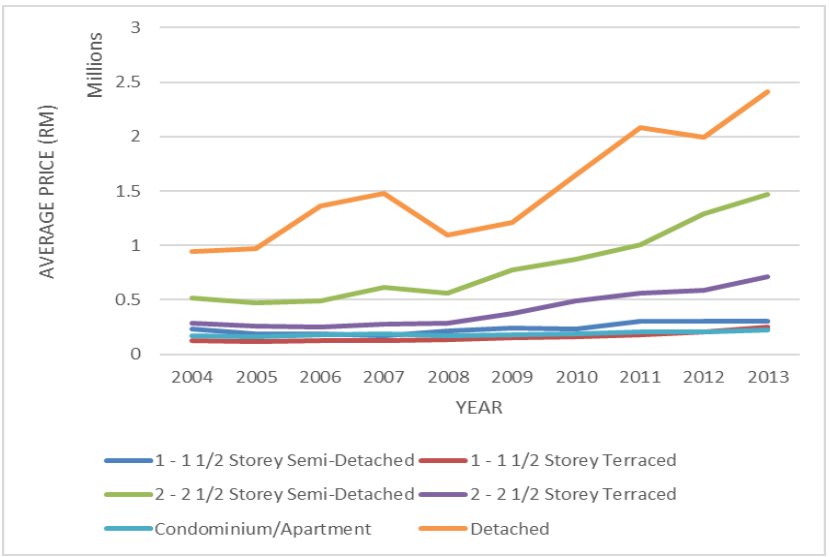

Figure 10: Trend of average price of primary market by type of residential property

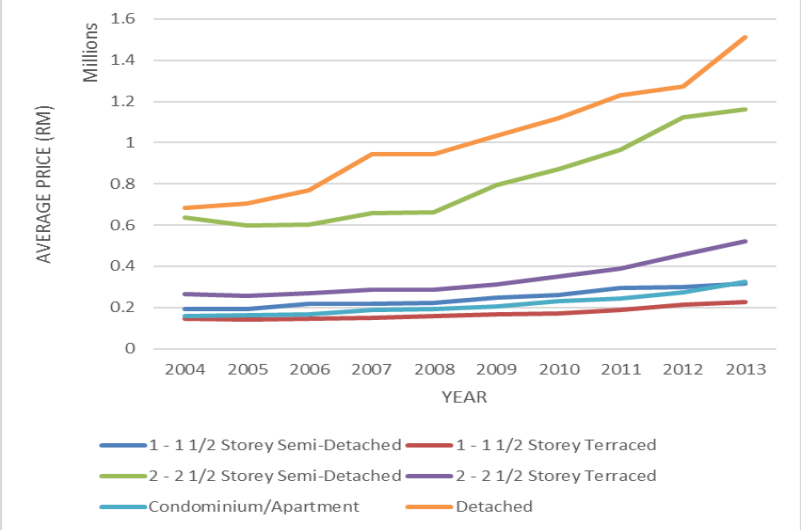

Figure 11: Trend of average price of the secondary market by type of residential property

The price for detached house showed escalation at approximately 150% with average price reaching almost RM2.5 million in the year 2013 compared to less than RM1.0M in 2004. Double storey terrace houses also showed escalation with 150% reach until RM700, 000.00. Highest risen price was recorded by semi-detached house with approximately 200% increment in 10 years. While the other types of homes demonstrated slow growth. The flow of the average house prices by type of residence can be referred in the figure 10 above for the primary market.

The secondary market also shows the detached houses, double storey semi-detached and double storey terraces are active in price escalation. From the analysis, detached houses increased up to 120%, 80% for semi-detached and almost 100% for 2-2 ½ storey terrace houses. Figure 11 shows the trend of average price of the secondary market by types of residential properties.

Figure 12: Trend of average price for double storey terrace

Figure 12 above represents the price trend for double storey terrace house in Selangor. It shows that both primary and secondary markets were stable, beyond RM300, 000 for the year 2004-2008. However, a slight movement was observed in the middle of 2008. The price in the primary market increased to RM700,000 in year 2013 while in the price in secondary market went up to RM500,000 in year 2013.

From the graph and analysis, it is safe to conclude that the price determined by the developer for the new development will bring a positive impact on the secondary market price.

CONCLUSION

From the analysis, it is evidenced that even though the volume of transactions decreased, prices of residential properties were steadily increasing. This escalation indirectly affects the secondary market price mostly for high-end and medium residential homes.

In the face of economic difficulties, prices for residential property tend to be fall-resistant and are more likely to remain unchanged compared to the commercial property as well as equity. In many cases, movement in residential housing market will contradict the volume of transactions compared to prices since property owners will not sell their properties at low price (Zhu, 2005).

Developers also have exclusive rights to determine the flexi price rather than seller in secondary market and able to encourage homebuyers to purchase house above market value. Developers also offer “bulk purchase” for oversupply scenario, with attractive package, below the market or at cost price.

Developers will slow down their activities to ensure that the completed residential schemes developed are fully sold. With the existing price of primary market, most future purchasers would move to secondary market to purchase their property. Small family may prefer the primary market for modern concept and design. As for aged family, they would divert their intention taking into consideration cost of living, hence settled with residential in the secondary market. Secondary market becomes an option due to the accessibility neighbourhood scheme, recreational and others.

As of the current scenario, most of immigrants in Selangor are categorized under the middle-income earners, thus, they prefer to invest in secondary market. The above facts show that secondary market is growing in line with the movement of price for primary market. It is then concluded that the price movement in secondary market is affected by price escalation in primary market, demand from middle-income earners as well as immigrants, high population area, and readiness of completed infrastructure to reach the housing area. Most of secondary market areas had been fully equipped with modern infrastructure, schools, complexes and even higher education institutions and market analysts opine that those infrastructures will boost the secondary market up.

The future exercise will focus on the factors which will directly influence the escalation of price, particularly in the secondary inactive market. These factors will be identified through surveys with respondents being buyers or potential buyers, real estate agents and appraisers in areas identified as inactive areas. The government will utilise the findings to re-develop those inactive areas to resolve the issue of house ownership in Malaysia.

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DETERMINING MODEL CONFIGURATION FOR THERMAL SIMULATION OF URBAN MOSQUE FAÇADE DESIGN

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ABSTRACT

Urban mosque (UM) façade design, besides its aesthetical role, is a passive architectural design strategy in handling how much heat penetrates into the internal spaces. In determining the model configuration for thermal simulation of urban mosque façade, the orientation and massing of the UM is tested. The orientation of UM relates to the *qiblat* direction and sun exposure. On the other hand, the massing is defined by the volume of the UM. This research investigates the effects of form layout and volume on thermal performance of the interior environment. A model with no openings on north-westward façade (NWF) and south-eastward façade (SEF) is simulated for a baseline scenario for comparison purposes. Autodesk Ecotect Analysis 2011 is a computer-based simulation tool used in this research to measure the thermal analysis in the UM model. The results indicate the performance of different types of forms, layouts and volumes. By the end of this study, the configuration of the base model is determined according to the results of the orientation and volume variations.

Keyword: urban mosque, baseline model, thermal simulation, form layout and volume

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INTRODUCTION

Urban microclimate of Kuala Lumpur is characterised by high temperatures and humidity with low wind velocity. This condition is in accordance to the observation by Marzita, Mohd Hairy, Mazlini, Che Nidzam and Noraini (2012) that confirmed the increased temperature at urban built-up areas compared to urban fringes and rural areas. Jusuf, Wong, Hagen, Anggoro and Hong (2007) suggested that the gradual rise in urban air temperature in all cities in the world are caused by drastic reduction of the green area. The high temperature in urban areas lead to concerns in attaining indoor thermal comfort with the threat of climate change (Adunola, 2012). Hence in the urban microclimate is a major concern in offering comfortable indoor environment. Mosques in urban area are subjected to the high temperature conditions in urban microclimate that lead to uncomfortable thermal condition for the worshippers to perform prayers.

Congregational prayer times are the critical periods due to high number of people in the prayer hall area. The alternative to maintain a thermally comfortable conditions is using air conditioning to cool the interior space. Dependence on air conditioning system to cool the main prayer hall increased the energy consumption and electricity cost which will burden the management of the mosque. Therefore, it is important for the urban mosque to adopt passive design strategies that will in turn sustain a conducive interior environment of the urban mosque.

Building design have a primary function to provide an internal environment that is suitable for the purpose of the building (Department of Standards Malaysia, 2014a). Façade design is a passive design strategy in response to the climatic context of the urban area. A suitable façade design optimise daylighting and thermal comfort (Department of Standards Malaysia, 2014b) of the interior spaces. Shafizal (2014) found that big openings allow the heating and cooling process faster as the indoor air temperature reaches the same temperature with the outside air. Consequently, the open areas of the building façade have an influence on the heat gain of the indoor environment. Hence, it is important to focus on the façade design over the aesthetic expression, as a reliable passive design strategy contributes to thermal comfort of the indoor environment.

The issues discussed highlight issues on the urban mosque thermal comfort and how façade design is important to control the thermal comfort of the interiors. This research intends to determine the model configuration for thermal simulation of urban mosque façade design. The model is important to test the performance of the façade design for urban mosque.

RESEARCH OBJECTIVES

Questions arisen from the previous findings; What are the critical façade orientations? What is the performance of urban mosque facades? What are the effects of form, layout and volume to thermal comfort? This research will

determine the critical façade orientation (form and layout) and the effects of massing (volume) on thermal performance of the interior environment.

Façade Orientations

The façade orientations are related to direct sun penetration into buildings which consequently affects thermal comfort of the indoor environment. Most researchers such as Liping and Hien (2006), Al-Obaidi and Woods (2006), Al-Tamimi and Sharifah Fairuz (2011), and Al-Tamimi, Sharifah Fairuz and Wan Mariah (2011) suggest that maximising façade orientation towards North and South resulted to better indoor thermal environment compared to east and west orientations. In the case of urban mosque, the building is orientated directly towards *Qiblat* (the direction towards the Holy Kaabah in the city of Makkah). This orientation is a must rather than being a design variable (Al-Homoud, 1999).

The mosque façade orientations can be deemed as North-westward façade (NWF) or qiblat-façade-facing, South-westward façade (SWF), North-eastward façade (NEF) and South-eastward façade (SEF) (Figure 1). The mosque superimposed on a sun path diagram of Kuala Lumpur (see Figure 2) indicates that the NWF and SEF are the facades facing towards direct sun path that consequently affects the indoor thermal condition of the mosque. Hence, the northwest and southeast façades need to be incorporated in the passive design strategies to handle the unwanted exposure to direct sunlight.

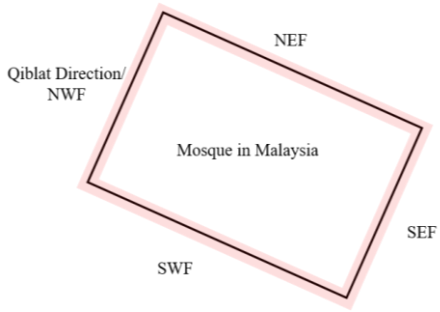


Figure 1: Mosque facade orientations

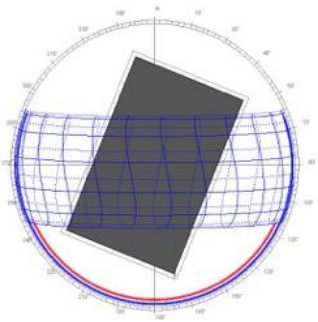


Figure 2: Sun path diagram of mosque façade orientation

RESEARCH METHODOLOGY

This research is focused on developing a model for thermal simulation to determine the urban mosque façade design for the thermal comfort of the indoor environment. The baseline model will be used for further indoor thermal simulation models of variety façade designs. The model is tested on factors such as façade orientation and massing. The significance and impact of design

parameters depend on the essential characteristics of the input and output variables such as building volume, type of layout form and so forth for further simulations of other UM façade design models. Autodesk Ecotect Analysis 2011 software is used to test the baseline model and the design variables.

Baseline Model: Urban Mosque Model Configurations

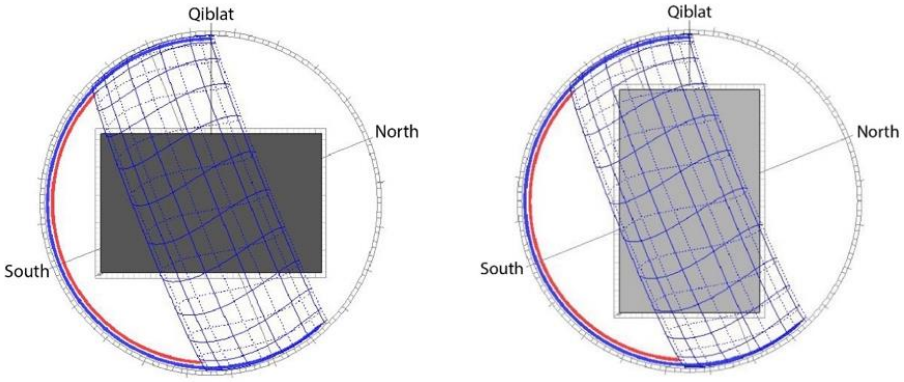
The baseline model for the computational experiment is the configuration to be developed and utilized to test the different façade design variables. A basic UM model with no opening on North-westward façade (NWF) and South-eastward façade (SEF) is proposed as baseline model. All the input required by Ecotect to simulate thermal comfort such as, building system, internal design consideration, activity level, materials and properties and are as described in Table 1.

Table 1: Urban mosque model configurations

No.	Characteristics	Descriptions
1	Façade Openings	NWF & SEF: no opening NEF & SWF: 10% opening area each
2	Dimension	25m x 40m (Type A) and 40m x 25m (Type B)
3	Occupancy	1000 occupant (full capacities) and 10 % from full capacities (100)
4	Form Layout	Rectangular Type A and Type B (see figure 3)
5	Volume	Single, Double and Triple (see figure 4)
6	Site Location	Kuala Lumpur, 3.1 N and 101.6 E
7	Local Terrain	Urban
8	Internal Design Condition	1. Clo. Value, clo. :0.89 adopted from (Hussin, Salleh, Chan, and Mat, 2014) 2. Humidity, % :70% as recommended by MS1525:2014 3. Air Movement, m/s :0.5 as recommended by MS1525:2014 4. Lighting Value, lux :300 as recommended by ISO 8995 (2002) and SASO (2009)
9	Activity Level	70W at Sedentary Level
10	Building System	Naturally Ventilated
11	Comfort Band	24°C -26°C as recommended by MS1525:2014
12	Materials and Properties	1. Wall 130 mm brick with 10mm plaster either side 2. Floor 100mm thick concrete slab on ground plus ceramic tiles.

		3. Ceiling	150mm THK Concrete with both side each 12mm THK ceramic tiles and gypsum. The air gap is 600mm between concrete and gypsum
13	Measurement Period	Hottest Day-6 July as recommended by EnergyPlus Weather Data of Kuala Lumpur	

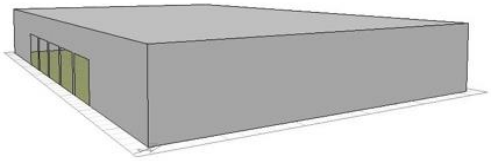
The model represents a rectangular building with a plan size of 1000m^2 within the dimension of 25m x 40m or 40m x 25m. The 1000m^2 is decided based on 1000 persons with 1m^2 is allocated per person occupancy as recommended by MS2577:2014 (Department of Standards Malaysia, 2014b). However, as seen in Figure 3, the rectangular form can be orientated into two types of form layout (type A and Type B). The investigation discussed in this research focus on the façade opening on NWF and SEF, while the opening on North-eastward façade (NEF) and South-westward façade (SWF) is controlled with 25m^2 opening at each (as shown in figure 4). The orientation of the model is referring to the orientation of mosque building which is orientated towards *qiblat* direction (232°). The solar charts used are for Kuala Lumpur. The exposure to direct solar need to be minimized by having shorter facades towards NWF and SEF.



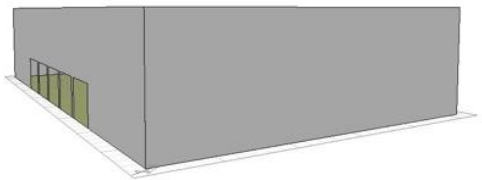
Type A Type B

Figure 3: Form layout Type A and Type B

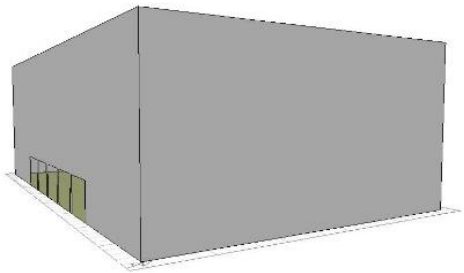
**Inventory conducted on UM in Kuala Lumpur City has identified a total of 56 urban mosques. These samples are categorized into three groups; single volume (4-6 metres high), double volume (7-9 metres high) and triple volume (10-13 metres high) where the height for each groups is shown in Figure 4.*



Single



Double



Triple

Figure 4: Types of volumes for UM

The building is planned to be occupied by 100 persons for normal prayer times (*subuh, asar, maghrib and isya*') and 1,000 occupants (for Friday prayers) for comparison on effect of number of occupancy on thermal comfort.

Autodesk Ecotect Analysis 2011

The measurement of thermal comfort is done by using the methods of simulation with Autodesk Ecotect Analysis 2011 software. This research chooses to use Ecotect program because of its facilities with respect to making a perfect induction on thermal performance of the building and pleasant user interface, which is easily used by architects (Crawley, Hand, Kummert, & Griffith, 2008). The thermal measurement calculation suggested by Ecotect for a building model without using air conditioning system is temperature, loss and gain, and comfort. Measuring temperature is the focus of this research to analyse indoor thermal comfort. The calculations related to measuring temperature in Ecotect is Hourly temperature (HT) and Annual Temperature Distribution (ATD). Thus, these two calculations will be applied and analysed to discuss thermal comfort in UM.

Weather Data

For the purpose of this research, the weather data of Kuala Lumpur is obtained from EnergyPlus website (EnergyPlus, 2016) and converted to suitable file format for Ecotect. The site location and local terrain is set up respectively to Kuala Lumpur as the selected location for urban mosque in this research. The thermal analysis is experimented on the hottest day of the year or 6th July for hourly temperature thermal calculation.

Data Analysis

The result of thermal comfort simulation on baseline model will be analysed in three stages;

i. First Stage: Relationship between thermal analysis with Type of Form layout.
ii. Second Stage: Relationship between thermal analysis with Type of Volume.
iii. Third Stage: Thermal analysis of UM Baseline Model

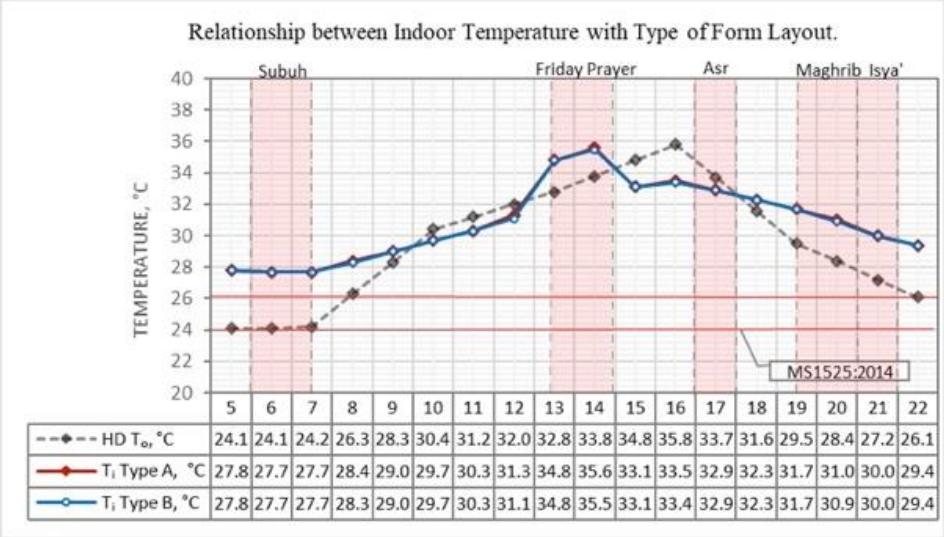
The result will justify model configurations of further UM model simulations on thermal comfort.

RESEARCH ANALYSIS AND FINDINGS

At the first stage, a baseline model of UM with form layout type B was analysed. Second, the result of different types of volume was investigated. The results determined the final model configurations of UM which would be utilized for further investigation on thermal comfort.

Effect of Form Layout

There was minimal difference in indoor temperature for Type A and Type B (see Figure 5). During prayers times, both layout was not comfortable for worshippers. The highest temperature recorded was 35.5°C and 35.6°C during Friday prayer by both types of Layout. However, for annual temperature distribution (ATD) analysis, Type B recorded slightly higher comfort temperature percentage than Type A, where the comfort temperature percentage over the year (see Table 2) was +0.3%. Hence, the form layout of UM had significant in providing thermal comfort in UM. Both type of layout form of UM recorded uncomfortable conditions based on recommended comfort range by MS1525:2014 (Department of Standards Malaysia, 2014a).



	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
HD T_o, °C	24.1	24.1	24.2	26.3	28.3	30.4	31.2	32.0	32.8	33.8	34.8	35.8	33.7	31.6	29.5	28.4	27.2	26.1
T_i Type A, °C	27.8	27.7	27.7	28.4	29.0	29.7	30.3	31.3	34.8	35.6	33.1	33.5	32.9	32.3	31.7	31.0	30.0	29.4
T_i Type B, °C	27.8	27.7	27.7	28.3	29.0	29.7	30.3	31.1	34.8	35.5	33.1	33.4	32.9	32.3	31.7	30.9	30.0	29.4

Figure 5: Relationship between hourly temperature with type of UM layout during hottest day (peak)

Table 2: Relationship between annual temperature distribution with type of UM layout

Type of Form Layout UM	**Comfort Temperature,% (as recommended by MS1525:2014)**
Type A, 25m x 40m	37.7
Type B, 40m x 25m	38.0

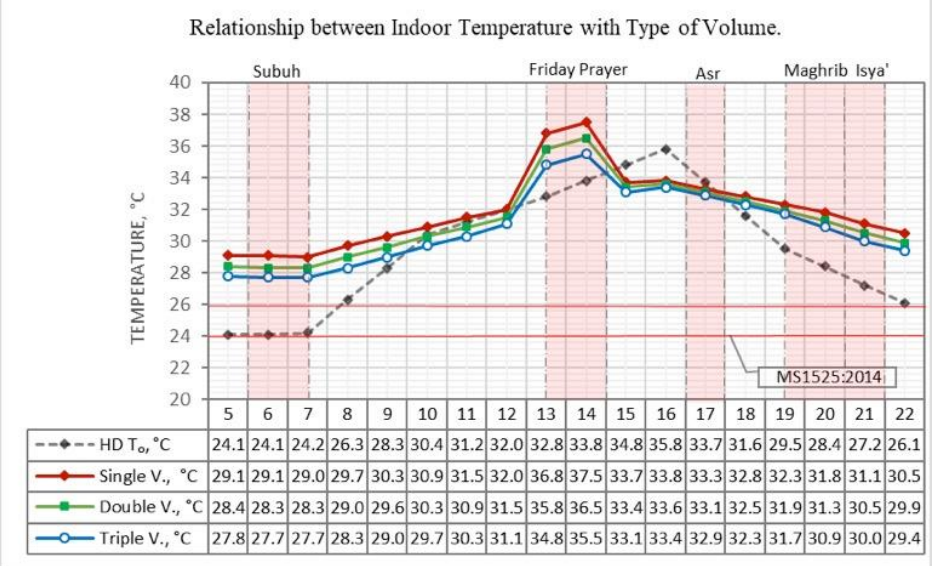
Effect of Volume

The graph of relationship between indoor temperature with types of volume of UM is presented in Figure 6. Single volume recorded higher indoor temperature compared to double and triple volume. Triple volume documented better indoor temperature than single and double volume. During 1000-1100h, Triple volume and double volume registered lower indoor temperature than outdoor temperature. While around 1500-1700h, all type of volumes displayed lower indoor temperature than outdoor. However, all types of volume were beyond the recommended comfort range by MS1525:2014. The results suggested that the occupants never feel comfort during all five time daily prayers including during Friday prayer.

Table 3: Relationship between annual temperature distribution with type of UM volume

Type of Volume	**Comfort Temperature,% (as recommended by MS1525:2014)**
Single	15.3
Double	27.0
Triple	38.0

As recommended by MS1525:2014, triple volume recorded highest comfort temperature percentage along the year compared to double volume and single volume registered the lowest comfort percentage (see Table 3). Through the results of 2 series of investigation on thermal comfort based on hourly temperature and annual temperature distribution, the triple volume UM was selected for further investigation on effect of façade design.



	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
HD T_o, °C	24.1	24.1	24.2	26.3	28.3	30.4	31.2	32.0	32.8	33.8	34.8	35.8	33.7	31.6	29.5	28.4	27.2	26.1
Single V., °C	29.1	29.1	29.0	29.7	30.3	30.9	31.5	32.0	36.8	37.5	33.7	33.8	33.3	32.8	32.3	31.8	31.1	30.5
Double V., °C	28.4	28.3	28.3	29.0	29.6	30.3	30.9	31.5	35.8	36.5	33.4	33.6	33.1	32.5	31.9	31.3	30.5	29.9
Triple V., °C	27.8	27.7	27.7	28.3	29.0	29.7	30.3	31.1	34.8	35.5	33.1	33.4	32.9	32.3	31.7	30.9	30.0	29.4

Figure 6: Relationship between hourly temperature with type of um volume during hottest day (peak)

CONCLUSION

Determining the procedure for simulation of thermal comfort through baseline model provided the preliminary data to further investigate thermal comfort performance of the other UM Models. Although the determination of thermal comfort through baseline model is a preliminary study, it is an essential phase to be able to compare and refer for further simulations. The following results are the determining factor for the baseline model;

1. The triple volume obtained better percentage for thermal comfort conditions compare to double and single volume.
2. The number of occupancies played significant role in indoor thermal condition. The highest number of occupancy increased the level of discomfort. However, the mosque was dealing with intermittent occupancies where the number of occupant was irregular. Therefore, for the purpose of research, occupancy schedule was proposed at 10% occupancy for congregational prayers except during Friday prayer (1300-1430h) and zuhur prayer time that was simulated for full capacity (1,000 persons).
3. The type B (rectangular form with the short façade facing *qiblat* or North-westward façade (NWF)) recorded better thermal condition. This indicate the small surface of façade would gain low heat than large surface.
4. All result was mapped against the recommended comfort range by MS1525:2014. The baseline showed that the temperature was beyond the recommended comfort range.

Through the investigation on type of form, layout and volume, the configuration of UM baseline model is type B layout form with triple volume is the selected model. All other parameters in Table 1 is maintained to further investigate on the effect of different façade design for the UM. For future recommendation, investigating UM with effects of different air velocity may improve the comfort conditions or the performance of ATD. Further research on the UM is important to underline the basic urban mosque façade design that will in turn provide thermal comfort instead of merely for aesthetic values.

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URBAN MORPHOLOGICAL ANALYSIS FRAMEWORK FOR CONSERVATION PLANNING AND MANAGEMENT

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Abstract

A closer look on scientific research and professional practice concerning on the planning and management of historic towns significantly reveals the absence of integrated approaches for urban morphological analysis as a diagnostic tool to interpret the evolutionary process of its physical form. Such circumstances have influenced the transformation of urban fabric which eventually contributed to fragmented urban landscape. This study aims to provide a unifying conceptual framework represented by morphological aspects of city block as spatial units. Through a conceptual comparative approach, the framework draws upon a typo-morphological approach that integrates the process typological approach and historico-geographical approach. The findings revealed that there were three main phases in construing the framework. Firstly, the pertinent basis of urban analysis can be delineated at the typological scale of city *(citta)*; representing by building typology at its most basic level. Consequently, to establish the interrelationship between elements of urban form, the most relevant level of resolution is on the taxonomy of *sertum* (block) and *textus* (plot series); emphasizing the representation of urban block as spatial unit. In the final phase, the inherited spatial structure of the town is unveiled according to four process of morphological region. The framework developed will ensure a clear urban form which is necessary for technical functioning and visual legibility for conservation of Early Malay town.

Keyword: typo-morphology, spatial pattern, urban block, urban landscape, early malay town

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INTRODUCTION

Urban morphology in simple terms is the scientific study of urban form (Gauthier & Gilliland, 2006; Marshall, 2015). The very essence of the term 'morphology' as interpreted by Steadman (1983; 1998; 2008) from Goethe's precedence (1749-1832) in biology is referring to the study of the structural relationships between different parts or aspects of the object to ascertain the relative of location resulted from the process of formation and transformation which shaped the overall form. In the context of the city, urban morphology analyse the relationships of the physical form, spatial structure and character of the city through four main components of urban form that apparently signifies the form of the urban fabric (Levy, 1999) which are: (i) Buildings (or constructed space); (ii) Plots or lots; (iii) Streets and (iv) Open space (Moudon, 1997; Oliveria, 2013). These components were analysed throughout its morphogenetic processes, henceforth disclosed the genesis as well as an engendering process of the city's form (Kropf, 2013).

Central to the urban morphological discourse, there seems to be an ambiguity in its theoretical and universally applicable approaches in analysing the city since the emergence of the field around 1960s led by pioneers such as Saverio Muratori and Giafranco Caniggia in Italy and M.R.G Conzen in Britain. The major challenge is to operationalize the morphological analysis in terms of acceptable practice as similar elements in the morphological studies coined differently by both scholars; however applied in parallel context with slightly difference in the level of analysis. For example, the concept of urban organism (Caniggia & Maffei, 2001) and morphological regions (Conzen, 1960) is actually referring to the area with homogenous functions that constitutes the macro level concepts (the overall view) and significant to development process of towns.

In addition, Dibble et al. (2015) pointed out that notwithstanding the remarkable amount of effort spent by both founders and their direct descendants (see Cataldi, Maffei & Vaccaro, 2002) revealed an absence of a unifying and quantifiable method of assessing urban form. Similar concern also raised by the international Urban Morphologist's in their discussion held in the International Seminar on Urban Form (ISUF), which has resulted to the consensus on the significant need in concluding the findings from rigorous analysis. For instance, the contribution of design theory based on traditional processes of city building as preambles to preservation effort is limited and seems to perceived on the uniqueness of the city without much emphasis on practical application (Moudon, 1997; Caliskan & Marshall, 2011). Drawing upon the above matters, work of Kropf (1993; 2009) proposed an integration of four existing approaches namely Spatial Analytical Approach, Configurational Approach, Process Typological Approach and Historico-geographical Approach. Despite of his attempt, the ambiguity of the morphological analysis scope is continuously debated.

Questions have been raised about the specific morphological approaches needed to better plan and conserve historic urban fabric. In the context of Early Malay town, albeit the significance of cultural heritage revealed in the spatial development of Early Malay town, yet current conservation practices have not often referenced to the various urban typologies. The major drawback is seen in the absence of the hierarchical level of urban form that are used for strategic planning purposes. Inevitably, this conservation-development conflict (Kong & Yeoh, 1994) became evidence as the urban conservation efforts is isolated and confined to the preservation of single building and monument without much consideration of the contextual urban environment (Shamsuddin, 2011; Said, Aksah, & Ismail, 2013). Consequently, specific impacts on heritage values in physical form and spatial structure presents in Early Malay town have not been correlated to these urban form typologies.

Drawing into these ambiguities, this research therefore aimed to provide an understanding on the morphological aspects of city block as spatial units and subsequently proposes an integrated and systematic framework for analytical processes. The reason for selection of city block as spatial unit is due to its unique characteristics and persistency that is developed from a smaller scale in accordance to the principles of organic growth. The study therefore, is a theoretical attempt to formulate a synthesized methodological framework for typo-morphological analysis to be applied in the context of Early Malay town. The framework proposed is therefore anticipated to provide practical conservation that considers a hierarchical structure of time-related layers of the city for conservation planning and practices that effectively respond to the urban landscape context of the city.

METHODOLOGY

The literature was drawn from research articles in journals papers accessible through online databases published between 1960 and 2017. Data were gathered largely from the International Seminar on Urban Form (ISUF) and Urban Morphology journal issues. This exploratory type of reviews attempts to identify and integrate the significant relationship with regard to the approaches and process involved within the reviewed scope of urban morphological analysis, historical city and urban conservation that are deemed relevant to be applied in the context of Early Malay towns. Through adoption of the conceptual comparative approaches, the research unveils the conceptual morphological analysis framework which draws on Caniggia and Conzen's tradition of typo-morphological approaches.

In the first step to plan a system to identify the principles and methods of urban morphological analysis; i.e the relationship between building type and urban fabrics and between typology and morphology can be interpreted using synthetic model. This simplified synthetic model shows the two-way

relationships between the different primary elements of the urban fabric to emphasize their dialectical nature. Following Caniggia & Maffei (2001) who adopts an organic approach, such relationship becomes a dynamics process of typological approach that creates pseudo-types which functionally lead to identify the basic fabric and eventually the particular fabric along the layer of hierarchy. In addition the typological process also able to link to more general mechanism of cultural transmission reflected in urban community (Table 1 and Table 2).

Further, the diachronic approach to urban form aimed to further develop an understanding on explaining the mechanisms of evolution or the process of formation and transformation of urban form. This process largely circulates around the historico-geographical approach of Conzen's (1960) town-plan analysis. The principle focuses on the plots and their aggregation in street blocks as one of the three distinct complexes of plan element according to Conzen. As a role of constant or historically persistent element in the city-level, it is represented by city block (Tale 3).

The integration of both types of approaches as outlined by Kropf (1993) build a theoretical foundation to develop the conceptual framework of urban morphological analysis in Early Malay town. Such integration is explicitly important as stresses by Osmond (2010), Cőmert (2013), Ravari and Mazloomi (2015), and Lovra (2016). The approach considered the dynamic process of urban change evaluated from a smaller scale and through logical consequences, the structure has been gradually formed to a city which asserts an important aspect relevant for managing historic urban landscape. It is illustrated in the framework processes that are further elaborated in the findings section (Figure 1).

FINDINGS: URBAN MORPHOLOGICAL ANALYSIS FRAMEWORK

Theoretical Foundation of Principles for Hierarchical City Levels

Prior studies have noted the importance of providing a clear classification framework and basic units of morphological description. It involves some processes of selection and simplification to reflect a shared understanding of the physical and material scales at which city can be analysed (Kropf, 1993; 2013; Osmond, 2010; Ravari & Mazloomi, 2015; Crowther, 2016) without a significant loss of the capacity of description and explanation to explain the comparison and therefore synthesis the morphological processes of the analysed city (Oliveria, 2013). This is based on the premise that *"the city is the most complex of human invention"* (Moudon, 1997); exposing the vast network to analyse both the physical and spatial components of the morphological elements comprised as an urban structure, all of which are part of the evolutionary processes of city development.

Due to the complexity of these relationships, the theoretical foundation for the urban form analyses integrated by Kropf (1993) proves to be a utilitarian instrument. The methodological frameworks established reflects an abstraction and simplification of the complexity of the urban structure using the hierarchical city layout, thus facilitates more operative system for coherent morphological analysis of the city as illustrates in Table 2. Furthermore, such classification framework through a consistent and repeatable basis of hierarchical subdivision of urban form recognized that cities are more accurately characterized as overlapping sets rather than strictly nested sets as previously epitomized in the multi-scalar system to understand the city as a patchwork of heterogeneous fragments in *Collage City*. Kropf's 'Taxonomy of Urban Form', Kropf (1993; 2013) made a greater comprehend on the conception of space, time and energy as basic aspects in spatial structure that have a greater relevance in the morphological analysis (Saraiva, n.d) which then should be viewed in a logic codependency based on logical connection and the relationships of part-to-part and part-to-whole among all urban elements in each hierarchical city's level for a fuller understanding of the physical materiality of the city (Osmond, 2010; Crowther, 2016)

The basic morphological principle presented primarily engage with the concept of coextensive forms which reflects the integration of Caniggia & Maffei's (2001) approaches of spatial (or co-presence) and temporal (or derivation), implying the understanding on the formation and transformation of the city's form throughout four multiple scales. The analysis of spatial correlations proceeds from an abstract set or schema of component subdivisions that forms a hierarchy consists of: (i) Elements; (ii) Structure of Elements; (iii) System of Structures; and (iv) Organism or nucleus of city. Accordingly, this schema is then applied accordingly to: (i) Buildings; (ii) Groups of Buildings; (iii) City; and (iv) Region (Moudon, 1994). Following the principles of aggregation as the very basic phenomena for the hierarchical subdivision structure of elements and operated with a sense of modularity; the forms identified at the different levels recognised as *types;* giving emphasis on identification of the concept of urban tissue (Kropf, 2013; Oliveria, 2016) also known as urban fabric.

In accordance to the recognized forms derived from the process typological approach that are conceived as *'cultural entities rooted in'* (Kropf, 2009), the local processes of development, change and diversification on the other hand, resulted to the distinction of such forms with a generic similarity to the process closely associated with derivation. Extending the established understanding of the logical connection between different hierarchical levels in Caniggia's work, the first part formulates the identification of the most relevant level of analysis according to Kropf's taxonomy of urban form to determine the perspectival synthesis of urban morphological analysis. The proposed framework

provides a critical tool to allow the investigation of the diversity of built form and construct more rigorous and nuanced explanation in explaining the process of formation and transformation. Table 1 and Table 2 show the logical connection and simplify the taxonomy.

Table 1: Synthetic model of relationship

Elements of Urban Fabric	Plot (P)	Street (S)	Constructed Space (CS)	Open Space (OS)
Plot (P)	P/OS	S/OS	CS/OS	OS/OS
Street (S)	P/CS	S/SC	CS/CS	CS/CS
Constructed Space (CS)	P/S	S/S	CS/S	OS/S
Open Space (OS)	P/P	S/P	CS/P	OS/P

Source: Adapted from Levy (1999)

Note: The highlighted column signifies the relationship between Constructed Space (CS) (or referred to buildings, i.e group of building in city block in the context of this research) to Open Space (OS) playing an important role in the formation of the urban landscape, presented as a relationship between private space and public space.

Table 2: Interpretation of Kropf's Taxonomy of built form

Taxonomy	**Interpretation**	**Scale of Analysis (correspond to Caniggia & Maffei, 2001)**	**Spatial Structure**	
Urban Tissue (or fabric) *Sedes*	Combination of urban fabric, shaping distinct urban area, city or town.	City		
Street *Textus*	Combination of city blocks, squares and roads, conforming different urban fabrics.			Routes / Street Spaces
Plot Series *Sertum*	Recognizable combination of parcels (plot/block) and the road system.			
Plots / Block *Fines*	Cadastral zone with one or more buildings, open spaces, plots / parcels.			
Buildings *Aedes*	Combination of rooms, detached buildings.	Building	Areas	
Rooms *Tectum*	Combination of structures.			
Structures	Structural elements.			

Statio		
Materials *Materia*	Construction materials.	

***Note:** The representatives of Latin names in taxonomy following Saraiva (n.d) seek to rule out any ambiguities of language around the built environment observed, noting similarities with the framework developed by Caniggia.
Source: Adapted from Osmond (2010) & Saraiva (n.d.)

Urban Form Complexes to Determine the Spatial Urban Landscape Unit According to Morphogenetic Process

The hierarchical structure of the city levels also quite explicit within the historico-geographical approach, a fundamental to Conzen's work (1960). In reference to the seminal study of town-plan analysis of Alnwick and Ludlow, the analysis conducted at extended to reveal the existence of physical form and transformation layout of the town as well as how the various components of that layout fitted together. This is based on distinguishing five general aspects of: (i) Site; (ii) Function; (iii) Townscape; (iv) Social and economic context; and (v) Development. Emphasizing to trace the character of historic city, the layout of the town were disaggregated and mapped according to three form complexes consisting of significant unitary areas, that are: (i) Town-plan or plan type areas, referring to areas delimited according to ground plan composing of street system, plot pattern and building pattern combining as plan-units; (ii) Land Utilization Pattern, referring to land and building utilization areas; and (iii) Building Fabric or building type areas focusing on the 3-dimensional physical form of the building (Kropf, 2009).

This approach provided an important opportunity to advance the understanding by articulating the ways of the development of those particular form complexes in each established unitary areas as being an integral part to the patterns delineated. Central to this, the analytical framework underpinned the significant integration of the historicity of the urban landscape, often termed as historical expressiveness whose importance expanded to uncover the societal values permeated in reference to 'morphogenetic priority' (Whitehand, 2007; Whitehand & Gu, 2010). This priority reflects the relative resistance to changes of the elements that comprise each form complexes in order to determine the landscape unit. For instance, ground plan of street patterns tend to have high resistance as compared to land and building utilization which is more ephemeral as well as buildings, are on average intermediate in their resistance to change.

Thus, focusing on the Conzen's townscape aspect as the physiognomy of urban landscape, the characteristic of the town can be identified as comprising the physical configuration of the spatial patterns. This produces a consistent representation with a composite view of complementary elements according to different morphological period. The occurrence of different morphological periods imparted to the townscape known figuratively as historical layering and

point out to the historical development involved in creation of such distinctive townscape character. Conzen describes morphological regions as areas of having homogenous urban form in terms of land use, building type and plan type which can be distinguished from other surrounding areas in four levels within the hierarchical system, ranked as: (i) Morphotopes; which shows the basic historical elements and development with adaptive processes; (ii) First settlement areas and old development characterized by transformative processes; (iii) Combination of old and new development areas which involves the process of repletion; and (iv) New development areas represented by additive processes. All of these ranked levels create a basis for townscape that signifies the characteristics of each time-layer of the historical town. Table 3 illustrates the general conceptual of the integrated approach.

Table 3: The integrated approach according to Kropf's Taxonomy of built form and its correlation with Conzen and Caniggia

Kropf Taxonomy	**Historico-Geographical Approach / M.R.G Conzen (Townscape)**	**Process Typological Approach / G. Caniggia (Co-presence)**
Urban Tissue *Sedes*	**Plan Division / Fringe belt / Morphological Region**	**Urban Organism**
Street *Textus*	**Townscape** - Land Utilisation Pattern - Plan Unit - Building Fabric	**Urban Tissue (or Fabric)** - Lot -Pertinent Strip - Route
Plot Series *Sertum*	**Town Plan** - Street System	- Block - Infill / Base Tissues
Plots / Block *Fines*	- Plot System - Building Pattern	- Node and Poles
Buildings *Aedes*		**Buildings**
Rooms *Tectum*		
Structures *Statio*		
Materials *Materia*		

Source: Adapted and Revised from Saraiva (n.d.)& Comert (2015).

DISCUSSION

The establishment of the framework and spatial units of urban growth represented by city block reflects a shared understanding of the integrated approaches whose concept could be applied with urban conservation practice. As identified by Nikovic', Dokic and Maric (2014), the key characteristics of morphological analysis are contained within the urban entity of urban block, which can be considered as a basic generative elements and generic features of cities reflected by its physically static component to reveal the transformation of urban structure in historical towns. Dokic (2007) further emphasis the idea on urban block as constituent elements of an urban space which had a significant influence in morphological analysis. By performing a comparative analysis of methodological approaches, this research generally follows the Conzenian cognitive approach with a combination of Caniggia's dialectic relationship of typological process as illustrates in Figure 1. The theoretical account of the methodology developed considering the socio-spatial character of Malay Early towns for apprehending their specificities. This study anticipated to offer some important insight on unifying approaches of morphological analysis with a shared representation of urban block as spatial units that signify the establishment of interrelationship between different hierarchical scales to facilitate more purposeful application of urban morphology in conservation planning and management of Early Malay towns.

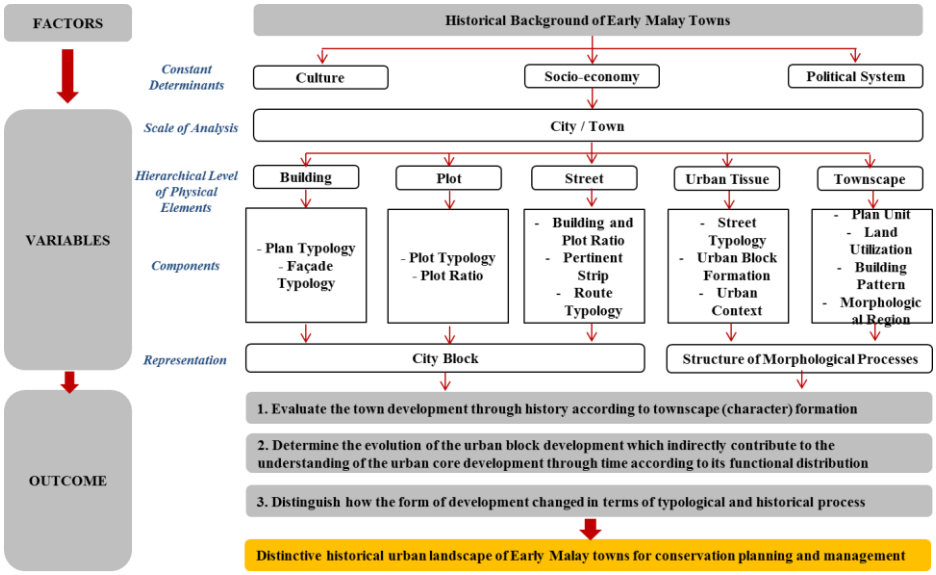

Figure 1: Conceptual framework for morphological analysis of early Malay towns with key representation of city block derived from the integrated approach of process typological (according to Caniggia) and historico-geographical (according to Conzen).

CONCLUSION

The form of the city is the physical manifestation of its identity that contributes to a better understanding of the urban reality of the place. Such deficiency in morphological understanding that mirrors the evolutionary dynamics of the city as a mosaic of urban formation in planning and design will lead to the dysfunctional of the city; peering into its relations with the surrounding urban fabric. The research revealed the representation of urban block as a basis of the morphogenetic method typical of any approaches either in Conzenian and Caniggian tradition that served as the backbone to connect the spontaneous and planned forms of settlements. In line with this, the research recommended that further investigation on the underlying of the indices in developing the integrated framework should receive more attention with regard to both physical and non-physical characteristics for evaluation in each hierarchical scale of urban form analysis.

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ANCIENT MARITIME SYMBOLS IN MALAY TRADITIONAL BOAT IN THE EAST COAST, PENINSULAR MALAYSIA

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Abstract

The study on decorative arts in Malay culture has been widely discussed by domestic and foreign researchers. However, dedicated discussions on decorative arts on traditional Malay boats are still lacking. This article will discuss the discovery of ancient symbols, which was once used in Malay traditional boat arts, especially in the East Coast, Peninsular Malaysia. The objective of this study is to draw a similarity in the understanding of maritime society around the world about the use of ancient symbols on their boats. This study used a visual analysis approach based on the findings of images resembling ancient symbols that were found in boat decorations around the world. These symbols will be described by their meaning and relevance through the use of the iconographic method. The results of this study reveal the understanding and beliefs of maritime communities around the world that are almost identical in terms of their ancient symbols. One of the artistic uniqueness produced by the Malay community is the creation of ancient symbol in a distinctive way and it is also an iconic feature that is connected to the Malay sailor community in the East Coast.

Keyword: decorative arts, ornamental arts, traditional boat, ancient symbol, stylisation.

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INTRODUCTION

The Malay art is formed from the mould and the manifestation of the local culture and the inclusion of various cultures. The art also gives way to the nature and identity of the Malays, which explains the value of a society, the way of life, and the influence of their traditional belief. The term 'Malay' refers to a community that is located in a vast territory, from Easter Island to Madagascar, and that they practice coastal culture. The Malay people who are proficient in the boat-making and sailing industries have travelled and scattered far across the globe. Furthermore, several researchers have discovered similar culture and language beyond these regions. The use of some terms – such as the Malayo-Polynesian and Austronesian by western researchers – refers to a common race of the Malays. Although the Malays have their own skills and capabilities in producing boats and water transportation equipment, the influence and use of external elements remain in the production of their boats and decorations.

This was the result of the spread of Malay sailors across outlying regions as well as the observation of the Malays on the boats that came to trade and docked at the harbours in the Malay World.

The production of decorative art on the traditional boats does not only exist in the Malay World, but in all maritime communities around the world, both in the East and in the West. The use of the figurehead on western boats is also a research focus dedicated on boat decorations in the west. The use of figurehead by western sailors is said to have begun around the 15th century. The figurehead was made of various shapes and engravings. In their beliefs, these figurehead decorations provide luck and control over their safety when they are in the middle of the sea. Wood carving that resembles human and animal forms is placed on the side of their boat. In the Malay community also, the use of ornaments on the boat has long been used that it garnered the attention of some western recorders who arrived in the Malay World. In Tome Pires's note, he had seen the boat used by the Malay community that was decorated with various dragon-shaped carvings. Manguin (2012) also stated that the decorations on the Malay boats around the 16th century were as follows;

> *"The state lancaras of Bintan in 1520, had their bows and stern beautifully decorated in gold in the way the princes of these places showed off the dignity of their service."*

The Lancang boat painted by Manuel Godinho de Heredia around the 16th century also displayed the shape of a Malay boat that had carved ornaments on the bow and boat stern. However, there is no description of the small boat in the Malay world that had the aforementioned ornament, except for the illustration of the early Malay ship (that had decorations) as recorded by Smyth in 1902.

PROBLEM STATEMENT

The boat decorations produced by the Malay community in the East Coast are ornamented artwork that were produced by a number of earlier generations and they were continued to be used on traditional boats. Decorations of the traditional boat in the East Coast are considered to be high art artefacts of the Malay art and it has its own distinctive features. The traditional Malay boats in the East Coast are furnished with decorative components, each of which has its own function. These components are decorated with certain motifs and has become a benchmark for the decoration of any boat's components. One of the components to be discussed in this research is an ancient symbol that appeared in the motif of a crane. This symbol was once discussed by James Hornell in some of his writings, such as the Survival of the Use of Oculi in Modern Boats and The Prow of the Ship: Sanctuary of the Tutelary Deity. However, the study of the use of this ancient symbol on traditional boats in the Malay World has yet to be carried out by researchers.

THE USE OF MARITIME SYMBOLS BY SEAFARER AROUND THE WORLD

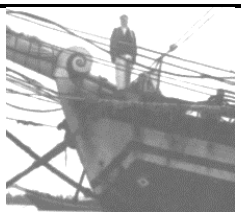
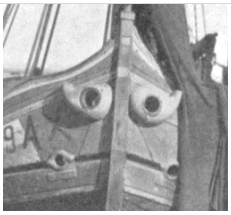
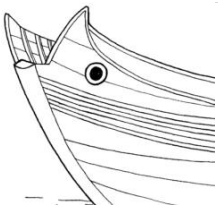
When James Hornell served as Director of Fisheries in Madras, India circa 1908, he had studied all types of boats in India and in the surrounding areas. In his observations, he discovered that there were uniform symbols used on boats by the Hindus in India. The use of the oculus and sulur symbols had caught his attention, in which these symbols could be seen on traditional boats in India. His research on the symbol began in 1923, when he had discovered it on a boat in Portugal, along the coast of the Mediterranean, Madagascar, some of the African countries (such as Zanzibar), Swahili, and in some Central American countries. Agius (2007) also discovered the oculus and surul symbols on the Arabian boats along the Red Sea, the Persian Gulf, and the Arabian Sea. These symbols were also found on boats in China, Vietnam, Singapore, and other countries as shown in Table 1. The discoveries in these places prove that the use of this symbol is one that is universal, as used by various marine communities around the world. These symbols also do not have a uniformity and a specific form. The symbol also does not have a special place, unlike the Bahglah boat which has the oculus symbol placed on the boat's stern.

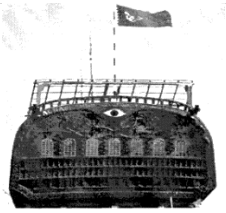
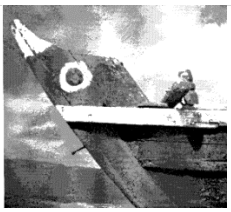
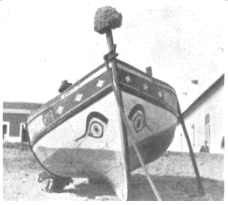
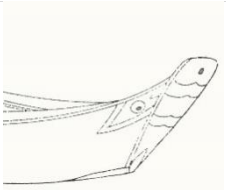
Culus is an eye-shaped symbol that is often placed on the bow of the boat. There are various forms of the eye found among them, as illustrated in Table 1. This symbol carries the meaning of vision, particularly when the boat sails in the middle of the sea. In the belief of the Chinese community, the oculus is important because each boat needs to have "eyes" in order to ease the sailing of the boats. The oculus serves as a direction indicator for a boat in the middle of the ocean and it also carries the spirit and protection from god (Hornell, 1923). Hornell also noted that the fishermen in Malta believed that by laying the oculus, their boat

had "life" and the spirit to navigate its direction in the ocean. Forde (1928) adds that this oculus is owned by all seafarers in the world, it protects the sailor who needs security during his voyage at sea.

The *surul* is a spiral or spiral symbol usually found in the bow of the boat. In the Malay society, surul or sulur is in a form of rolls and appears like a plant's shoot that is also widely used in carvings and other decorations. Haziyah, Zawiyah, Aminuddin and Aishah (2012) state that this surul or sulur takes on the image of makara. In the Hindu belief, the makara is an aquatic animal that becomes a vehicle of Vishnu when moving on the surface of the water. This makara image can also be found in front of the entrance to the candi (temple), which also serves as a guard and protector.

Table 1: Pictures of the **oculus** and *sulur* use worldwide

Country	**Symbol**	**Type of Boat**
India		Jafna Dhoni
Italy		Guzzu
Malta		Dghajsa
China		Wenchow

Arab		Baghlah
Arab		Sanbuq
Portugal		
Singapore		Sampan Kotak

THE USE OF OCULUS AND SULUR SYMBOLS IN THE MALAY COMMUNITY

The use of a boat's decoration is an important part of the Malay community, especially in the East Coast. Differences in the name of the boat can also be distinguished by looking at the boat decoration, such as that of the Pinis Gobel boat and the Pinis Dogol boat. The Pinis Gobel boat has a spiral ornament on its bow (as illustrated), while the Pinis Dogol boat does not have any ornament on its bow. Similarly, the name "Dogol" used by Kelantan people is an indication of the lack of ornament on its bow. In the Kamus Dewan's fourth edition, 'dogol' means not having hair, horns, or bones on its head, which can also be interpreted that the boat has no ornament on its bow.

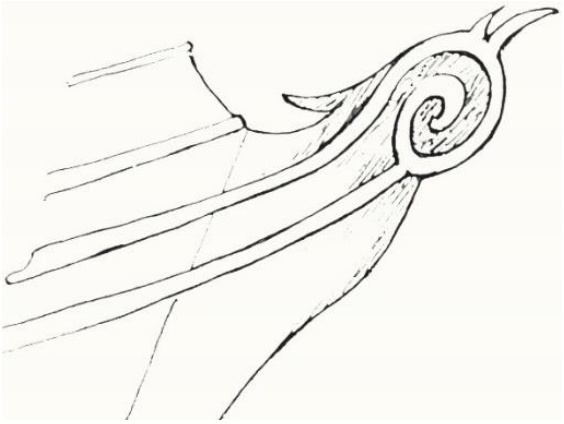


Figure 1: *Sulur* in Terengganu's Pinis Gobel

One of the interesting things in the boat on the East Coast is the use of decorative tools, such as head (kepala), crane (*bangau*), *okok*, *caping*, *sangga tengah*, *sangga kemudi*, *cagak*, and,*koyang*. However not all boats have this entire set of decorative appliances. Only the crane and *okok* are often used in all types of traditional Malay boats in the East Coast. Crane is a tool placed on the bow of the boat and serves as a prop on the mast and sails used by fishermen. The crane is made of hardwood, such as *cengal* (neobalanocarpus), *meranti* (shorea), *jelutung* (dyera costulata), and *pulai* (alstonia angustiloba). Most large cranes are over 1 meter long, 1 meter wide, and 5.5 cm thick; while for normal sized crane, it is about 40-60 cm high, 30-50 cm wide, and 4-5 cm thick. The crane is decorated with various carvings and paintings, furnishing the front and back of the crane. The front of the crane is the surface facing the sailors, while the back of the crane is the surface facing the ocean. The analysis of the findings of several storks has discovered that the front surface has a more beautiful and detailed carving than the back surface. According to Rosli (personal communication, 20th February 2014), it is the practice and belief of the fishermen community in the East Coast that the sailors need to face the crane when the boat is sailing and they are also forbidden to step over and turn their backs facing the crane while the boat is sailing. According to Nik Abd. Rahman (2002), in the Malay community, the crane also has the function of being a protector and has the spirit that helps fishermen while working at sea.

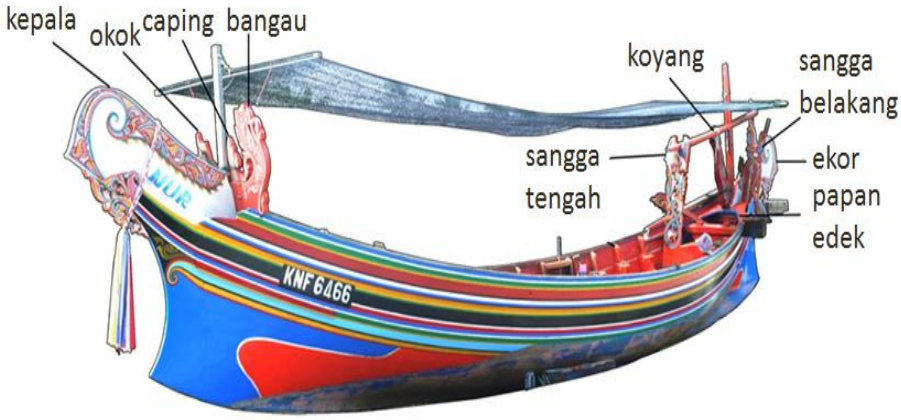


Figure 2: Boat's decoration on Western's produced boat

The use of the *sulur* can also be seen on the Western boat, where the *sulur* paintings are as clear as the elephant trunk on the bow and on the stern of the boat.

VISUAL ANALYSIS ON CRANE SAMPLES

In the visual analysis of the motives used in the 137 crane samples analysed, it is found that the motifs often found in crane samples are *sulur* motifs, while certain characters have the image of an eye.

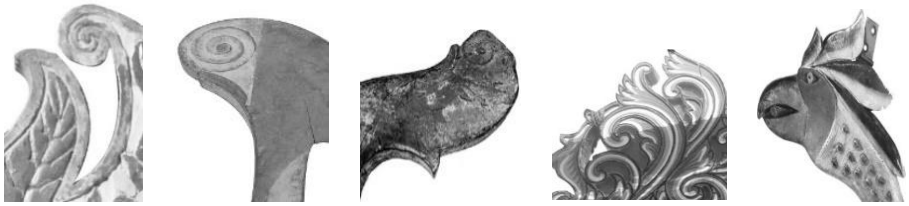


Figure 3: Findings of the *Sulur* image on the crane decoration

Figure 4: Findings of the *Oculus* image on the crane decoration

The images that have been found are stylised according to their suitability and used different approaches to distinguish them from the boats found in other countries. The interpretation and understanding of marine communities around the world on this symbol are the same, but the style of the process of the Malay society is quite different from those of the other societies.

DISCUSSION

The symbols and designs produced are the stylisation of the symbols used by ancient seafarers throughout the world. This symbol has become a belief and it is used on sailors' boats, especially in India. The use of the Oculus and *surul* symbols are used in the traditional Malay ornamental art of the East Coast, Peninsular Malaysia, but with different processes and styles. The spread of this symbol may occur from the relationship and interaction between the Malay community and the outside world, especially the people from India. However, with the creative leverage and intelligence of the Malay community, these symbols are fashioned in a more unique style and would showcase the identity of the Malays.

The understanding of the Malay community on some matters in marine affairs is also similar to other societies. For example, the Malays are of the belief that there are creatures or external forces that are in the middle of the ocean – in which they would hold a ceremony or ritual for ship launching, or a beach *puja* ceremony. The old understanding and belief was influenced by the ones brought in by foreign traders.

CONCLUSION

The craftiness and authenticity of producing art is one of the characteristics for the Malay artisans, but the production is based on a relationship of belief and understanding that has long existed in its environment. The Malays – who master the craftsmanship and handicrafts – could produce different artistry that are distinctive from other societies. Although the understanding of the symbols may be the same, but with the creative superiority and intelligence of the Malay community, it was produced in a distinctive style. This art also has connections to the teachings of Islam that prevents non-religious beliefs yet retain some of its traditional and pre-Islamic influence. The art produced, such as the crane, proved the Malays' ingenious method in laying old symbols and beliefs in oceanography.

ACKNOWLEDGEMENT

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INCOME TARGETS AND POVERTY OF RUBBER SMALLHOLDERS IN FOUR STATES OF MALAYSIA

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Abstract

Both rubber and oil have contributed significantly to Malaysia's revenues and job creations especially for those in the rural areas. Malaysia now stands at third after Thailand and Indonesia in natural rubber production. However, the country's natural rubber productivity began to decline since late 2011 and would probably deteriorate through 2016 as consumption growth weakens in China – the largest importer, curbing prices of the raw material used in everything from tyre to medical gloves and condoms. The declining rubber price has moved the smallholders who mostly live in rural areas into serious poverty. This has led the smallholders, who sustain latex production, to suffer and find alternative jobs to sustain. This has dampened the government's intention to ensure smallholders earn at least RM2,500 per month by 2015 and further to RM4,000 by 2020. The key objectives of this paper are to determine the poverty level, whether this policy has been met, and the impact of the reducing price of the commodity on the smallholders' spending patterns. The study finds a large proportion of this group fall into the hardcore poverty category, which deviates very much from the national poverty levels pronounced by the government. More needs to be done to assist this impoverished group.

Keyword: household income, poverty, rubber, smallholders

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INTRODUCTION

The Malaysian rubber industry has successfully established itself as the third largest producer of natural rubber in the world. The industry produces a broad range of products from natural rubber as well as rubber wood products with superior quality and is widely used as a benchmark in the international market. Malaysia also remains as the world largest exporter of natural rubber medical gloves, catheters and latex thread. From the finished rubber products, rubber gloves are one of Malaysia's biggest export product. It is estimated that over 60 percent of the rubber gloves in the international market is produced by Malaysia. As reported by the Department of Statistics Malaysia (2015), Malaysia has invested heavily in research and development (R&D) in the rubber industry in order to develop innovations and identify new uses for rubber.

Growth in agricultural productivity is a requisite to sustain current and future economic development. An increase in the agricultural productivity can lead to an increase in income, alleviate poverty and improve the standard of living of those in the rural area. Malaysia started its agrarian reforms under the First Malaysian Plan (1966-1970), which implemented land development, regional development, agricultural research and development schemes on commodities policies (Pazim, 2003). Land development programs are carried out through the opening of new land schemes and in-situ programs such as land rehabilitation and consolidation, replanting schemes, modern irrigation schemes and integrated agricultural projects. Regional development emphasizing on balanced development between rural and urban areas was implemented by means of locating small-scale industries in modern agricultural areas. In support of this, agricultural research is carried out by institutions such as Malaysian Agricultural Research and Development (MARDI), Rubber Research Institute of Malaysia (RRIM), Forest Research Institute of Malaysia (FRIM) as well as local universities. Besides involved in research, these agencies also disseminate their findings to farmers through extended and support services.

For rubber industries itself, Rubber Industry Smallholders' Development Authority (RISDA) was established on 1st January 1973 under the Ministry of Rural and Regional Development to address the plight of the smallholders. Besides that Malaysia Rubber Board (MRB) under Ministry of Plantation Industries and Commodities (MPIC) was established as a statutory authority responsible to manage the rubber industry in Malaysia.

Since 1984, Malaysia has already launched four National Agricultural Policies viz. the First National Agricultural Policy (1984-1991), the Second Agricultural Policy (1991-1998), Third Agricultural Policy (1998-2010) and Fourth Agricultural Policy (2011-2020). The thrust of various agricultural policies in Malaysia is to transform the agricultural sector into a modern, dynamic and competitive sector. In general, agricultural development in Malaysia focuses on agricultural productivity improvement through a more efficient and greater

utilisation of agricultural resources (Ministry of Agriculture & Agro-Based Industry Malaysia, 2012).

In the commodity sector, the implementation of National Commodities Policy (NCP) in 2011 by the Ministry of Plantation Industries and Commodities (MPIC) has formulated strategies to strengthen the role and contribution of the plantation and commodities industries to the economy. The NCP targets the transformation of the commodities industry to a dynamic and competitive sector by 2020. The NCP's formulation takes into account the industries' orientation towards market requirements and the potential of wealth creation through the production of high value-added products (Ministry of Plantation Industries and Commodities, 2012). Policies supporting natural rubber in the last decade saw areas planted with rubber increase from 1.39 million hectares to 1.63 million hectares by 2014 (RISDA, 2013). Rubber cultivation from total planted areas attributed to 16.8 percent in 2011 and decreased to 16.3 percent in 2014 due to greater growth in areas planted with oil palm.

Malaysia's policy against poverty first took a clear and coordinated shape with the introduction of the New Economic Policy (NEP) in 1970. It was designed to be an integral part of the NEP, thereby underscoring its importance to overall national development. When the National Development Policy (NDP) was introduced in 1991 to replace the NEP, some adjustments were made to the poverty reduction policy but its basic features remained. Similarly, Vision 2020, which was formulated at about the same time as the NDP, gave strong emphasis on poverty eradication. However, the smallholder families have been pushed into poverty due to current volatility in the rubber prices, making things worse for many.

Generally, poverty is defined as the inability to meet basic needs as measured by income or consumption. Poverty and standard of living are inter-related. Poverty may be visible as shown by several indicators, such as lack of control over resources such as education, skills, shelter and access to basic utilities like water, electricity, and sanitation. Other aspects include poor health, malnutrition, vulnerability to shocks, violence and crime (Chamhuri Siwar & Norshamliza Chamhuri, 2008).

Ever since the early 1900s, poverty have been traditionally measured using an economic approach based on income and consumption levels. Over the last decades social scientists have criticised this approach and have produced an impressive amount of work presenting alternative definitions and ways of measuring poverty. However, much of the poverty indicators used to this day are still imbedded in this income/consumption paradigm, while fieldwork undertaken so far on alternative indicators have been primarily carried out in rural areas (Hasan, 2002).

The objectives of this paper are to analyse smallholder's current household income; and to establish the proportion of the households which fall

under poverty; to analyse the impact of falling rubber prices on smallholders' on household income; and to explore means at which the smallholder households are managing the decline in rubber prices and household income.

The study intends to verify smallholders' income based on the current volatile price of rubber. Currently, almost all smallholders are low income earners of below RM800 (USD 195; 1 USD=RM4.10) per month and they live scattered in rural areas (RISDA, 2013). This study was conducted in four regions – southern and northern peninsula, Sabah and Sarawak.

LITERATURE REVIEW

According to Yeoh and Loh (2008), the main reason why China adopts developmental approach to poverty reduction in rural areas is related to the level of development of the rural economy. Compared to the urban areas, the level of development in the rural areas is relatively low. The urban-rural gap before and after the reforms has been widening. Dissanayake, Wasana Wijesuriya, Herath and Gunaratne (2013) refer to Sri Lanka's issue of declining rubber prices that has affected the smallholders' income. The smallholders continue to be farmers due mainly to their low educational attainment. We would relate three key theories to the issue in this paper. First, the supply and demand theory, second, growth pole theory, and finally the market efficiency theory.

Supply and Demand Theory explains the main concern in Malaysia's natural rubber as fluctuation of market price that affects the demand, supply (productions), the quantity and the earnings from exports. Price is determined by the intersection of supply and demand. Barlow, Jayasuriya and Tan (1994) presented a broad economic framework for natural rubber industry. The expected rubber prices in the market, production capacity of natural rubber, input costs of natural rubber and the underlying technological progress are the determining factors for natural rubber supply. Meanwhile, income level in the overall economy, prices of rubber substitutes, price of final goods, technology, consumer preferences, stocks and manufacturing capacity utilising determine the demand for natural rubber. Both demand and supply actively correlate in setting natural rubber in market. Relating to the supply and demand theory, natural rubber supply depends on several factors such as mature rubber plantation area that are eligible for tapping, the number of tapping days and rubber prices in the market. Smallholders' involvement depends on some of these. They will re-engage to tap rubber once the prices rise.

The Growth Pole Theory is a regional and industrial planning model for a set of expanding industries located in rural areas which induce further economic development. It is the product of agglomeration economies in a leading, dynamic industry or sector that serves as an engine for development, creating forward and backward linkages in promoting diversified production and consumption for a growing local rural population. This theory supports MRB in the upstream natural

rubber sector to continuously develop natural rubber production and the low domestic productivity by introducing key programs to support mechanisation and incorporating Good Agricultural Practices (GAP) for the rubber industry smallholders.

Market Efficiency Theory can be used to relate rubber as an investment item and smallholders as the investors. This theory can be classified at historical, current or forecast of the rubber price. The more information available to the public on rubber price will better the situation for the smallholders to make informed decisions whether to tap or not. In a strong efficient market, the current market price will reflect all the relevant information. MRB published daily the world market price of rubber in the websites and reports. The report uses physical rubber prices and can be retrieved from MRB portal as well as from RISDA's e-services portal which is open to the public.

METHODOLOGY

Smallholders are scattered across the country, especially in rural areas. A census by RISDA (2013) shows there were 283,683 smallholders who occupy 621,270 hectares of land cultivated with rubber (Table 1). Rubber smallholders comprise almost two-thirds of all smallholders in the country, and the land occupied for rubber is about 63 percent.

The agencies in charge of smallholders are RISDA in the peninsula, Sabah Rubber Industry Board (LIGS), and the Department of Agriculture Sarawak (JPS).

Table 1: Numbers and percentage of smallholders lot and land area cultivated for rubber and oil palm

	Smallholders			Percentage		
	Number	Lot	Land Area (Ha)	Number	Lot	Land Area (Ha)
Rubber	283,683	326,525	621,269.72	64.8	62.74	56.31
Oil Palm	154,090	193,885	482,023.89	35.2	37.26	43.69
Total	437,773	520,410	1,103,293.61	100.0	100.0	100.0

Source: RISDA (2013), p.19.

This study was conducted in the four states in Malaysia to identify the impact of reducing rubber price on smallholders' income. The respondents were from a population of smallholders of selected areas in the states as proposed by RISDA, LIGS and JPS. They were from Kuala Pilah in Negeri Sembilan; Kuala Kangsar in Perak; Betong in Sarawak and Kota Marudu in Sabah. The officers communicated with village headman of each district to gather the respondents.

The sessions with the smallholder respondents were held at different hours and venues accordingly in groups of 20 to 35 respondents each.

A survey questionnaire was used but face-to-face interview sessions was done as almost all of the respondents were from rural areas and required deliberation for better understanding of the questions posed. Other than interviewing, data from research papers, statistical reports, and government publications are a part of the secondary sources of data.

401 respondents participated in the survey. 77 respondents were from Negeri Sembilan, 119 were from Perak, 102 were from Sarawak and 103 were from Sabah. The interviews were held at UMNO Youth Operations Centre, Kg Ketior Dalam, Kuala Kangsar, Perak; RISDA Office, Stesen Manong, Kuala Kangsar, Perak; Kg Ulu Inas Community Centre, and Air Mawang Community Centre, both at Johol, Negeri Sembilan. In Sabah and Sarawak, the officers from LIGS and JPS assisted in conducting the interviews on the field. Interviews were carried out with the help of the officers. The respondents were approached house to house. This include the disabled respondents, especially in the peninsula.

A pilot test was conducted at Kuala Pilah, Negeri Sembilan with the assistance of RISDA's District Officer on 24 January 2016 at 9.00 a.m. Twelve respondents gathered at the Air Mawang Community Centre, Johol. However according to the respondents, the interviews were best held around 11.00 am or after 2.00 pm, as they need to attend to the farms early in the morning and would be back by 10.30 a.m. Most of the respondents were from rural areas and were over 50 years of age. The interviews were face-to-face in order to ensure the questions were answered well and accurately. As the respondents were about 50 years of age and the questions raised were sensitive – such as ownership of land and its size, children's contribution, and monthly income and expenditure matters – these were conveyed in an utmost polite manner. These were followed through by the actual study in February 2016.

The questionnaire comprised of four sections: respondent's background; occupational details; monthly income and expenditure patterns; and issues on market rubber price and how they manage it. In addition, there was a table for details of family demography to examine the household size, educational levels, occupation, incomes, and income sharing with the head of household.

Secondary data was obtained from the Malaysian Rubber Board, while Natural Rubber Statistics published is confined from year 2012 to mid-2015.

RESULTS AND DISCUSSION

Besides tapping, some respondents also had alternative jobs such as small businesses, fishing or rearing livestock. The smallholders need to have alternative jobs as rubber was highly dependent on weather as too much of rain and drought would influence their incomes from rubber, hence the need for supplementary incomes.

Table 2 shows the demographic distributions of the respondents. The demographic aspects covered respondent age, gender, ethnicity, health status, marriage status, number of children and number of dependents living in the same residential unit. The proportion of respondents who attended primary and secondary schooling was more than 85%, showing majority of the respondents had basic literacy. Less than 10% of the respondents had not attended school, and about two-thirds of the respondents were 50 years or above in age. 71% of the respondents were male and majority of the respondents were either Malays (47.9%) or "Others" (50.6%). The former were mostly Bumiputera respondents in the peninsular while the latter were mostly indigenous Bumiputera groups at Sabah and Sarawak, namely *Iban, Kadazan, Dusun, Bajau, Bugis* and *Rungus*. 84% of the respondents were married and 9.5% were single mothers. 83.6% of the respondents had six children or less. The average number of children was three while the mode is two. Majority of the dependents were staying with them.

In terms of health, 93% of the respondents declared themselves as healthy. Only 1% of them were disabled but were still able to work. Those who were unhealthy comprise 5.5%. Amazingly, it was found that, despite their age, these respondents still go to the farms to earn their living.

Figure 1 describes smallholder respondents' occupation at the four states. Distribution of jobs showed that the respondents were working as rubber tappers, oil palm planters, civil servants, private sector employees, rearing livestock, self-employed, farmers, or being fishermen. Additionally, the respondents tend to supplement their income with handicraft, lawn-moving, manning durian orchards, planting black pepper or are drivers. There were also some respondents who were unable to work due to old age or health issues. In addition, when the land was under replanting by RISDA, the smallholder had to look for other jobs while waiting for the tree to grow.

Data in Table 3 shows that a large proportion of the smallholders were rubber tappers in all states but least in Sarawak. At the latter, the difference was accounted for oil palm smallholding, livestock rearing, and farmers, more than their counterparts in the other three states. Some of the smallholders took up multiple jobs to sustain their families.

Table 2: Demographic background of participants

Demography	Frequency	Percentage
Age		
21 - 35	50	12.5
36 - 50	132	32.9
50 and above	219	54.6
Ethnicity		
Malay	192	47.9
Chinese	6	1.5
Indian	-	-

Others	203	50.6
Health Status		
Healthy	374	93.3
Unhealthy	22	5.5
Disabled, able to work	4	1.0
Disabled, unable to work	1	0.2
Marriage Status		
Single	21	5.2
Married	336	83.8
Widow	6	1.5
Single mother	38	9.5
No. of Children		
None	36	9.0
1 - 3	219	54.6
4 - 6	116	29.0
7 - 9	24	6.0
10 and above	6	1.4
No. of Dependents		
None	33	8.2
1 - 3	183	45.7
4 - 6	152	37.9
7 - 9	29	7.2
10 and above	4	1.0
Education Level		
None	37	9.2
Primary	171	42.6
Secondary	180	44.9
College /University	13	3.3

Table 3: Smallholders' occupations by state

Employment Status	State				All States
	Negeri Sembilan	Perak	Sarawak	Sabah	
Rubber Smallholder	59.8	48.9	34.3	62.2	47.3
Oil Palm Smallholder	1.0	8.2	14.1	4.5	8.9
Public Sector Employee	6.2	3.8	0.0	1.3	2.0
Private Sector Employee	2.1	2.7	1.3	1.3	1.8
Livestock Rearing	4.1	5.4	21.2	1.3	10.8
Business	5.2	4.3	1.7	1.3	2.7
Farmer	2.1	4.9	24.6	19.2	15.5
Fisherman	-	3.8	-	5.8	2.2
Unable to Work	5.2	4.9	-	-	1.9
Not Working	11.3	9.8	0.7	-	4.2
Others	3.1	3.3	2.0	3.2	2.7
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Note: Includes multiple occupations; "Unable to work" includes pensioners, "Others" include being a carpenter, manning orchard, cultivating black pepper, and driver.

Land Ownership, Land Size, Income and State

Total owner-occupied land was 72.6% (Table 4). All respondents in Sarawak were landowners with the land sizes mainly above 3 acres (at 94.1%). Respondents who own land 3 acres or less accounted for 40 percent, mostly in Negeri Sembilan and Perak. Smallholders in Negeri Sembilan and Perak were landowners but rubber serves only as a supplementary income as they mainly worked in public or private sectors. They tend to hire third parties to tap rubber. Over one third (34%) of smallholders own land above 5 acres.

Table 4 Distribution of smallholders by land ownership, land size and monthly income by state

	Negeri Sembilan	**Perak**	**Sarawak**	**Sabah**	**Total (%)**
Smallholder Status					
Owner occupied	74.0	54.6	100.0	65.0	72.6
Owner not operator	9.1	25.2	-	2.9	10.0
Operator occupied	10.4	16.0	-	28.2	14.0
Power of Attorney to Manage	6.5	4.2	-	3.9	3.5
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Land Ownership					
None	11.7	15.1	-	-	6.7
1 acre or less	6.5	15.1	-	-	5.7
1.1 to 3 acres	64.9	47.2	5.9	24.3	34.2
3.1 to 5 acres	10.4	17.6	30.4	17.5	19.5

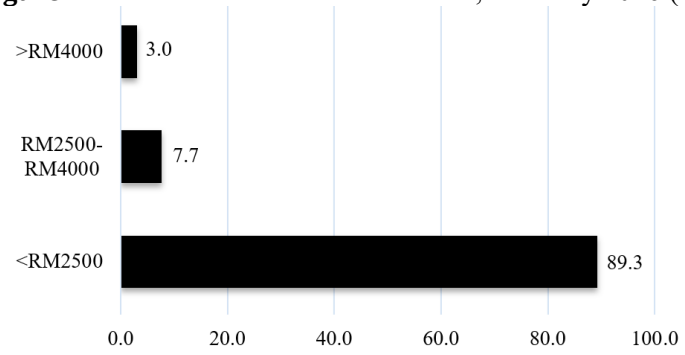
More than 5 acres	6.5	5.0	63.7	58.2	33.9
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Monthly Household Income					
RM1,000 or less	55.8	65.5	11.8	56.3	47.6
RM1,001-RM2,000	31.2	23.5	52.9	43.7	37.7
RM2,001-RM4,000	9.1	8.5	29.4	-	11.7
Above RM4,000	3.9	2.5	5.9	-	3.0
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Overall, those earning household income less than RM1,000 stood at 47.6%. Only 3% of the households earned above RM4,000 per month. By doing various jobs, Sarawak respondents were able to earn higher monthly income, more than RM2,000 (35.3%) compared to respondents from other states. Almost two in three smallholders (65.5%) in Perak earned RM1,000 or below and the proportion was nearly the same in Negeri Sembilan (55.8%) and Sabah (56.3%). With the decline in rubber price, they had to find alternative jobs and sublet their rubber trees to third parties to tap. If one were to combine incomes of those earning RM2,000 and below per month, the proportion would have stood at 87% in Negeri Sembilan, 89% in Perak, all of them in Sabah and lowest being 64.7% in Sarawak.

Overall Income of the Respondents Based on PLI

RISDA's target was to ensure smallholders earn at least RM2,500 per month by the end of 2015 and RM4,000 by year 2020. Referring to Figure 1 on respondent's monthly household income, overall household income below RM2,500 per month stood at 89.3%. Those earning between RM2,500 and RM4,000 per month only account for 7.7% and only 3% of the respondents had household income above RM4,000 per month. This shows RISDA's target of minimum RM2,500 had not been achieved as a large majority (90%) earned below RM2500 per month.

Figure 1 Smallholders' household income, February 2016 (%)



Poverty Line Income (PLI) and Food Poverty Line Income (FPLI)

Hardcore poverty or hardcore poor is defined as monthly income below the food poverty line that is needed to cover nutritional meals of the family (Malay Mail Online, 8 June 2014). The latest formula for the poverty line income established in 2014 is minimum RM930 in Peninsular Malaysia, RM1170 in Sabah and RM990 in Sarawak (Chi, 2015). Meanwhile, the same source identifies the food poverty line as minimum household income under RM580 in the peninsula, RM710 in Sabah and RM660 in Sarawak. Using these definitions, crude hardcore poverty is highest at Perak, high at Sabah and none at Sarawak. Incidence of poverty among smallholders is thus highest at Negeri Sembilan (36.4%), followed by Sabah (35.9%) and Perak (21.9%), and is lowest (2.9%) at Sarawak (Table 4). These figures were much higher than the poverty rates issued by the Economic Planning Unit, Prime Minister's Department in 2014 which reported a very low of 0.7% at Perak; 0.4% at Negeri Sembilan; 3.9% at Sabah and 0.9% at Sarawak. This illustrates that incidence of poverty among rubber smallholder was very high at all the four states.

Table 5 Distribution of smallholders' crude poverty rate by state

Level of Poverty	**State**				**Total**
	Perak	Negeri Sembilan	Sabah	Sarawak	
Hardcore	38.7	15.6	33.9	-	22.1
Poverty	21.9	36.4	35.9	2.9	24.3
Out of Poverty	39.4	48.0	30.2	97.1	53.6

Note: For 2014 Food PLI, Peninsular Malaysia –RM580; Sabah RM710; Sarawak RM660
For 2014 PLI, Peninsular Malaysia –RM930; Sabah RM1170; Sarawak RM990
Source: Malay Mail Online, 8 June 2014.

Monthly Income and Expenditure by Income Source

We begin here with the premise that the reducing price of rubber certainly affected household income of smallholders and their living standards. Table 5 proves that 22.1% of the respondents in the four states were earning RM500 per month. Healthy smallholders survived by doing alternative jobs like farming, fishing and planting other crops. Respondents who were unhealthy or aged 50 and above were unable do multiple jobs to supplement their income. They depend on government contributions such as Special Assistance Due to Declining Rubber Prices (BKKH), an assistance of RM500 given in 2014 and 2015. Besides that, the government also provided BRIM (1 Malaysia People's Aid) which enabled them to receive a one-off amount of RM500. BR1M was an amount given to deserving lower income citizens across all sectors by the government. In 2016, the BR1M aid had been given through three instalments compared to previous disbursement to households and single individuals. The minimum monthly threshold eligibility for BR1M had been raised to RM4,000 per household (*BR1M*

2016 online dated 1st May 2016). These disbursements were seen to reduce the burdens of the poor.

Table 6 shows that there were 2.2% smallholders who did not receive any income as their land was currently under rubber replanting programs and had to wait for the rubber trees to grow at least for another four years before they could tap. During this period they had to find other supplementary income.

Table 6: Smallholders' monthly income by source

Sources of Income	**Income (RM)**					**Total**
	None	Up to 500	501-1,000	1,001-1,500	Above 1,500	
Rubber	2.2*	40.5	66.3	58.0	50.0	35.8
Salaried jobs	10.9	32.7	23.4	28.4	36.5	21.8
Pension	21.4	2.6	6.4	13.6	13.5	9.1
Children's Contribution	19.4	18.0	2.4	-	-	7.0
Rental (house /car)	23.3	1.8	1.0	-	-	10.9
Others	22.8	4.4	0.5	-	-	15.4
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

*Note: * - due to replanting; "Others" comprise incomes from, Social Welfare Department, poultry farming and other supplementary jobs.*

Children's contribution to the respondents was also very low. Only 18.0% of respondent's children contribute below RM500 to their parents. The respondents also received other incomes from businesses, formal employment with the public sector, Social and Welfare Department, poultry and other supplementary jobs. Only 9% received their pensions and among them, those receiving more than RM1,500 per month stood at 13.6%. Only a negligible proportion earned from rentals.

Food is basic human needs. With the decline in the price of rubber, the smallholders tend to spend less on food. For example, over 71% spent less than RM500 on food (Table 7). Almost one-quarter of the respondents spent between RM500 and RM1,000 on food. However, many also spent below RM500 each on bills, children's education and transportation.

Table 7: Monthly expenditure of smallholders

Purpose	**Expenditure (RM)**					**Total (%)**
	None	Up to 500	501-1,000	1,001-1,500	Above 1,500	
Food	-	71.3	23.7	5.0	-	100.0
Rent & Bank Loan	81.0	15.0	3.5	0.5	-	100.0
Children Education	48.9	46.3	4.0	0.8	-	100.0
Transport Expenses	68.6	31.4	-	-	-	100.0

Utilities/Bills	-	99.0	1.0	-	-	100.0
Investment	83.5	16.5	-	-	-	100.0
Others	84.8	12.5	2.7	-	-	100.0

Note: Others include vehicle repair, medicine, fuel, car loan and groceries.
Figures in table show proportions with column.

Government Assistance to the Smallholders

The government was concerned with the present low prices for rubber that had affected smallholder's income. There had been several plans by the government to help them. The government helped on replanting with the state governments subsidising between 22% and 28% at Negeri Sembilan, Perak and Sarawak compared to only 7.8% by Sabah (Table 8).

Table 8: Subsidy received by smallholders by state

Type of Subsidy	**State**			
	Negeri Sembilan	Perak	Sarawak	Sabah
Replanting	22.3	21.6	28.1	7.8
Livestock Rearing	-	2.1	16.3	4.9
Cash Crops	1.3	1.6	-	-
Increase Rubber Productivity	1.3	-	-	2.9
Rubber Latex Booster	11.8	11.1	2.5	4.9
Tapping Equipment	9.9	1.0	1.9	4.9
Rain Protector	-	1.0	1.3	-
Fertiliser/Insecticides	24.3	43.2	35.5	33.0
Financial Support	1.4	3.7	14.4	-
BKKH	26.3	8.4	-	-
Additional Economy Activities (AET)	0.7	-	-	-
Rubber Production Incentives (IPG)	-	-	-	41.6
None	0.7	6.3	-	-
Total	**100.0**	**100.0**	**100.0**	**100.0**

Although Sabah smallholders get the lowest subsidy among the states for replanting, they received the highest incentives of Rubber Production Incentives (IPG) from the MRB at 41.6% compared to other states which did not apply for it. A large proportion of government subsidy went to fertilisers and insecticides. BKKH subsidy of RM500, were given to smallholders who were registered with RISDA. In the peninsula, Negeri Sembilan smallholders received the highest (26.3%) followed by Perak (8.4%).

Other subsidies provided by the government include providing livestock (cattle and goat) or seeds for cash crops planting (such as chillies and vegetables) and integrated farming, rain protector and, tapping equipment.

Conclusion

Natural rubber has put Malaysia as the top latex producing countries in the world some decades back before lagging behind to the third place now after Thailand and Indonesia. Natural rubber still continues to position itself as a strategic commodity crop in Malaysia, especially in supporting the rubber-based industries as well as being one of the main sources of income for rural smallholders. In tandem with the objective of transforming Malaysia into a developed and high-income nation status by 2020, the rubber industry is expected to sustain its contribution by producing high value and green products to meet global demand. This can only be sustained if those involved in the rubber plantations find it worthwhile to continue planting rubber. Various schemes and assistance have been introduced to help smallholders by providing special cash payments, subsidising fertiliser, providing assistance to rearing livestock and IPG.

This study found that almost 90% of the smallholders' monthly household income had fallen very much below RM2,500 at all the four states studied. It shows that the government policy targeting at smallholder's income to reach RM2,500 by year 2015 had failed. In fact, hardcore poverty stood at 39% among smallholders in Perak, 34% in Sabah, and 16% in Negeri Sembilan. Overall 23% of all smallholder families lived in hardcore poverty. Smallholders families who had household income below PLI was highest at Negeri Sembilan and Sabah (at 36%, respectively) and 22% at Perak. In sum, only 39% of smallholders in Perak, 48% in Negeri Sembilan, 30% in Sabah and 97% in Sarawak had income above PLI. Put together, 46% of the smallholder population in the four states were either in poverty or hardcore poverty.

By analysing the smallholders' spending pattern due to the falling rubber price, the smallholders had to manage their spending to mere basic needs such as food, children's education, transportation and utilities or bills. Some reportedly starve as they had no money to spend on food. Results of the study showed a majority of the smallholders studied were aged in their 50s. Many were approaching their retirement age but their current financial instability required them to have supplementary jobs to support themselves and their family. Most of their adult children were also unable to contribute to the households as they had migrated, were studying, or settled down elsewhere.

Unfortunately, household expenditures had escalated along with the government service tax beginning April 2015. Healthier smallholders managed the drop in their income through alternative jobs such as fishing, rearing livestock and cultivating cash crops. However, for the aged and the unhealthy, they were unable to look for alternative jobs. This had worsened by weak family support. They were also categorised as poor people and registered with *E-Kasih. E-Kasih* is a national database on poverty which contains information on poverty beginning with individual's profiling, history of program/grants received by the

household, allowing applications for assistance, till the request is accepted or approved (Ministry of Women, Family and Community Development, 2016).

Although the current government has policies to remove subsidies in the economy, monthly subsidy should be extended to smallholder families to support them. The aged rubber smallholders should also be aided as they are prone to ill-health conditions and are unable to earn a living. It is perhaps better to assist smallholders to form cooperatives by consolidating smallholder lands to modern smallholding where they could synergise work for mutual benefit and to receive constant incomes and assistance. The cooperatives may also operate the land as if the land has been outsourced, encourage cultivation of cash crops to diversify income sources, and integrated farming. The younger generation may be introduced into modern smallholding through new land schemes, just like the way the oil palm plantations are currently promoted. It is most important that poverty among smallholder families are addressed.

The study may benefit plantation schemes around the world and in particular to give attention to farmers. Future research should consider widening the study to more states and a larger sample size, and to see the role of the second and third generations of rubber smallholders in rubber cultivation.

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POLICY AVAILABLE AND SUSTAINABLE WATERFRONT DEVELOPMENT

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Abstract

Waterfront redevelopment emerged in the 1970s. Since then, numerous waterfront areas went through transitions from abandoned spaces to commercial, residential and recreational areas. The transformation symbolizes the independent city states' efforts to remake themselves for the 21st century. However, due to constraints such as ineffective governance as well as inadequate federal, state and municipal planning guidelines, the waterfronts faced problems such as environmental degradation, crime and flooding. Although some waterfront development projects remained profitable due to good public access, many did not. This paper intends to identify and evaluate the current regulations and guidelines towards sustainable waterfront development in Malaysia. The findings were based on the questionnaires mailed and e-mailed to property development companies listed under Bursa Malaysia in Malaysia. The findings identified ten laws and regulations related to waterfront development in Malaysia such as; the National Land Code 1965, the Town and Country Planning Act 1976, and the Environment Quality Act 1974. In terms of the sufficiency of those regulations and guidelines for controlling waterfront development, more than half of respondents claimed that Malaysia did not have sufficient regulations to control waterfront development and the regulations were weakly enforced in Malaysia. The findings indicated that the government and the policy makers need to improve regulations for waterfront development.

Keyword: enforcement, laws and regulation, waterfront, waterfront development

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INTRODUCTION

The growth of urban areas is a sign of a healthy Malaysian economy. The rapid development and urbanization encouraged the waterfront development for recreational use and mixed-use development. To date, demands on waterfront properties are booming even when offered at high prices, as more and more people wish to live close to the water for recreation and aesthetic reasons (Yassin, 2012). However, the implementation of these waterfront projects is driven more by investment needs rather than by community and environmental needs. Waterfront development creates negative impact environmentally and socially such as water pollution and crime (Ali & Nawawi, 2009; Latip, Heath, Shamsuddin, Liew, & Vallyutham, 2010). Therefore, this paper aims to identify and evaluate the current regulations and guidelines relating to waterfront development in Malaysia. A quantitative research strategy with survey questionnaire approach was adopted in this research. The findings of the study discuss on the planning of waterfront development to improve future practices of waterfront development in Malaysia.

WATERFRONT DEVELOPMENT

Generally, a waterfront is the zone of interaction between urban development and the water. A waterfront area is considered as a unique and irreplaceable natural resource. It is the interface between land, water, air, sun and productive plants (Wrenn, 1983). The seashore and riverfront are the most attractive water bodies for human settlement. In most countries, the land in front of water bodies is developed prior to the inland areas.

Waterfront development refers to any development in front of water bodies; river, lake, ocean, bay, creek or canal (Breen & Rigby, 1994). In the development area, It is considered that a waterfront development may not necessarily need to be directly fronting water but may only need to be somewhat attached to the water (Breen & Rigby, 1994; 1996). Properties with views towards water bodies are considered as waterfront properties.

WATERFRONT DEVELOPMENT IN THIS RESEARCH

In this research, waterfront development represents terms such as waterfront revitalisation, waterfront rehabilitation and other terminologies. The word redevelopment is only used when necessary; to differentiate between the redevelopment of previously built-up areas and new developments that are undertaken on a new development site. Waterfront development in this research refers particularly to any development in front of rivers. The exclusion of other waterfront development types such as the coastal development, is because the coastal zones are generally managed in a sectoral manner in Malaysia (Hussein, 2008; Zarin et al., 2001). The sectoral management approach is based on a tiered structure, between the Federal and State Government and Local Authorities. The

governance in each level of government is responsible for their own management roles, which include performing planning and coordination, implementation and enforcement, and development roles within their jurisdictions.

REGULATIONS RELATED TO WATERFRONT DEVELOPMENT IN MALAYSIA

In most countries, various forms of regulations are implemented to improve physical, economic, social and spatial imbalances (Singh, 1994). In Malaysia, legislative systems are implemented within a broader framework and supervised by the federal government. Laws are also used as a form of management in response to environmental problems in Malaysia.

The importance of law, policies and guidelines towards waterfronts has been recognised in Malaysia as it has been in many countries (Riley & Shurmer-Smith, 1988). The earliest law in Malaysia which included the urban river aspect was introduced in 1907 and was known as the Sanitary Board Enactment (Latip et al., 2010). The Sanitary Board Enactment was focused on health and sanitation including drainage as part of the law. This enactment was later reviewed and renamed as the Municipal Ordinance Cap 133/1913, and the Town Improvement Enactment 1917. The development focused more on health and the habitation of houses (the setting of back lanes and open spaces for sanitary conveniences) (Norris, 1980). However, these new regulations did not specifically discuss rivers or the importance of them.

The specific law in relation to rivers was established in the 1920s and was known as the Water Act 1920. The Water Act 1920 provided a detailed definition of rivers, the responsible authority for the rivers and the riverbanks, and those involved in the appeal board (Water Act, 1920). The law remains to date and is used by the Department of Drainage and Irrigation of Malaysia (Malaysian Department of Irrigation and Drainage, 2009).

The first policy that stated the importance of waterfronts for public use was established in 1984 and was known as the Kuala Lumpur Structure Plan 1984 (Dewan Bandaraya Kuala Lumpur, 1984). The Kuala Lumpur Structure Plan provided specific concerns on developments around the natural features and including rivers. After that, several other initiatives directly and/or indirectly in relation to rivers and waterfronts were announced including the Malaysia Plan and the amendment of the Town and Country Planning Act 1976 in 1994. Despite the laws, various guidelines in relation to waterfronts were drafted by several department including guidelines for development related to rivers and river reserves as recreational areas (Malaysian Department of Irrigation and Drainage, 2006; National Landscape Department, 2005).

Presently, many laws, policies and guidelines that directly and/or indirectly relate to waterfronts are put in place. However, most of the laws established concentrate on penalties for the pollution of rivers rather than

specifically monitoring the importance of waterfronts. These laws include the Fishery Act (Act 317) (1985), the Environmental Quality Act (Act 127) (1974) and the Local Government Act (Act 171) (1976). The policies and guidelines introduced are very general and mostly enforced based on zoning rather than specific plots. For example, the National Urbanisation Policy by the Town and Country Planning Department. This has resulted in difficulties in monitoring and controlling development (Latip et al., 2010). Moreover, some of the guidelines are not gazetted and are only used in isolation within the department which produced them, such as the waterfront as recreational area by the National Landscape Department, the planning guidelines for river reserves as public open space by the Town and Country Planning Department and facing the river concept guidelines by the Drainage and Irrigation Department. This resulted to difficulties to implement the guidelines and discourage efforts to sustainable waterfront development (Latip et al., 2010).

RESEARCH METHODOLOGY

In this study, a quantitative research strategy was adopted. The survey was carried out within Malaysia and the respondents were property development companies listed under Bursa Malaysia. A stratified sampling procedure was used as part of probabilistic sampling (Sapsford & Jupp, 2006; Sekaran, 2003).

The sample data comprised of firms listed under the property counter that traded at Bursa Malaysia. Considering that a waterfront development project requires strong financial records and sufficient and efficient management teams as well as excellent experiences in the past, the selection of property development companies who were listed in Bursa Malaysia was therefore appropriate. As stated by Bursa Malaysia, only 91 property development companies were listed in 2009.

RESULTS AND DISCUSSION

Response Rate

Out of 91 questionnaire forms mailed and e-mailed to the respondents, 61 forms were returned (67% response rate). The respondents were mostly property development companies that have been actively practising property developments for many years and were listed in Bursa Malaysia.

Waterfront Development Practice in Malaysia

From the results, nearly a third (32.8%) of the property development companies undertook waterfront development projects in Malaysia, while the rest (67.2%) were not involved in waterfront development in Malaysia or internationally. More than half (58.6%) of the respondents were motivated to undertake waterfront development in the future, while the rest decided not to undertake waterfront development in the future and were not depending on the financial support or demands on waterfront property.

Moreover, from the 32.8% of respondents who undertake waterfront development, 75% of the development were for residential use, 70% were for mixed-use and 25% were for recreational purposes. The results also indicated that no companies undertake waterfront projects for industrial use, while 5% undertake the waterfront projects for 'other' uses.

These findings were supported by the literature that indicated that in the past, many waterfront redevelopment areas went through a transition from abandoned spaces to commercial, residential and recreational areas (Bruttomesso, 1993; Butuner, 2006; Sairinen & Kumpulainen, 2006). Moreover, previous research (Tumbde, 2005) also found that the riverfront redevelopment emphasizing on mixed-use developments enhance the economic feasibility of the redevelopment projects. In short, waterfront redevelopment projects were economically viable with implementation of mixed land use development during the redevelopment processes (Bruttomesso, 1993; Tumbde, 2005; Torre, 1989).

Respondents' Level of Awareness towards Regulation for Waterfront Development in Malaysia

The results indicated that overall property development companies were somewhat familiar with regulations related to waterfront development in Malaysia such as the National Land Code 1965 (mean score=3.59), the Town and Country Planning Act 1976 (mean score=3.57), the Building By-Law 1984 (mean score=3.56), the Land Acquisition 1960 (mean score=3.52) and guidelines for riverfront development (mean score=3.05) (just to name a few of the regulations and guidelines).

Sufficiency of Regulations and Guidelines for Waterfront Development

The results indicated that almost half (44.3%) of the property development companies disagreed that Malaysia had sufficient regulations for waterfront development. The findings were consistent with previous studies (Latip et al., 2010) that revealed the reasons contributing to the loss of integration between cities and their water bodies in Malaysia. The reasons include the absence of policies and guidelines for waterfront development, the lack of policies and guidelines suitable for waterfront development and policies and guidelines

developed and implemented in isolation by different government agencies, and some guidelines that are not gazetted.

Subsequently, insufficient regulations and guidelines to control waterfront development in Malaysia and poor enforcement by the policy makers caused unsustainable waterfront development in Malaysia. These findings were supported by the literature that indicate that various forms of regulations were important for successful waterfront development (Riley & Shurmer-Smith, 1988). In addition, adequate regulations and guidelines formulated for waterfront regeneration could have a significant impact upon waterfronts and enhance waterfront areas (Breen & Rigby, 1996; West, 1989).

ENFORCEMENT OF REGULATIONS FOR WATERFRONT DEVELOPMENT IN MALAYSIA

From the results, only a quarter (24.6%) of property development companies agreed that Malaysia enforces the regulations and guidelines for waterfront development sufficiently, while the rest believed that the guidelines were moderately enforced and were not enforced. The findings were consistent with previous studies (Latip et al., 2010) that showed that policies and guidelines developed and implemented in isolation by different government agencies. Additionally, some guidelines that were not gazette contributed to the loss integration between cities and their water bodies in Malaysia. Perhaps the Malaysian government and the responsible agencies need to strictly enforce the regulations to improve the sustainable waterfront development in Malaysia.

CONCLUSION

This paper identified and evaluated the regulations for waterfront development in Malaysia. The results concluded that Malaysia has insufficient number of regulations for controlling waterfront development. Moreover, the results also indicated that Malaysia has moderately enforced the regulations and guidelines developed for waterfront development. Surprisingly, some of the policies and guidelines were developed and implemented in isolation by different government agencies while some guidelines were not gazette. Therefore, sufficient number of regulation for controlling waterfront development as well as clear and coherent principles and policy are important in order to maximise the benefits of waterfront development (Riley & Shurmer-Smith, 1988; Yossi & Sajor, 2006). The guidelines and policies are also highly required in order to control waterfront development in Malaysia.

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