PLANNING MALAYSIA

Journal of the Malaysian Institute of Planners

Editorial & Business Correspondence
PLANNING MALAYSIA
Journal of the Malaysian Institute of Planners
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This journal is a refereed journal.
All articles were reviewed by two or three unanimous referees identified by the Institute (MIP).

Published By
Malaysian Institute of Planners

ISSN Number
1675-6215

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"Whoever travels in search of knowledge is on Jihād until he returns"
(Transmitted by Tirmidhi & Darimi)

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MESSAGE FROM THE PRESIDENT

Dear Readers,

MIP is once again proudly to riposte its eleventh volume of Planning Malaysia. Since its inception in 2003, the Journal was well-received by the members as well as the academic fraternity. This is due to perhaps, the awareness for knowledge seeking and improvement among the members as the articles touch on wide spectrum of our daily planning issues. It is indeed a great achievement to the Institute as we strive to encourage more members and academics to write and share new ideas on planning and urban development.

Urban and Regional Planning is very broad based subject that covers technical and political process concerned with the control of the use of land and design of the urban environment, including transportation networks, to guide and ensure the orderly development of settlement and communities. The wide ranging topics in this issue reflect the various dimensions of sustainable cities and urban planning that is holistic and comprehensive. One of the key objectives of this issue is to provide a platform for town planners to share new ideas and experiences on cities and urban planning. Such new ideas are by research, studies undertaken or actual hands-on experiences of planners. Thus I hope this issue provides a better insight to all readers of the broad dimensions that urban or town planning has and the role of town planners play in growth and development of the nation.

Apart from the MIP's contribution to the planning circle, Planning Malaysia is also extended to various planning related organizations, institutions of higher learning as well as to all members of the institute. We anticipate to eventually extending the circulation of this journal to non-planning related organizations and institutions that has an indirect role in planning within and outside the country. We hope this issue will serve the purpose and welcome any feedback for the improvement in the forthcoming issue.

As a new preside President, I would like to acknowledge and congratulate the new journal's Editor-in-Chief, Professor Dato' Dr. Mansor Ibrahim and his team for the dedication and continuous support to the Institute.

Thank you and happy reading.

Md Nazri Mohd Noordin
PRESIDENT
(2013-2015)

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Journal of the Malaysian Institute of Planners
Volume **XII** (2014), Page 1 - 16

EVALUATING THE IMPACT OF DENSITY ON ACCESS TO LOCAL FACILITIES IN URBAN NEIGHBOURHOODS

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Abstract

Local services and facilities in residential neighbourhoods play an important role towards the social sustainability of local residents. It is believed that having good provision and access to these local services and facilities would contribute significantly to the quality of life and residents' well-being. The form of the neighbourhood influences the way people live in the neighbourhood. The way people settle in neighbourhood's shapes the quality of life, the richness of the local economy, the level of social cohesion, the level of safety and the amount and the kind of human activities in public spaces. Different urban forms can have very different degrees of sustainability. Density is one of the urban form elements that have been research numerous times and proven to have an influence on the neighbourhood sustainability. Density is the most easily measured urban form element either at a macro level (city) or micro level (neighbourhood). This research discusses the impact of density on the micro scale through estimating its influence on access to local facilities. Through the use of household survey and supported by observation survey, this study findings on the impact of density on access and use of local facilities. The study concludes with establishing the findings of the survey to reflect and fit into the body of knowledge and how it would improve the guidelines and policy on social sustainability in improving the urban living as a whole.

Keyword: Density, urban form, social sustainability; access to services and local facilities

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INTRODUCTION

In recent years, Malaysia has put great effort in moving towards a more sustainable urban environment. This is associated with the vision to place Malaysians on a par with societies in developed nations and to develop a progressive and inclusive society (Prime Minister's Office, 2011; Malaysia, 2010, p. 178). A '*progressive society'* was described as *"one that balances personal needs and civil liberties to ensure the rights of its citizens are upheld and respected"* (Malaysia, 2010, p. 178). Malaysian policymakers have put emphasis on the policies related to social issues to show their concern on the importance to move towards social sustainability particularly in the urban environment setting. On the subject of urban sustainability, social issues are one of the most discussed aspects. This is because social equity and sustainability of the community are most affected by the changes in urban form as a result of the urbanization process. Moreover, the physical form of cities influences the way society lives and interact in cities. In relation to social sustainability, major cities in Malaysia are deemed to be affected by rapid urbanization. The costs and benefits of living in urban areas are still uncertain. Understanding urban form and its relation to aspects of sustainability is essential to understanding the impact of urbanization on our daily social life. However, there has been little discussion or research into this matter in the Malaysian context, in comparison to some developed countries such as the United Kingdom and United States where this issue has gained much attention and a lot of research has been done. Hence, there is a need to explore the issue of social sustainability in relation to urban form aspects in Malaysia.

RESEARCH BACKGROUND

The study focuses on how density impacts social sustainability in a neighbourhood scale specifically focusing on access to local services and facilities. The hypothesis for this study is '*Higher density would result in improved access to services and public facilities'*. This hypothesis is in line with many previous studies that claimed density is the overall urban form measure that can explain improved access (Bramley, Dempsey et al. 2009; Bramley and Power 2009; Jenks and Jones, 2010). However, findings by Burton (2000a, 2000b and 2003) were mixed across different services. The role of local facilities in urban areas is very crucial as it would indefinitely increase the quality of urban living. Abdul Rahman et al. (2012) explains that what constitutes a healthy urban neighbourhoods are the relationship and interactions between the local communities with mixed land use and facilities. Generally, the main purpose of

this study is to obtain a better understanding of the impact of urban form on social sustainability in Malaysia.

> *"In terms of social facilities, it was found that the provision of recreational areas is generally inadequate for all towns in Malaysia. Moreover, there is a problem of maintenance of the facilities as well as being non-user friendly since the location and design of facilities do not take into account the needs of certain segments of the society such as the disabled, children and elderly. Vandalism of public properties also exists and leads to not fully utilized facilities".*
> *(Federal Department of Town and Country Planning, Peninsular Malaysia, 2006, p. 28)*

Specifically, the interest to explore this research arises from concern about the potential impact of rapid urban growth and changing urban form of major cities in Malaysia on social sustainability. Currently, major cities in Malaysia are experiencing rapid development growth which has resulted in numerous urban problems. These include social problems, traffic congestions, environmental degradation, and economic instability.

The study was conducted in two major cities in Malaysia: the Federal Territory of Kuala Lumpur and the Federal Territory of Putrajaya. These two cities were chosen because of their distinctive characters. In brief, the reason for selection was due to the contrast of the two cities, i.e. older and unplanned city (Kuala Lumpur) versus modern planned city (Putrajaya); the experience of rapid growth in both cities and finally, due to the ease for the researcher to facilitate field survey logistically.

In the case study city of Kuala Lumpur, the survey areas focus on three sub areas which have been categorized according to inner, intermediate and outer sub area located within Wangsa Maju-Maluri Strategic Zones. Wangsa Maju-Maluri Strategic Zone is defined in the north by the boundary of Kuala Lumpur, which separates the City from Batu Caves, Gombak, and Ampang areas in Selangor. Definition of the sub areas was defined by the geographical proximity of the sub area of the city center (CBD) and local knowledge, which was also applied in the City Form UK study (Jenks and Colins (Ed), 2010). Inner sub area refers to the Datuk Keramat which is also known as the village in the town. It is one of the oldest residential villages in Kuala Lumpur. Intermediate sub area refers to Taman Setiawangsa which is located approximately 5km from Kuala Lumpur City Centre. Finally the outer sub area refers to Taman Wangsa Melawati which is approximately 7-10 km from the city centre. Using a similar approach to Kuala Lumpur City, the survey in Putrajaya also focuses on three sub areas within the Putrajaya City with areas defined as inner, intermediate and outer area based on their proximity to the Putrajaya

core area (Precinct 1-3) and local knowledge. Also, in this study, density is one of the urban form variables used to assess the usage pattern and access to the selected local services and public facilities. A three level density measure was applied i.e. Low density, medium density and high density. The three categories were referred to and guided by the density levels provided by the Kuala Lumpur City Hall (see Table 3.1). The density variable was created based on assessment of the plans for each case study area.

THE INFLUENCE OF DENSITY ON SOCIAL SUSTAINABILITY

Density and its application

Density is one of the aspects of urban form that have been receiving more attention in the literature with regard to its social impact. This is due to the fact that density of any particular development has the potential to impact upon all aspects of social sustainability (Bramley and Power, 2008). Furthermore, density is also effectively the overall summary measure of urban form, particularly when related to the concept of compactness in opposition to sprawl. According to Jabareen (2006, p. 41), *"the relationship between density and urban character is also based on the concept of practicable threshold"*. This implies that to make an urban area functional or viable, there needs to be a certain level of densities with certain numbers of people to generate the interaction needed. Density typically refers to a measure of the number of people living in a given area of land although it can also be measured in physical terms (e.g. Number of dwellings) (Towers, 2005).

Density also has some cultural dimensions as the density of where people live may be considered as relative (Dempsey, et al. in Jenks and Jones, 2010, p. 23). In the United Kingdom, the recent English housing policy stated that new residential development should have a minimum of 30 dwellings/ ha. This is considered high in some areas and low to some others (Dempsey, et al in Jenks and Jones, 2010, p. 23). On the other hand, Hong Kong, a minimum of 300 dwellings/ha is still considered as low density (Jenks, 2000; Jenks and Dempsey, 2005). Richardson et al (in Burgess and Jenks, 2000) affirmed that densities in developing countries are much higher compared to developed countries, especially in the core cities including in Malaysian cities.

Density – Malaysian Context

Malaysia, as one of the developing countries also has significantly higher density in most of its major cities i.e. Kuala Lumpur. In Malaysia, most of the local councils are guided by the following table for density classification (Kuala Lumpur Local Plan). Referring to Table 3.1, it shows that what is considered low density in Hong Kong is considered as medium density in Malaysian cities. In

comparison to UK cities, for a residential building of a minimum of 30 dwellings/ ha in Malaysia, this would be considered within the range of low density. This indicates that the cultural dimension of density in Malaysia can be regarded as moderate.

Table 1: Density Control in Residential Zones in most Malaysian Cities

	Maximum Density Allowable	
	Person/ha(pph)	Unit/ha
Low density	10	2
	30	7
	45	15
	100	20
Medium density	100	30
	200	50
	300	75
High density	300	80
	600	150
	850	200
	900	250
Public Housing	900	250

Source: Kuala Lumpur City Hall, (2008) Kuala Lumpur Structure Plan

Density and its impact on social sustainability

There are several ways on how density may impact on sustainability. Areas with higher density would give the opportunity to have better access to services and local facilities (Haughton and Hunter, 1994; Towers, 1996; Burton, 2000; Dempsey et al. 2012). Bramley et al. (2010, p. 111) stated that *"there are reasons to expect access to services to be better in denser urban forms, while the quality of neighbourhood environment, community and social interaction may be less good in denser areas"*. It was also claimed that higher density would promote commercial viability and therefore revived public realm (Talen, 1999). Similarly, Dempsey et.al (2012) also claimed that residential density impacts several aspects of social sustainability and positive influence on the use of local services and facilities is the most obvious. However, Bramley and Power (2009) argued that in terms of quality of neighbourhood environment, community, and social interaction it may be better in lower density areas. In terms of social interaction, higher density may provide more possibilities for people to meet each other on the street than slower density areas. However, beyond a certain level, high densities may make people feel that their personal space is compromised and the sheer number of people makes for anonymity (Dempsey et.al. 2011). Lower

densities provide less potential for spontaneous interaction and lead to greater dependency on car travel (Bramley and Power, 2009).

Bramley and Power (2009) explained the way to measure the impact of density is to look at the density measures in terms of gross residential, which can be measured in terms of dwellings or habitable rooms per hectare. This is because using people per hectare would lead to confusion in terms of occupancy with physical form. Furthermore, it is difficult to measure the net density because of the nature of the census data that covers all types of land use and not only residential use (Bramley and Power 2009, p. 35). They further suggested that density is considered as the most important aspect of urban form because it is a general summary measure which many other features will be partly correlated with.

METHODOLOGY

The method used for this study is a mixed-method approach through two (2) case study areas. In the initial stage, it is important to understand the current urban form of the study areas and its transformation from the past. This was obtained through secondary sources such as development plans, structure plans, local plan, and other related government publications. Data on social characteristics was collected through a primary survey. Based on the information gathered from both primary and secondary sources, the researcher later evaluated and measured how density impacts the access and use to local services and facilities. For the purpose of this study, a household survey was conducted in the selected neighbourhood within two study cities of Kuala Lumpur and Putrajaya using random sampling. The targeted study population was local households/ adults and a random sample within the case study areas were interviewed using a structured questionnaire. The total number of questionnaire form distributed was approximately 2500 for both study areas. With the response rate of 43%, the total number of respondents was 1084. These data were complemented by information from an analysis of detailed maps/ plans and site observation survey. Descriptive statistics such as frequency distribution, cross tabulation, mean and standard deviation was used to analyse the data collected for the social characteristics and the respondents' satisfaction towards different aspects of urban form and access to services. Several findings were further tested using a range of statistical tests of associations. Regression and logistic regression models were used to identify factors affecting social sustainability, particularly urban form elements. This was used to identify and quantify the relationship between several independent variables of urban form and social sustainability indicators while controlling for other factors such as demographics.

FINDINGS AND RESULTS

ACCESS TO LOCAL SERVICES AND FACILITIES

Influence of socioeconomic factor towards access to local services and facilities

Finding of the study revealed the relationship between perceived access to local services and facilities with the household income group in the case study cities. For commercial facilities, it was revealed that for Kuala Lumpur, medium high income group (RM3001-RM5000) is the most likely to report better access to supermarket with 67%. However, for the sundry / convenience shop, the medium low income group (RM1001-RM3000) is more likely to report having good access (96.4%). The pattern is quite different for Putrajaya, where the lower income group (50.0%) was more likely to report having good access to supermarket as compared to the higher income group (27.5%). Through the chi-square analysis performed, this relationship was reported to be significant at 95% confidence level. No significant pattern was reported for the healthcare facilities. However, for the recreational facilities, in both case study cities, the playground was the most reported facility that have good access especially among the low income group with 92.2% in Kuala Lumpur (95% confidence interval) and 100% for Putrajaya). Findings for other support services revealed an interesting finding for the religious facility (mosque), where more people among the lower income group (94.1% in Kuala Lumpur and 85.7% for Putrajaya) reports to have good access as compared to higher income group (90% in Kuala Lumpur and 82.6% in Putrajaya).

Table 1: Cross tabulation between household income level and access to local services and facilities (%)

		Low income group	**Medium low income group**	**Medium high income group**	**High Income group**
		(n=51)	*(n=253)*	*(n=109)*	*(n=70)*
Kuala Lumpur (N=483)	*Commercial Facilities*				
	Supermarket*	54.9	60.5	67.0	64.3
	Sundry Shop	90.2	96.4	95.4	92.9
	Healthcare facilities				
	Private and Public Clinics	72.5	70.0	65.1	65.7

	Recreational facilities				
	Playground	92.2	78.3	79.8	80.0
	Football field	45.1	47.0	54.1	45.7
	Park/Garden*	11.8	14.6	12.8	18.6
	Other Support Services				
	Post office	52.9	45.1	36.7	44.3
	Bank	37.3	45.1	45.9	47.1
	Petrol Station***	33.3	55.7	54.1	65.7
	Religious	94.1	91.7	91.7	90.0
		(n=14)	*(n=182)*	*(n=219)*	*(n=167)*
Putrajaya (N=582)	*Commercial Facilities*				
	Supermarket*	50.0	34.6	39.7	27.5
	Sundry Shop	64.3	87.4	83.6	85.0
	Healthcare facilities				
	Private and Public Clinics**	64.3	59.9	63.9	76.0
	Recreational facilities				
	Playground*	100.0	91.2	94.5	97.6
	Football field	35.7	46.7	54.8	56.9
	Park/Garden*	50.0	44.5	47.5	56.9
	Other Support Services				
	Post office	28.6	28.6	32.4	29.3
	Bank	21.4	41.8	47.0	46.7
	Petrol Station***	64.3	73.6	79.9	86.8
	Religious	85.7	84.6	82.2	82.6

**indicates statistically significant at 10% level*
*** Statistically significant at 5% level*
****statistically significant at 1% level*

Table 2: Cross tabulation between car ownership and access to local services and facilities (%)

		No Car	**Owns one car**	**Owns two or more cars**
		(n=52)	*(n=236)*	*(n=209)*
Kuala Lumpur (N=497)	*Commercial Facilities*			
	Supermarket	57.7	64.0	59.3
	Sundry Shop	98.1	93.6	95.2
	Healthcare facilities			
	Private and Public Clinics	71.2	71.2	63.6
	Recreational facilities			
	Playground	82.7	79.7	78.9

	Football field	48.1	45.3	49.8
	Park/Garden	7.7	13.1	17.2
	Other Support Services			
	Post office	46.2	43.6	42.6
	Bank	38.5	46.2	44.5
	Petrol Station***	36.5	54.2	59.8
	Religious	94.2	91.9	89.5
		(n=17)	*(n=194)*	*(n=376)*
Putrajaya (N=587)	*Commercial Facilities*			
	Supermarket	29.4	35.1	35.4
	Sundry Shop	82.4	83.5	85.1
	Healthcare facilities			
	Private and Public Clinics	58.8	62.4	68.1
	Recreational facilities			
	Playground	100.0	94.3	94.1
	Football field*	29.4	50.0	55.1
	Park/Garden	35.5	45.9	51.6
	Other Support Services			
	Post office	17.6	23.7	34.3
	Bank*	23.5	34.0	51.1
	Petrol Station	64.7	74.7	83.0
	Religious	76.5	85.1	82.7

**indicates statistically significant at 10% level*
*** Statistically significant at 5% level*
****statistically significant at 1% level*

Generally, car ownership in a particular household is regarded as one of the important factors that would determine the level of accessibility gained by household members (Ferguson and Woods in Jenks and Jones, 2010). On average, most of the respondents in Putrajaya have 2 cars and Kuala Lumpur have 1 car. Table 2 reports the findings on the relationship between car ownership and access to local services and public facilities. However, overall, findings in Kuala Lumpur revealed that there is not much significant pattern on the relationship between car ownership and having good access. This may be due to the various options of public transportation available to serve the residents of Kuala Lumpur besides only a small fraction of household have no car. However, in Putrajaya, for most facilities except for the playground, having at least one car seems to be important to access these facilities. This finding is somehow expected due to the fact that there is limited public transport option and the nature of the zoned layout. On the whole, access towards recreational facilities is better among those that own a car. This finding was reported significant for access to park/ garden at 95%

confidence level. For other support services, the pattern of findings is quite similar except for religious facilities. For motorcycle ownership, although it is a popular use in most Malaysian cities, owning one does not imply having better access to most of the facilities. It was only reported significant to Putrajaya city specifically to have access to the playground.

Influence of density on access to local services and facilities in Malaysian Cities

Density has always been associated with access to services because of its influence on the aspect of the viability of a service or facility (Burton 2000; Burton 2003; Rokicka and Warzywoda-Kruszyńska 2006; Bramley, Dempsey et al. 2009; Bramley and Power 2009; Jenks, Jones et al. 2010). Most research hypothesized that density plays a significant role in determining access to the particular service or facilities. The following table 5.3 reveals the three way relationship between case study cities, density and access to local facilities and services. For Kuala Lumpur, finding for commercial facilities were reported significant. Since total n for low density in Kuala Lumpur is very low (n=7), the researcher only considered results for medium density and high density sub areas. As expected, access to sundry shop facilities was better within the high density areas (96.9%). Relationship for access to sundry shop in Putrajaya also reports the same finding (89.6%) and it was also reported to be confidence at 99% confidence level. Access to recreational facilities was also reported to be significant for Putrajaya's case. Findings revealed that easy access to recreational was greater among those living in low dense areas (98% and 71%) particularly the playground and football field followed by medium density (95% and 53%) and finally the high density (93% and 48%). However, after combining data for Kuala Lumpur and Putrajaya, patterns for access to most facilities are more clear and distinct (see Table 5.4). Access to commercial facilities was reported to be easier in high density areas. In lower densities, it was revealed that there are better access to not only recreational facilities but also health care facilities, banks and petrol stations. This may also be influenced by higher car ownership in both cities. Through the use of private cars, residents can easily access services and facilities at a greater distance despite living in low density areas. Previous research such as Breheney (1992), Knight (1996); Stretton (1994); Burton (1997, 2000); Williams (2000); and Bramley et.al. (2009) claimed that higher density areas have better access to services and facilities due to its compactness and proximity. Williams (2000, p. 40) claimed that intensification of urban areas "*improve accessibility to services and facilities"*. It was further added that for retail facilities, higher densities improved access best to shops that serves *everyday needs* (Williams, 2000, p. 40). Hence, the researcher would likely conclude that density is a significant factor towards having access to certain services and facilities. However, the mixed findings may be further improved when other variables such as demographic variables are being controlled for. In terms of use of the local

services and facilities, low density only reports a marginal response, only medium and high density is considered for interpretation. Overall, medium density shows a higher percentage of respondents using the services and facilities in both cities except for sundry shop; religious facilities and banks in Putrajaya and sundry shop in Kuala Lumpur.

Table 4: Relationship between case study cities, density and access to local facilities and services

		Low density	**Medium density**	**High density**
		(n=7)	(n=201)	(n=289)
Kuala Lumpur	Commercial Facilities			
(N=497	Supermarket***	85.7%	47.8%	70.2%
	Sundry Shop***	85.7%	92.0%	96.9%
	Healthcare facilities			
	Private and Public Clinics***	71.4%	59.2%	74.0%
	Recreational facilities			
	Playground	57.1%	81.6%	78.9%
	Football field	28.6%	44.8%	49.8%
	Park/Garden		14.4%	14.5%
	Other Support Services			
	Post office	71.4%	42.3%	43.6%
	Bank*	71.4%	39.8%	47.4%
	Petrol Station	85.7%	55.2%	53.6%
	Religious	85.7%	89.6%	92.4%
		(n=51)	(n=324)	(n=212)
Putrajaya	Commercial Facilities			
(N=587)	Supermarket	33.3%	34.3%	36.8%
	Sundry Shop***	86.3%	80.9%	89.6%
	Healthcare facilities			
	Private and Public Clinics**	76.5%	67.9%	60.4%
	Recreational facilities			
	Playground	98.0%	94.8%	92.9%
	Football field**	70.6%	53.1%	47.6%
	Park/Garden**	47.1%	53.7%	42.9%
	Other Support Services			
	Post office	35.3%	29.0%	31.1%
	Bank	54.9%	42.3%	45.8%
	Petrol Station	84.3%	80.9%	76.9%
	Religious***	90.2%	76.2%	92.5%

**indicates statistically significant at 10% level*
*** Statistically significant at 5% level*
****Statistically significant at 1% level*

Table 5: Relationship between density and access to local facilities and services

	Low density	**Medium density**	**High density**
	(n=58)	(n=525)	(n=501)
Commercial Facilities			
Supermarket***	39.7%	39.4%	56.1%
Sundry Shop***	86.2%	85.1%	93.8%
Healthcare facilities			
Private and Public Clinics***	75.9%	64.6%	68.3%
Recreational facilities			
Playground**	93.1%	89.7%	84.8%
Football field*	65.5%	49.9%	48.9%
Park/Garden***	41.4%	38.7%	26.5%
Other Support Services			
Bank**	56.9%	41.3%	46.7%
Petrol Station**	84.5%	71.0%	63.5%
Religious***	89.7%	81.3%	92.4%

**indicates statistically significant at 10% level*
*** Statistically significant at 5% level*
****Statistically significant at 1% level*

CONCLUSIONS

Implication of the Results

Overall, the study has revealed the possible impact density may have upon access and use of local services and facilities in residential neighbourhood of two Malaysian cities, Kuala Lumpur and Putrajaya. Among the key findings of the study, in terms of socioeconomic aspects, lower income households generally reported having better access to selected services and facilities within their neighbourhood areas compared to higher income households; this applied particularly to commercial services and recreational facilities in both case study cities. However, the relationship was not as strong as expected. Chi-square results of these relationships were reported only significant for access to supermarket, park, garden and petrol station. In Putrajaya, having one car is generally an important factor to have better access. This corresponds well with the claim made by Ferguson and Wood (in Jenks and Jones, 2010, p.57) that car ownership is an important factor in determining the level of accessibility hence improving access to some if not all local services and facilities. Based on the findings, the study partly supports the hypothesis that *"higher density would result in improved access to services and facilities"*. This is because; the hypothesis does not apply to all types of local services and facilities. Findings revealed that access improved in higher density areas in both case study cities, particularly for commercial facilities. This supports the claims of previous research, including among others, Williams et al. (2000, p. 40) who mentioned that intensification of urban areas has the advantage of improving access to services and facilities and other

opportunities. However, for recreational facilities in Putrajaya case is rather different. Households in lower density areas within Putrajaya reported to have better access as compared to households of higher density. Findings from a survey conducted in some UK cities also reported similar findings. Dempsey et al. (2012) reported that higher residential density would have lower public and green space. Provision of public and private green space is better in lower density residential areas. Furthermore, it is important to note that higher density can have negative impacts on community and quality of life (Bramley & Power, 2009, Bramley et al., 2009).

LIMITATIONS OF THE STUDY

There are several limitations of this study that the researcher believes have had some impact on the overall outcome. Firstly, the researcher is aware that the nature of the samples for the household survey is one of the limitations in this study. It is noted, that if more time and budget were available, the researcher would have richer data, both in the quantitative sense of having more observations and more variation within the data, and in the qualitative sense that it would be feasible to conduct focus group discussions from local residents of the selected case study areas. Furthermore, the researcher would also gain more information if the scope of the study covered a wider range of locations and types of area. The findings obtained with regard to the access and usage of the services and facilities were only on a perceptual or self-reported basis. Respondents were required to respond to questions in the questionnaire that corresponded to whether they have access to the services and facilities within their neighbourhood. On the usage pattern, it was a self-reported usage. The respondents were given full responsibility to report their usage pattern. Another issue is the fact that data is only collected at one single time point, which may not be fully represented and will not reveal changes over time. Given these limitations, the findings and implications of the study need to be interpreted with caution. The limitations identified in this study are also aspects that can consider for future research. For example, a future survey might interview households at 1-2 year intervals or ask about the use of services 1-2 years previously, to pick up the aspect of change.

SCOPE FOR FURTHER RESEARCH

This study has focussed on the influence of density on access to and using local services and facilities. The study was motivated by the fact that it would be of benefit to the municipalities to improve existing cities in order to become more urbanized and at the same time be socially sustainable. Another important

implication of this study is it contributes to providing valuable knowledge needed for urban planners and policymakers to meet the challenge of urban growth more effectively and to devise a framework for sustainable urban form to ensure it is socially sustainable. The research findings also contribute to the existing knowledge in such a way that future development and growth in metropolitan regions in developing countries can be guided in a manner that enhances long-term sustainability.

ACKNOWLEDGEMENTS

This study is part of a PhD research study funded by the Ministry of Higher Education, Universiti Teknologi Malaysia (UTM – Q.K130000.2740.00K40) and IHURER, School of Built Environment, Heriot Watt University, United Kingdom.

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PLANNING MALAYSIA:
Journal of the Malaysian Institute of Planners
Volume **XII** (2014), Page 17 - 32

TOWN PLANNERS' PERCEPTIONS OF SPORTS FACILITIES AND URBAN DEVELOPMENT: A CASE STUDY OF 13 STATES' MAIN SPORTS FACILITIES IN MALAYSIA

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Abstract

Sport is defined as recreation and is considered as the symbol of developed degree of a country and economic development. However, globalisation and dramatic growth of urbanisation highlight the importance of sport and sports facilities in cities. On the other hand, there is a recent trend in some countries to build sports facilities not only for their intended sporting purpose but also for the twin aim of stimulating urban areas. In Malaysia, sports and sports facilities have improved rapidly over the past years. There is also currently tremendous interest in sports and a wave of sports investment. This research aims to examine town planners' perceptions of sports facilities and urban development focusing on the main sports facilities at State level in Malaysia. It is based on quantitative research via postal questionnaire survey and key informant interviews. The research reveals new trend of sports investment and sports facilities construction started in the mid-1990s. The findings of this research elaborate new considerations for town planners to determine the type of local environment for a new sports facility. Further, it may assist to review and provide specific guidelines and principles for sports facilities in Malaysia to follow the global trend in the future.

Keyword: Town planners, sports facilities, urban development

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INTRODUCTION

Sport is defined as recreation involving the active production of leisure (Haywood et al. 1991). Leisure is mentioned as "the symbol of developed degree of country" and "leisure sports" as "the production of modern society" (Min & Jim 2010, p. 99). According to Aman (2005, p. 15), economic development "plays a significant role in leisure, recreation and sport sectors." Most of the literature on sports, sports facilities and their impacts comes from the experience of developed world (Chen 2006). On the other hand, globalisation and dramatic growth of urbanisation in low- and mid-income countries in the next few decades (Beall & Fox 2009) highlight the importance of sports and sports facilities in cities.

In Malaysia, sports and sports facilities have improved rapidly over the past years, especially after the country hosted the 16th Commonwealth Games in 1998 (Megat Daud 2007). The increase in the amount of public money being spent on sports facilities, and at the same time, the increase in the number of sports facilities in Malaysia necessitate an investigation into the issues surrounding the development of sports facilities.

A number of different terms have been used for places related to sports, e.g., stadium, arena, sports venue, and sports complex. The term sports facility is used in this research. According to Webster's New World College Dictionary, facility is defined as "a building, special room, etc. that facilitates or makes possible some activity" (Agnes & Guralnik 2004). Sports facilities define the equipment and buildings for playing sports, e.g., tennis courts and swimming pools. This research focused only on sports facility as any enclosed facility where sports are played, where sports events can be hosted, which needs public money for construction and maintenance, and is large enough to require ancillary construction. Therefore, the study focused on the main sports facilities at state level in Malaysia.

In order to achieve the aim of the research, which is to examine the town planners' perception of sports facilities and urban development, the first step was to investigate the existing sports facilities. The questionnaires were sent to the City Councils of the 13 state capitals, specifically to the chief town planner and to the manager of the main sports complex in each state. Further, heads of 13 State Departments of Youth and Sports and Sports Councils. Secondly, to gather the perceptions of town planners by sending out a questionnaire to specific government agencies in Kuala Lumpur and all 13 states responsible for formulating and administering all national policies relating to town and country planning. Thirdly, direct interviews were carried out with four key personnel from the Ministry of Youth and Sports, the Ministry of Housing and Local Government, the National Sports Council and the Department of Town and Country Planning. Information obtained from these interviews was triangulated

with the data gathered from the postal survey, which was carried out during April and May 2010. The research is structured as follows. The next section reviews the current literature on sports facilities development. The third section concentrates on research methodology. The findings are provided in section four. Finally, discussion and conclusion extract lesson from empirical investigation.

THEORETICAL BACKGROUND

Sport is influenced by the process of globalisation in several ways such as internationalisation of sports competitions, international diffusion of sports, sports mega events (Aminuddin & Parilah 2008), and emergence of international organisations (Aman 2005). Sports facilities have changed through the years from functional facilities, adapted facilities, state-of-the art facilities to centre of business and regenerating area facilities (Aymeric Magne Stadiums Consulting Group [AMSCG] 2009). After the new Olympic movement, was proclaimed in 1894 (Horne et al. 1999), sports have emerged in their modern forms and the sports facilities have evolved into one of the great public building forms of the twentieth century, regarded, at their best, as an essential and positive element of civic life (John et al. 2007).

Most of the literature on sports facilities draws upon North American experiences as professional sports facilities there are very popular. The construction boom in sports facilities started in the 1990s in America (Fried 2005). These facilities were developed by local areas to attract professional sports teams and franchises from other cities and considerable public funds from local taxpayers' money were devoted to these projects (Thornley 2002). While in the US, cities compete with each other for sports investment, in the UK sports facilities are national public investment or funded by public-private partnership (Suzuki 2007).

In the 1970s and 1980s, most countries' expenditure on sport expanded considerably with the rationale that sport made an important contribution to local communities in welfare terms (Gratton & Taylor 1991). On the other hand, following the 'bricks and mortar' approach over the past two decades, the single most popular city centre redevelopment project to emerge in urban America has been the sports stadium (Chapin 1999). In the UK, in the late 1980s, a second wave of sports investment began with a similar rationale. However, several cities built prestigious sports-led development, using enterprise-led development policies, to promote economic and regional development (Davies 2002; Jones 2001; Lawless 1990; Loftman & Nevin 1995). There is a recent trend in some countries to build sports facilities not only for their intended sporting purpose but also for the twin aim of stimulating urban areas (Davies 2005; Suzuki 2007).

Nowadays an increasing number of developed and developing cities are promoting the cultural dimension – the arts, entertainment, festivals, leisure, tourism – and remaking cities as 'places to play' (Eisinger 2000). According to Davies (2005, p. 3), "Sport has transcended the boundary from being considered as an active leisure pastime to being recognised as having considerable social and economic influence in contemporary society."

Malaysia gained its independence from the British in 1957, after more than 400 years of colonial rule since 1511. Since Independence, the country's economy had undergone a tremendous change from a basic agricultural economy to a new industrialised country (Chan 1997; Lai 1997). Malaysia's former Prime Minister Dr. Mahathir Mohamed was the leader who was most active in engaging the design of the built environment in the service of nation-building (Che' Man et al. 2013). As mentioned by Moser (2010, p. 288), "Mahathir's nationalist vision had a lasting impact on the course of Malaysian urbanism." In 1991, the Prime Minister announced the formation of 'Vision 2020' which stressed the importance of the Malaysia Incorporated Policy, in achieving the national goal of becoming an industrialised nation (Abdullah 1997). As part of 'Vision 2020', the year at which Malaysia is intended to achieve a developed country status, several spectacular mega-projects have been undertaken (Ahmad et al. 2013). Subsequently, there is currently tremendous interest in sports and a wave of sports investment. The constant increase of the allocation for sports programmes by the government reveals the increasing importance placed on sport in the country. The total allocation for sports programmes from 1986 to 1990 was RM97 million, although only RM49 million was actually spent. Nevertheless, in the Sixth Malaysia Plan (1991-1995), the allocation was increased to RM179 million, to become the third highest programme allocation after the Public Housing Programme (RM803 million) and the Fire Services Programme (RM193 million) (Government of Malaysia 1991). The budget allocation for sports development, under the Ninth Malaysian Plan (2006-2010), RM620.8 million, was more than double that of the allocation in the previous five-year plan period (2001-2005), RM307.2 million (Government of Malaysia 2006).

RESEARCH METHODS

The research described here is an applied exploratory research, using applied a mixed research design; this is a procedure for collecting, analysing and "mixing" both quantitative and qualitative data in a single study to understand a research problem (Bryman 1988; Creswell 2009, 2005, 2003). The research covered the sports facilities throughout Malaysia and the mailing approach is considered the best way to reach the selected samples due to limited time of the research. A total

of 52 survey questionnaires were posted on June 8th 2009, followed by reminder letters together with another set of questionnaires on July 15th 2009. It was followed up by phone calls on September 15th 2009. Finally 25 replies out of 52, which form 48%, were received by post. Of the total respondents, the majority, 40% (10), were town planners, 32% (8) the head of the Youth and Sports Departments, 16% (4) the head of Sports Councils, and only 12% (3) included the managers of sports facilities. The composition of the respondents who participated in the survey is presented in Table 6.

Table 6: Category of Respondents

Category of Respondents	**No. of Responses**	**Percentage**
The managers of main sports facilities, Capital City Councils	3	12.0
Town planners, Capital City Councils	10	40.0
Departments of Youth and Sports	8	32.0
Sports Councils	4	16.0
Total	25	100.0

Secondly, the exploratory survey conducted on specific government's agencies either in Kuala Lumpur or in each of the 13 states, responsible for formulating and administrating all national policies relating to town and country planning. This section covers the planning offices throughout the country; therefore, the mailing approach has been considered the best way to reach the selected samples. The questionnaires were sent out to the above government's agencies on July 17th 2009, followed by postal reminder on September 8th, and phone reminder on September 30th 2009. Finally, there were 11 out of 15 questionnaires received by post which resulted in a 73% response rate. This response rate is considered as very high in this method. Further, to explore in depth the concepts of sports facilities and the concepts of decision making in Malaysia, key informant interviews were conducted with different persons. They were including Secretary-General of the Ministry of Youth and Sports, Policy Division, Ministry of Housing and Local Government, Properties and Facilities Division of the National Sports Council, and Research and Development Division of the Federal Department of Town and Country Planning.

RESULTS AND DISCUSSION

The analysis is presented in seven sections. These sections provide results and discussion of the data collected concerning the 13 states specific main sports facilities, as well as, town planners' perception of sports facilities and urban development. It uses triangulation of both qualitative and quantitative data to provide general comment regarding sports facilities in the Malaysian context.

Trends of Sports Facilities Development

The research findings reveal that more than half, 53.9% (7), of the 13 states' main sports facilities were opened during 1995-2010. In addition, while 38.4% (5) of the existing sports facilities have had major renovation, all of this renovation has been done during 1995-2010. This is also to mention that, the rate of construction and renovation was higher during 1995-2004. This high percentage of construction and renovation underline the consideration and importance of sports facilities. This happened at the same time as hosting the 16th Commonwealth Games and the construction of sports facilities for that event. In Malaysia SUKMA Games are held once every two years in different states. It started since 1986. The first and second Games were held in Kuala Lumpur. However, following national trend, the increase in construction and renovation of sports facilities in the states has been due to hosting the SUKMA event.

Therefore, the findings reveal the new trend for sports facilities construction which has started in the mid-1990s. However, it is due to the changing the role of sports facilities within the past 15 years. Firstly, sports facilities are constructed for hosting events. Secondly, sports facilities are there to develop harmony and unite people in line with the nation-building program. Thirdly, sports facilities are there for creating a sports culture to get the local community involved into sports. Finally, Vision 2020 requires having development in all aspects.

Activities of Sports Facilities

The result of the survey reveals that all of the 13 states' main sports facilities are multi-purpose. They use for sporting and non-sporting activities. As can be seen in the Figure 1, all of the sports facilities are used for national sports games, while 66.7% are used for international sports games, national official government events and national seminars and rallies. National concerts, exhibitions, expos, family days and ceremonies were selected by 33.3%. All of the sports facilities have capacity of more than 1000 people. There are only 15.4% (2) out of 13, with the capacity of more than 5000 people.

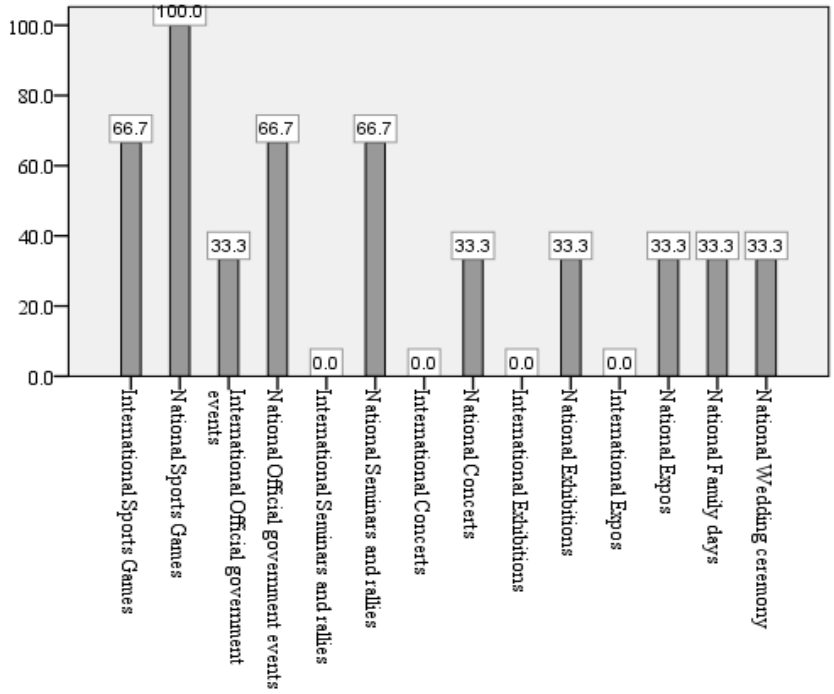

Figure 1: Activities

Location of Sports Facilities

Sports facilities are located within the city areas. In the National Urbanisation Policy (2006-2020) sports complex are considered to be provided for urban hierarchies at national growth conurbation, regional growth conurbation, sub-regional growth conurbation, state growth conurbation and district growth conurbation. The 80% of the data gathered for this research comes from the sports facilities in 10 km or less than 10 km distance from the city centre. The most important factor for selecting the location of sports facilities is land availability as mentioned by majority of respondents.

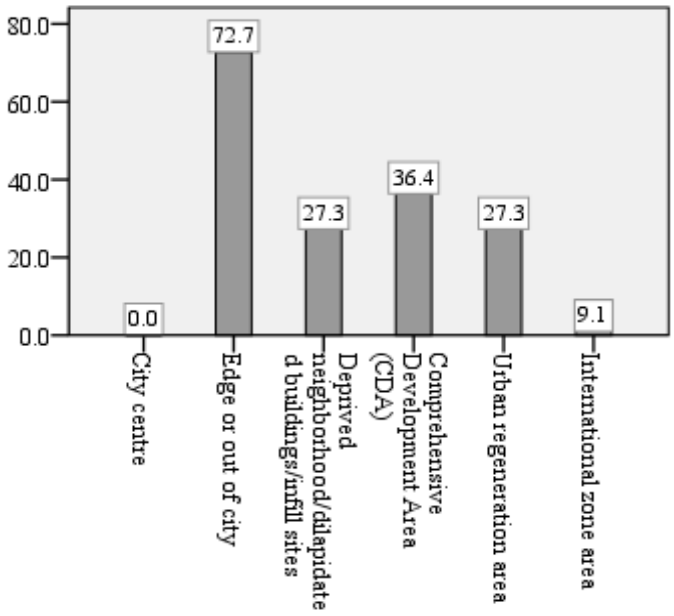

Figure 2: Optimal Site in the City

The findings on optimal site for the sports facilities reveal that majority of town planners, 81.8% (9), agreed on green-field site for sports facilities. In addition, the majority of town planners, 72.7% (8), agreed upon edge or out of city locations for optimal sports facilities sites. Comprehensive development area comes next at 36.4% (4). Deprived neighbourhoods mentioned by 27.3% (3), at the same level with urban regeneration areas. International zone areas gained the least choice from the respondents (Figure 2).

It is clear that green-field sites and edge or out of city locations are considered by majority of the sample population as optimal sites for sports complexes. However, none of the respondents agreed upon city centre locations for sports complexes which underline a contrast with the international trend. It is due to sports complexes belong to public and necessitate public space. On the other hand, brown-field sites usually belong to private and there is not enough space in urban areas.

Problems of Sports Facilities

There were 75% (19) of the respondents who stated the income of the sports facility is not enough for maintenance costs. However, 83.4% (20) of the respondents mentioned to use tax money or having subsidy. In addition, lack of funds was quoted to be the most important problem of sports facilities stated by 52% (13) of the respondents. The question on the problems of the sports facilities reveals that, lack of activities was stated as the second important problem mentioned by 40% (10). It was followed by lack of public use and areas not fully utilised both at the same rate of 32% (8) (Figure 3).

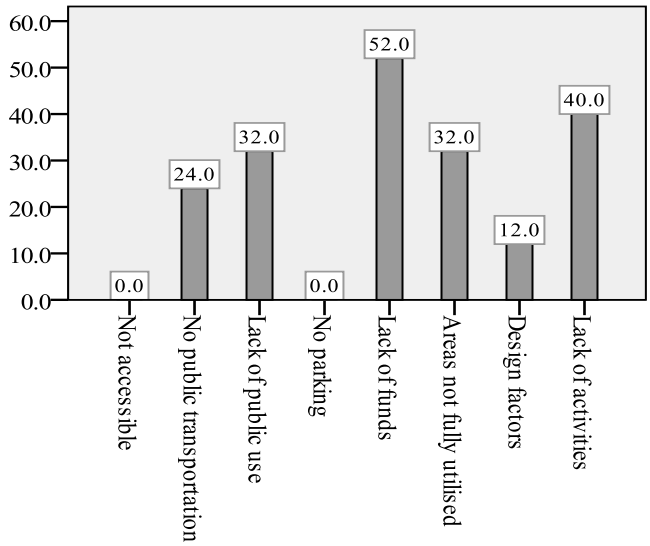

Figure 3: Problems

More than half, 60% (15), of the sports facilities have increased in their attendance rate. Only 20% (5) of respondents stated that the existing sports facilities do not have enough number of people attending the function. There were 76% (19) who were satisfied with the existing facilities enough for the people living there. Although, there were 44% (11) believed that there is still a requirement for additional new sports facilities in the area.

Site Selection Process of Sports Facilities

The states government always proposes the site. The location and provision of recreational and sports facilities are identified in the Structure Plan prepared by local authorities based on population and standards for target people. The

guidelines and planning standards prepared by the Federal Department of Town and Country Planning are used by local planning authorities in controlling activities in land development for uniform, comfortable and safe execution.
The research findings reveal that the guidelines and planning standards for sports facilities are prepared by the Federal Department of Town and Country Planning under the Ministry of Housing and Local Government based on population and urban hierarchy for every level of community. On the other hand, the required sports facilities are decided by the National Sports Policy provided by the Ministry of Youth and Sports. Further, the budget allocation is dedicated to sports by the Government through five-year plans. While the Federal Government is more on providing money for sports facilities construction, the State and Local Governments each provide land and layout, respectively. State authorities propose land and decide about the site selection of sports facilities. In addition, the land sometimes comes from federal or local authorities or the private sector.

Rationales for Development of Sports Facilities

Sporting events hosting was the main reason and rationale for sports facilities development in Malaysia, as can be seen in the Figure 4. It was due to the national trend regarding hosting the 16th Commonwealth Games. Significantly, SUKMA Games are hosted every two years by different states. As mentioned by town planners, benefit to local community and social developments were considered as following the main rationales for sports facilities development. The other factors selected by fewer respondents included necessity for the city, local or city landmark, local physical development and local economic development. In addition, the results from other group of respondents strength that sporting events is the main rationale, selected by 96% (24), to support sports facilities development in the states. Other factors including benefits to local community and social development are considered by more than half, 56% (14), of the respondent. This is in line with the national sport policy in Malaysia which encompasses both high performance sport and sports for all or mass sport for all strata of the community.

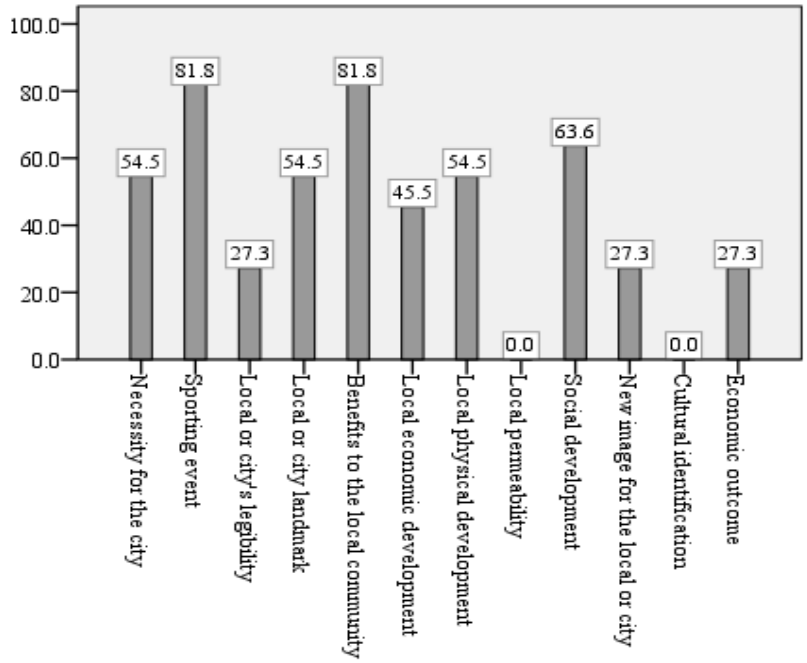

Figure 4: Rationales for Development

Sports Facilities and Urban Development

The research findings on the urban development strategy in Malaysia reveal the importance of residential, commercial and industrial aspects. Furthermore, none of the respondents chose the entertainment-based factor. The findings reveal that the majority of the town planners thought positively of the sport-centre urban development in Malaysia. There were only 18.2% (2) moderately disagreeing and 9.1% (1) slightly disagreed. There were different types of development stimulated by sports facilities as mentioned by town planners. There are infrastructure, commercial, residential, informal sectors and entertainment ones, respectively. Accessibility was selected as the most important factor to improve the sustainability and to enhance the sports facilities impacts. It was then followed by public transportation, activities and the location of the sports facilities. There were more than half of the town planners, 54.5% (6), who agreed on physical development as the role of sports facilities in their surrounding area. It was followed by social development, 45.5% (5), and economic development mentioned by 36.4% (4) of the respondents.

Table 7: Sports-Centre Development

Agreement level	Frequency	Percentage
Strongly Disagree	0	0
Moderately Disagree	2	18.2
Slightly Disagree	1	9.1
Neither Agree Nor Disagree	0	0
Slightly Agree	3	27.3
Moderately Agree	4	36.4
Strongly Agree	1	9.1
Total	11	100.0

The results from the survey provide information on the type of development stimulated by sports complex construction. The research found that infrastructure development is the most significant factor as mentioned by 90.9% (10) of the respondents, followed by commercial at 63.6% (7). Residential and informal sector were chosen by 54.5% (6) and 45.5% (5) respondents, respectively. However, entertainment factor is chosen only by 27.3% (3) of the respondents which is the least chosen after industrial development factor that was not selected by any of the respondents.

CONCLUSION

Findings from exploratory research on sports facilities development in the Malaysian context provides an insight into the sports facilities in Malaysia compare to other countries. The findings reveal new trend of sports investment and sports facilities construction started in the mid-1990s. However, with accordance to economic growth and 'Vision 2020' in Malaysia, it is consistent with the previous research. In addition, according to Min and Jin (2010) and Aman (2005), economic growth and developed degree of a country shows the role of leisure, recreation and sport in the country. Further, as mentioned by Fried (2005), sports facilities construction boom that hit North America in the 1990s spread internationally.

In Malaysia image-transformation through hosting event and contribute to local communities through creating sports culture have been the centre point of sports investment. However, according to Gratton & Taylor (1991), in the 1970s and 1980s, the sports facilities construction was to make an important contribution to local communities in welfare terms. Later 1980s, the rationale has changed to build prestigious sports-led development to promote regional and economic development (Davies 2002; Jones 2001; Lawless 1990; Loftman &

Nevin 1995) or aiming to transform the image of cities and turn them into major world cities (Gratton et al. 2005). With accordance to sports facilities construction boom in Malaysia, the findings of this research elaborate new considerations for town planners to determine the type of local environment for a new sports facility. Further, it may assist to review and provide specific guidelines and principles for sports facilities in Malaysia to follow the global trend in the future.

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PLANNING MALAYSIA:
Journal of the Malaysian Institute of Planners
Volume **XII** (2014), Page 33 - 54

DISASTER RISK REDUCTION IN MALAYSIAN URBAN PLANNING

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Abstract

Disaster risk reduction (DRR) has become one of the main agenda at the global level. This is reflected in *the 'Hyogo Framework for Action (2005-2015) Building the Resilience of Nations and Communities to Disasters*' where one of the priority actions that has been agreed is to reduce the risk factors that can induce disasters. In addition, consensus was obtained during the United Nations Conference on Sustainable Development which was held in 2012 better known as Rio+20 where disaster risk reduction, resilience and risk resulting from climate change should be taken into account in urban planning. Strengthening the instruments for the implementation of disaster risk reduction and risk assessment is needed to ensure that more sustainable urban planning can be implemented in order to accommodate rapid development that goes hand in hand with rapid urban population growth in the future. This research explores the needs for disaster risk reduction in Malaysian urban planning and also explores the roles of urban planners in disaster risk reduction. Further, this study will briefly discuss on preliminary review on disaster risk reduction agendas that has been incorporated in five stages of development plans and document in Malaysian urban planning practice namely the National Physical Plan (NPP), the State Structure Plan (SSP), the Local Plan (LP), the Special Area Plan (SAP) and the Development Proposal Report (DPR).

Keyword: Disaster risk reduction, urban planning, urban planners

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INTRODUCTION

Impacts of disasters have been much discussed since the early development years, particularly after the industrial revolution in Europe. Demand for land for daily uses such as for housing, public amenities, utilities and businesses in urban areas has resulted in the use of areas which are exposed to danger like flood prone areas (Bosher et al.2008). Pelling (2006) notes that rapid urban development and ineffective urban governance have exposed a large number of the world's urban population to risks and hazards of disasters.

Any economic, social and environmental crisis will slow down the process of planned developments and thus affects current and future developments. The United Nations Human Settlement Programme (UNHSP) (2007) has pointed out that disasters can increase the negative effects of any development as they will prevent individuals, families, communities and nations from progressing. The losses due to the disasters in less developed and developing countries are increasing each year. This is because most of the infrastructure and other physical assets in these countries are more concentrated in one area and made them vulnerable to the disaster risks (The International Federation of Red Cross and Red Crescent Societies, 2006).

The importance of the application of disaster risk management and disaster risk reduction in urban planning can be seen in the early days from the United Nations agreements and declarations namely The Declaration of The Yokohama Strategy and Plan of Action for a Safer World in 1984, followed by the International Decade for Natural Disaster Reduction in 1990 (Montoya, 2004), the Habitat Agenda in 1996, The Declaration on Cities and Other Human Settlements in the New Millennium in 2001, The Hyogo Framework for Action 2005-2015 in 2005 and the latest was The Future We Want (Rio+20) in 2012. All agreements and declarations have urged and encouraged the international community to improve the prevention, preparedness, reduction and response aspects in order to reduce vulnerability of human settlements to natural disasters or man-made disasters as well as adoption of the post development programmes effectively.

In 2005, Malaysia is among 168 countries signed The Hyogo Framework for Action 2005-2015. This framework specifically calls upon all international players to integrate disaster risk management and disaster risk reduction into their country development framework (Benson & Twigg, 2007) and especially in urban planning (Bosher et al., 2007; United Nations International Strategy for Disaster Reduction (UNISDR), 2005). There are five priorities that need to be addressed by all members namely: (1) ensure that disaster risk reduction is a national and local priority with a strong institutional basis for implementation; (2) identify, assess and monitor disaster risks and enhance early warning; (3) use

knowledge, innovation, research and education to build a culture of safety and resilience at all levels; (4) reduce the underlying risk factors; and (5) strengthen disaster preparedness for effective response at all levels (United Nations International Strategy for Disaster Reduction (UNISDR), 2005).

Malaysia has implemented The Hyogo Framework for Action through the existing National Security Council Directive No. 20. The Directive No.20 has been prepared by The National Security Council of Malaysia in 1997. Since then, this directive has been acting as the main reference for disaster management in Malaysia. The responsibilities and functions of related agencies for emergency management have been established to ensure all activities related to preparedness, prevention, response and recovery will be properly operated. The National Security Council of Malaysia has been acted as a coordinator for the implementation of The Hyogo Framework for Action in the country (National Security Council of Malaysia, 2011).

Since 2005, Malaysia is being very committed on the disaster management and disaster risk reduction and continuously supports the efforts towards implementing all five priorities areas as been stated in The Hyogo Framework for Action. Every two years, a review will be sent out to the United Nations Strategy for Disaster Reduction (UNISDR) to acknowledge the on-going actions taken by Malaysia regarding all the priorities in The Hyogo Framework for Action (National Security Council of Malaysia, 2011).

In urban planning, the implementation of Hyogo Framework for Action can be seen through various continuous efforts done by professionals in this area. Whether the efforts came from the local planning authorities, Town and Country Planning Departments or the private planning consultants, they all have the same objective in mind which is to ensure the urban planning practices in Malaysia will incorporates the disaster risk reduction agenda. Urban planners have the capability and authority to integrate disaster risk reduction agenda into their respective urban planning practices. A lot of efforts has been done by the urban planners in order to make sure they can implement the disaster risk reduction efforts through their urban planning practices such as through legislations and regulations and through various urban planning guidelines and manuals.

This research will explore the needs for disaster risk reduction in Malaysian urban planning and also explores the roles of urban planners in disaster risk reduction. Further, this study will briefly discuss on preliminary review on disaster risk reduction agenda that has been incorporated in five stages of development plans and document in Malaysian urban planning practice namely the National Physical Plan (NPP), the State Structure Plan (SSP), the Local Plan (LP), the Special Area Plan (SAP) and the Development Proposal Report (DPR) to get the idea on the implementation of disaster risk reduction in Malaysian urban planning practices.

THE NEEDS FOR DISASTER RISK REDUCTION IN MALAYSIAN URBAN PLANNING

Hazards and disasters are a threat to sustainable development. Integration of urban planning and disaster risk reduction is seen as an excellent effort towards sustainability (Mileti, 2002). Planning and building an environment that is able to deal with the potential effects of a disaster requires a deep understanding of specific knowledge on how to prevent and mitigate the impacts of disasters (Hamelin & Hauke, 2005; Bosher et al. 2007). All parties responsible for urban planning, urban design and construction need to take into account all types of current and potential threats in their respective professional activities effectively (Bosher et al. 2007; Bosher & Dainty, 2011).The agenda of resilience built environment should be integrated in the overall development framework from the very early stage of the construction and planning processes (Benson & Twigg, 2007; Bosher et al. 2007; Powell, 2009).

Haigh and Amaratunga (2010) point out that built environment are designed to fulfil human needs and values. The overall quality of the built environment that we live are depending on how well we can design and maintain each component according to the specific context given to us. The design between each component in the built environment will determine the vulnerability of people and property (Berke & Steven 2009). The resilience of built environment can be increased by putting more focus on the characteristics of the built environment as disasters happens because of the intersection between hazards and built environment characteristics. Disaster risk reduction need to be implemented in all stages of the construction of the built environment to ensure the vulnerability can be managed effectively from the early stage of development.

Disaster risk reduction effort can be incorporated in urban planning by making changes to the concepts and current practices used by all parties involved. The main outcome of urban planning is no longer just only producing various plans for an area but at the same time needs to be able to give guarantees in terms of security and prosperity from the physical, economic and social aspects for an area. This can be achieved by integrating disaster risk reduction into the planning activities such as through building regulation and development control and also the construction processes (Ofori, 2008).

Wamsler (2004) found that urban planning can reduce the risk of disaster through good physical design. Wamsler (2004) also urged that there is a need and potential to overcome the consequences of the disaster by combining disaster risk reduction and urban planning initiatives particularly in the pre-disaster phase. The importance of the application of disaster risk reduction in urban planning in particular has been asserted again by Wamsler (2006) by stating that urban

planning is an important element of resistance that can prevent disasters from happening through land use control.

Malaysia is having disasters such as floods, landslides, thunder storms and severe haze every year (National Security Council, 2011). Floods become the biggest threat to Malaysia as it affects a lot of people and caused a lot of monetary losses for more than 100 years (Centre for Research on the Epidemiology of Disasters, 2013). Various disasters occurs in the urban areas as in the rural areas in Malaysia.The location of city in hazard prone areas will expose population to various kind of hazards (United Nations for Development Programme, 2004). The characteristics of many Malaysian urban areas which built on the floodplains has exposed them to the risk of disaster (Department of Irrigation and Drainage of Malaysia, 2009).

The conversion of floodplains to the urban surfaces will increase the impervious areas and disrupt the hydrological processes in that area. Floodplains continuosly chosen by people as their sites for development because of the locational advantages for various urban uses (Burby & French, 1981). The economic, social and environmental advantages that floodplains have to offer the population makes them very attractive for development. These are some attraction reasons for development in floodplains (1) the land is easy to develop as it relatively flat; (2) easy to construct infrastructures such as roads and railways; (3) fertile land; and (4) accessible for water supply, waste disposal, hydropower and river transport (Department of Irrigation and Drainage of Malaysia, 2009).

Besides floods, Malaysia also experienced landslide disaster occasionally in a year. This disaster occurs due to several reasons namely weather, geology structure, rainfall, runoff, seismic activity, design weakness, deforestation, hill denudation, land use unsuitability, less maintenance, less supervision and heavy vehicle tremor (Mohamed Jamil, 2008). The physical dimensions of the urban areas especially the urban settlements has increased the vulnerability towards disaster. According to Alarslan (2008), the risks of urban settlements can be determined by examining various physical dimensions factors namely the site of the settlement whether it is located at the coastal, hillside or floodplain area, the ground survey of the settlement in terms of soil types and groundwater level, the planning standards of the settlement, land use, population density, population profile, construction density and quality of the settlement, the quality of urban infrastructure and services and the economic profile of the settlement. The disruption of one urban settlement due to any disaster will cause disruption to other urban settlement as well as they are related to each other in terms of location and resources (Bosher et al., 2008).

Urban planning in Malaysia plays a significant role in reducing the disaster risks. All of these disaster risks can be reduced through effective and

efficient urban planning practices taken by the government and the private sectors in Malaysia. For example, various initiatives has been taken by the Federal Town and Country Planning Department of Peninsular Malaysia (FTCPDPM) to incorporate disaster risk reduction agendas in urban planning practices in Malaysia such as preparation of various planning guidelines and manuals as the main reference for the urban planners in conducting their respectives practices effectively and mainstreaming disaster risk reduction agendas in development plans and document namely the National Physical Plan, the State Structure Plan, the Local Plan, the Special Area Plan and the Development Proposal Report. Besides that, the FTCPDPM has introduced Land Use Planning Appraisal for Risk Areas (LUPAr) to achieve safety and sustainability in land use planning with effective disaster mitigation strategies and to provide general guidelines for development control in hazard prone areas and to provide mitigation measures for the areas (Mohamed Jamil, 2008).

The FTCPDPM also has undertaken many research regarding flood, landslide and forest fire. They have published many monograph on their research and one of them is the Monograph of Geohazard in Land Use Planning. This monograph focuses on five areas which are (1) geohazard factors; (2) development policies in disaster risk areas; (3) geohazard study in development plans; (4) geohazard assessment; and (5) Low Impact Development (LID) design proposal. Other than that, FTCPDPM and Malaysian Institute of Planner (MIP) occasionally organized seminars and dialogs between urban planners in the government and private sector to exchange thoughts and discuss issues related to the current Malaysian urban planning practices. This seminars and dialogs are intentionally organized to get feedback from the urban planners on disaster risk reduction initiatives that could be implemented to enhance the quality of urban planning practices in Malaysia.

Even though a lot of initiatives provided by both government and private sectors related to mainstreaming disaster risk reduction in urban planning practices in Malaysia, there are still some issues that need to be addressed by urban planning communities. The issues are (1) non compliance of development plans and planning guidelines at local level; (2) lack of data for detail assessment at local level which need cooperation from other technical agencies; (3) ineffective implementation of development policies occurs when state plans fail to harmonize with national objectives and when the plan exceeds the national target; (4) lack of support and full commitment from local, state and other relevant authorities; and (5) conformity of local plans with development policies outlined at Federal and State level (Mohamed Jamil, 2008). If all of these issues addressed wisely by the urban planning communities, it will guarantee the succesful of disaster risk reduction agenda in urban planning practices in Malaysia.

THE ROLE OF URBAN PLANNERS IN DISASTER RISK REDUCTION

Urban planners play a significant role in mainstreaming disaster risk reduction in development planning (United Nations International Strategy for Disaster Reduction, 2001). They are responsible to determine the potential level of exposure and vulnerability of people towards disaster (Esteban et al., 2011). Urban planners have to understand hazards in terms of its location, magnitude and frequency in order to help them plan effectively. Besides that, they have to consider site viability in terms of location, density, type and design of development (Berke & Smith, 2009) and determine whether re-siting of land uses is needed to reduce disaster risks. They also have to know how to use different features of topography and landscape in order to reduce the impact of disaster (Benson & Twigg, 2007).

Urban planners need to be proactive and committed to build knowledge among developers regarding disaster risk reduction agendas. Some of the assistance that can be done by them are explaining related policies and regulations, clarifying issues of sustainability to be addressed, providing detail information regarding related developments and give relevant advices to developers on how to carry out their developments with disaster risk reduction in mind (Berke & Stevens, 2008).Urban planners also have been given the power and authority by their respective Act to challenge proposed development that they think will contribute to the vulnerability of an area and community (Berke & Smith, 2009).

Regardless of whether the urban planners are from the public or private sectors, they all have one thing in common. They are responsible to reduce and minimize various types of vulnerabilities (McEntire, 2001) whether it is physical, economic, social, political, institution and environmental vulnerabilities. Urban planners in public and private sectors have to work hand in hand to ensure they can create disaster resilience community and environment that can last longer without causing any major problem in the future (Nolon, 2006). Urban planners have to know how to use various tools provided by the government and authorities in order to mitigate the disasters (El-Masri and Tipple, 2002). Using appropriate policies, guidelines and regulations will help urban planners to promote disaster resilient development.

Jones et al. (2009) has outlined the roles of urban planners in every phase of disaster risk management including the disaster risk reduction phase also known as the mitigation phase. Urban planners have their own role in mitigation, preparedness, response and recovery phase (see Table 1).

The significant roles of urban planners in every phase in disaster risk management outlined in Table 1 shown that urban planners is one of many important profession in construction industry that have their own unique

responsibilities in helping the local authorities and communities to achieve sustainable development for their respective areas. To ensure their roles and responsibilities can be carried out effectively, urban planners need to equip themselves with knowledge related to disaster risk reduction. They could acquire the disaster risk reduction knowledge to name a few from the formal learning in the university, training and courses organized by various agencies, peer experience exchange and other reading materials such as books, documents and etc. The future urban planners need to take disaster risk reduction seriously in their urban planning practices to ensure all development planned by them will lead to long term sustainable development.

PRELIMINARY REVIEW ON DISASTER RISK REDUCTION IN MALAYSIAN URBAN PLANNING

The disaster risk reduction agendas that need to be addressed by urban planners in preparation of development plans and document are set out in various guidelines and manuals prepared by the Federal Town and Country Planning Department of Peninsular Malaysia (FTCPDPM) and Malaysian Institute of Planners (MIP).

According to the Town and Country Planning Act (TCPA) 1976 (Act 172), there are four development plans that need to be prepared at different level of development planning which namely the National Physical Plan (NPP), the State Structure Plan (SSP), the Local Plan (LP) and the Special Area Plan (SAP). In addition to the four development plans there is another important document need to be prepared by urban planners to assist local authorities in decision making at site planning level, namely the Development Proposal Report (DPR). The DPR is prepared and submitted by urban planners to the local planning authority on behalf of the land owner or the developer for the purpose of getting a planning permission, called *Kebenaran Merancang*.

Disaster risk assessment which consists of hazard and vulnerability analysis will be conducted in the preparation of these five development plans and document to allow urban planners to understand the impacts of various risks to the community and the planned area. Preliminary review of various guidelines and manuals regarding the preparation of development plans and document at different planning level in Malaysia has been done to identify the disaster risk reduction agenda adopted in every development plans and document. The identifications of disaster risk reduction agendas adopted in every planning sector in these guidelines and manuals are using the hazard and vulnerability analysis criteria as in Table 2 and the findings are outlined in Table 3.

Table 8: Roles of Urban Planners in Each Phases of Disaster Risk Management

Phase	**Activity**	**Activity component**	**Roles of urban planners**
Mitigation	Risk assessment and exposure to danger	Risk assessment and exposure to danger	• Estimate the exposure of people and buildings towards disaster risks and analyze the effectiveness of existing regulations to mitigate disaster
	Disaster risk reduction and mitigation	Disaster risk reduction and mitigation	• Identify risks according to area, give relevant advices on disaster risk reduction and plan quality development in the suitable location
Prepared-ness	Disaster preparedness and pre-disaster planning	Disaster preparedness and pre-disaster planning	• Identify the settlement at risk and give relevant advices on relocation during and after disasters
Response	Emergency relief	Emergency water supply and sanitation	• Estimate the demand for clean water and the locations where it is needed
		Logistical planning	• Evaluate local access and plan for transportation and storage for supplies and establish needs of affected communities
		Relief shelters	• Estimate the shelter demand in terms of number, type and location
		Project planning and management	• Assess initial infrastructure recovery requirements and liaise with all stakeholders and communities to establish feasible strategic plans for the affected areas
Recovery	Early Recovery	Physical condition surveys	• Assess potential locations for interim settlements, transitional dwellings and important facilities by having consultation with various stakeholders
		Compensation packages	• Give advice on strategic objectives of compensation packages
		Rapid mapping	• Work with surveyors to establish proper maps that can provide the estimation of the disaster impact on land use, transport and access lines
Recovery	Early Recovery	Community surveys /resource mapping	• Provide information on population, households, social and economic activities and carry out additional participatory surveys to get the communities aims
		Housing needs assessment	• Evaluate overall housing needs, establish the type of infrastructure, housing and land required for transitional and permanent housing and also consider layout design at the settlement level
		Land survey and acquisition	• Advise on optimum locations for transitional housing based on economic,

			social and environmental considerations and have consultations with the communities and local authorities regarding the exchange, purchase and transfer of land
		Physical planning	• Plan in terms of buildings locations, key facilities, transport routes and access
		Infrastructure demolition/repair /renewal	• Identify key infrastructure that need priorities action
		Transitional shelter	• Draw and amend local planning policies and guidelines to take into account transitional housing requirements and site planning to ensure access to necessary facilities
		Land boundary/ cadastral survey	• Give advice on physical planning to the local authorities and communities
Recovery		Project planning and management	• Plan strategically for disaster affected areas to ensure integrated delivery of housing and services, coordinate inputs from various professionals and guide all stakeholders involved on the implementations of codes of standards and regulations related to disaster risk reduction
	Reconstruction	Land development and landscape design	• Determine overall settlements location, access routes and type of infrastructures that need to be reconstruct for that disaster affected areas
		Housing allocation	• Allocate the number of dwellings needed in every settlement according to needs assessment
	Reconstruction	Advice on regulations and codes	• Propose ways on how to monitor and enforce all regulations that have been established and give advice on longer term policies and plan development to support future risk reduction and efficient response to risks
		Housing and building design	• Manage and amend local planning policies and guidelines to take into account of new housing and site planning requirements
		Housing and building construction advice	• Provide background information on by laws, construction practices and compliance to the local communities
		Infrastructure planning and implementation	• Make sure that planned infrastructures meets the communities demand as well as the regulation requirements imposed by the local authorities and also develop

		integrated spatial strategies and action plans for the implementation
	Training	• Provide training in research and risk assessment to the communities so that when they design the new permanent settlements it will comply with the regulations and policies
	Project planning and management	• Provide strategic input and consultation with communities and local authorities in order to establish projects aim and objectives at the local level
	Financial planning and management	• Provide background estimation on funding required and give advice on the future locally generated revenue to the local authorities and communities
Post reconstruction development, review and ongoing risk reduction	Monitoring and evaluation	• Periodically review the demand and capacity of infrastructures, review the disaster preparedness plans by having consultation with local communities and monitor the implementation and compliance of regulations by the stakeholders involved in this activity
	Project planning and management	• Work with local communities to review and renew plans for long term sustainable human settlement development
	Cost-effectiveness and financial advice	• Give advice on how to establish disaster risk reduction regulations that cost less to implement
	Infrastructure maintenance advice	• Raise awareness among general public and enforcing the regulations when necessary
	Retraining	• Provide training for the professionals in local authorities regarding the risk assessment so that they can plan their development with disaster risk reduction in mind

Source: Jones et al, 2009

Table 9: Hazard and Vulnerability Analysis Criteria

Type of analysis	**Criteria**
Hazard analysis	• What kind of hazard exists? • What are the features of those hazards? • What are the frequencies of those hazards? • How many populations are within hazard prone areas? • Where it might happen? • What is the scale and trend of those hazards? • What are the impacts and potential fatalities?

Vulnerability analysis	• Who are the most vulnerable? • Where are the most vulnerable? • Why are they vulnerable? • What makes them vulnerable? • What assets are vulnerable? • How will vulnerabilities alter? • The element at risk and possible damages

Sources: Department for International Development, 2012; Jianping Yan, 2010; Jieh-Jiuh Wang, 2012; United Nations Development Programme, 2010

Table 10: Disaster Risk Reduction Agendas in Development Plans and Document

Planning level	Development plan	Sectors involved	Disaster risk reduction agenda adopted
National	**National Physical Plan**	Physical development and urbanization	• Provide a map that shows terrain areas which are not suitable for development • Provide environmentally sensitive area map showing the water catchments, forests, rice reserves areas, minerals and marine park areas • Map filtering needs to be assessed according to the evaluation of environmental capacity
		Agriculture	•Outline the spatial policies and strategies that support the existing agricultural and forestry sectors policies and strategies to improve productivity while maintaining the quality of the environment and biological diversity
		Urbanisation	• Define the limits of urban development
		Population, housing and public facilities	• Formulate and analyse the profile of the current population in terms of size, growth rate, distribution and density by state • Provide the development policies and strategies of countries and territories important public facilities according to their placement, location and level of use
		Irrigation and drainage	• Identify the current capacity and maximum level of existing drainage system • Make the projection of total capacity of liquid waste that will be generated for the proposed land use development

		Sewerage	• Identify the current capacity and maximum level of existing sewerage system
		Transportation	• Evaluate the impact of land, air and sea transportation system on the development of the country, region and state
		Environment and natural resource	• Analyse and map out areas with mineral resources which need to be reserved, geo-hazard areas and areas with geological interests • Identify environmental sensitive areas
State	**Structure Plan**	Population and human resource planning	• Analyse existing policies, formulating population distribution policies and strategies based on the spatial development of the state • Provide population distribution plan
		Land use and physical	• Review and analyse the topography and geological structure of the area of the state to identify the constraints and potential development • Formulate policies and state land use spatial strategies towards sustainable development
		Urban and rural settlement	• Determine the boundaries of the development of the city • Determine the needs of the green belt between the urban and rural areas
		Housing	• Review the requirements for the provision of high, medium and low density housing
		Drainage and irrigation	• Review the drainage system and drainage network including its area and analyse the effectiveness and capacities of existing systems • Identify areas having problem with flooding and flash floods
		Environment and natural resource management	• Identify environmental sensitive areas • Review of the environment management system • Examine conflicts of environment and identify approaches to resolve them
District	**Local Plan**	Physical and land use characteristics	• Analyse the topography, geology, soils and hydrology of an area
		City centre and commercial	• Analyse the level and intensity of city centres development • Review the requirements of greenbelt to separate the city and rural areas in

District	**Local Plan**		order to protect wildlife and other important function of ecology
		Housing	• Analyse the problems of housing estates such as squatters, environmental pollution and others
		Public facilities	• An assessment of the facilities that need expansion, improvement or relocation.
		Rural area development	• Analyse the distribution of land use and physical condition of the settlement itself
		Industry	• Assessment of industrial waste disposal system
		Population and employment	• The distribution and current population density and major settlement blocks
		Transportation and traffic management	• Analyse capacity, physical condition, hierarchy, and reserve system routes/roads in the main settlement • Analyse the accident area and the black area
		Drainage and irrigation	• Analyse the effectiveness and capacity of drainage and irrigation systems • Analyse the natural drainage system in river basins • Analyse the flood area and their causes as well as the number of people involved • Analyse the ability of the retention and detention pond
		Environment and natural resource management	• Identify areas that suffer from pollution, the level of pollution and pollution sources • Identify location, the importance and the threat of environmental sensitive areas • Analyse the carrying capacity • Analyse the environmental sensitive areas • Identify issues, problems, potential and constraints related to the area at risk
Special Area	**Special Area Plan**	Type I Redevelopment of city centre	• Analyse the physical issues and social safety issues that lead to redevelopment • Analyse the potential and constraints of the existing areas • Traffic management relationship with surrounding areas

Special Area	**Special Area Plan**		• Social Impact Assessment (SIA) of development
		Type II Heritage interest area	• The aspects of the current situation in terms of conditions and maintenance of the buildings • Aspects of spaces in terms of building conditions, environment quality, traffic conditions and economic and social aspects • Social Impact Assessment(SIA) of development
		Type III Environmental sensitive areas Rank 1 and Rank 2	• Identify the value of life support, the threat and the need for sustainability • The impact of surrounding area development • Analyse the carrying capacity/environmental impact • Social Impact Assessment (SIA) of development
		Type IV Special needs area	• Issues of physical, social and economic lead to special actions in the area • Social Impact Assessment (SIA) of development
Site	**Development Proposal Report**	**Analysis of existing site conditions**	
		Existing land use	• Description of the development of the surrounding area that is likely to receive/give impact on the development on the site • Description on analysis and site suitability in terms of land use
Site	**Development Proposal Report**	Topography	• Description of analysis and site suitability in terms of topography and supported by slope analysis plan • Cross-section for development of areas with more than 15^0 of slope as in *Garis Panduan Pembangunan di Kawasan Bukit dan Tanah Tinggi, JPBD, 2009* • Geotechnical report needed for development under Class III and IV • Safe zone confirmation needed for development near the limestone hill as in *Garis Panduan Pembangunan di Sekitar Bukit Batu Kapur, Jabatan Mineral dan Geosains Malaysia, 2003*
		Geology	• Description of analysis and site suitability in terms of geology • Summary from geology terrain mapping report prepared by registered geologist

			to be included for developments on hilly areas with more than 15^0 of slope
Site		Landscape	• Description of analysis and site suitability in terms of landscape
		Environmental quality	• Description of water and air quality index degree of noise and flood risk area • Description of analysis and site suitability in terms of environmental quality
		Irrigation and drainage	•Description of analysis and site suitability in terms of irrigation and drainage
	Development Proposal Report	Vegetation	• Identify and indicate trees with more than 0.8 metres diameter and under the Tree Preservation Order as in Act 172.
		Building	• Suitability of new development with existing buildings need to be considered and explained • Summary from Heritage Impact Assessment (HIA) report need to be included for new development in heritage site area • Impact analysis from new development to the conservation area that has been identified in Local Plan need to be considered and conservation proposal need to be prepared
Site		Infrastructure, utility and public facility	• Suitability and carrying capacity analysis need to be done for development area and surrounding area
	Development Proposal Report	Development potential and constraint	• Description of development potential in terms of physical aspects including view and vistas, economy, environment and social also development proposal implication • Description on development constraint and mitigation and improvement measures
		Development proposal	
		Analysis of proposed development	• Proposed land use analysis in terms of its suitability and it synchronicity with Local Plan from these aspects: - Land use zoning - Density - Height control - Plot ratio

	- Plinth area - Development component
Accessibility and circulation	• Description on proposed road hierarchy and synchronisation with existing road and committed road to ensure good accessibility • Traffic Impact Assessment. • Road Safety Audit (RSA)
Irrigation and drainage	• Preliminary Drainage Plan for surrounding area and outside the development construction site to control flood before earthwork and construction work is taking place • Description on how the water features will be conserved if any • Calculation of capacity of the drainage networks and water reservoir as in *Manual Saliran Mesra Alam (MSMA)*
Public facility	• Proposed public facility must conform to the planning guidelines
Utility	• Location of electric substation must be above the flood level • Location of water tank must not be at the steep area • Proposed sewerage system need to conform to guidelines by *Suruhanjaya Pengurusan Air Negara (SPAN)* • Proposed telecommunication system need to conform to guidelines by *Suruhanjaya Komunikasi dan Multimedia Malaysia (SKMM)*
Implementation steps	• Measures to protect and improve the environment physically • Measures to protect the natural topography •Measures to improve in terms of landscape • Measures to conserve and plant vegetation • Measures to minimise impact to the infrastructure, utility and existing facilities on site and surrounding area
Development Proposal Impact	
Physical impact	• Explanation of proposed development impact from physical aspect in terms of topography, land use, skyline, urban design,

			aesthetic and development intensity and mitigation measures
		Economic impact	• Explanation of proposed development impact from economic aspect in terms of population generation, job opportunities, investment opportunities and other related factors
		Infrastructure and utility impact	• Explanation of proposed development impact in terms of existing infrastructure and improvement of the quality of infrastructure and utility of surrounding area in the future
		Social impact	• Explanation of proposed development impact in terms of local community and individual activities, quality and wellbeing, health and security with mitigation measures to prevent negative impacts

Sources: Asas Rujukan Rancangan Fizikal Negara, 2000, Manual Rancangan Struktur, 2001, Manual Rancangan Tempatan, 2009, Garis Panduan Rancangan Kawasan Khas, 2006 dan Manual Laporan Cadangan Pemajuan Edisi Kedua, 2011

From Table 10, we can see there are efforts to adopt disaster risk reduction agendas in each development plans and document at different planning level. The elements of disaster risk reduction have been set out in every planning sector in each development plans whether in the physical, economic or social aspect. Urban planners should incorporate the disaster risk reduction agendas at the very early stage of any development.

The development plans and document prepared at various planning level are important as a guide for development of respective areas. Even though there are disaster risk reductions agendas adopted in the guidelines and manuals, it can be seen that it has been set out generally for each planning sector with a little explanation and a few detail information on how that particular disaster risk reduction agendas need to be addressed and considered by urban planners in their urban planning practices. Every guidelines and manuals need to be very detail and rich with disaster risk reduction information to ensure every development planned by the urban planners in the future will have high level of resiliency and can minimize the vulnerability of people towards disaster risks.

CONCLUSION

As the conclusion, there are still plenty of rooms for improvement in mainstreaming disaster risk reduction agenda in development plans and document at various planning level such as in terms of availability of complete guidelines and manuals as a reference for urban planners in conducting their urban planning activities in the future. The guidelines and manuals need to be as detail as possible in terms of information related to the disaster risk reduction to ensure urban planners are provided with good and complete references for their daily urban planning practices.

Each development plans and document prepared at all planning level in Malaysia will complement each other in terms of the implementation of disaster risk reduction efforts. Disaster risk reduction agendas set out in the Development Proposal Report will determine the success of disaster risk reduction agendas in the Special Area Plan, Local Plan, State Structure Plan and National Physical Plan. The continuous efforts from the urban planners to mainstreaming disaster risk reduction in their respective practices will help enhancing Malaysian urban planning practices in the future.

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PLANNING MALAYSIA:
Journal of the Malaysian Institute of Planners
Volume **XII** (2014), Page 55 - 74

CONCEPTUALISE TOURISM SUPPORT SYSTEM THROUGH WEB-BASED GIS FOR COLLABORATIVETOURISM PLANNING

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Abstract

Web based GIS plays a bigrole in tourism, especially in public and management use. The popularity of Web based GIS is increasing dramatically as seen through the number of web GIS emerging over the years. Web based GIS allows professionals, organizations and the public to share and collaborate on information unhindered by geographic boundaries. The integration of GIS with the World Wide Web (WWW) brought a new paradigm of enhancing the collaborative planning effort among stakeholders. It also became a new medium of inviting public participation in planning and management processes by providing information in the form of maps and data for public access and paving the path for data sharing with agencies having the same interest. This paper aims to explore the concept of web based GIS and identify how it can be used towards enhancing collaborative planning and public participation among tourism stakeholders and communities. The Langkawi Island Web GIS is a website which provides tourism related information about Langkawi Island and allows for public participation as an information supplier.

Keyword: Web based GIS, tourism, collaborative planning & Langkawi Island.

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INTRODUCTION

The Information Communications Technologies (ICT) is inevitably making societies and cities increasingly knowledge-based (Ali, 2006). It empower consumers to identify, customize and purchase tourism products and support the globalization of the industry by providing tools for development, managing and distributing offerings worldwide. ICTs have a broad terminology referring to the multitude of communication technologies ranging from simple to the complex, namely cell phone applications (SMS), Digital Cameras, Internet, Wireless (WiFi and WiMAN), VOIP, GPS, GIS, Convergence (data, voice, and media), Digital radio, etc. Considered an information intensive industry, tourism can benefit synergistically from the use of ICT components especially the internet. The internet provides a wealth of pertinent and directly accessible information at low costs on prices, products and potential opportunities. A simple assessment of the impacts of the internet lead to the ready conclusion in the reduction of information asymmetries on the market and to the emergence of markets of pure and perfect competition (Loghi, 2008).

The internet is especially relevant to tourism since it enables knowledge gathering about the consumer or tourist products. According to Werthner & Klien, (1999) this gives rise both to global visibility of destinations and a global merging of market segment. The use of web based tourism information system is growing significantly and is predicted to remain so in the future, with the distinct possibility of creating the whole tourism business premised on the internet. Web-based GIS has been applied in many fields, including geography, forestry, urban development and planning and environmental studies. The integration between the World Wide Web and Geographic Information System (GIS) has changed the way organizations use geographic information, as well as the process of accessing, sharing, disseminating and analyzing data (Duran, Seker, & Shrestha, 2004). Today, the popularity of Web based GIS has shown a marked increase as seen through the emerging number of web GIS, which allows the professionals, organizations and the public to share and collaborate information unhindered by geographic boundaries.

CONCEPT AND ARCHITECTURES OF WEB-BASED GIS

Web based GIS is a type of information system that integrates, disseminates and communicates spatial information on the internet or the World Wide Web (Gillavry, 2000; Peng & Tsou, 2003). There are a number of various web based GIS system currently on the internet, classified based on functionalities or types of systems but the classification basis is fairly complex. The simplest classification of web based GIS can be defined into two categories based on

their sources, namely single source and multiple sources. The single source system refers to the system having only one web server in providing the information while multiple source system could request data from a variety of web servers (Shaig, 2001). To develop a web base GIS, the basic approach for deploying Web based GIS application depends on the user requirements which addresses concerns of which web GIS packages are suitable to best accomplish their objective.

In developing web based GIS application, there are basically two types of architectures; first is the server-side and the second is the client-side. In server-side web GIS architecture, users (clients) are allowed to submit requests for data and analysis to the Web server. The server processes the request and returns data or a solution to the remote client (Fajuyigbe, Balogun, & Obembe, 2007). Usually, the web GIS server combines a standard web (HTTP) server, GIS application server and the GIS database and also functionalities that reside completely on the server (Markos, 2012).

A standard Web (HTTP) server, the GIS application server and GIS databases are the common components in the Internet-GIS server, with the functionalities residing completely on the server. The design in server-side architecture allows the users to interact with the clients' machine via typed queries (requests). The user's queries are transferred to the Web server and then passed to the GIS application server, which run an address matching routine. It then generates a map graphically, convert it to the Web format, wraps the image in HTML and sends it back to the web server as a result of the user's queries. The results will emerge as a standard Web page and can be easily accessed through any web browser, creating significant positive implications for performance, reliability and size of the user base (Figure 1). Due to the complex and proprietary softwares in server-side design, as well as the GIS database residing on a server, application development in these designs for deployment and maintenance of the data can thus be simplified. However, server-side architecture is almost always associated with poor performance and limited user interface and interaction (Belay, 2005).

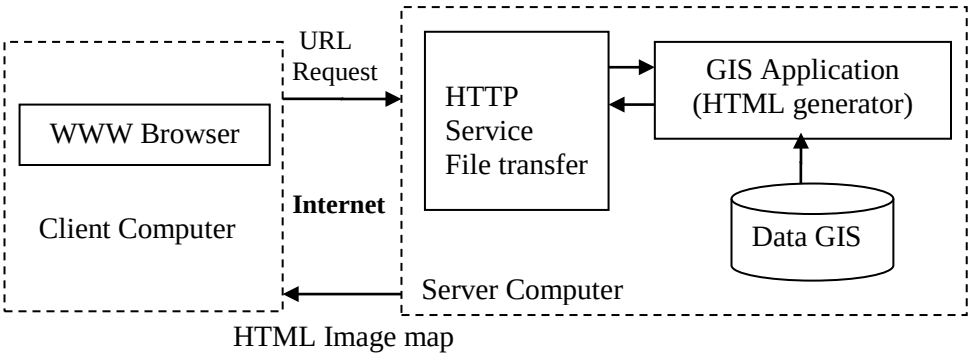

Figure 5: Server-Side Architecture

Source: Markos, 2012

Client-side architecture, on the other hand allows the users to perform some data manipulation and analysis locally on their own machines. For that, users are required to install a complete client application, and in such systems, either a substantial amount of GIS functionality is moved to the client, or only the user interface is enhanced slightly to enable specific user interaction. Correspondingly, the client-side application requires software and some other than browsers to be transferred to the user (Figure 2) (Markos, 2012).

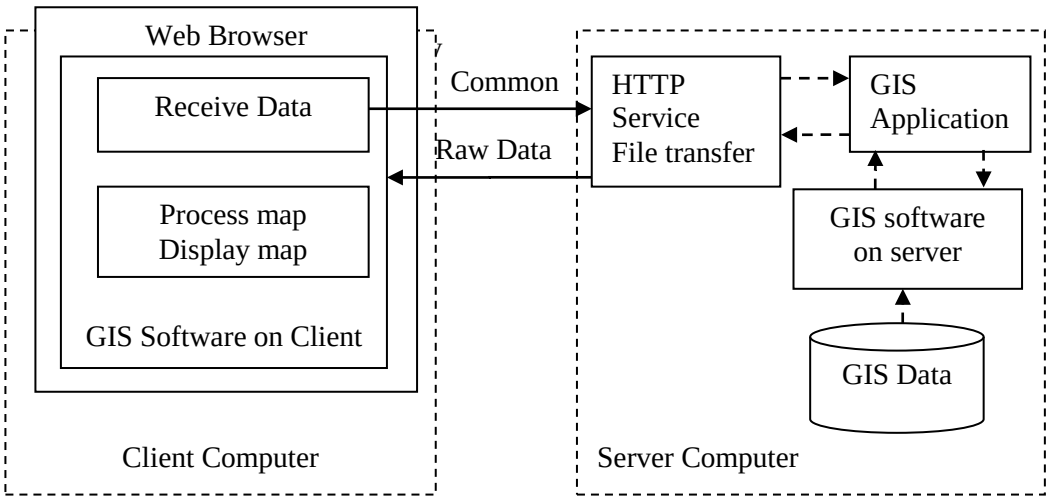

Figure 6: Client Side Architecture

Source: Markos, 2012

On client-side Internet-GIS, the main operation will run on the server. When the server receives inquiries from the client, it will begin communicating to the database and retrieves attributes of the map from the database. That apart, the GIS application server also has direct access to the map. The output map file could be SHP, DXF, etc and will be used to create map files like lines, points, area and also the labels. The raw map and HTML image will be provided to users via the servers (Belay, 2005). In client-side solutions however, the biggest disadvantages are the software and distributing data.

The software distribution is very problematic as it consumes the technical support to handle it which involves high cost. The combination of server side and client side architecture will create a new form of system named as hybrid or client/server architecture. This architecture is created to overcome the limitations in client-side applications and allows the user to use both (server and client) design techniques to access the GIS on the internet. Users can make the request to the web server through the web browser which will generate the HTTP request in the form of an html page like the server-side design or access GIS data from the Internet. The process occurs through the users' own GIS packages which will enable manipulation on the client system (Figure 3). Generally, the server tasks in hybrid architecture can be simplified into four main activities - map browsing, query, analysis and map drawing. For client-side architecture, the task is for display, map browsing and query.

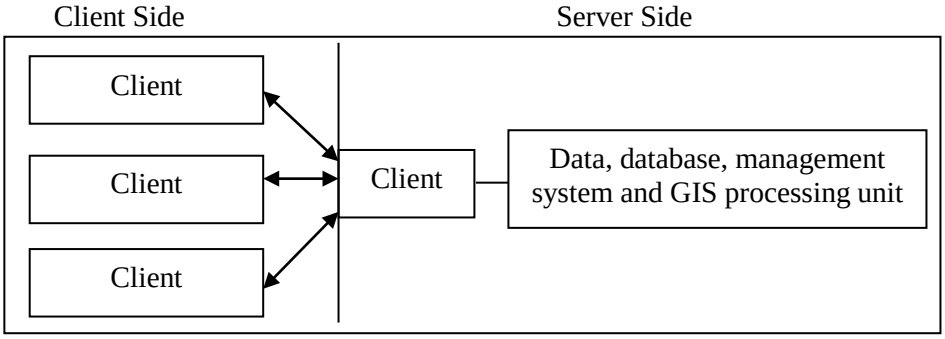

Figure 7: Hybrid Architectures

Source: Belay, 2005

Geographic Information Systems (GIS) are now widely recognized as a valuable tool for managing, decision making, analyzing, and displaying large volumes of diverse data pertinent to many local and regional planning activities (Avdimiotis & Christou, 2004). The combination of GIS and web-based applications which contained spatial attributes has evolved to become more than

a program since GIS is a visual and analytical tool and helps users understand or visualize this information in a map and enables the users to manage this information interactively and analytically. The developments in Web-based GIS make it a distinct feature with high inter-activity and strong end-user participation (Chang & Caneday, 2011).

WEB-BASED GIS AS MEDIUM OF COLLABORATIVE PLANNING AND PUBLIC PARTICIPATION

In 1996, after the meeting of the National Center for Geographic Information System and Analysis the term 'public participation geographic information systems' was conceived. The concept of using GIS technologies was to produce local knowledge with the purpose of including and empowering the marginalized population (Brown & Reed, 2009). The integration of GIS with the World Wide Web (WWW) brought about a new paradigm in enhancing the collaborative and community participation aspects in planning. It was applied to many sectors as one of the medium to help stakeholders to create a more effective planning and decision making process involving public participation.

Citizen participation is widely viewed as a key component in the planning process, and for the most part, planners accept the notion that participation is important to producing enduring plans (Brody, Godschalk, &Burby, 2003). But effective participation involves a two-way process that includes sending information out to the public and getting their ideas, concerns and thoughts back (Godschal, Parham, Porter, Potapchuk, & Schukraft, 1994). In the traditional approach, due to aspects of venue, time, cost and the delivery mechanism, active participation was considered a failure as public participant meetings were dominated by small, disproportionately vocal groupsl; many individuals were hesitant to express their concerns and opinions (Healey, McNamara, Elson, & Doak, 1988).

Web-based GIS offers an effective approach in getting a wider range of opinions and information at lower cost because of its online system that can be used by the public anywhere and anytime as long they have access to the web. Web based GIS provides all of the functions, allowing users to explore, evaluate, prescribe and discuss planning and policy issues within the community. An application GIS for public participation includes features that cover the community economic development, environmental dispute resolution, participatory planning, and other activities involving public collaboration. Technologies chosen or developed to support this approach can be designed to document and record the problem resolution process, allowing evolving

priorities and problem definitions to be tracked by all participants (Banger, 2002).

Based on the different levels of contents and functionality, web based GIS for the collaborative and public participation processes could have various phases of services which involve the different degree of public participation and user interactions. The lower level services represent the lower requirement of public participation, and accordingly, the highest levels of services represent the highest requirements. The generalization of frameworks of the system and the level of service categories can be designed based on information content (general information, plan alternative, data, analysis tools) and interface functionality (web browsing, static map [clickable maps], interactive map-based search, query, and analysis and Scenario building and on-line editing). The different levels of functionality also require different types of system architectures. In ways to support high involvement of public participation using web based capabilities, a three-tier architecture is required premised upon a hybrid design (Figure 4). This architecture comprises the web browser (client tier), web server (server tier) and one or more server application (application tier) (Peng & Tsou, 2003).

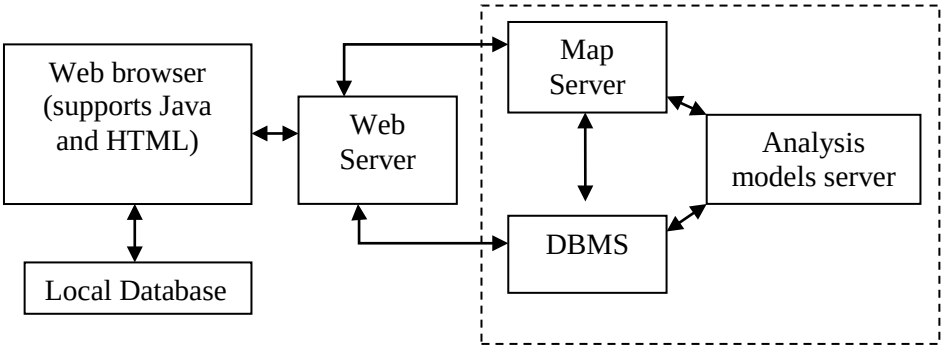

Figure 8: A three-tier Architecture for Internet GIS-based Public Participation
Source: Peng Z.-R. , 2001

Therefore, in enhancing public participation, web-based GIS could be a medium of specific information sharing that enables and supports efforts to view as well as retrieve information at different time and places (Devaraju, Nanna, & Shahrin, 2007). Web-Based GIS is a medium inclined more towards inviting public participation, apart from providing information in the form of maps and data for public access, and paving the path for data sharing with agencies having the same interest. A component of Web-based GIS Public Participation System consists of map viewer and web content management, which will be used for the public in giving their opinion or information. The map viewer which

includes basic functions such as pan, zoom, select, identify and custom search tool, will allow the user to submit their views or suggestions on the tourism product. The tools menu contains functions such as edit, draw and print and can be used for general purposes. Edit function allows users to add point features (objects) or edit information (Attribute data) of existing point features in the Web GIS.

The application of web based GIS for collaboration and public participation was used broadly to support the decision making process in many fields included in urban planning and management research (Yaakup, Jama'an., Abu Bakar, & Sulaiman, 2001; Ventura, Niemann, Sutphin, & Chenowith, 2002; Belay, 2005; Devaraju, Nanna, & Shahrin, 2007; Kingston, 2007); environmental planning and management (Kingston, Carver, Evans, & Turton, 2000; Carver, Evans, Kingston, & Turton, 2002; Nuohua, Juustila, Raisanen, Kuutti, & Soudunsaari, 2008); social research (Casey & Pederson, 2002; Al-Kodmany, 2002); and environment and public health (Devictor, Whittaker, & Beltrame, 2010). Other than that, the tourism industry is one field that uses Web based GIS intensively in ways to plan, manage and promote tourism products in most destinations around the world.

One of the earliest public participation using GIS was originated in mid-1990s by Onsrud, Schroeder and Lopez of the University of Maine. Based on their workshop on how to improve access to GIS among non-governmental organisations and individuals involved with public policy making, public participation GIS (PPGIS) has been used to come up with tools for spatial decision-making (Schroeder,1997). A Collaborative planning and public participation Web GIS enables people to express their views by posting comments in a relatively anonymous and nonconfrontational manner (Meng & Malczewski, 2010).

Nevertheless, even after Web GIS technologies were used for collaborative planning and public participation, the feedback from local community members sometimes is quite unsatisfying. According to Lee (2000), about 34 % of all users visit the website with GIS application on a monthly or occasional basis. Study by Hopkins et al. (2004) found that some users just give up in the middle of the involvement process because of learning barriers and complicated interfaces, while some projects end up with only few number of participants (Sidlar & Rinner, 2007; Ingensand & Golay, 2010).

In relation to the above issues, Meng & Malczewski (2010) suggest that Web GIS designers should focus on refining the system features, such as navigating the Web site, locating desired documents, and enhancing content; design functions that work with standard Web browsers; and choose the right resolutions to attract users to stay longer on the Web site and interact more with others. The idea is to ensure users will visit the Web sites more frequently, view more pages, and interact more often with other participants.

THE COLLABORATIVE PLANNING AND PUBLIC PARTICIPATION USING WEB-BASED GIS FOR TOURISM PRODUCT

In the tourism industry, information in various fields is necessary for tourists to make informed decisions but it is rather difficult or nearly impossible to pull all the information together and make sense of them. Besides that, tourism development is also related to many other industries such as accommodation, transportation, leisure, services and hospitality (Wilkinson, 2007; Gu & Ryan, 2008). Today, Web based GIS plays a decidedly important role in tourism, especially in public and management use which have raised several key questions by public and managements users as shown in Table 1.

Table 11: Question by Public and Management User on GIS System

Public User Questions	**Management User Questions**
Where is the city, state or country located?	What are the areas that tourists are interested to visit?
What is the climate? Does it have warm or cold weather? What is the best time of year to visit?	What are the physical geographic characteristics of those areas?
What is the official language	What are the accommodations available? What is their classification and categorization?
Where are the accommodations in the city located? What is their classification? What are their rates?	Where are the stops/stations of public transport facilities located
What kinds of public transportation are available? Where are rental car agencies located?	What are the demographic and socioeconomic characteristics of the local population of each tourist space?
Where are the cultural/natural amenities located? What is their operating schedule? What is the cost to attend?	What are some plans, programs and projects that would help stimulate tourism activity.
What attractive places are near my hotel?	What infrastructure services are in current and potential tourist areas? Which is the service quality?
Where are the banks? Where is the police station? Where is the hospital?	What is the tourist demand for attractive places, tourist equipment, and services?
Where are the shopping centers?	Which public and private institutions are available and competent in tourism planning?

Source: Duran, Seker & Shrestha, 2004

Interestingly, public participation has become one of the main source to build the web base GIS as a medium to promote tourism products. There are a lot of web based GIS created for that purpose, one of which include Nigeria's Oyo State Web based GIS tourism portal. Data collection for the project was done using the primary and the secondary method, with primary data collected through the interviews with state tourism board, manager of the tourist centers, Ministry of Information, Oyo State and the department of survey, the Oyo State Ministry of Lands and the Housing and also GIS expert from the Federal School of Survey. The Oyo State Web based GIS were designed using a combination of both the server-side and client-side applications which is hybrid architectures (Figure 5). Spatial component (database) was developed using ESRI's Arc View software, and the project also collects the data attributes (image, text, etc.) from various sources and links it to their respective spatial features. Oyo State Tourism web based GIS homepage contained five main icons - tourist attraction (ecological, cultural, modern features), GIS (internet and desktop GIS), tourism facilities (hotel, location and other services), contact us and about Oyo State.

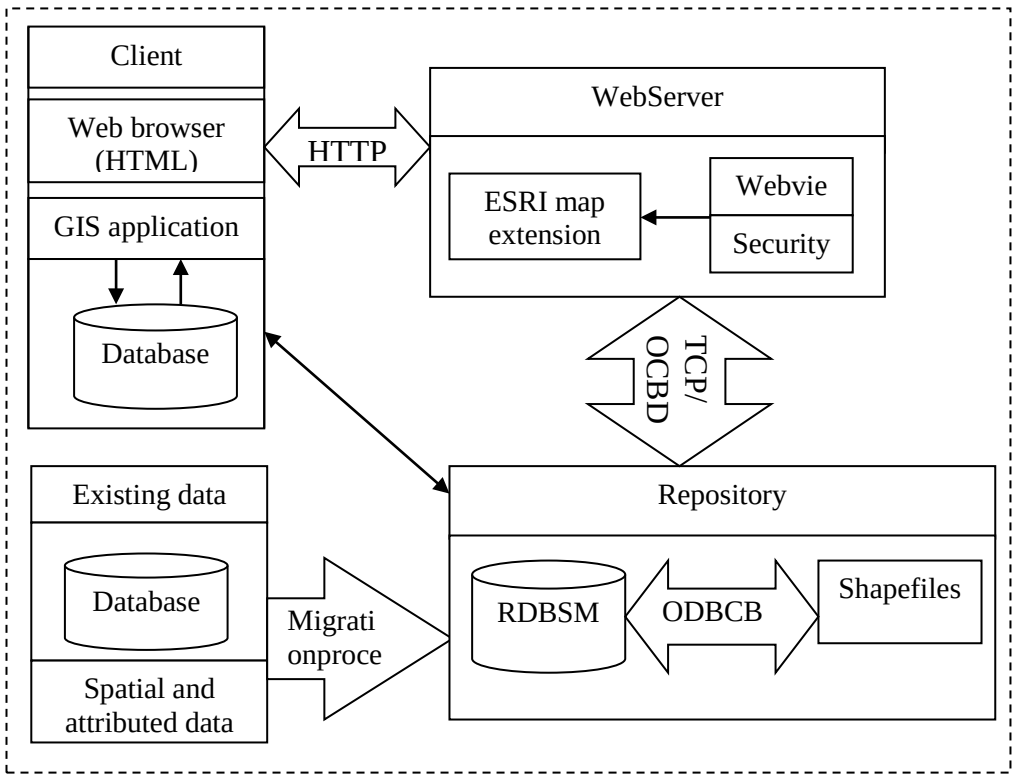

Figure 9: Hybrid Architecture for Web based GIS in Oyo State Tourism
Sources: Fajuyigbe, Balogun, & Obembe, 2007

Markos (2012) also developed a web GIS for tourism development of Bahir Dar town in Ethiopia to provide spatial and non spatial tourism information for tourist purposes. The web GIS development cycle starts with requirement analysis and ends with the implementation of the web GIS system. In requirement analysis, there are two critical pieces of information, first being a list of functions that is needed and second, a master list of available attractions. The project was developed using three tier software architecture with server-side solution (Figure 6). The web GIS contain the information about tourist spots, hotels, banks, shopping markets, health centers, transport destinations, main roads and information about Lake Lana (Figure7).

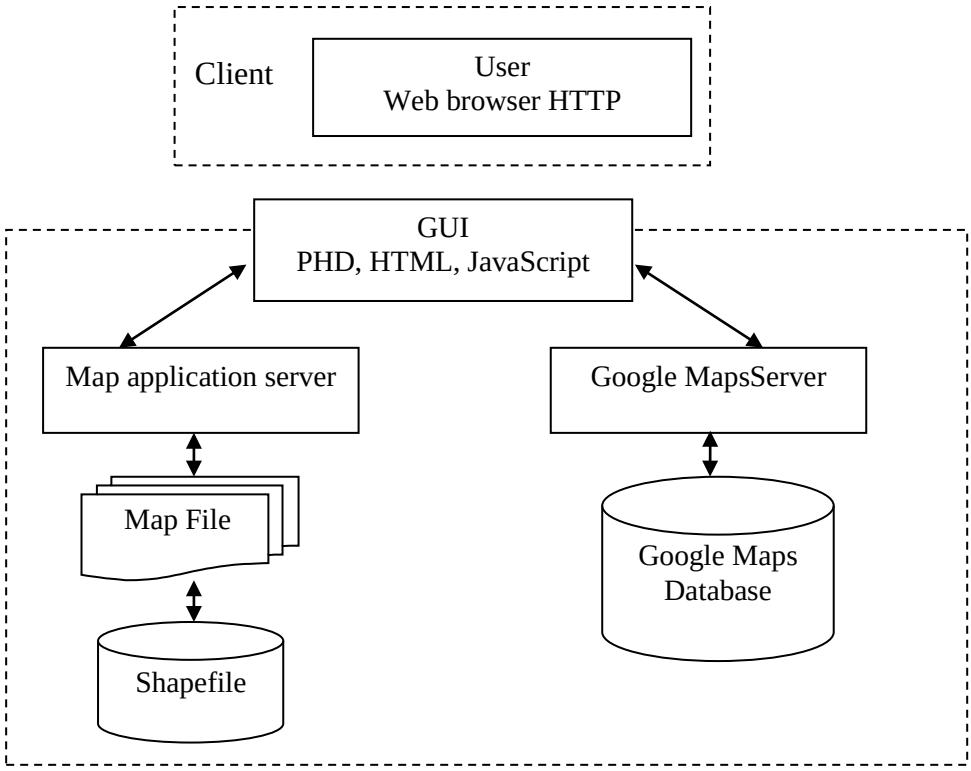

Figure 10: Bar Dar Town Web based Architectures

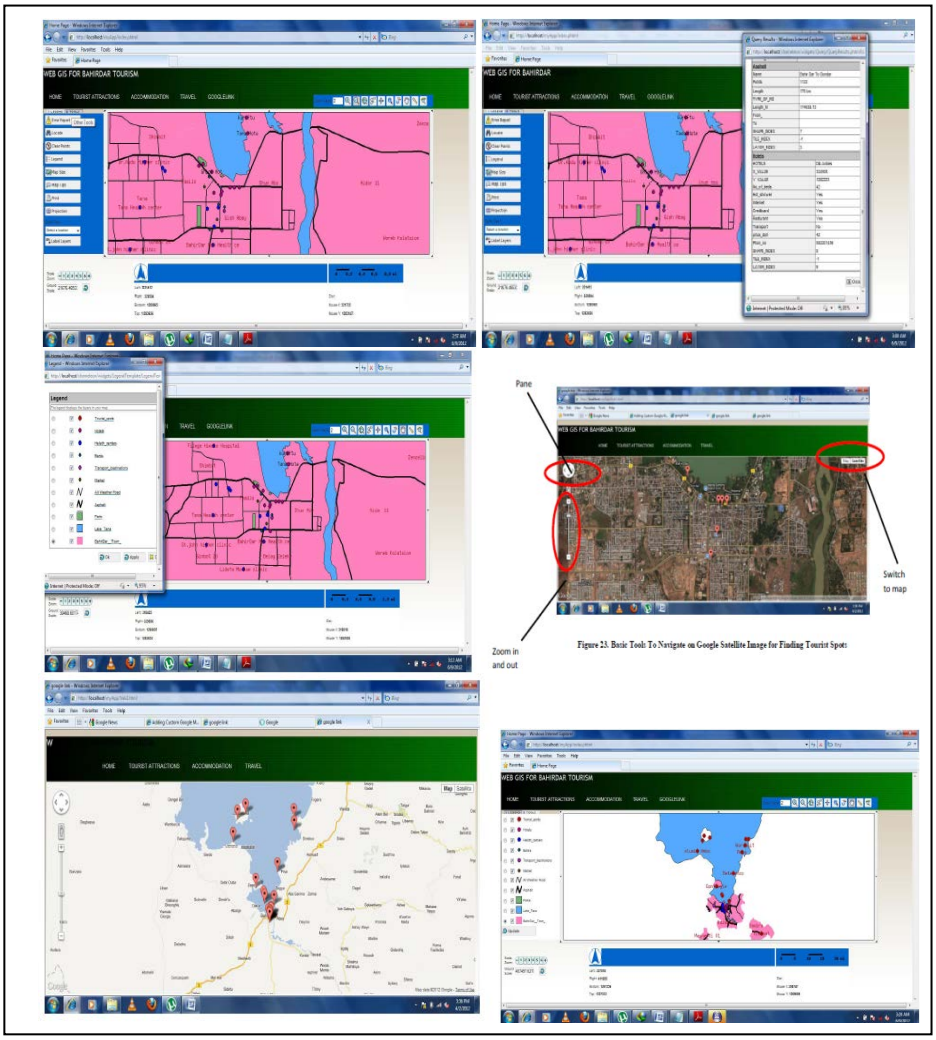

Figure 11: Application and Interface in Bar Tar Town Web GIS
Source: Markos, 2012

The web based GIS in Zaozhuang, China was also developed for tourism information and tourism-related products such as transportation, shopping, accommodation and catering and other ancillary travel information for tourist to plan their itinerary. The system has beeen divided into two modules - tourism application subsystem and administrator management subsystem which includes four different layers: data layer, service layer, basic information layer and finally an application layer (Figure 12).

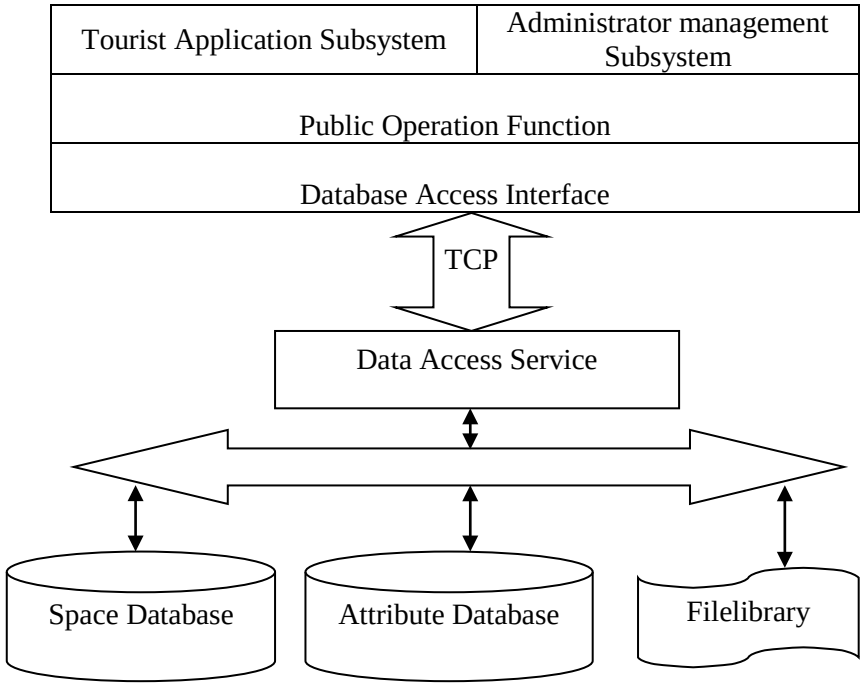

Figure 12: The structure of Zaozhuang Tourist Information System

This is a very capable system with an impressive array of functions of the map view and search requirements as follows - spatial information measurement; statistical analysis and statistical mapping display; Multiple Window Linkage; typical feature dimension; displaying the scenic spots, optimal path analysis; dynamic and interactive features, prediction function and system management, data maintenance and update (Yan & Wang, 2012).

Malaysia's Langkawi Island web GIS was also developed using client-server application or known as hybrid solution architecture using three tier GIS web based system (Figure 9). The web is hosted on the server, which delivers web content requested by the client hardware. The server requires certain software to produce the web content requested by the client, while the client requires software to display the web content. The software included the ArcGIS 10.1 for Server, PostgreSQL 9.0, Internet Information Service (IIS) and web browser. The development of web GIS of Langkawi Island is not performed via the server but through another computer which requires the ArcGIS for Desktop, ArcGIS, Viewer for Flex - Application Builder and Adobe Flash Builder 4.6 and ArcGIS API for Flex. The public user does not need any GIS to access GIS function in the Langkawi Island Web GIS. In fact, the web GIS was

designed for any user, with or without GIS knowledge, as it just requires simple software which has a web browser and flash player only.

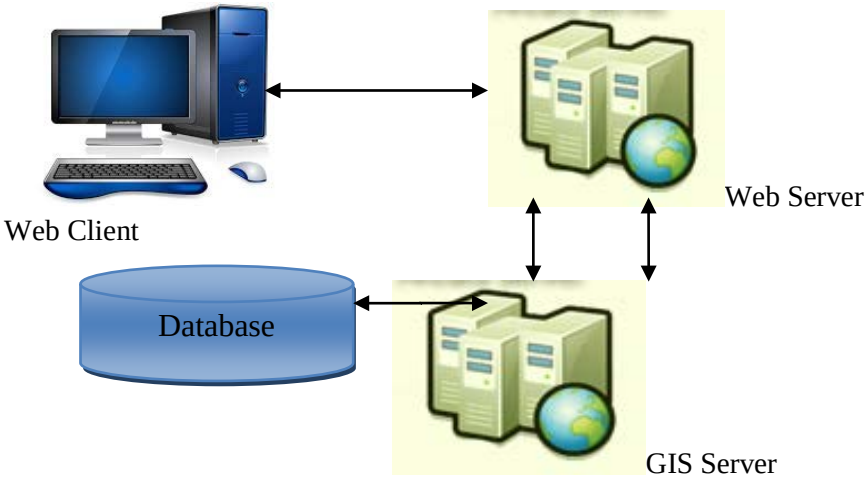

Figure 13: Architecture of Three Tier Langkawi Island Web GIS

Several functions in the Langkawi web GIS include navigation tool (zoom in, zoom out, pan, zoom slider, zoom to full extent, previous and next extent, and move up/down/left/right); map switcher (between topographic map and satellite imagery) and map functions (Figure 10). There are five function categories in the map function menu, with each having their own submenu (Table 2).

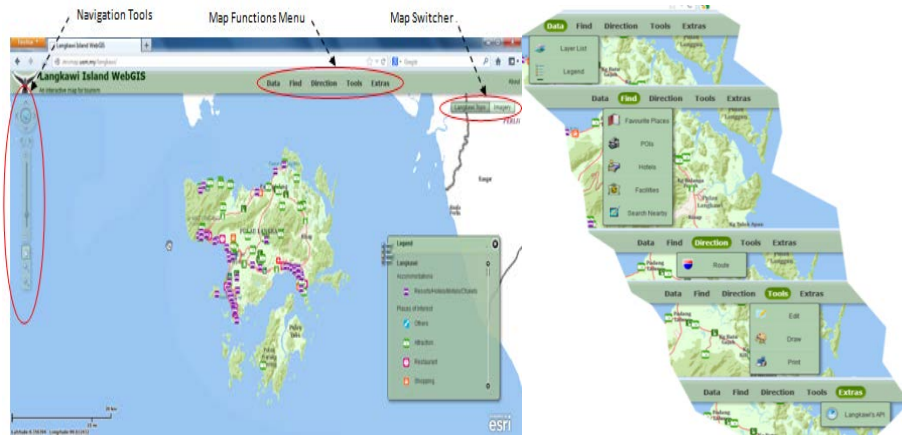

Figure 14: Langkawi Island Web GIS Functions

Table 12: Sub menu in Map Function for Langkawi Island Web GIS

No	Menu	Sub menu	Description
1	Data	Layer List	This submenu shows layers of data available in the web GIS. The currently available layers are 'Langkawi' (i.e. Location of accommodation, shopping, and tourist attractions), 'More Langkawi Data' (i.e. Land Use of Langkawi in 2006 and Development Block in Langkawi), and Langkawi Annual API (i.e. Annual Pollution Index within Kuah town). 'Langkawi' layer is shown by default, while the other layers are hidden by default. 'More Langkawi Data' layer can be shown manually by the user, while 'Langkawi Annual API' will be shown automatically when 'Langkawi's API' function is executed.
		Legend	This submenu turns the legend window ON or OFF. The legend window is ON by default.
2	Find	Favorite Places	This submenu lists, bookmark of famous tourism areas in Langkawi. When a bookmark is clicked, the map will zoom in the corresponding area.
		POIs	This function searches for places of interest based on user input. A user can choose between searching by name or by attributes (type or location) of the place.
		Hotels	This function searches for accommodations based on user input. A user can choose between searching by name or by attributes (type or location) of the accommodation.
		Facilities	This function searches for public facilities, such as bank and petrol station, based on user input. A user can search by attributes (type or location) of the place.
		Search Nearby	This function searches for accommodations, facilities, and place of interest within a certain distance from a point location in the map. A user specifies the distance and clicks any location in the map to do the search.
3	Direction	Route	This function finds the shortest or the quickest route to travel from one starting point to one or more (up to 9) destinations. The function has options to find the best sequence to visit the points as well as the route to return to starting point. Users pick the points by clicking on the map.
4	Tools	Edit	This function allows users to point data of accommodations, and tourist attractions. Users can also use the function to edit attributes of existing points. The editing results are subjected to validation by the data administrator before they are shown in the WebGIS.
		Draw	This function allows user to draw lines or polygons to measure distance or area in the map.
		Print	This function allows a user to print the current view of the map.
5	Extras	Langkawi's API	This function displays a time animation of the Average Annual Pollution Index over the year of 2000 to 2010.

The Langkawi Island WebGIS utilizes many spatial data to present information as an interactive online map. The main data used are stored as feature classes in a geodatabase and it includes the data of road networks, accommodations, tourist attractions, facilities and places of interests in Langkawi Island. Each attribute data was provided with explanations and image. Figure 11 shows some application of the Langkawi Island web GIS interface.

Figure 15: Langkawi Island Web GIS Application and Interface

The Langkawi Island Web GIS is a web site which provides tourism related information about Langkawi Island in the form of interactive maps with Geographic Information System capabilities. In contrast with the usual website, this website presents its information content by using maps more than a text description. A visitor of the Langkawi Island Web GIS can zoom in or out the map and pan the map (or, scroll the map) to view a location. Accommodations,

sightseeing attractions, shops, restaurants, and public facilities are shown as different symbols which can be clicked to view their related information.

Since the web site has GIS capabilities, visitors can do a number of GIS operation on the map, which are not possible with ordinary websites. For example, visitors can search for an accommodation or sightseeing attractions based on keywords, or the visitor may find public facilities available within a given distance from their hotel. Another example of a useful GIS function allows the Web GIS in finding the shortest or quickest route from one location to other location (up to 9 destinations). The Web GIS shows the best route on the map with detailed driving directions to travel along the route. This system also allows public participation as an information supply. The edit function in this web GIS allows users to add point features (objects) or edit information (attribute data) of existing point features in the Web GIS. A point feature may represent an accommodation or a place of interest. The new point features (objects) or changes in information of existing point feature, however, will not appear in the web GIS before they are verified by the GIS Administrator. Only valid point features and information are displayed in the web GIS.

A tourism industry plays an important role for many local economies particularly in developing countries and small island states (Liu & Sharina, 2011). Due that, more information was requiring to make sure it good enough to compete with other destination. The Langkawi Web GIS is not only useful for tourists or potential tourists. The web site also provides maps and data that can benefit researchers or other people. For example, the web visitor can activate land use layer to view the land use map of Langkawi. The Web GIS also has a time animation function which shows changes in map over time, such as the change in the Air Pollution Index. In summary, the Langkawi Island Web GIS provides a novel and interesting way to present information about Langkawi Island which encompassing historical sites, geological wonders, beautiful natural landscapes and a wealth of local culture and traditions (Rahimah, Halimanton Saadiah & Ibrahim, 2011).

There are a lot of web based GIS being developed for the tourism industries, but different objectives of the projects require different design, software and architectures. Firstly is the difference in the architecture system itself. The implementation of hybrid architecture is more powerful than using specific server-side or client-side architecture as hybrid architectures are more public friendly allowing the user to use both (server and client) design techniques to access the GIS on the internet. Secondly, is about the level of public participation. Public participation and involvement can be obtained in the first phase (surveys and interviews) while also allowing the public to become sources of information through the edit application over the web based portal.

CONCLUSION

Application of web GIS as a medium to provide spatial and non-spatial tourist information is fast becoming the current trend. The application of web based GIS like Google Map, Yahoo Map and GlobeXplore provides a new generation of interfaces and expanded the ways in which travel information can be accessed. Geographical information accounted for nearly half of travel information search queries (Jansen, Ciamacca, & Spink, 2008). Further, there are many web based GIS developed by organizations, governments, NGOs, researchers, individuals, tourism stakeholders and others in a plethora of ways to promote tourism industries in their countries. The use of web based tourism information system is growing significantly and is predicted to maintain its growth trajectory in the future with the real possibility of ultimately creating the whole tourism business as an internet based business.

However, to create the web based GIS are a complicated task and require expert knowledge to visualize the architecture and to enable the web GIS system. Developing a web GIS is beyond simply using the appropriate hardware and software. The understanding about equipment analysis, conceptual design, acquisition of GIS hardware and software, database design and construction, integration of the web GIS system and web GIS use and the implementation required in ways to develop the massive web based GIS for collaborative planning and public participation in tourism industries, all feature prominently in the creation of a progressive web based system. The high level of information and functionality in web based GIS is a clear reflection of the complexity of the architecture inside web based GIS.

ACKNOWLEDGEMENT

This paper is part of the Research University Grant for Cluster (RUC) 1001/PTS/8660014. Tourism Decision Support System, Sustainable Tourism Research Cluster USM, Malaysia.

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PLANNING MALAYSIA:
Journal of the Malaysian Institute of Planners
Volume **XII** (2014), Page 75 - 96

INTEGRATING CLIMATE CHANGE MITIGATION AND ADAPTATION INTO SPATIAL PLANNING: DEVELOPING CRITERIA FOR SPATIAL PLAN EVALUATION IN THE SELANGOR RIVER BASIN

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Abstract

Spatial planning practice in Malaysia has given greater prominence to environmental matters since the amendment of the Town and Country Planning Act 1976 in 1995, in which sustainable development has become the core emphasis of all planning policies and plans. However, elements of climate change, which require being addressed in strategic planning, have not been explicitly incorporated into spatial plans that cover urban and rural areas at both state and local levels. This study presents a framework for the evaluation of the content of spatial plans in response to climate change adaptation and mitigation in the case of the Selangor River Basin, which may be considered the life support for the Kuala Lumpur Conurbation, the largest urban mega region in Malaysia. A content analysis of national, state and local level spatial plans reveals that the overall quality of plans is higher at the national level, but gradually declines towards lower tier plans, and that generally an equal emphasis has been paid to both climate change mitigation and adaptation. The findings support the argument that spatial planning provides a platform for coordinating mitigation and adaptation responses through its sustainable development policies, however, there is a need to reframe the scope of sustainable development in the country for this purpose.

***Keyword**:* Spatial planning, spatial plan, plan evaluation, climate change

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INTRODUCTION

The Malaysian National Policy on Climate Change (NPCC) was approved by the Cabinet in November 2009, and serves as a framework to mobilise and guide government agencies, industries, communities, and other stakeholders in addressing the challenges of climate change in an integrated manner. One of the objectives of the Malaysian NPCC is to integrate climate change responses through national policies, plans and programmes (NRE 2009), including spatial plans. Spatial planning practice in Malaysia has given greater prominence to environmental matters since the Town and Country Planning Act 1976 was amended in 1995, in order to make sustainable development the core emphasis of all planning policies and plans (Bruton, 2007). Nonetheless, climate change is still considered as a relatively new challenge to be engaged in terms of spatial planning in Malaysia.

The aim of this study is to present a framework for the evaluation of the content of spatial plans in response to both climate change adaptation and mitigation, using the case of the Selangor River Basin in Malaysia as an example. Two research questions are addressed in this research, which are: i) To what extent have spatial plans in the Selangor River Basin prepared for climate change? Are there variations between spatial plans at the national, state and local levels in this context? ii) Do spatial plans pay an equal amount of attention to climate change mitigation and adaptation? The answers to these questions will help to identify gaps in the existing spatial planning responses towards climate change, and guidance for future reviews of spatial planning policies. This study commences with a brief discussion on the relationships between spatial planning and climate change, followed by an explanation of the conceptual framework for spatial plan evaluation based on both the relationships and the methodology used in this study. Finally, this research describes the results of the application of the method on the Selangor River Basin.

SPATIAL PLANNING AND CLIMATE CHANGE

Spatial planning is a tool or decision making process to steer land use changes and future distribution of activities in space by coordination of different relevant socio economic and environment objectives (European Commission, 1997). It is a generic term that refers to the various types of planning practices at different planning levels or spatial scales (Schmidt-Thome, 2006). With the emerging issue of climate change, spatial planning plays a vital role in responding to both the causes of climate change (through climate change mitigation) and the

impacts of unavoidable climate change (through climate change adaptation) (Davoudi et al., 2009). Spatial planning, through its organization of land uses, may help to reduce greenhouse gases emission, particularly through the planning of land uses, transportation and waste management (Robinson, 2006; DCLP UK, 2007; Wheeler et al., 2009; Blanco &Alberti, 2009; Savacool& Brown, 2010). On the other hand, planning against the unavoidable impact of climate change can be realized particularly in water, flood and coastal management (Boult, 2009; Wilson & Piper, 2010; Nicholls, 2011; Erol&Randhir, 2012). However, this may require a reframing of spatial planning interventions, with a renewed and revised interpretation of sustainable development (Wilson and Piper, 2010). Initially, climate change was mainly integrated into spatial planning in the form of various mitigation strategies (Robinson, 2006; Levett, 2006), however, in this century, the current focus has begun to shift from mitigation strategies to adaptation strategies. Scholars have also considered the possible role of spatial planning in the coordination and development of effective mitigation and adaptation options in an integrated manner through sustainable development policies (Bulkeley, 2006; Biesbroek et al., 2009).

Sectors in spatial planning that can contribute to the mitigation of climate change are: land use, transportation, energy planning and waste management. On the other hand, climate change adaptation is more related to waste resources, food and coastal management. Biodiversity conservation and urban environment are two sectors that can integrate both mitigation and adaptation responses (Wilson and Piper, 2010). The role of spatial planning in climate change mitigation, climate change adaptation and the integration between mitigation and adaptation are summarized in Table 1.

Table 13: Linkages between spatial planning and climate change based on literature

	Policies in Spatial Planning	**Literature**
	Land Use	
1.	Development away from vulnerable area (A)	Schmidt- Thome (2006), Keeffe (2009), Peltonen et al. (2005), Bulkeley (2006)
2.	Disaster resistant land use and building code (A)	Tang et al. (2010), Boult (2009), Keeffe (2009), Kabat (2009)
3.	Control of urban service/growth boundaries/ concentrated development/ reduce urban sprawl (M)	Tang et al. (2010), Wheeler et al. (2009), Robinson (2006)
4.	Mixed use /compact development (M)	Permana et al. (2013), Tang et al. (2010), Brown et al. (2009), Sovacool& Brown (2010), Wheeler et al. (2009)
5.	Urban regeneration/ infill development/ brown field development (M)	Tang et al. (2010), Wheeler et al. (2009), Robinson (2006)
6.	Land use and urban design that retain	Jusuf et al. (2007), Wong and Chen (2005)

	natural area (M&A)	
	Transportation	
7.	Transit-oriented development and corridor improvements (M)	Brown et al. (2009), Wendea et al. (2010), Tang et al. (2010)
8.	Alternative transportation strategies / rail and bus network planning/ Integrated transportation system (M)	Brown et al. (2009), Sovacool& Brown (2010), Wheeler et al. (2009), Bulkeley (2006), Tang et al. (2010), Levett (2006)
9.	Parking standards adjustment (M)	Levett (2006), Tang et al. (2010)
	Energy	
10.	Energy efficiency planning (M)	Wendea et al. (2010), Wheeler et al. (2009), Tang et al. (2010)
11.	Renewable energy planning (M)	Tang et al. (2010), Bulkeley (2006), Brown et al. (2009), Sovacool& Brown (2010), Wendea et al. (2010), Blanco &Alberti (2009)
	Waste	
12.	Planning for landfill with methane capture strategy (M)	Wheeler et al. (2009), Tang et al. (2010)
13.	Planning for zero waste reduction and high recycling strategy (M)	Tang et al. (2010)
	Water	
14.	Water use efficiency planning (A)	Wilson et al. (2010)
15.	Watershed based land management/ River basin management/ Ecosystem based land management (A)	Biesbrock et al. (2009), Wilson & Piper (2010), Tang et al. (2010)
16.	Storm water management/ Flood mitigation (A)	Blanco &Alberti (2009), Fleishhauer and Koh (2009), Boult (2009), Wilson & Piper (2010), Tang et al. (2010), Erol and Randhir (2012)
17.	Water demand management planning (A)	Beck &Bernauer (2011)
18.	Water supply management planning (A)	Beck &Bernauer (2011)
	Coast	
19.	Coastal zone protection (A)	Blanco &Alberti (2009), Fleishhauer and Koh (2009), Nicholls (2011)
	Urban Design/ Building	
20.	Green building codes/ standards (with climate resistant and energy efficiency/ capture natural climate) (M&A)	Wilson & Piper (2010), Brown et al. (2009), Wendea et al. (2010), Wheeler et al. (2009), Blanco &Alberti (2009), Fleishhauer and Koh (2009), Tang et al. (2010)
21.	Urban design that reduce urban heat island effect (M&A)	Giridharan et al. (2007), Stone (2005)
	Biodiversity	
22.	Creation of conservation zones or protection areas (forest, natural habitat, food, etc) (M&A)	Wilson & Piper (2010), Wendea et al. (2010), Escobedo et al. (2010), Tang et al. (2010).
23.	Reforestation/ Reduce land clearing (M&A)	Wilson & Piper (2010), Driscoll et al. (2010)
24.	Creation of ecological linkages (M&A)	Wilson & Piper (2010), Opdam (2009), Barbour (2010)
25.	Expand parks and other green spaces in/ around cities, plant trees/ gazette parks (M&A)	Wendea et al. (2010), Akbari (2002), Keeffe (2009)

M = Mitigation; A = Adaptation; M&A = Mitigation and Adaptation

CONCEPTUAL FRAMEWORK FOR SPATIAL PLAN EVALUATION

The spatial plan evaluation exercise has evolved from developing several alternative plans as a part of the plan making process; and evaluating the conformance and performance of plans; to evaluating the quality of a subject or element in a plan (Baer 1997). The evaluation of planning is a necessary exercise, since it can contribute to a better planning practice. It may also guide the evaluation of existing plans, the preparation of new plans or the updating of existing plans (Berke and Godschalk, 2009). Plan quality is increasingly being used, both as an outcome variable for assessing the planning process, and as a causal variable for assessing the plan implementation process (Brody, 2003a).

For the evaluation of the quality of a subject in a plan, Kaiser et al. (1995) had proposed plan components, such as facts, goals, policies and evaluations as the criteria for planning evaluation. Consequently, this was also highlighted in studies by Berke and French (1994) and Brody (2003a). Some scholars have also introduced additional characteristics to the four criteria, such as inter-organizational coordination, capabilities and implementation (Brody, 2003b), plan analytical quality and plan consistency (Norton, 2008) and awareness analysis and actions (Tang et al., 2010).

A number of previous studies have focused on the evaluation of climate change integration in spatial plans (Lu and Stead 2013; Pinto and Martins 2013; Pettersson and Keskitalo 2013; Grazi and Bergh 2008; Urwin and Jordan 2008; Tang et al. 2010; Wheeler 2008; Wilson 2006). However, most of the studies focus on either mitigation or adaptation, without considering the holistic integration of both mitigation and adaptation elements in the spatial plans.

The conceptual framework for this study evaluates the quality of climate change elements (both mitigation and adaptation) in spatial plans based on the combination of plan components emphasized by Kaiser et al. (1995), and the Planning Process Model proposed by Baer (1997; Figure 1), on the basis that a plan is a document outcome from the planning process. As an addition to the four plan components by Kaiser et al. (1995), a separate component on the analysis is proposed based on the Planning Process Model (Baer, 1997), as we find that spatial plan preparation gives favourable attention to analysing past trends, future trends, land suitability analysis and other multi-criteria data analysis.

The fact component refers to the presentation of data and the spatial implication of climate change, either explicitly or implicitly. The criteria for the fact component are identified based on the projected climate change stipulated in National Communication 2 (NC2) Malaysia, i.e., temperature rise, changing rainfall amount (increase or decrease in different localities), changing rainfall intensity and sea level rise. The analysis component refers to the analysis of climate change scenarios at the local level and the impact of activities at the

regional and local scale, contributing to climate change and vulnerability assessment at the local level. The goal component of spatial plans is evaluated based on its emphasis towards four sustainable development principles set out by Berke and Conroy (2000), namely, harmony with nature, liveable built environment, place based economy and equity. The policy component is measured through a series of criteria or relationship between spatial planning and climate change (mitigation and adaptation) that allow for quantitative assessment and analysis of plan quality. Lastly, the implementation and evaluation component involves the setting of timelines for actions, identifying responsible organizations for actions, sources of funding and setting criteria for plan monitoring. All these items are important for the coordination and implementation of actions between agencies.

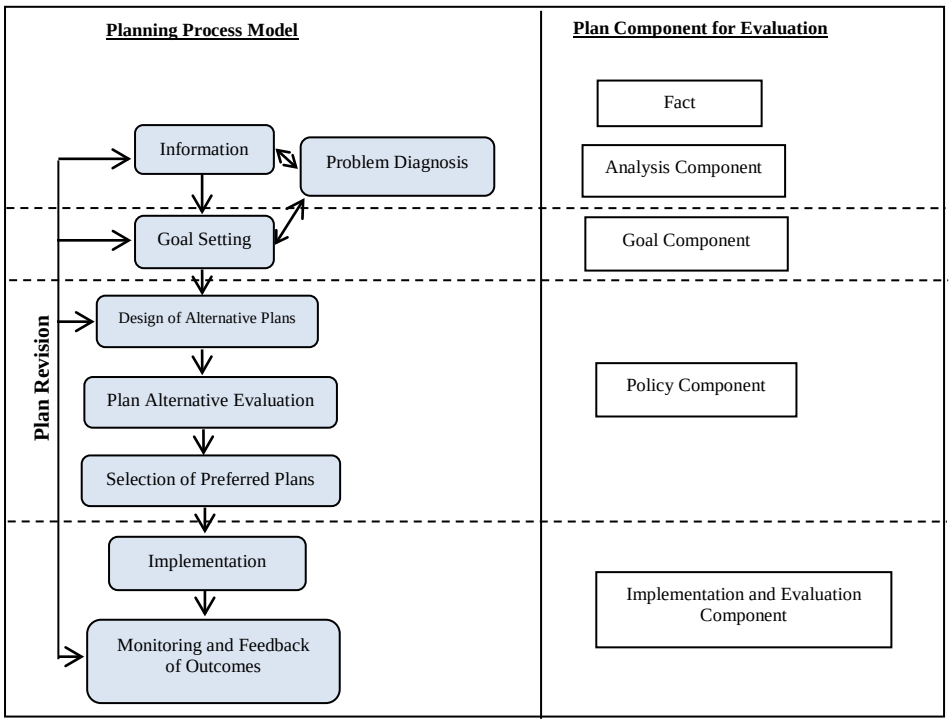

Figure 16: A conceptual framework of planning process and plan components
Planning Process Model adapted from Baer (1997)

METHODOLOGY

This study uses content analysis to evaluate the integration of climate change in spatial planning (via spatial plan) in the case of the Selangor River Basin. Previously, numerous studies had evaluated the quality of a certain subject in spatial planning, e.g., urban sprawl reduction (Norton, 2008; Brody et al., 2006), natural hazards (Berke and French, 1994; Brody, 2003a), state planning mandates (Berke and French, 1994), sustainable development (Berke and Conroy, 2000), stakeholder participation (Brody, 2003b), and climate change (Lu and Stead, 2013; Wilson, 2006; Wheeler, 2008; Tang et al., 2010). For the evaluation of climate change integration in spatial planning, scholars had mainly focused on two methods, which are questionnaire surveys (Gurran et al., 2012; Robinson, 2005), or content analysis (Lu and Stead, 2013; Wilson, 2006; Wheeler, 2008; Tang et al., 2010). Comparatively, content analysis has been widely applied based on the assumption that a plan is the outcome of the planning process, and serves as a basic guidance for the planning practice (Faludi 2000).

The population of this study involves six spatial plans at three different administrative levels in the Selangor River Basin, which are: the National Physical Plan (or NPP1 (2005) and NPP2 (2010)) at the national level, the Selangor State Structure Plan (SSSP) at the state level, and the Selayang Municipal Council Local Plan (SMCLP), Kuala Selangor District Local Plan (KSDLP) and Hulu Selangor District Local Plan (HSDLP) at the local level. The Selangor River Basin is located in the State of Selangor, Peninsular Malaysia, with a total area of 2,200 km^2. It is the third largest river basin in Selangor after the Langat River Basin and Bernam River Basin (Selangor State Government, 2007). This river basin was selected because it is the most important water resource in the state of Selangor and the Federal Territories of Kuala Lumpur and Putrajaya. The Selangor River supplies 60% of the water used in Klang Valley (the most developed urban mega region in Peninsular Malaysia). The main challenges for the planning and management of the Selangor River Basin is the increasing demand for water due to the rapid population growth and brisk economic development, coupled by a decrease in rainfall levels, a decrease in monthly river flow levels and a decrease in water supply levels (NRE, 2011).

For plan evaluation, initially, the characteristics of a high quality spatial plan with climate change elements were defined. This was followed by the construction of a plan quality evaluation protocol based on the combination of the conceptual framework defined earlier and the relationships between spatial planning and climate change (Table 2). Spatial plans were evaluated based on the five plan components with a total of 43 criteria. The criteria for each plan component were scored on either a 0 – 2 scale, or a 0 – 1 scale. A content

analysis was applied to calculate the plan component quality and total plan quality for each spatial plan. Higher summed scores indicate that the plan places more emphasis on relevant components, following the plan quality evaluation approach from previous studies (Berke, 1996, 1998; Berke and Conroy, 2000; Brody, 2003a, 2003b, 2006; Norton, 2008; Tang et al., 2010). To increase reliability for the content analysis, the plans were evaluated by two coders independently, and each spatial plan was evaluated three times. The evaluations were compared, and inconsistently scored criteria were revisited to yield a score that was agreed upon. The results were then further verified by the senior staff members of the Department of Town and Country Planning, which are responsible for the preparation of spatial plans at the three spatial scales.

Table 14: Criteria for spatial plan evaluation

	Parameter/ Component	Criteria	Scope
1.	**Fact component** 0 = not present, 1 = present but not detailed, 2 = present and detailed/with indicative map (national)/diagram or illustration (state)/map (local)	**Explicit reference** - Climate change as issues - Data (scenario, projection, maps) - Spatial implication (explanation, maps) **Implicit reference** - Temperature (urban heat island effect) - Changing rainfall amount (flood or drought/ water stress area) or changing rainfall intensity (extreme weather) - Rise in sea level	- Issues - Presentation of data
2.	**Analysis component** 0 = not present, 1 = adopt analysis from other study, 2 = analysis within the study	- Downscaling climate change scenario - Impact of region's / local activities contribute climate change (e.g., GHG emission) - Vulnerability assessment	Spatial implication of climate change
3.	**Goals component** 0 = not present, 1 = present	**Goal statement** - Explicit goal statement for sustainable development **Objectives (Based on Sustainable Development Principles)** - Harmony with nature - Liveable built environment - Place based economy - Equity	Emphasis towards sustainable development principles

4.	**Policies component** 0 = not present, 1 = present but not detailed, 2 = present and detailed/with indicative map (national)/diagram or illustration (state)/map (local)	**Land uses** - Development away from vulnerable area (A) - Disaster resistant communities (A) - Reduce urban sprawl (M) - Infill development (M) - Redevelopment of brown field lands (M) - Land use and urban design that retain natural area (M&A)	Policy focus based on planning subject
		Transportation - Transit-oriented development and corridor development improvements (M) - Integrated transportation system (M) - Parking standards adjustment (M)	
		Energy - Promote energy efficiency/ reduce energy dependency (M) - Promote use of renewable energy (M)	
		Waste - Promote landfills with methane capture strategy (M) - Waste reduction developments with high recycling strategy (M)	
		Water - Water use efficiency planning (A) - Coordination with river basin management (A) - Storm water management/ Flood mitigation (A) - Water demand management planning (A) - Water supply management planning (A)	
		Coast - Coastal zone protection (A)	
		Urban Design/Building - Guidelines for green neighbourhood/building (M&A) - Urban design that reduce urban heat island effect (M&A)	
		Biodiversity - Creation of conservation zones or protection areas (forest, natural	

		habitat, food, etc.) (M&A) - Reforestation/ Reduce deforestation/ increase gazettement of forest land (M&A) - Creation of ecological linkages (M&A) - Creation of green spaces/parks, planting trees (M&A)	
5.	**Implementation and evaluation component** 0 = not present, 1 = present	**<u>Implementation</u>** - Timelines for actions - Organizations identified that are responsible for actions - Sources of funding/Amount of fund are identified to supporting actions **<u>Plan monitoring</u>** - Criteria for Evaluation/ Policy Indicator	Implementation programs, responsibility and monitoring

To answer the first research question in this study, there are three steps in the calculation of total plan quality (for climate change integration) for each plan. First, the equation for plan component score (PCS_j) was created by summing up scores for each of the criteria (C_i) within each of the plan components (equation 1). Where PCS_j is the plan component score for the *j*th component, and m_j is the number of criteria within the *j*th component.

$$PCS_j = \sum_{i=1}^{m_j} C_i \quad (1)$$

Second, the equation for plan component quality (PCQ_j) was developed by standardizing the plan component score (PCS_j) by dividing the possible score in each plan component ($2m_j$ or m_j) and multiplying the fractional score by 10 to place the component on a 0 to 10 scale (equation 2 and 3).

For plan components which are scored on a 0 – 2 scale,

$$PCQ_j = \frac{10}{2m_j} PCS_j \quad (2)$$

For plan components which are scored on a 0 – 1 scale,

$$PCQ_j = \frac{10}{m_j} PCS_j \quad (3)$$

Finally, the total plan quality (*TPQ*) was gained by summing up all the plan component quality indices (equation 4). The maximum score for each plan is 50.

$$TPQ = \sum_{j=1}^{5} PCQ_j \quad (4)$$

For the second research question in this study, the calculation was done only for the policy component, where criteria within the policy component were categorized into three responses, namely, mitigation, adaptation, and both mitigation and adaptation. There are two steps in the calculation of an index for each response. First, the equation for response score (RS_k) was created by summing up scores for each of the criteria (C_i) within each of the response groups (equation 5). Where RS_k is the response score for the *k*th response, and m_k is the number of criteria within the *k*th response.

$$RS_k = \sum_{i=1}^{m_k} C_i \quad (5)$$

Second, the equation for Response Quality (RQ_k) was developed by standardizing the Response Score (RS_k) by dividing the possible score in each response ($2m_k$) and multiplying the fractional score by 10 to place the component on a 0 to 10 scale (equation 6). Where $RQ_k$is the response quality for the *k*th *response,* and m_k is the number of criteria within the *kth* response.

$$RQ_k = \frac{10}{2m_k} \sum_{i=1}^{m_k} C_i \quad (6)$$

Data were further analysed using descriptive statistics to assess the quality of spatial plans based on three different levels (i.e., national, state and local).

RESULTS

The results from the plan evaluation above are presented based on two research questions previously mentioned. The first research question relates to the plan's overall quality in the planning process for climate change. The second research question allows for a comparison between the weight of climate change mitigation and adaptation policies in the spatial plans evaluated.

To what extent have spatial plans in the Selangor River Basin prepared for climate change? Are there variations between spatial plans at the national, state and local level?

Table 15 shows the overall results from the evaluation of spatial plans for the Selangor River Basin. Spatial plans at the national level scored the highest in total plan quality, followed by those at the state and local levels. The pattern is also echoed in the analysis based on each plan component (Figure 17). The state level plan scored as high as the national level plans in terms of goal and policy components, and in second place (after the national level) in terms of the fact component. Overall, the local level plans scored the least in all plan components, except in the implementation component. Evaluation at all levels shows the goal component scored the highest, followed by the policy, implementation, fact and analysis components. All three level plans scored fairly weak in analysis and fact components, with the plan quality ranging from 0 to 0.83 for the analysis component, and 0.48 to 3.93 for the fact component (out of the highest possible score of 10). This indicates that the evaluated plans cover not more than 8.3% of the criteria in the analysis component, and not more than 39.3% of the criteria in the fact component. The result indicates that the spatial plans generally provide room for climate change integration, particularly in goal, policy and implementation components, as the plans have held sustainable development as the guiding principles in the plan making process, and there are close connections between climate change management and sustainable development. However, since the scope of sustainable development in Malaysia has not included climate change explicitly, the relevant data and analysis are still not included in the spatial planning process, and this indirectly caused the assessment in fact and analysis integration of climate change in spatial planning to become relatively low.

Table 15: Spatial plan quality for climate change integration in Selangor River Basin based on three levels of government

	Plan Component Quality (PCQ)	**National**	**State**	**Local**
1.	Fact[a]	3.93	1.43	0.48
2.	Analysis[a]	0.83	0	0
3.	Goal[a]	7.14	7.14	5.71
4.	Policy[a]	5.60	5.60	3.67
5.	Implementation and evaluation[a]	6.25	2.50	5.00
	Total Plan Quality[b](TPQ)	**23.75**	**16.67**	**14.86**
	Percentage of performance (%) (TPQ/50*100)	**47.51**	**33.34**	**29.71**

[a] Principle scores are scaled to 0-10
[b] Highest possible score = 50

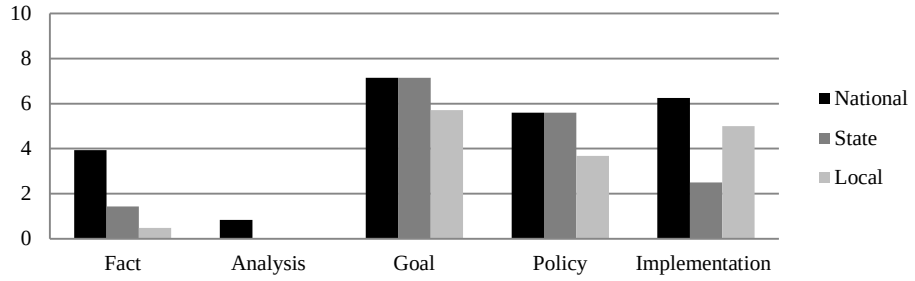

Figure 17: Total plan quality for climate change integration

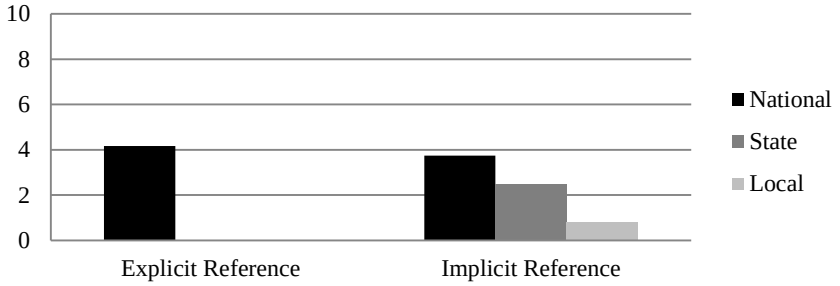

Figure 18: Plan quality for fact component

The following sections compare the performance of spatial plans at three different levels in relation to fact, analysis, goal, policy and implementation/evaluation components.

FACT COMPONENT

The fact component in spatial plans at the three levels scored relatively low compared to the other plan components. As discussed earlier, spatial plans at the national level are more advanced in presenting the fact component, followed by those at the state and local levels (Figure 18). A comparison between the sub-components, which are explicit and implicit references, show that most of the facts in relation to climate change are presented implicitly in terms of rainfall data. Only national level spatial plans present explicit references to climate change, covering 41.7% of the criteria. However, there was less focus on the spatial implications of climate change, even at this level. On the other hand, the state and local level plans do not explicitly recognize climate change as an issue, and therefore lack in presenting data in relation to climate change. In terms of implicit references, the national level plans also scored the most,

covering 37.5% of the sub-component criteria, followed by the state level (14.3%) and local level (4.8%) plans. The temperature and rainfall intensity information were ignored in the plans at all three levels. Additionally, the state and local level plans do not cover sea level rise as one of the impending issues in spatial planning. The result is not surprising, since NPP2, which was prepared after the other five spatial plans, was the first planning document in Malaysia to acknowledge climate change. This impending issue is believed to have spatial implications, hence, should be considered during the early stage of spatial planning.

ANALYSIS COMPONENT

The analysis component scored the least when compared to other plan components. The spatial plans at the state and local levels do not undertake analysis in relation to climate change. Only spatial plans at the national level include little vulnerability assessment due to sea level rise, based on secondary data from other studies (Figure 19). The analysis of the downscaling climate change scenario and impact of regional and local activities that contribute to climate change are also absent in the national level plans.

GOAL COMPONENT

The goal component is the highest plan component considered by the spatial plans in the study area. Sustainable development is cited explicitly in all spatial plans at the three levels, particularly at the national and state levels, and recognized as the guiding principle in the spatial plans. Figure 5 shows that the national and state level spatial plans present a full score in the goal component, while local spatial plans have an average score of 3.33 (out of 10). The lower score in local level spatial plans is due to the emphasis of the two spatial plans on economic development and city liveability. For the objective sub-component, spatial plans at all levels have a fairly equal score, with more emphasis on the sustainable development principles of: i) harmony with nature; ii) liveable built environment; iii) place based economy; and iv) equity. Two principles that are completely disregarded by all of the spatial plans are the polluters pay principle and the responsible regionalism principle. A comparison between the two sub-components of goal statement and objectives indicates that the national and state level spatial plans excel in goal statement but weak in objectives. On the other hand, the local level spatial plans have a low score in goal statement, but have a high score in the objective sub-components.

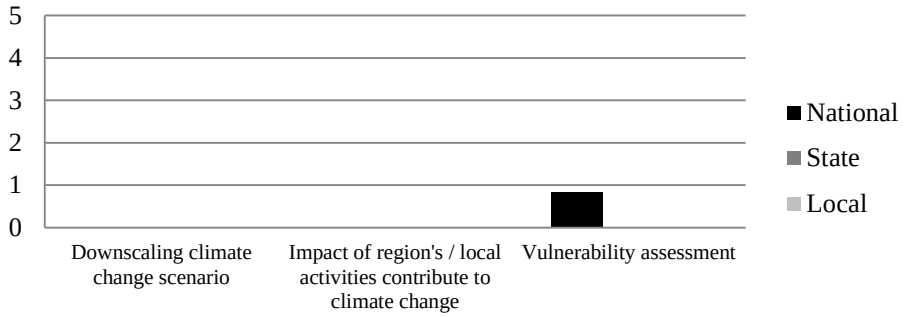

Figure 19: Plan quality for analysis component

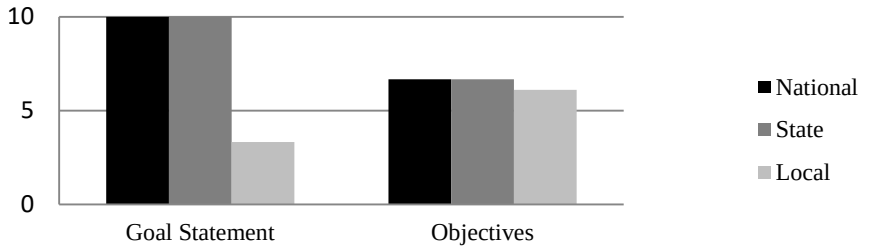

Figure 20: Plan quality for goal component

POLICY COMPONENT

Generally, the policy component is the second highest plan component being considered by the spatial plans in the study area, and directly follows the goal component. Compared to other plan components, this component scores the second highest in the state level spatial plan, and the third highest in the national and local level spatial plans (Figure 17). The scores for the national and state level plans are the same, covering 56% of the policy component criteria. However, the local level plans score slightly lower than the upper two levels, i.e., only covering 36.7% of the criteria. Figure 6 shows the plan quality for the policy component based on a standardized score for each plan sub-component. From Figure 21, a general pattern is observed where the national and state level plans include more policies than the local level plans in relation to climate change (except in the sub-component of urban design/building). Biodiversity is the most emphasized sub-component, followed by transportation, coastal planning and land use planning. Nonetheless, planning for waste, which includes promoting landfills with methane capture strategy and waste reduction developments, is completely ignored in all spatial plans. The energy plan sub-component is only considered in spatial plans at the national level, but absent at

the state and local levels. The state level spatial plan is more advanced in water resources planning, i.e., slightly higher than the national level plan.

IMPLEMENTATION AND EVALUATION

The implementation and evaluation component had relatively average scores, with spatial plans at the national level covering 62.5% of the criteria, local level plans covering 50%, and state level plans covering 25%. The implementation sub-component is more advanced at the local level, followed by the national and state levels (Figure 7). The state level plan lacks in setting up timelines for actions and identifying sources of funding. For the sub-component of plan evaluation, only spatial plans at the national level include criteria for plan evaluation.

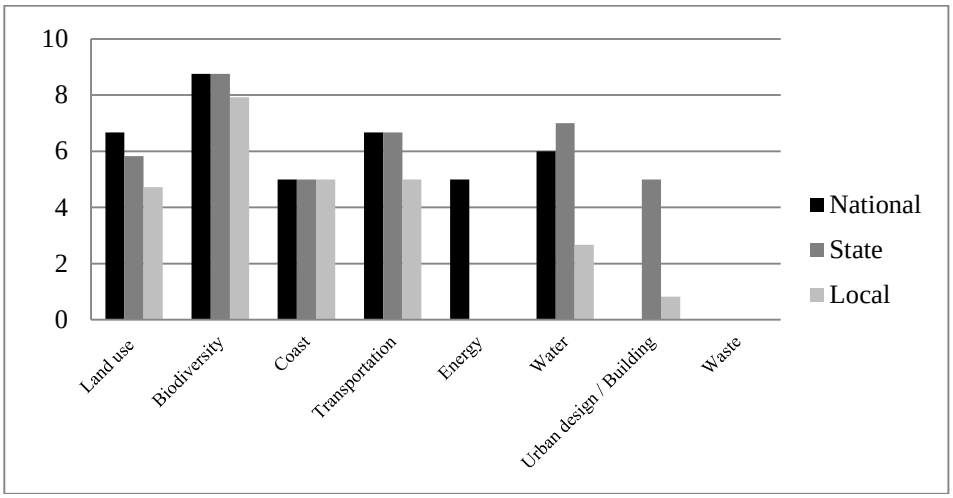

Figure 21: Plan quality for policy component

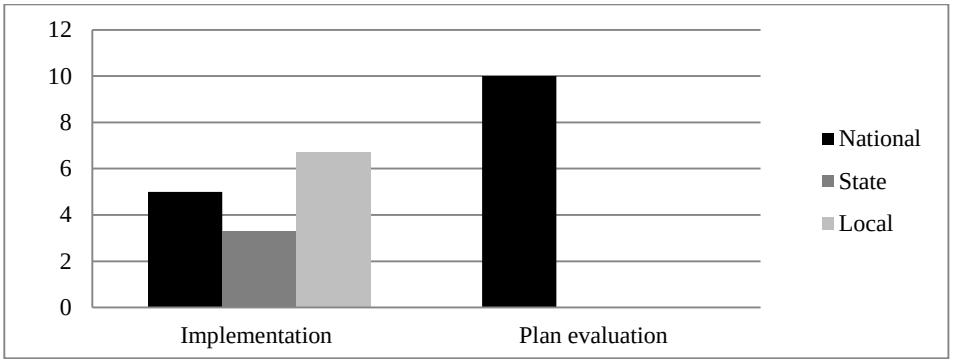

Figure 22: Plan quality for implementation and evaluation component

Do the spatial plans pay an equal amount of attention to climate change mitigation and adaptation?

Collectively, all three levels of spatial plans pay an equal amount of attention to both climate change mitigation and adaptation (Figure 23). Among the three types of responses, spatial plans place more attention to policies that integrate climate change mitigation and adaptation, accounting to 44% of the total responses. Figure 34 shows the focus of spatial plans at different levels by standardizing the scores between climate change mitigation, climate change adaptation and both mitigation and adaptation. The differences between climate change mitigation and adaptation are not much, ranging from only 2% (for the national and local level) and 3% (for the state level). All plans at the three levels consistently show emphasis on the integration between both climate change mitigation and adaptation. Comparatively, the national level spatial plan is more advanced in mitigation measures due to its attention to the energy aspect. On the other hand, the state level plan achieves more in adaptation as a result of its focus on water efficiency and water supply planning. The roughly equal amount of attention to both responses support the argument that spatial planning can actually coordinate effective mitigation and adaptation responses in an integrated manner through sustainable development policies (Biesbroek et al., 2009).

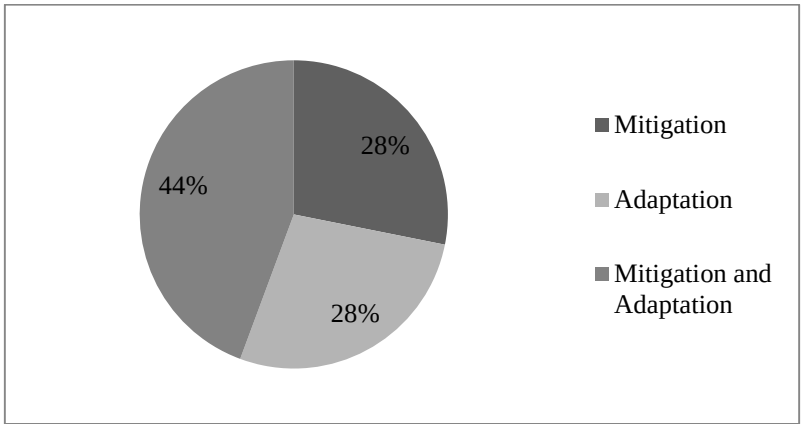

Figure 23: Overall planning responses to climate change

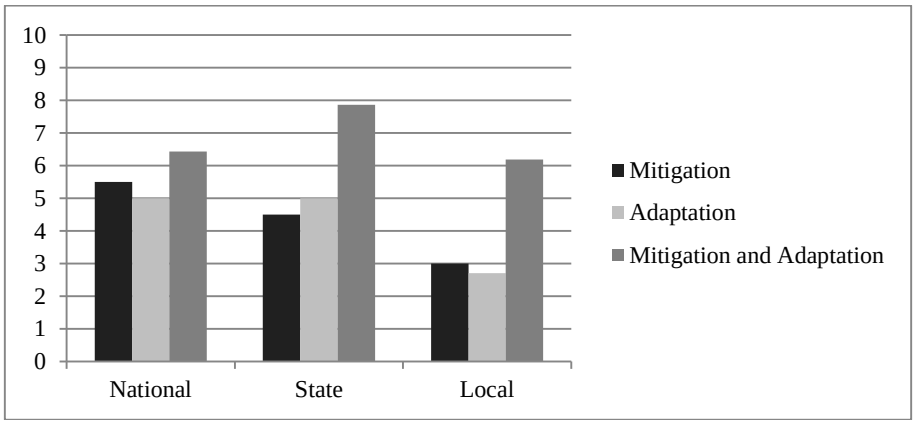

Figure 24: Comparison of planning responses to climate change at national, state and local levels

THE GAPS

By referring to Figure 17, the main gaps for all the spatial plans are fact and analysis components, and this is most apparent at the state and local levels. The other three plan components, which are the goal, policy and implementation components, also need to be strengthened by the reframing of sustainable development in the context of Malaysia. All spatial plans fail to utilize temperature and rainfall intensity data in shaping future land use developments. The spatial implications of climate change due to changing temperature and rainfall patterns are also in need of serious attention. In terms of analysis, spatial

plans at all levels need to be improved on vulnerability assessment as a result of climate change, impact of local activities which can contribute to climate change, and the application of downscaling climate change scenario in its future land use planning. In addition, all spatial plans need to include waste planning, which include the promotion of landfills with the methane capture strategy and waste reduction development in future plan reviews to effectively respond to climate change. Compared to others, spatial plans at the national level lack the promotion of green neighbourhood and urban design that can reduce the Urban Heat Island (UHI) effect. Relatively, spatial plans at the state and local levels are deficient in terms of planning for disaster resistant communities, water demand management and including criteria for plan implementation/evaluation.

CONCLUSION

This study provides a systematic evaluation of how well spatial plans in the Selangor River Basin respond to climate change across various critical components that define the quality of the plans, including facts, analysis, goals, policies and implementation. The first set of findings reveal that the spatial plan quality is higher at the national level, but gradually declines in the lower tiers. This finding is not surprising, because NPP2, with explicit consideration of climate change, was prepared after the other plans. Nonetheless, lower plan quality at the local level, compared to the state level, is in need of serious attention as to why some of the data, analysis or policies on climate change in the higher level plans are not being utilized and refined at the local level. The second set of findings show that all of the spatial plans generally give an equal emphasis to climate change mitigation and adaptation. This supports the argument that spatial planning provides platforms for coordinating mitigation and adaptation responses through its sustainable development policies (Biesbroek et al., 2009).

This research extends the literature of plan quality evaluation by incorporating the Planning Process Model as the basis for the plan assessment process. In addition, the assessment involved both mitigation and adaptation responses at three different levels of jurisdiction, compared to previous studies, which mostly focus on either mitigation or adaptation, and at only one level of administration. The criteria, plan evaluation protocol and the quantitative assessment of plans can be adapted to other river basins with some improvement to the evaluation criteria based on the local context of climate change impact. It can also be used by planners in the future to track changes in plans over time, and the degree to which this change leads to improved outcomes. The evaluation is vital to identify the gaps towards climate change

integration, and could assist in resource allocation in the future for the mainstreaming of climate change in spatial planning.

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PLANNING MALAYSIA:
Journal of the Malaysian Institute of Planners
Volume **XII** (2014), Page 97 - 122

ANALYSIS ON COMMUNITY INVOLVEMENT IN CULTURAL ACTIVITIES: TRANSMISSION OF ETHNIC LANGUAGE

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Abstract

This research reviews an analysis of Community Involvement in Cultural Activities specifically from the angle of transmission of Ethnic Language. Convention for the Safeguarding of Intangible Cultural Heritage (ICH) which has been adopted by UNESCO in October, 2003 has aimed to raise awareness at the local, national and international levels of the significance ICH, to ensure ICH is mutually respected by the communities concerned and to provide assistance for education and fund for the maintenance of this heritage. Survey Questionnaires have been recently conducted in one of the World Heritage Site, Melaka; to measure and determine the level of community involvement in cultural activities. The survey adopts five domains of ICH, Oral Tradition, Performing Arts, Knowledge, Social Practices and Traditional Craftsmanship in determining the involvement level of four cultured communities in their cultural enactments. These four communities are selected geographically. They are Morten Village Community, Portuguese Village Community, Heren and Jonker Streets Community and Gajah Berang Village Community. This paper acknowledges the significance, similarities and differences of the four cultured communities especially on transmission of ethnic languages with regards to community characters, specifically demographic and socio-economic factors. Finally the analysis evaluates on the significance ethnic language transmission towards the overall cultural manifestations of the cultural communities.

Keywords: Ethnic Language, Language Forms, Language Experience, Language Shift, Intangible Cultural Heritage.

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INTRODUCTION

For over 600 years since Malacca was founded, Malaysia is now inhabited by more than 50 ethnic groups of diverse languages and dialects. With interesting history and variety of architectural and other cultural heritages, Malaysia has turned into mosaics of cultures. Although the official language in Malaysia is the Malay language, other languages such as Mandarin, Tamil, Cristao, Malay Creoles and many others need to be acknowledged. These languages are the vehicles connecting one cultural community to the other as well as a tool in transferring knowledge from one generation to the next.

A phenomenon addressed as 'Language Shift' occurs when a language is displaced by another along the lives of community members. Among the factors contributing to this phenomenon are demographic declination, Interlingua distance, dialect diversity, writing system and mass media (Huebner T., 1987). The phenomenon of language shift also occurs in Malaysia whereby one of the contributing factors are the use of English has once been adapted in text books and is also employed in discourses in school classes and social interaction. Other than the fact that there are varieties of Malay dialects articulated among the citizens, Malaysians being a multiracial society are typically to experience interethnic (Asmah O., 2004). Thus it is possible for the official Malay language, and perhaps other languages used in Malaysia to experience language shift. Therefore acknowledging diversity of languages in a particular cultural community is crucial to determine if the culture has been genuinely transmitted or passed on. This also establishes the degree of understanding and involvement of a certain individual to his cultural community.

Survey Questionnaires have been recently conducted in one of the World Heritage Sites, Melaka, inquiring four cultural communities to address their level of involvement in social and cultural clubs. These four communities are selected geographically. They are Morten Village Community, Portuguese Village Community, Heren and Jonker Streets Community and Gajah Berang Village Community. Research hypothesis addresses that different communities have different level of language practice and that the differences are caused by the significance of community demographic and socio-economic characters. In order to prove so, the sample from the questionnaires is analyzed by employing suitable SPSS statistical tests. In consistent with the primary hypothesis, subsequent hypotheses are addressed for each statistical test in supporting the primary hypothesis.

PRACTICE OF ETHNIC LANGUAGE

Ethnic Language is referred to the language which is highly associated with the respondents' ethnic background. In this research, the case studies namely Morten Village, Portuguese Village, Heren and Jonker Street and Gajah Berang Village are selected because of the minority cultured communities who are claimed to reside in the four locations. The cultured communities are Traditional Malays, Chetty, Portuguese and Baba and Nyonya. It is presumed that the respondents from the cultural community speak their Ethnic Language. Therefore, Chetty respondents speak Malay Creole Chetty, Baba and Nyonya respondents speak Malay Creole Baba, Portuguese respondents speak Cristao, Indian respondents speak Tamil, Chinese respondents speak Cantonese, Mandarin or Hokkien and lastly Malay respondents speak Malay.

However, it is discovered that only 60% of the respondents recognize their Ethnic Language as their Mother Tongue and Spoken Language, 2% of the respondents recognize Ethnic Language as Spoken Language but not Mother Tongue, and 38% of the respondents no longer recognize their Ethnic Language as Spoken Language or Mother Tongue. Additionally, 30% of the respondents recognize Ethnic Language as their Mother Tongue but not their Spoken Language. This implies that transmission of Ethnic Language is deteriorating. Furthermore, 6% of the respondents recognize English as their Mother Tongue and Spoken Language. English is considered a popular Spoken Language since 36% of the respondents speak English regardless of their Mother Tongue.

Despite the fact that the statistical evidence implies that Ethnic Language practice is deteriorating, majority of the respondents claim that they still practice their Ethnic Language occasionally. Therefore, regardless if their Mother Tongue and Spoken Language are not their Ethnic Language, Ethnic Language is still recognized and practiced in certain occasion.

ANALYSIS ON FACTORS INFLUENCING PRACTICE OF ETHNIC LANGUAGE

Ethnic Language Practice is a dichotomous variable which determines whether the respondents are either Ethnic Language Practitioners or Non-Practitioners. Chi-Square for Independence tests are implemented to assess if there are relationships between any of the demographic and socio-economic variables with Ethnic Language Practice variable. The results of the tests are shown in Table 16.

Table 16: Summary of Chi-Square for Independence Results for Ethnic Language Practice with Demographic and Socio-Economic Variables and Club Participation Variables

H_0:	There are no relationships between Ethnic Language Practice and the following variables
H_1:	There are significant relationships between Ethnic Language Practice and the following variables

Variables (Factors)	Variable Type	df	Cal. x^2 Value	Crit. x^2 Value	Asymp. Sig. (2-Sided) / P - Value	Decision
Gender (Male/Female)	Nominal	1	1.831 [a]	3.841	0.176047 > 0.05	Fail to Reject H_o
Marital Status (Single/Maried)	Nominal	1	23.303 [a]	3.841	0.000001 < 0.05	Reject H_o
Age Categories	Interval	6	47.497 [a]	12.592	0.000000 < 0.05	Reject H_o
Location of Residence	Nominal	3	247.373 [a]	7.815	0.000000 < 0.05	Reject H_o
Origin (Native/Non-native)	Nominal	1	12.242 [a]	3.841	0.000467 < 0.05	Reject H_o
Duration of Residence	Interval	8	30.085 [a]	15.507	0.000204 < 0.05	Reject H_o
Ethnicity	Nominal	5	258.619 [a]	11.070	0.000000 < 0.05	Reject H_o
Religion	Nominal	4	255.172 [a]	9.488	0.000000 < 0.05	Reject H_o
Work (Working/Not Working)	Nominal	1	0.271 [a]	3.841	0.602544 < 0.05	Fail to Reject H_o
Occupation	Nominal	7	50.973 [a]	14.067	0.000000 < 0.05	Reject H_o
Jobs Promote Culture?	Nominal	1	6.243 [a]	3.841	0.012472 > 0.05	Reject H_o
Education Level	Ordinal	3	20.604 [a]	7.815	0.000127 < 0.05	Reject H_o
Household Income Cat.	Interval	10	91.143 [a]	18.307	0.000000 < 0.05	Reject H_o
Household Members Cat.	Interval	2	13.485 [a]	5.991	0.003698 < 0.05	Reject H_o

According to Table, the summary of Chi-Square results indicates 12 factors which influence Ethnic Language Practice. The outcome summary implies that between subjects of the 12 factors highlighted in the table, the observed counts of Ethnic Language Practitioners have deviated from the expected counts which consequently results in statistically significant value of $\chi 2$. As the amount of deviation increases, the value of $\chi 2$ also increases and p value retreats from 0.05.

The lesser the p value from 0.05, the more significant is the value of $\chi 2$. Thus for the 12 factors, the Chi-Square tests reject the null hypothesis. This means that there are relationships between the 12 factors and Ethnic Language Practice. On the other hand, two factors namely Gender and Work have no relationships with Ethnic Language Practice, $p > 0.05$. Table 17 is the interpretation of results for the 12 significant factors.

Table 17: Chi-Square for Independence Interpretation of Results for Ethnic Language Practice with Significant Related Factors

Decision: REJECT H_0 (*There is a significant relationship)*		
DV: Ethnic Language Practice		
IV (Factor)	Interpretation of Results	Significance
Marital Status (Single/ Maried)	▪ There is a highly statistically significant relationship between Ethnic Language Practice and Marital Status, ▪ $x^2(1) = 24.18$, $p = 0.00 < 0.01$. ▪ Measure of Association: Phi : - 1.94, p = 0.00	▪ Frequency of ethnic language practitioners between single and married respondents is significantly different. This means ethnic language practice is significantly influenced by marital status. ▪ However, Phi of -1.94 indicates a weak association between Marital Status and Ethnic Language Practice ▪ There are significantly high observed counts than expected counts of married respondents who practice ethnic language compared to single respondents who practice ethnic language.
	Reasoning: The weak association between Ethnic Language Practice and Marital Status indicates that most ethnic language practitioners are married, however the likelihood is not too convincing. Married respondents have more family interaction compared to single respondents. Majority of married respondents have the same ethnic-affiliated partners. Thus explains how being married have higher possibility to practice ethnic language compared to being single. On the other hand, majority of single respondents experience schools and work environment, therefore tendencies of interaction with non-ethnic affiliated acquaintances are higher and more than married respondents. Additionally, it is discovered that 50% of single respondents consider English as their Spoken Language. Therefore infers that it is unlikely for the members of the cultural community who are single to practice ethnic language.	
Age Categories	▪ There is a highly statistically significant	▪ Frequency of ethnic language practitioners in every age category is significantly

	relationship between Ethnic Language Practice and Age Categories, ▪ $x^2(6) = 47.50$, p = 0.00 < 0.01. ▪ Measure of Association: Eta : 0.272, p = 0.00 *The greater the age of respondents, the more likely they practice ethnic language	different. This means ethnic language practice is significantly influenced by age categories. ▪ However, Eta of 0.272 indicates a weak positive association between Age Categories and Ethnic Language Practice. ▪ There are significantly high observed counts than expected counts of ethnic language practitioners who are more than 70 years old.
	Reasoning: The positive yet weak association between Ethnic Language Practice and Age Categories indicates that as the respondents' age increases, the more likely the respondents practice ethnic language, although the likelihood is not too convincing. It is discovered that less than half of the respondents who are below 40 years old practice ethnic language. On the other hand, there are 72% of respondents who are above 40 years old practice ethnic language. Based on this finding, there are two sides of inferences which can be addressed. First is that practice and transmission of ethnic language of the drastically declining. It is found that 50% of respondents who are below 40 years old consider English as spoken language, and 25% of respondents who are above 40 years old consider English as spoken language. English is the most popular spoken language of the younger generation of the cultural community, compared to their ethnic language. Secondly, this also infers that ethnic languages may still be articulated in the cultural community however they are greatly practiced by the older generation compared to younger generation. This is because interaction with people of different ethnicity such as in schools and working environment reduces as age increases. At the same time, interaction with family members who tend to be ethnic-affiliated people increases as age increases. This encourages the use of ethnic language as spoken language as respondents grow older.	
Location of Residence	▪ There is a highly statistically significant relationship between Ethnic Language Practice and Location of Residence, ▪ $x^2(3) = 247.4$, p = 0.00 < 0.01. ▪ Measure of Association: Cramer's V : 0.622, p = 0.00	▪ Frequency of ethnic language practitioners in every location is significantly different. This means ethnic language practice is significantly influenced by location of residence. ▪ Cramer's V of 0.622 indicates a strong association between Location of Residence and Ethnic Language Practice. ▪ There are significantly high observed counts than expected counts of ethnic language

		practitioners who live in Morten Village, Gajah Berang Village and Heren and Jonker Streets respectively. Only 15% respondents from Portuguese Village practice their ethnic language.
	Reasoning: The strong association between Ethnic Language Practice and Location of Residence points out that there is a strong likelihood of respondents from Portuguese Village not to practice their ethnic language, while respondents from Morten Village, Heren and Jonker Streets and Gajah Berang Village to practice their ethnic language. All respondents from Portuguese Village are Portuguese descendants thus their ethnic language is Cristao which is among the least common spoken languages in Malaysia. As the Portuguese respondents interact with other people outside their village, Cristao is no longer a widely comprehensible language. This has become a difficulty for the Portuguese residents in Malaysia to practice Cristao as a spoken language. Although 36% of the Portuguese respondents' mother tongue is Cristao, only 15% of them speak Cristao. Instead, English is the most widely used language in Portuguese Village. In addition, the only 15% of the Portuguese's Village respondents who still speak Cristao age above 50 years old. This suggests that apart from having difficulty in practicing Cistao, the use of Cristao in Portuguese Village is highly deteriorating and poorly transmitted to the younger generation. In contrast, all respondents from Morten Village, and majority of Gajah Berang Village and Heren and Jonker Streets respondents are still practicing their ethnic languages; which are mostly Malay, Creole Malay and Mixed or Traditional Chinese. Since these ethnic languages are widely conversed and comprehensible in Malaysia, the difficulty to practice ethnic language for respondents from the three locations is significantly less than respondents from Portuguese Village.	
Origin (Native/ Non-native)	▪ There is a highly statistically significant relationship between Ethnic Language Practice and Origin, ▪ $x^2(1) = 12.242$, $p = 0.00 < 0.01$. ▪ Measure of Association: Phi: -0.143, p = 0.000	▪ Frequency of native and non-native ethnic language practitioners is significantly different. This means ethnic language practice is significantly influenced by origin. ▪ However, Phi of -0.143 indicates a very weak negative association between Origin and Ethnic Language Practice ▪ There are significantly high observed counts than expected counts of ethnic language practitioners who are non-

		native to their location of residence.
	Reasoning: A very weak association between Ethnic Language Practice and Origin indicates that ethnic language practitioners are likely non-native to their location, although the likelihood is not too convincing. It is discovered that the observed counts of non-native ethnic language practitioners are only higher than expected counts for Morten Village, Gajah Berang Village and Heren and Jonker Streets. It is not surprising for all the non-native respondents in Morten Village to practice their ethnic language since all of them are Malays and Malay is the national language of Malaysia. However for Gajah Berang Village, Chetty Creole Malay is practiced by majority of the non-native respondents. This implies a possibility that most of the non-native residents of Gajah Berang Village originate from areas where Chetty Creole Malay is widely practiced. Additionally, this also suggests that the non-native respondents have adapted well with majority of Chetty residents in the village, thus enable them to enhance the use of Chetty Creole Malay. In Heren and Jonker Streets, 27% of native respondents of Heren and Jonker Streets practice English while nearly half of the non-native respondents speak English. However, majority of both native and non-native respondents still speak their ethnic language, which is mostly Mixed or Traditional Chinese. The language is also among commonly used languages in Malaysia by the Chinese people. Unlike the three locations, majority of non-native respondents from Portuguese Village speak English instead of their ethnic language. Since majority of the native residents in Portuguese Village speak English too, thus the possibility for the non-native residents to learn Cristao from the native residents is bleak.	
Duration of Residence Categories	▪ There is a highly statistically significant relationship between Ethnic Language Practice and Duration of Residence Categories, ▪ $x^2(8) = 30.085$, $p = 0.00 < 0.01$. ▪ Measure of Association: Eta: 0.241 *The greater the duration of residence of the respondents, the more likely they practice ethnic language	▪ Frequency of ethnic language practitioners in every category of duration of residence is significantly different. This means ethnic language practice is significantly influenced by duration of residence categories. ▪ However, Eta of 0.241 indicates a weak positive association between Duration of Residence Categories and Ethnic Language Practice ▪ There are significantly high observed counts than expected counts of ethnic language practitioners who have settled in their respective locations for more than 40 years
	Reasoning: The positive yet weak association between Ethnic Language Practice and Duration of Residence Categories indicates that the longer the	

	respondents' duration of residence, the more likely the respondents practice ethnic language, although the likelihood is not too convincing. It is discovered that most ethnic language practitioners are respondents who have settled in for more than 40 years. This suggests that the longer the respondents stayed in their respective locations, the more likely ethnic language is practiced as spoken language by the respondents. Since ethnicity is a geographical driver of the cultural community, communication with the existing community influences the use of ethnic language. This means that duration of residence determines the length of interaction which certain individuals experience with their community. The length of interaction represents profoundness of community bridge, which at the same time encourages the community to speak in a language that shows a sense of belonging to each other and to the place. However, since the measure of association indicates a weak positive relationship of 0.241, this means that the practice of ethnic language which results from this interaction is deteriorating. This may be due to several reasons, one of which is the use of ethnic language in the place itself is deteriorating. At the same time, interaction between the individuals in the community can also be declining.	
Ethnicity	▪ There is a highly statistically significant relationship between Ethnic Language Practice and Ethnicity, ▪ $x^2(5) = 258.62$, $p = 0.00 < 0.01$. ▪ Measure of Association: Cramer's V : 0.636, p = 0.000	▪ Frequency of ethnic language practitioners in every ethnicity is significantly different. This means ethnic language practice is significantly influenced by ethnicity. ▪ Cramer's V of 0.636 indicates a strong positive association between Ethnicity and Ethnic Language Practice. ▪ There are significantly high observed counts than expected counts of ethnic language practitioners who are Malay, Chinese and Chetty respondents.
	Reasoning: The strong association between Ethnic Language Practice and Ethnicity indicates that there is significant partiality of frequencies of ethnic language practitioners in every ethnicity. It is discovered in that there are significantly high observed counts than expected counts of ethnic language practitioners who are Malay, Chinese and Chetty respondents compared to Indians, Baba and Nyonya and Portuguese respondents. Indians and Baba and Nyonya are minorities of the communities in Gajah Berang Village and Heren and Jonker Streets respectively. Indian respondents do not speak their ethnic language of Tamil, instead their spoken language is Malay Creole Chetty, alongside with the Chetty respondents who are majority residents of Gajah Berang Village. Although 60% of Baba and Nyonya respondents still speak Malay Creole Baba, vast	

	majority of them are above 60 years old. The rest of Baba and Nyonya respondents speak Mixed or Traditional Chinese, alongside with the Chinese respondents who are majority residents of Heren and Jonker Streets. Two inferences can be addressed from this finding. From a positive angle, this implies that there is a strong community bridge between Indians and Chetty respondents as well as between Chinese and Baba and Nyonya respondents. However, from a negative angle, this has caused deteriorations of ethnic language practice for minorities like Indian and Baba and Nyonya respondents when they adapted with majority residents of their locations. A different case for the Portuguese who are ethnic minority of the country that have among the least comprehensible ethnic languages; hence it is unsurprising for them to face difficulties in practicing Cristao.	
Religion	▪ There is a highly statistically significant relationship between Ethnic Language Practice and Religion, ▪ $x^2(4) = 255.17$, $p = 0.00 < 0.01$. ▪ Measure of Association: Cramer's V : 0.631, p = 0.000	▪ Frequency of ethnic language practitioners in every religion is significantly different. This means ethnic language practice is significantly influenced by religion. ▪ Cramer's V of 0.631 indicates a strong positive association between Religion and Ethnic Language Practice. ▪ There are significantly high observed counts than expected counts of ethnic language practitioners who believe in Islam, Buddhism and Hinduism.
	Reasoning: The strong association between Ethnic Language Practice and Religion indicates that there is a significant partiality of frequencies of ethnic language practitioners for every religion. Since religion variable is strongly associated with ethnicity variable (all Malay respondents believe in Islam, most Chinese respondents believe in Buddhism and most Chetty respondents believe in Hinduism), therefore observed counts of ethnic language practitioners are higher than expected counts for Islam, Buddhism and Hinduism.	
Occupation	▪ There is a highly statistically significant relationship between Ethnic Language Practice and Occupation, ▪ $x^2(7) = 59.973$, $p = 0.00 < 0.01$. ▪ Measure of Association:	▪ Frequency of ethnic language practitioners in every occupation is significantly different. This means ethnic language practice is significantly influenced by occupation. ▪ However, Cramer's V of 0.283 indicates a weak positive association between

	Cramer's V : 0.282, p = 0.022	Occupation and Ethnic Language Practice. ▪ There are significantly high observed counts of ethnic language practitioners who work as Government Employees, Sole Traders, Retirees and Housewives
	Reasoning: The weak association between Ethnic Language Practice and Occupation indicates that there is a significant partiality of frequencies of ethnic language practitioners for every occupation. Earlier it is discovered that whether the respondents are working or not, it has no significant relationship with whether or not the respondents are ethnic language practitioners. This result further indicates four categories of Occupation which are mixed of working and not working respondents that have high observed counts than expected counts of ethnic language practitioners. The four categories are Government Employees, Sole Traders. Retirees and Housewives. Vast majority of Government Employees are Malay and Chetty respondents. Only two of the Government Employees in the sample are Portuguese respondents. Malay and Chetty respondents' ethnic languages are Malay and Malay Creole respectively. Since both languages are the most widely practiced and comprehensible language in the country; therefore it is spontaneously easy for the Malay and Chetty respondents to practice their ethnic language in a larger society. Additionally, this explains why only two Portuguese respondents work as Government Employees. One of the reasons is due to the use of language in the working environment with society outside their village. Vast majority of Sole Traders are respondents from Heren and Jonker Streets. 52% of the Sole Trader respondents work in the fields of Trade and Retailing and Arts and Handicrafts. The two fields are culture based professional fields. The rest of working fields of Sole Traders in the sample are mostly related to culture based professions. Examples of other working fields of the Sole Traders include Culture and Performing Arts, Manufacturing and Production, Catering and Restaurants and Accommodations. The ability to practice ethnic language is an advantage for those who work in culture based professions. Thus this explains why vast majority of Sole Trader respondents practice their ethnic language. For Retirees and Housewives respondents, most of them spend their time at home or with families and their cultural community. One of the strong factors which can influence the tendency to speak ethnic language is the surrounding individuals a person interacts with. Since interaction with family and surrounding residents are likely more regular for Retirees and Housewives in comparison with other categories of Occupation, it is therefore unsurprising for majority of Retirees and Housewives of the cultural community to practice their ethnic language as spoken language.	
	▪ There is a highly statistically	▪ Frequency of ethnic language practitioners who have

Job Promotes Culture? (Cultural Based Profession / Non-Cultural Based Profession)	significant relationship between Ethnic Language Practice and Job Promotes Culture, ▪ $x^2(1) = 6.243$, $p = 0.01 < 0.01$. ▪ Measure of Association: Phi: 0.135, p = 0.000	cultural based profession and non-cultural based profession is significantly different. This means ethnic language practice is significantly influenced by job promotes culture. ▪ However, Phi of 0.135 indicates a very weak positive association between Job Promotes Culture and Ethnic Language Practice. ▪ There are significantly high observed counts of ethnic language practitioners who have cultural based professions.
	Reasoning: The strong association between Ethnic Language Practice and Job Promotes Culture indicates that ethnic language practitioners are likely those who work in cultural-based profession. Respondents who work in cultural based professions are likely those with professional expertise in cultural manifestation and tourism management. Since practice of ethnic language is significant in determining the strength of community bridge, to master in ethnic language practice is an advantage for the respondents with cultural based professions. First, this enables the respondents to make the most out of the interaction with individuals in the cultural community especially resourceful individuals who are cultural experts. Secondly, this enables the respondents to maximize understanding and skills in culture through ethnic conversational practice. Thirdly, the ability to converse well in ethnic language reflects skills and expertise in culture of the professionals. Therefore it is expected for those with cultural based professions to acquire the ability to converse in their ethnic language.	
Education Level	▪ There is a highly statistically significant relationship between Ethnic Language Practice and Education Level, ▪ $x^2(3) = 20.604$, $p = 0.00 < 0.01$. ▪ Measure of Association: Cramer's V: 0.179, p = 0.000	▪ Frequency of ethnic language practitioners of different education levels is significantly different. This means ethnic language practice is significantly influenced by education levels. ▪ However, Cramer's V of 0.179 indicates a very weak positive association between Education Level and Ethnic Language Practice. ▪ There are significantly high observed counts of ethnic language practitioners who

		have primary school education attainment.
	Reasoning: A weak association between Ethnic Language Practice and Education Level indicates that ethnic language practitioners are likely those with low education attainment, although the likelihood is not too convincing. Conversely, this implies that the chance for individuals with high education level in the cultural community to speak their ethnic language is unpromising. High education levels enable the respondents to work in more demanding professions, thus allow more interaction with larger society. It is possible for ethnic language practice to deteriorate due to less interaction with cultural community and more interaction with the larger and more general society. Nevertheless, for the individuals in the cultural community to obtain a high education level is equally important as protecting their heritage. It is vital for the individuals in the ethnic minorities of Malaysian citizens to move up in the general society through better education attainment, not only for them to have access to more opportunities to improve their way of living, but also for the larger society to be conscious of the existence of the ethnic minorities. At the same time, culture manifestation must also be upheld to sustain the strength of the cultural roots.	
Household Income Categories	▪ There is a highly statistically significant relationship between Ethnic Language Practice and Household Income Categories ▪ $x^2(10) = 91.143$, $p = 0.00 < 0.01$ ▪ Measure of Association: Eta: - 0.377 *The smaller the household income of the respondents, the more likely they practice ethnic language	▪ Frequency of ethnic language practitioners of different household income categories is significantly different. This means ethnic language practice is significantly influenced by household income categories. ▪ Eta of - 0.377 indicates a weak negative association between Household Income Categories and Ethnic Language Practice. ▪ There are significantly high observed counts of ethnic language practitioners who have lower than RM 4,000 household income.
	Reasoning: The negative yet weak association between Ethnic Language Practice and Household Income Categories indicates that as the respondents' household income increases, the more unlikely for the respondents to practice ethnic language, although the likelihood is not too convincing. The reasoning for Household Income Categories is parallel to the reasoning in Education Level. Better education attainment allows more job opportunities and higher income. Thus household income correlates with education attainment. It is previously pointed out that the higher the education level, the more unlikely for the respondents to practice ethnic language. Both education level and household income responds to socio-	

	economic status of the respondents. This implies that as the respondents move up in the socio-economic status, ethnic language practice is likely to deteriorate. This finding is alarming for the cultural community. This is because for the cultural community to transmit their ethnic language is equally as important as to improve their socio-economic status. Alas, the finding proves otherwise. Therefore, among efforts to sustain ethnic language practice, there must be unique or exclusive approaches on individuals with high income and high education attainment.	
Household Members Categories	▪ There is a highly statistically significant relationship between Ethnic Language Practice and Household Members Categories ▪ $x^2(2) = 13.485$, $p = 0.00 < 0.01$. ▪ Measure of Association: Eta: - 0.093 *The smaller the household members of the respondents, the more likely they practice ethnic language	▪ Frequency of ethnic language practitioners of different household members categories is significantly different. This means ethnic language practice is significantly influenced by household members categories. ▪ Eta of - 0.093 indicates a weak negative association between Household Members Categories and Ethnic Language Practice. ▪ There are significantly high observed counts of ethnic language practitioners who have lower than five household members.
	Reasoning: The negative yet very weak association between Ethnic Language Practice and Household Members Categories indicates that as the respondents' household members increases, the more unlikely for the respondents to practice ethnic language, although the likelihood is not too convincing. There are two ways to infer this finding. First, in response with latter reasoning, since household members categories correlate with household income categories, household members can also be used to determine socio-economic status. Therefore the reasoning for this analysis is similar to previous reasoning on household income. Secondly, as family members increases, there is a possibility that more variety of language is used to converse at home, thus reduce the use of ethnic language. This is because as individuals in the family socialize with the general society, chances of 'Language Shift' to occur are inevitable. Thus, when the individuals return home, there is a possibility that the ethnic language practiced in the family to be replaced by other languages. Therefore, the greater the amount of members in the family, the stronger is the likelihood of Language Shift to occur.	

According to the reasoning of results in Table 18, characters of majority of ethnic language practitioners and non-practitioners in the cultural community can be distinguished. Table addresses the common characters of ethnic language practitioners and non-practitioners.

Table 18: Common Characters of Club Participants and Non-Participants

Common Characters of Respondents Who Are Drawn to be Practitioners of Ethnic Language		
Marital Status	:	Married
Age Categories	:	40 years old and above
Location of Residence	:	Morten Village, Heren and Jonker Streets, Gajah Berang Village
Origin	:	Non-Native
Duration of Residence Categories	:	60 years and above
Ethnicity	:	Malay, Chinese, Chetty
Religion	:	Islam, Buddhism, Hinduism
Occupation	:	Government, Sole Traders, Housewives, Retirees
Job Promotes Culture	:	Cultural Based Professions
Education Level	:	Primary Schools
Household Income Categories	:	Below RM 4,000
Household Members Categories	:	5 Members and below

Common Characters of Respondents Who Are Drawn to be Non-Practitioners of Ethnic Language		
Marital Status	:	Single
Age Categories	:	40 years old and below
Location of Residence	:	Portuguese Village
Origin	:	Native
Duration of Residence Categories	:	Below 60 years
Ethnicity	:	Baba and Nyonya, Indians, Portuguese
Religion	:	Roman Catholic, Atheism
Occupation	:	Private Employees, Partnerships, Students, Unemployed
Job Promotes Culture	:	Non-Cultural Based Professions
Education Level	:	Secondary Schools, College, Bachelor Degree
Household Income Categories	:	Above RM 4,000

Household Categories	Members	:	More than 5 members

The Chi-Square Analysis indicates that there are significant relationships between some demographic and socio-economic factors. Therefore, in order to implement efforts to enhance the practice of ethnic language, the focus groups are those who are drawn not to be non-practitioners of Ethnic Language.

ANALYSIS ON PRACTICE OF LANGUAGE FORMS BASED ON AGE FACTOR

Language Forms refer to practices and expressions which require strong command of Ethnic Language. In this research, there are 10 Language Forms to be analysed. The followings are the 10 Language Forms:

1. Accent and Dialect
2. Proverb and Idioms
3. Spiritual Religious Passages
4. Spell Incantation
5. Traditional Songs
6. Nursery Rhymes
7. Poems Epic Songs
8. Riddles
9. Hereditary Tips
10. Myths and Legends

The respondents are inquired to address their practice regularity of 10 language forms. Each level of regularity is given scores for further statistical test.

Language Scores refers to a continuous variable which represent the sum of scores of practice regularity for each language forms. It is found that as age increases, the practice of language forms improves.

A Trend Analysis is implemented to observe the mean difference of Language Scores between younger age group, middle age group and older age group.

Table 19: Trend Analysis between 3 Ascending Age Categories and Language Scores

H_0:	There is no difference of mean Language Scores between 3 Ascending Age Categories
H_1:	There is a difference of mean Language Scores between 3 Ascending Age Categories

Descriptives
Language Score

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Min	Max
					Lower Bound	Upper Bound		
10 - 39 yrs old	276	20.41	5.212	.314	19.80	21.03	10	40
40 - 69 yrs old	314	21.77	5.571	.314	21.15	22.39	10	40
70 - 99 yrs old	50	24.06	6.377	.902	22.25	25.87	10	40
Total	640	21.36	5.573	.220	20.93	21.80	10	40

Test of Homogeneity of Variances

Language Score

Levene Statistic	df1	df2	Sig.
.957	2	637	.385

ANOVA

Language Score

			Sum of Squares	df	Mean Square	F	Sig.
Between Groups	(Combined)		664.950	2	332.475	11.042	.000
	Linear Term	Unweighted	563.018	1	563.018	18.700	.000
		Weighted	641.080	1	641.080	21.292	.000
		Deviation	23.870	1	23.870	.793	.374
Within Groups			19179.223	637	30.109		
Total			19844.173	639			

The Trend Analysis produces three consecutive tables. The Desciptives table shows that as the age categories increase in continuum, the language scores also increases. Levene's test for homogeneity of variances is not significant ($p = 0.345 > 0.05$), indicating that the assumption of homogeneity has not been violated. The Anova table shows a significant between-groups F-ratio ($p = 0.000019 < 0.05$), thus it can be concluded that Language Score differs significantly across the age categories, $F(2, 637) = 11.042$, $p < 0.05$. Therefore rejects the null hypothesis, which means there is a significant difference of mean language scores between 3 ascending age categories. Furthermore, by examining the linear term, which is also significant ($p < 0.05$), it can be concluded that language score increases consistently across age categories. An illustration of this linear trend can be observed in Figure 25.

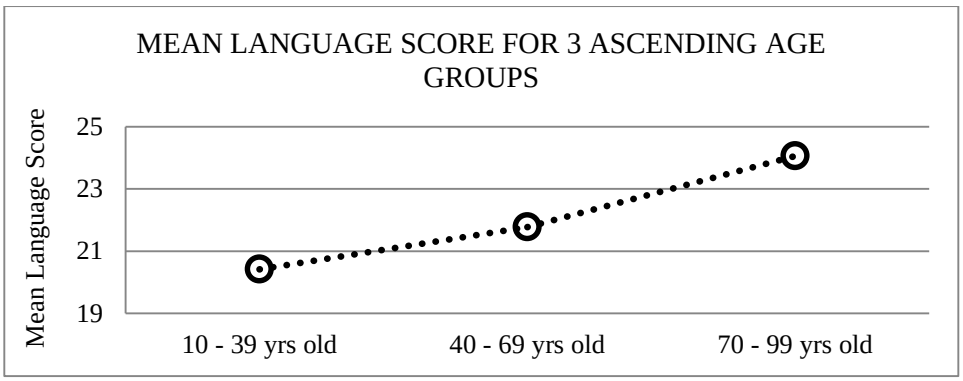

Figure 25: Linear Trend of Language Score across 3 Ascending Age Categories

Figure 25 shows a linear relationship between the three age categories and language score. As age increases in continuum, the Language Scores also increases. Thus, the older respondents are likely to gain high language scores than younger respondents.

For more accurate result, a correlation test on a continuous Age variable and Language Score variable has been implemented beforehand. The analysis yields a low correlation value, r = 0.153. This suggests a possibility of interfering factors which have weakened the relationship. Since Language Score is the total score of practice regularity for 10 language forms, there is a chance that for a few language forms, age has no effect on the practice regularity score. That is, for some language forms, respondents from older age categories do not score higher than respondents from younger age categories. A Multivariate Anova is conducted to observe the significant differences of mean practice regularity score of each 10 language forms for 3 ascending age categories.

Table 20: Multivariate Anova [Manova] to Compare Practice Regularity Score of 10 Language Forms between 3 Ascending Age Categories

H_0:	There is no significant differences of Mean Practice Regularity Score for 10 Language Forms between the 3 Ascending Age Categories
H_1:	There are significant differences of Mean Practice Regularity Score for 10 Language Forms between the 3 Ascending Age Categories

Descriptive Statistics

Language Forms	Age Categories	Mean	Std. Deviation	N
Accent & Dialect	10 - 39 yrs old	2.78	1.019	276
	40 - 69 yrs old	2.90	1.077	314

	70 - 99 yrs old	3.40	.969	50
	Total	2.89	1.055	640
Proverb & Idiom	10 - 39 yrs old	1.89	.767	276
	40 - 69 yrs old	2.19	.841	314
	70 - 99 yrs old	2.36	1.005	50
	Total	2.08	.839	640
Spiritual Religious Passages	10 - 39 yrs old	2.17	.974	276
	40 - 69 yrs old	2.40	.981	314
	70 - 99 yrs old	2.68	.978	50
	Total	2.32	.988	640
Spell Incantation	10 - 39 yrs old	1.84	.930	276
	40 - 69 yrs old	1.89	.972	314
	70 - 99 yrs old	2.12	.872	50
	Total	1.88	.948	640
Traditional Songs	10 - 39 yrs old	2.22	.831	276
	40 - 69 yrs old	2.28	.864	314
	70 - 99 yrs old	2.18	.896	50
	Total	2.25	.852	640
Nursery Rhymes	10 - 39 yrs old	2.01	.813	276
	40 - 69 yrs old	1.95	.798	314
	70 - 99 yrs old	1.92	.804	50
	Total	1.97	.805	640
Poems Epic Songs	10 - 39 yrs old	1.97	.802	276
	40 - 69 yrs old	2.07	.818	314
	70 - 99 yrs old	2.48	.762	50
	Total	2.06	.816	640
Riddles	10 - 39 yrs old	1.69	.710	276
	40 - 69 yrs old	1.81	.707	314
	70 - 99 yrs old	2.22	.815	50
	Total	1.79	.729	640
Hereditary Tips	10 - 39 yrs old	2.01	.822	276
	40 - 69 yrs old	2.34	.850	314
	70 - 99 yrs old	2.46	.973	50
	Total	2.20	.865	640
Myths & Legends	10 - 39 yrs old	1.83	.762	276
	40 - 69 yrs old	1.94	.754	314
	70 - 99 yrs old	2.24	.894	50
	Total	1.91	.775	640

Multivariate Tests

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.899	558.510[b]	10.000	628.000	.000

(Age Categories) Range 30 Years	Pillai's Trace	.153	5.199	20.000	1258.000	.000

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Age Categories (Range 30 Years)	-Accent&Dialect	16.472	2	8.236	7.552	.001
	-Proverb&Idiom	17.471	2	8.736	12.862	.000
	-Spiritual&Rel Pass	14.733	2	7.366	7.701	.000
	-Spell&Incantation	3.395	2	1.698	1.894	.151
	-TraditionalSongs	.774	2	.387	.532	.588
	-NurseryRhymes	.793	2	.397	.612	.543
	-Poems&EpicSongs	11.193	2	5.596	8.595	.000
	-Riddles	12.006	2	6.003	11.661	.000
	-HereditaryTips	19.564	2	9.782	13.587	.000
	-MythsLegends	7.651	2	3.825	6.470	.002
Error	-Accent&Dialect	694.652	637	1.091		
	-Proverb&Idiom	432.623	637	.679		
	-Spiritual&Rel Pass	609.316	637	.957		
	-Spell&Incantation	570.816	637	.896		
	-TraditionalSongs	463.226	637	.727		
	-NurseryRhymes	412.807	637	.648		
	-Poems&EpicSongs	414.782	637	.651		
	-Riddles	327.937	637	.515		
	-HereditaryTips	458.622	637	.720		
	-MythsLegends	376.622	637	.591		

The Manova test produces three important tables. The followings explain these three tables.

Descriptive Statistics Table

Descriptive Statistics shows mean scores of practice regularity of 10 language forms between 3 age categories which increase in continuum.

- cells indicate the language forms which have statistically significant difference in practice regularity between age categories and increase in mean score of practice regularity as the age categories ascend.
- cell which belongs to Spell and Incantation shows an increase of mean score of practice regularity as the age categories ascend, however the differences of the mean scores between the age categories are not statistically significant.

- cells which belong to Traditional Songs and Nursery Rhymes indicate language forms which have no statistically significant differences of mean scores of practice regularity between the ascending age categories.

Therefore, based on the Descriptive Statistics, it is discovered that there are two language forms which affect the positive relationship of Language Score and Age. They are Traditional Songs and Nursery Rhymes.

Multivariate Tests Table

According to Multivariate Tests table, the highlighted significant value suggests that there is an effect of the 3 Age Categories towards the mean of Practice Regularity Score, $F(20, 1258) = 5.199$, $p < 0.005$

Test of Between-Subjects Effects

Tests of Between-Subjects Effects table indicates that there are seven language forms as highlighted in yellow which have p value < 0.005. This shows that there are significant differences of mean score of practice regularity of the seven language forms between the ascending age categories.

However, there are also three language forms as highlighted in red which have p value > 0.005. This shows that there are no significant differences of mean score of practice regularity of the three language forms between the ascending age categories. These language forms are Spell and Incantation, Traditional Songs and Nursery Rhymes. Table 2.6 is the overall result Manova test.

Table 21: Interpretation of Manova Results of Mean Scores Practice Regularity for 10 Language Forms between 3 Ascending Age categories

RESULTS OF MANOVA (Between Subject Effects)			
P < 0.005		P > 0.005	
Accent & Dialect	F (2, 637) = 7.552, p = .001	Spell & Incantation	F (2, 637) = 1.894, p = .151
Proverb & idioms	F (2, 637) = 12.68, p = .000	Traditional Songs	F (2, 637) = 0.532, p = .588
Spiritual & Rel. Pass.	F (2, 637) = 7.701, p = .000	Nursery Rhymes	F (2, 637) = 0.612, p = .543
Poems & Epic Songs	F (2, 637) = 8.595, p = .000		
Riddles	F (2, 637) = 11.66, p = .000		

Hereditary Tips	F (2, 637) = 12.59, p = .000	
Myths & Legends	F (2, 637) = 6.470, p = .002	

Since there are differences of mean found between subjects in the Manova test, the null hypothesis is therefore rejected. This means that there are statistically significant differences of Mean Practice Regularity Score for 10 Language Forms between the 3 Ascending Age Categories.

Up to this point, the statistical tests indicate that age influences practice regularity of most Language Forms and the overall Language Score. The statistical tests suggest that the older the respondents, the more regularly they practice their expressions of Language Forms, though some expressions of Language Forms indicate differently, especially Nursery Rhymes and Traditional Songs. These language forms have weakened the positive relationship between age and overall language score. However, at the same time this suggest that either the older respondents are showing lesser interest than younger respondents in expressing some of the language forms or the younger respondents are showing greater interests and commitment than older respondents in expressing some of the language forms. If this is the case, then different age categories have different interest, awareness and commitment in practice in different language forms. Then again, this outcome generalizes only on age categories for all respondents regardless of other demographic and socio-economic factors.

LANGUAGE EXPERIENCES AND INFLUENCES ON COMMUNAL ACTIVITIES

The respondents are inquired to address their level of three types of experience in the 10 Language Forms. These types of experiences are Exposure to Language Forms, Training of Language Forms and Knowledge on the basis of the Language Forms. The research attempts to determine the correlation between the three types of Language Experiences Score and Language Scores. A Pearson Correlation is implemented for this assessment.

Table 22: Pearson's Correlation Test of Language Score and Three Language Experiences

H_0:	There are no significant correlations between the 3 types of Language Experiences and Language Scores
H_1:	There are significant correlations between the 3 types of Language Experiences and Language Scores

		Language Score	Language Experiences Score		
			Exposure	Trained	Informed
Language Score	Pearson Correlation	1	.504**	.498**	.502**
	Sig. (2-tailed)		.000	.000	.000
	N	640	640	640	640

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

According to Table, all p values are less than 0.01 which imply that there are high level statistically significant correlations between the three types of Language Experiences and Language Score, Exposure ($r = 0.505$, $p < 0.01$), Trained ($r = 0.498$, $p < 0.01$) and Informed ($r = 0.502$, $p < 0.01$). This implies that there are positive correlations between Language Experiences and Language Scores. Since all correlations' figures are between 0.4 and 0.6, all correlations' strengths are considered moderate. This means that language experiences moderately influence Language Scores. There are other factors which influence Language Scores such as Practice of Ethnic Language, Demographic and Socio-Economic Factors which are highlighted earlier.

The significances of Oral Traditions are reflected in respondents' level of involvement in cultural and communal activities. The respondents are inquired to address their regularity in attending community gathering and rate their commitment towards their cultural community. Additionally, at the end of the questionnaire, the respondents are asked to address their level of awareness and involvement in their cultural activities. All of the respondents' statements on the four mentioned inquiries are measured in Anchored 5 point scale.

Language Experience Score is the sum of scores for the three types of Language Experiences mentioned earlier. The research attempts to observe the impacts of Language Score and Language Experience Score towards regularity in attending community gathering, commitment towards cultural community, awareness of cultural activities and involvement in cultural activities.

Table 23: Correlation of Language Experience Score, Language Score, Community Gathering, Commitment towards Community, Awareness and Involvement in Cultural Activities

		Attendance Community Gathering	Commitment towards Community	Awareness	Involvement
Language Score	Pearson Correlation	.293**	.356**	.407**	.455**
	Sig. (2-tailed)	.000	.000	.000	.000
	N	640	640	640	640
	Pearson Correlation	.182**	.207**	.512**	.451**
	Sig. (2-tailed)	.000	.000	.000	.000

Language Experience Score	N	640	640	640	640

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

Based on Table, all p values are less than 0.001 which implies that there are high level statistically significant correlations between every two variables being compared. All correlations display positive values which suggest that the increase of any of the variables influence the increase of other variables. However, none of the correlations are considered as strong correlations. Attendance Community Gathering and Commitment Community have low correlations with Language Score and Language Experience Score, while Awareness and Involvement variables have moderate correlations with Language Score and Language Experience Score.

According to Language Score row, the highest correlation value is Involvement variable ($r = 0.455$, $r^2 = 0.21$), followed by Awareness ($r = 0.407$, $r^2 = 0.17$), Commitment Community ($r = 0.356$, $r^2 = 0.13$) and Community Gathering ($r = 0.293$, $r^2 = 0.09$) respectively. This suggests that among the four, the highest percentage that can be attributed to Language Scores is Involvement variable, which is 21%. The remaining percentage of Language Scores is attributed to other variables. This means that 21% of Language Score affect Involvement in Cultural Activities.

On the other hand, for Language Experience Score, the highest correlation value is Awareness variable ($r = 0.512$, r2 = 0.26), followed by Involvement ($r = 0.451$, $r^2 = 0.20$), Commitment Community ($r = 0.207$, $r^2 = 0.04$) and Community Gathering ($r = 0.182$, $r^2 = 0.03$) respectively. This suggests that among the four, the highest percentage that can be attributed to Total Experiences is Awareness variable, which is 26%. The remaining percentage of Language Experience Score is attributed to other variables. This means that 26% of Language Experience Score affect Awareness in Cultural Activities.

This finding infers that in order for the respondents to be more involved in cultural activities, they have to practice their language forms and expressions more regularly. As well as that, in order for the respondents to have high awareness level of their cultural activities, they have to gain better knowledge and experience of their cultural language expression.

CONCLUSION

This paper reviews the significance of community character to practice of ethnic language and cultural language forms. It is found that community characters specifically referring to demographic and socio-economic factors influence the practice of their oral traditions. For cultural communities in Malacca, ethnicity and religion are two drivers of social geography. Thus expression of culture can be distinguished by locations since location represents majority of ethnicity and religion. Among the significant factors which affect ethnic language practice are Age, Location of Residence, Origin, Duration of residence, Ethnicity, Religion, Occupation, Job Promotes Culture, Education Levels, Household Income and Household Members. It is also found that Age significantly affects the level of practice regularity of cultural language forms. As the respondents grow older, it is more likely of them to practice their ethnic language forms. However, younger respondents have shown interests to practice Traditional Songs and Nursery Rhymes more than older respondents.

Language is an important tool to ensure cultural heritage such as traditional wisdom and folklores are transmitted in the most genuine manner. As mentioned by Shigemoto (2003), *"A language is the culmination of thousands of years of a people's experience and wisdom. Moreover, it is the vehicle that transmits and perpetuates that wisdom."* (Shigemoto, J, 2003). Language is intricately combined with a unique view of the world, belief system, culture and literature.

The surge of increasing homogenization of places causes the loss of distinctiveness and diversity which used to make lives interesting and profound. By understanding history and heritage through arts, celebrations and sharing institutions will strengthen a sense of cultural identity and distinctiveness of a place. Diversity promotes economic health as it fosters opportunity while non-diversity offers little prospect for future expansion, either in the form of personal growth or economic development. Designing for diversity combines the aesthetic interest of urban design with social objectives of urban planning. Sustainability rests on the ability of people to be involved in the contribution to the well-being of the society. Community's opinions and perspectives must be regarded as important information in decision making processes. The involvement of the community in the significant cultural activities of a place heightens integration of social, political and economic aspects of the place (ICHC (2003), Newman P. & Jennings, I. (2008) & UNESCO (2003)). The future direction of this analysis is the assessment of community involvement in the remaining four domains of Intangible Cultural Heritage. They are Performing Arts, Knowledge, Social Practices and Traditional Craftsmanship. The involvement levels are analysed based on preferences and regularity of customary cultural expressions and practices.

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NOTES TO CONTRIBUTORS AND GUIDELINES FOR MANUSCRIPT SUBMISSION

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