

ADAPTATION OF SUSTAINABLE NEIGHBOURHOOD ELEMENTS IN NEIGHBOURHOOD PLANNING AND DESIGN

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ABSTRACT: The sustainable environment is being debated as an important measure due to degradation of global environment and consent for our future generation. The land use development for neighbourhood construction need to be protected from being overused and devastated. Malaysia should have very focused sustainable neighbourhood planning and design so that the future generation can be benefited from this type development. The main concern of this study is to address the adaptation of Sustainable Neighbourhood Elements (SNEs) in neighbourhood planning and design in Malaysia as it gives much impact to the living environment of a group of community. The issues pertaining sustainable neighbourhood design and planning in Malaysia were also discussed. Sustainable Neighbourhood Elements (SNEs) were developed to assist planners and stakeholders involved in the planning process and can be manipulated based on the current need. This is to make the planning process more transparent and explicit, aiding participation, reducing the apparent uncertainty of the system and potentially making planning and design process more efficient.

Key words: *Sustainable development; sustainable neighbourhood; sustainable neighbourhood elements.*

1.0 Introduction

Sustainable development becomes the foundation of planning and design of building structures and infrastructures in recent decade. The land use development for neighbourhood should be protected from being overused and devastated. Rapid urban development has contributed to the degradation of environmental quality especially the quality of water, air and noise. These have impact vastly in the urban neighbourhood infrastructures which lead to negative impact on environment and urban quality of living. As such, developing country like Malaysia should be able to adapt sustainable neighbourhood planning and design so that the future generation can be benefited from particular development.

To incorporate the sustainability principles in Malaysia, the planning and development was strengthened during the Eighth Malaysian Plan by the incorporation of environmental considerations. This enabled a more integrated and holistic management of the environment and natural resources. The institutional capacity and regulatory framework was intensified and new approaches and planning tools introduced. These efforts to promote sustainable development resulted in Malaysia being ranked 38 among 146 countries worldwide and second in Asia with regard to environmental sustainability. In addition, an Environmental Performance Index Study ranked Malaysia ninth among 133 countries in terms of efforts taken to reduce environmental stress on human health and in protecting ecosystem vitality (Ninth Malaysian Plan, 2006).

To enable the environment being protected, a preventive measure must be implemented. The community participation is an important agenda as this can help the community to adapt the sustainable living environment to be part of their lifestyle. The sustainable living concept is simplified as lifestyle development of a group of community that sustained without diminishing any natural resources (Said M. I. M., Zakaria R. and Vikneswaran M., 2008). Sustainable living which is micro level can help to achieve the goal of sustainable development which is macro level of environmental sustainability. Neighbourhood elements are important as it conserve the resources and provide a healthy living environment in the living area. The initiative in Malaysian construction industry is lesser in term of the assimilation of the construction industry with energy-efficient and environmental friendly designs (Yin C.Y., 2007).

One of the decisive factors in sustainable living is sustainable neighbourhood. A sustainable neighbourhood is a mixed used area with a feeling of community; it is a place where people want to live and work, now and in the future. Sustainable neighbourhoods meet the diverse needs of existing and future residents, are sensitive to their environment, and contribute to a high quality of life. They are safe and inclusive, well planned, built and run, and offer equality of opportunity and good services to all (Bristol Accord, 2005).

Hugh Barton's (1996) approach on 'Ecological Perspective' emphasizes that "One way of approaching the problem of sustainable design is to see each development as an organism or a mini ecosystem in its own right" as shown in Figure 1 (Barton *et al.*, 1996). When see neighbourhood in the ecological perspective, it should provide the humans with essential local habitat which can create its own microclimatic condition, provide the natural environmental system to get the high comfort level (Al-Hagla K., 2008).



Source: Barton et al, 1996

Figure 1: Neighbourhood as an ecosystem

Looking at sustainable neighbourhood design in Kuala Lumpur 2020 City Plan emphasized that paths, edges, districts, nodes, and landmarks are the elements that give form to a neighbourhood by evoking an image which is recognized by the community. The key to improving the urban environment lies in protecting its natural environment and enhancing the environmental quality of Kuala Lumpur (Kuala Lumpur 2020 City Plan). It stated that principles of green infrastructure shall be adopted to improve level of urban services for drainage, sewerage, public transportation and solid waste management. In addition, green spaces shall be considered as part of urban infrastructure.

Whereas, the Iskandar Malaysia development plan recommended that sustainable neighbourhood designs should enhance paths (roads, lanes, walkways), which are the main corridors through which most of the community activities go through (Liveable Communities, 2008). So, here clearly we can see that the Malaysian planners did not give much emphasis on the ecological aspect of Kuala Lumpur 2020 City Plan and Iskandar Malaysia development plan.

Planning and design can be improved to overcome the above setbacks as it is an important task in delivering the sustainable development. Malaysian Government under the Ministry of Housing and Local Government has implemented the guidelines and standards which are used to develop the local plans. The Planning Guideline by Town and Country Planning Department become an important guideline for the States, Local Municipal Councils, government agencies and housing developers to plan and develop the housing projects in the district level, to prepare Development Suggestion Report

(*Laporan Cadangan Pemajuan*, LCP) and to get the Planning Approval (JPBD Semenanjung Malaysia, 2003).

At present, planning is done by urban planners without much consultation and it cannot be accomplished by planners operating in a vacuum. Improving quality of living environment requires the active participation of various. It then requires the consent of community group, civic organizations, elected and appointed public officials, and municipal employees. The scope can be broadened and the process to gear for greater transparency with the mechanism to obtain feedback from public needs to be introduced. Towards this end, the existing structural and local plans also need to be reviewed and positive values in new developments need to be incorporated, to ensure quality living environment (Artikel 3, 1999). To add to this, building design should also be economically, socially and environmentally responsive.

Adapting the sustainable neighbourhood elements into the planning and design stage especially in the development of the local structure and infrastructure plan need to be given much emphasis. The elements such as open space, neighbourhood landscape, river, natural ponds, canopy trees, green area, water retaining lands, siting, zoning and other elements need to be incorporated into the current practice to create sustainability in the living area (Said, M. I. M., Zakaria, R. and Vikneswaran, M., 2009). Act 172 (2006) stated that open area can be referred to children playground, badminton/*sepak takraw* court, tennis court and etc. To improve this to be more viable, the development pattern in Malaysia must coordinate with the Malaysian National Policy on Environment where it recommend clean, healthy and productive environment for present and future generation (*National Policy on the Environment*, 2002) and it shall included all the necessary elements into the neighbourhood planning and design stage.

The incorporation of sustainable neighbourhood elements in neighbourhood design is important because many of the problems encountered at the macro-city scale are in fact cumulative consequences of poor planning at the micro-neighbourhood level. This is an important fact that the neighbourhood-scale analysis can help in developing more efficient and sustainable local urban infrastructure, including building, transportation, urban vegetation, and water (water supply, wastewater and storm water) systems (Engel-Yan, *et al.*, 2005). When this could be achieved, the sustainable development principles can be achieved too. Sustainable urban infrastructure is a form of sustainable design, which adheres to the principles of sustainable neighbourhood. Its main principles are to achieve technological and governmental policies that enable urban planning for sustainable architecture and design. Sustainable neighbourhood design involves the development of communities with consideration to

environmental, social and economic goals in a balanced perspective (Churchill, C. J., and Baetz, B.W., 1999).

It is suggested that the transportation infrastructure should be designed to encourage the use of more sustainable mode of transportation, including walking, cycling and public transit. Second element is the water infrastructure where the implementation of urban water management techniques is a primary concern in the development of sustainable communities. Third element is the green building which has been growing fast in the construction industries. The urban forestry is the fourth elements to be considered in sustainable neighbourhood design as it influences the microclimate of the urban residential area. It affects both the comfort and building space conditioning energy use (Engel-Yan, *et al.*, 2005).

The interaction among engineers and specialist in sustainable neighbourhood design are an important aspect to create the local infrastructure system and the greater urban design. As the main focus of the study in adapting the sustainable neighbourhood elements in current neighbourhood planning and design, the green infrastructure constitutes a significant portion of land use provides accessibility to, from and within the neighbourhood, and its major determinants of neighbourhood form. The sustainable neighbourhood elements also need to be addressed as early as in the planning stage as they are very important in creating a better micro-climatic condition and healthy lifestyle neighbourhood area.

2.0 Methodology

The study focused on 5 city/municipal councils in the state of Selangor. They are municipal councils were Shah Alam City Council, Petaling Jaya City Council, Ampang Jaya Municipal Council, Kajang Municipal Council and Subang Jaya Municipal Council. The structure plans were collected from each city/municipal councils and review was done to understand on how the current urban residential area is being planned by municipals to fulfil the sustainable neighbourhood. The structure plans were helpful to gather information on the current practice of adopting the sustainable living concepts in the planning stage of each municipal council and it was reviewed thoroughly on its sustainability adaptation.

Then, the questionnaire survey was employed to gather information on opinions of occupants who are living in urban residential area. The Sustainable Neighbourhood Elements (SNEs) identification starts with data collection in city/municipal councils. The data were collected among the residents of five (5) city/municipal councils from the state of Selangor. There were 282 responses received during the questionnaire survey of the study area as stated in Table 1.

The questionnaire survey contain six section such as demographic information, neighbourhood elements, elements of sustainable development in neighbourhood area, awareness of sustainable development/sustainable living, awareness of the important of greeneries to enhance the healthy neighbourhood and sustainable living morphologies.

The respondents from each city/municipal council seem to have very good response and feedbacks which was very helpful to confirm most of the data collected. This was considered a positive development for this research, as the research helps to highlight the issues pertaining the planning and implementation of the sustainability issues at the respected area.

Table 1: City/Municipal Council

City/Municipal Council	Frequency	Percent	Valid Percent	Cumulative Percent
Kajang Municipal Council	58	20.6	20.6	20.6
Shah Alam City Council	44	15.6	15.6	36.2
Ampang Jaya Municipal Council	76	27.0	27.0	63.1
Petaling Jaya City Council	64	22.7	22.7	85.8
Subang Jaya Municipal Council	40	14.2	14.2	100.0
Total	282	100.0	100.0	

Then the survey result were analysed based on the frequency distribution analysis and descriptive statistic which resulted as summarized in Table 1. The data were analysed using Factor analysis and Pearson Correlation Coefficient Analysis and the results were shown in Table 2.

3.0 Result And Discussion

3.1 *Review of Municipal Structure Plan and factors affecting the sustainable living quality in Malaysian urban neighbourhood environment*

The reviews of the structure plan indicate that municipals concerns on improving environmental quality in majority concentrates in land use pattern. A highly concerns also paid to industrial area as compared to housing area in term of pollution control. Currently the implementation stage in each of the municipal that were reviewed shows that all of them have tremendous problem in this stage. The recommendations from each city/municipal council were compared according to their recommendation. An analysis of development plans has been

undertaken which identifies failings in their methodology and contents. A survey of principle planners responsible for preparing local plans in each district in Selangor reveals that generally no systematic process to plan preparation was followed and that plan preparation was largely dependent upon past proposals, local problems, intuition and the outcome of statutory consultation.

Table2: Rotated Factor Matrix for Sustainable Neighbourhood Elements

Rotated Factor Matrix			
Elements	Factor		
	Economic	Social	Environmental
Commuting time reduced	0.155	0.397	0.008
House price	0.188	0.575	0.058
Design of house	0.051	0.793	-0.009
Design of neighbourhood	0.034	0.801	0.060
Green recreational facilities	0.085	0.631	0.045
Away from heavy traffic	0.349	0.176	0.243
Tall trees	0.340	0.032	0.504
Gardens	0.368	0.208	0.621
Playgrounds	0.334	0.161	0.633
Natural ponds	0.094	-0.043	0.778
Wetlands	-0.037	-0.011	0.687
Green area important in Neigh. Area?	0.769	0.088	0.111
Greenery can give aesthetic value and shade?	0.886	0.076	0.034
Sound buffer, air filtration and reduce CO2?	0.742	-0.017	0.014
Greenery should be increased?	0.573	0.061	0.191
Sustainable living concept used as a tool for neighbourhood	0.616	0.130	0.227
Designed with proper permanent green area	0.152	0.112	0.316
Dust, smog and soot controlled with green area	0.094	0.338	0.260
Noise problem controlled by green buffer area	-0.028	0.404	0.282
Environmental friendly design and material used for neighbourhood construction	0.372	0.282	0.200
Natural heritage preserved during housing cons.	0.470	0.111	0.134

The neighbourhood elements which is scattered in few departments guideline without few important elements did not coordinated well and this makes the implementation stage even tougher. There were no single guidelines that can solve the problem in current practice. The need for a proper guideline that can include all the neighbourhood elements into one guideline need to be set up so that the reference can be evenly followed by all level planners whether in

federal, state or local level. The responsibility of the federal, state and local level agencies must be coordinated well to produce the proper sustainable neighbourhood plans. Each level of agencies needs to gather and fulfil the requirement of sustainable neighbourhood plans.

So, the urban sustainable neighbourhood elements need to be improved as soon as possible due to the current environmental problems in Malaysia especially in urban neighbourhood areas. The elements shall be studied carefully and arranged according to the need of sustainable urban neighbourhood. Under the current practice the elements were not planned properly as the involvement of the expertise lesser compared to the need of the planning. The research found that the neighbourhood elements need to be emphasised in the planning stage and also monitored in the implementation stage by the field expert from relevant authority.

3.2 National Planning Mechanism

The national planning mechanism was established based on the Town and Country Planning Act, 1976 (Act 172). There are 3 level of planning stage in Malaysia. The first level was the national level. In this level the JPBD of East Malaysia, will produce the National Physical Plan (NPP). The NPP Council were conducted with the association of Malaysian Prime Minister, Deputy Prime Minister and Ministers from few ministries, especially from Ministry of Housing and Local Government. They will produce the NPP for the usage of all state in Malaysia.

Then, in the state level, the State Planning Committee will produce the Structure Plan which is chaired by the Chief Minister of the state. The Structure Plan has considered all the recommendation from the NPP, so that the planning will be according to the country's planning policy. This document contains written statements and supported with maps and important data.

Finally, at the local level which is under the municipal level the City/Municipal Council will produce the Local Plan with proper maps and written statements. The local plans usually will be produced within the time frame of 10 to 20 years.

Urban planning activities need to look for ways to speed up processing and transparency in all scope of work. In Selangor for example, the need for faster and open planning approval process requires extensive and up to date data management. The city/municipal council may continue to integrate GIS as the core of the database system with proper advancements. Cooperation among various departments within the planners, developers and end users can help reduce

the development cost and time required to implement successful sustainable urban neighbourhood. However, there is still a need to educate and change of thinking among planning staffs as the need for environmental sustainability is very high and in demand. Whether it is spatial or attribute, both need dedicated management approach in handling them. The planning and data sharing must always be considered and encouraged given the interdependence of various departments within and beyond the city/municipal councils.

3.3 Neighbourhood planning practices

The current practices in neighbourhood planning were based on the municipal/city council neighbourhood residents need. In this case study area environmental concerns majority concentrates in land use pattern. The urban neighbourhood planners must incorporate the environmental, social and economical aspects into the design aspects to achieve the quality of life as proposed in Figure 7.1.

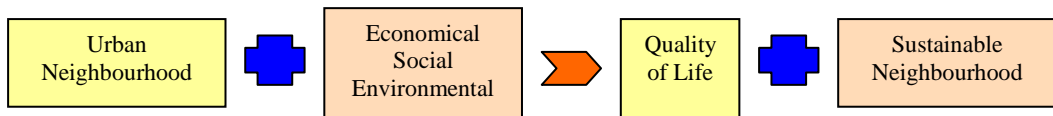


Figure 7.1: Sustainable Urban Neighbourhood

Based on review there need to be given much emphasis to the development of the local structure plan especially in adapting the sustainable neighbourhood elements into the planning stage. The elements such as open space, neighbourhood landscape, river, natural ponds, trees, green area, water retaining lands and all other important elements need to be incorporated into the current practice to create green infrastructure in the living area which indirectly help to cultivate sustainability principles.

Sustainable neighbourhood is an important concept that needs the fullest attention from the root of the community. The stakeholders and planners involvement in the implementation of sustainable living is highly accepted as it gives an adverse impact to the living environment. With the good planning guidelines and proper elements usage, the sustainable living of a community can

be achieved. To achieve healthy and save environment, the planning stage must be included with all the necessary sustainable living elements into the neighbourhood design. The elements arwhie important in neighbourhood design as it preserve the natural of the residential area.

Current discussion about sustainable living represents a push to encourage land development practices that incorporate sustainable living elements in neighbourhood open spaces and undeveloped land. These practices encourage more resource-efficient land use practices and neighbourhood environments while ensuring that development keeps pace with economic, social and environmental aspects.

3.4 Sustainable Neighbourhood Elements (SNEs)

The Sustainable Neighbourhood Elements (SNEs) were established to indicate the practice of sustainability in Malaysian neighbourhood. SNEs were the main findings in this study. The elements in urban neighbourhood were vital signs which can indicate the sustainable neighbourhood practice as stated in summarized Table 4. Under the sustainable development branch the economic, social and environment factors play major roles in creating the sustainability to the whole process.

The sustainable living lies under the sustainable urbanization and sustainable neighbourhood which is the researcher's area of concern stretch out from it. The Figure 2 shows the tree diagram of sustainable neighbourhood elements in the sustainable neighbourhood processes (Said, M. I. M., Zakaria, R. and Vikneswaran, M., 2009). SNEs were divided into two branches that are green space and grey space. The green space specifies all the natural and environmentally engineered elements which can create sustainability and healthy environment to the neighbourhood residents. Whereas the grey space can be identified as green infrastructures and structure which is built using green building materials or environmental friendly materials. Table 4 summarise the Sustainable Neighbourhood Elements (SNEs) according to their factors with the type of green space. The findings were very important to highlight the identification of urban residential area.

Table 4: Sustainable neighbourhood elements and the factors

Type of Space	Types of Elements	Types of Factors		
		Environmental	Social	Economic
Green Space > 10% (Retain Green identity)	Greenery can give aesthetic value to neighbourhood			√
	Green area important in neighbourhood area			√
	Sound buffer, air filtration and reduce CO2			√
	Sustainable living concept used as a tool for neighbourhood			√
	Greenery should be increased from current allocation			√
	Natural heritage preserved during housing construction			√
	Environmental friendly design and material used for neighbourhood construction			√
	Away from heavy traffic			√
	Design of neighbourhood		√	
	Design of house		√	
	Green recreational facilities		√	
	House price give satisfaction		√	
	Noise problem controlled by green buffer area		√	
	Commuting time reduced		√	
	Dust, smog and soot controlled with green area		√	
	Natural ponds	√		
	Wetlands	√		
	Playgrounds	√		
	Gardens	√		
	Tall trees	√		
Designed by preserving existing green area	√			

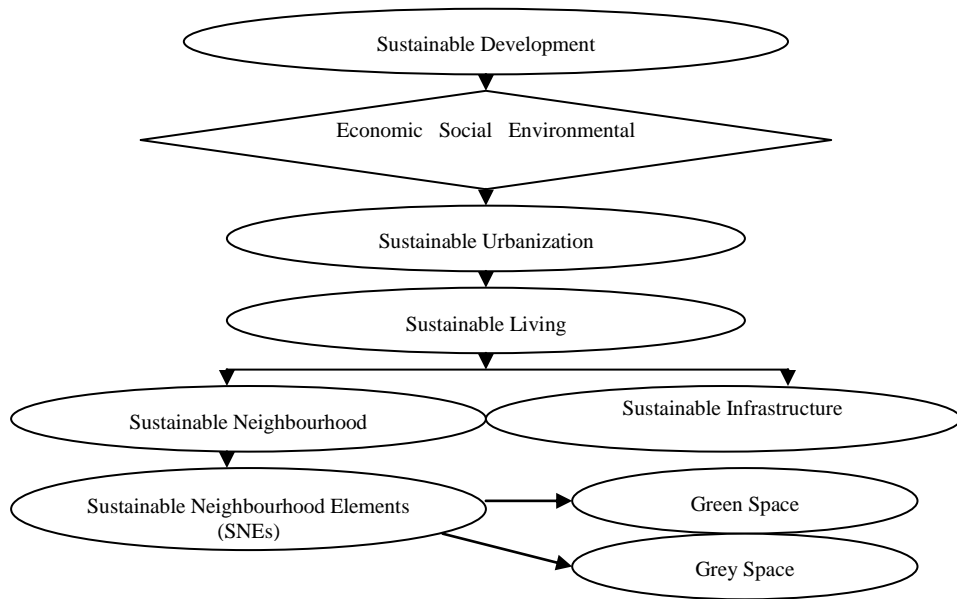


Figure 2: Tree diagram of sustainable neighbourhood elements

4.0 Conclusion and Recommendation

Cities and urban spaces are key elements for achieving sustainable living at the local, regional and global level. Since 1995 much effort has been spent on studying and developing sustainable living practices. Even though so much effort had been taken until now, but there need to be more focused documentation related to sustainable neighbourhood in Malaysian scenario. There is much effort on theoretical and technical knowledge on how to design resource efficient and environmentally sound buildings at the moment. But there are need to improve on producing guidelines for sustainable neighbourhood which can help to coordinate and get to more focused implementation in the local and national level.

Majority of the municipals concentrate in land use pattern development and industrial area. More systematic processes to plan preparation in their principal structure plans shall be adopted. They were largely depending upon past proposals, local problems, intuition and the outcome of statutory consultation to produce the structure plan. So this clearly emphasize that the current practice of planning and designing of neighbourhood were far from perfect. There were

major lack of practical advice on how to accommodate sustainability and quality of design issues within the planning process at a local level. Here the urban neighbourhood planners need to incorporate the environmental, social and economical aspects into the design aspects to achieve the best sustainable neighbourhood practice.

The natural landscape which is vital in the neighbourhood design, is also not properly maintained and there need an increment of natural landscape in the planning stage. Emphasis need to be given to the development of the local structure plan especially in adapting the sustainable neighbourhood elements into the planning stage. The elements such as open space, neighbourhood landscape, river, natural ponds, trees, green area, water retaining lands, siting, zoning and other elements need to be incorporated well into the current practice to create sustainability in the living area.

Furthermore, intensive efforts of co-operative branch organisations and top management within construction companies need to be raised to create general sustainability awareness among practitioners and stakeholders. There are also a large number of analytical environmental management techniques and tools that, for example, assess and monitor the environmental impact from the built environment and provide standardised guidance on what practices ought to be followed by DOE Malaysia and the Sustainable Assessment (SA) by JPBD Federal are few examples that need to be highlighted in the national level more seriously. Nonetheless, these efforts do not seem to have influenced the project practice and culture to any higher extent.

It was also found that the current efforts towards sustainable neighbourhood need more improvement as most of the guidelines and act were scattered among the ministries. So far the efforts have rather contributed to a perspective where environmental concerns have been narrowed down to a few targeted groups of people only. This means that environmental issues tend to be dealt with piecemeal rather than as part of an integrated and holistic picture, missing out on the holistic nature of environmental concerns.

To assist planners and the other actors involved in the planning process, Sustainable Neighbourhood Elements (SNEs) has been developed based on the current need which urban designers can manipulate. It must be stressed that SNEs are preliminary and are not finalised in detail. Their role is to act as a catalyst in introducing new ideas into the planning and urban design process. It is intended that they will involve and be refine as part of interactive process in their practical application and as new research on the various topics becomes available. SNEs have been developed as an agenda which may be used in planning process. The most appropriate solution will depend on the given solution, and the views of the various stakeholders in the locality.

The aim is to make the planning process more transparent and explicit, aiding participation, reducing the apparent uncertainty of the system and potentially making decision-making quicker. The SNEs are intended to be used in sequence, moving through from the broader guidelines which aid the selection of settlement sites, through to those patterns of elements which create the structure of the settlement and those which guide the design of individual plots and buildings.

Sustainable neighbourhood is an important concept that needs the fullest attention from the root of the community. The stakeholders and planners involvement in the implementation of sustainable living is highly accepted as it gives an adverse impact to the living environment. With the good planning guidelines and proper elements identification, the sustainable living of a community can be achieved. As stressed before the development pattern in Malaysia must be coordinate with the Malaysian National Policy on Environment. The planning and design stage must be included with all the necessary sustainability tools into the neighbourhood planning and design. Implementation of certain elements was in par with the neighbourhood design but the perpetuation is still need to be improved. The sustainability concept needs to be introduced in the urban neighbourhood area to filter all sort of pollution that impacts the living environment. Economic, social and environmental aspects must be fully integrated and acquiescent in the sustainable development policies of urban living areas, as reflected in the concepts of the sustainable neighbourhood.

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