



# A Conceptual Review of Green Neighbourhood Adaptive Model for Urban Living

Puziah Ahmad<sup>1</sup>, Alamah Misni<sup>1</sup>,  
Siti Mazwin Kamaruddin<sup>1</sup>, Nurazureen Daud<sup>2</sup>

<sup>1</sup>Faculty of Architecture, Planning and Surveying,  
Universiti Teknologi MARA, Puncak Alam, Selangor Malaysia

<sup>2</sup>Faculty of Architecture, Planning and Surveying,  
Universiti Teknologi MARA, Shah Alam, Selangor Malaysia

puzia892@salam.uitm.edu.my, alamahmisni@gmail.com, sitim065@salam.uitm.edu.my

## Abstract

Green Neighborhood can be defined as a neighborhood area that meets the needs of peoples' daily activities and allows communities to control pollution, save energy, increase employment, decrease crime rates, develop friendships, practice on-site renewable energy methods and preserve agricultural and environmentally sensitive areas. In such an environment, people make easy access to their home, workplaces, public facilities, transit facilities and green spaces within a comfortable walking scale. The guidance is aimed at assisting local authorities and agencies to implement five (5) selected green neighborhood initiatives; Provision of Pedestrian Walkway, Provision of Bicycle Lane, rainwater Harvesting System, Waste Composting and Community Farming.

Keywords: green neighbourhood; environment; community; comfortable

eISSN 2398-4295 © 2019. The Authors. Published for AMER ABRA cE-Bs by e-International Publishing House, Ltd., UK. This is an open-access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>). Peer-review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers), ABRA (Association of Behavioural Researchers on Asians) and cE-Bs (Centre for Environment-Behaviour Studies), Faculty of Architecture, Planning & Surveying, Universiti Teknologi MARA, Malaysia.  
<http://dx.doi.org/10.21834/ajbes.v4i15.167>

## **1.0 Introduction**

Environmental issues are undoubtedly the challenge of the 21st century. Climate change brings the need to seriously reconsider the way cities are designed. Ongoing urbanization and the relatively larger environmental footprint of urban inhabitants have resulted in the recognition of cities as being of fundamental importance for ambitions to achieve overall sustainable development. In fact, cities now find themselves at the very core of the “Green Revolution” as one of the main components for achieving sustainability. As a result, several urban initiatives are being put forward to make cities greener, healthier and more eco-friendly. One of these is the concept of “Green neighbourhood”, which is an attempt to connect urban sustainability principles with micro-level community planning. Discourses on sustainable neighborhoods have considered the variety of tools and approaches of establishing green cities, metrics of evaluation, and the process of attuning the ecologically complex urban situation and enhancing beautiful environments to be part of the process.

### **1.1 Background**

Sustainability is a relationship that people have with natural resources. Sustainability is a practice. The challenge of green neighborhoods regards how evolving sustainable practices are attached with the forms, technologies, and processes of 21st-century sustainable cities. This is not a cultural change made necessary by the negative impacts of global warming. It is rather, a creative opportunity to enhance the living environment. It is also an effort to practice the green neighborhood for environmental, human rights as the basis of intergenerational environmental justice. Due to the environmental inequality where more vulnerable communities in neighbourhood environment are more likely to be exposed to higher air pollution levels is well attested by studies from many parts of the world (Jerrett et al., 2001; Marshall, 2008; Richardson et al., 2013). Neighborhoods are the building blocks of cities. It is an imperative act to improve neighborhood sustainability by considering the buildings, public spaces, infrastructure, and integration among the components. It is a well-known fact that global climate change has implications on health, weather-related mortality, infectious diseases, air quality respiratory illnesses, crop yields, forest health and productivity, water supply and quality. Hence the negative implications of climate change will ultimately impact human quality of life in general.

### **1.2 Aim, Objectives, and Method**

The aim of this paper is to explore an adaptive model of a framework for a green neighborhood in the Malaysian context. The objectives are specifically for identifying factors relevant to the green neighborhood; reviewing and comparing the framework using the method of content analysis; and providing the adaptive framework that is relevant and adaptive to the local Malaysian scenario.

The study adopts the literature scoping and reviewing and various level of content analysis before arriving at the proposed adaptive framework and model for the green neighborhood for an urban living application. Neighbourhood level is the unit of study to ensure its closeness to the community and a natural scale for urban and non-urban settings.

### **1.3 Definition**

The mental borders of the neighborhood can be defined by residents. Residents' perception can be used to map the boundaries of neighborhoods (Hugh Barton, Grant, & Guise, 2003 in Sharifi Ayyob, 2013). Friedmann (2010) defines the neighborhood as "the area that neighbours acknowledge as their home or, as sociologists would say, as their primary space of social reproduction". Federal Department of Town and Country Planning (2011) defined a green neighbourhood as an area planned and designed in an integrated manner with the priority given to protection and consumption of natural resources with the application of green technology and recycling.

Sustainability refers to the ability to preserve and retain. According to Luederitz et al. (2013), sustainable planning is urgently needed due to deficits in environmental quality, loss of plant and animal species, and climate change. Zone of sustainability is the union of economic, environment and social factors (Salonena & Åhlberg, 2013).

## **2.0 Factors that contribute to green neighbourhood**

The green neighborhood is one of the important elements in the sustainable city to increase economic, environment and social quality in the area. In designing green, sustainable city, proper planning and implementation are required. A Proper consideration for a future greener environment needs to be prioritized based on all the below factors:-

### **2.1 Walkability and connectivity**

Green, walkable zone designs are necessary to preserve greenery and reduce carbon emission (Park et al., 2013). According to Krambeck (2006, in Park et al., 2013), the main factors to be taken into account in green, walkable zone designs are safety and conduciveness of walkable area for pedestrians. When people walk, the use of motor vehicles is less, thus reducing carbon emissions. Furthermore, walking is healthy, and it fosters social interactions among residents.

### **2.2 Safety zone**

Safety is being safe from any danger, harm or risk that can be prevented from happening (Ding et al., 2014). In a neighborhood, security is crucial to improve social life (Annerstedt et al., 2012). Cochrane et al. (2009) highlighted factors such as road, the traffic condition and the influence of illegal activities on community events.

### **2.3 Green infrastructure**

People's perception of a green neighborhood is dependent on the quality of its infrastructure. A park is a recreation place for people and a habitat for wildlife. Park et al. (2013) highlighted the infrastructure elements which include sidewalks, shops, kiosks, sidewalk furniture, trees, electric wires, street lighting and parking spaces.

### **2.4 Mixed use development**

Mixed-use development is a mixture of land uses with many different functions of buildings. Figure 1 shows the mixed-use development of residential, workplace, shopping mall,

recreational and educational facility in one neighborhood, and mono use. With the implementation of mixed-use development, the city will be more livable and can sustain the environment.

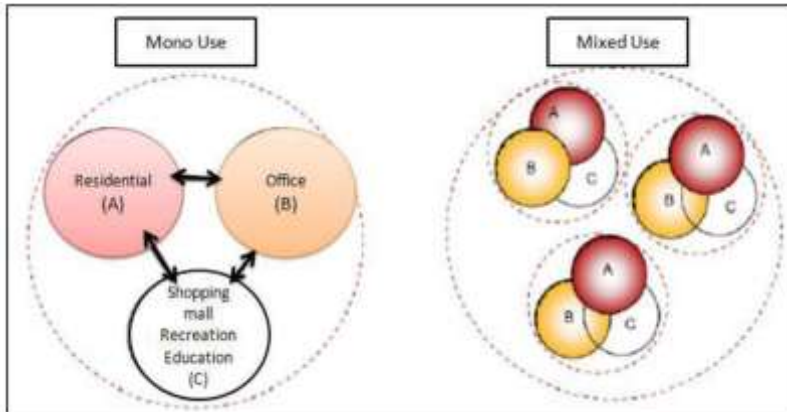


Figure 1: Mixed use and mono use neighbourhood development  
(Source: Arshad, 2012)

Arshad (2012) proposed vertical mixed development where the ground floor is for retail, the middle is for office space, and the upper part is for residence. Rosly and Hashim (2011) stated that one-floor area should fill-up at least 15% of a building for the business purpose. On the other hand, education facility should be located at the corner of the neighborhood so that everyone can have equal access.

### 3.0 Framework of green neighbourhood application

The objectives of the framework provide national consistency and a common language around the definition of best practice, sustainable communities, encourage innovation and excellence in our approach to creating communities of the future. The reference framework for green neighborhood city towards sustainability are as follows:-

#### 3.1 Mitigate climate change

Cities emit significantly and growing amounts of greenhouse gasses (GHGs) – accounting for 37–49% of total global GHG emissions (IPCC 2014). The International Energy Agency's projections indicate that urban energy-related GHG emissions will rise from around 67% today to 74% by 2030 (IEA, 2008). Cities implement their plan through - using their planning and taxation powers, - increasing energy efficiency on their building stock and more generally in the public realm, - encouraging local renewable energy sources and energy efficiency, - developing innovative financing instruments with private and public partners.

#### 3.2 Protect, restore and enhance biodiversity and ecosystems

Over the past 50 years, ecosystems have changed more rapidly and extensively than in any comparable period in human history. Globally, populations of fish, birds, mammals, amphibians, and reptiles have declined by 52% since 1970; and freshwater species have suffered a 76% decline – an average loss almost double that of land and marine species. The basis of the approach is the four pillars of identifying green and blue “corridors” and “nodes” of the green infrastructure to be protected from development. This includes avoiding urban sprawl and soil sealing by improving the quality of life in urbanized areas and taking financial measures to promote brownfield regeneration.

### **3.3 Reduce pollution**

Since the start of the industrial revolution in the 19th-century, environmental pollution has grown into a global transboundary problem that affects air, water, soil and ecosystems, and is linked directly to human health and wellbeing. The urban population is exposed to a high level of fine particles, ozone, nitrogen oxide and mutagenic “polycyclic-aromatic hydrocarbons” concentrations resulting from the concentration of population and activities, especially through the burning of fuels for heating and cars and lorries. Citizens are exposed to volatile particles and present carcinogenic effects.

### **3.4 Adapt to climate change**

Rising sea levels, inland floods, and extreme weather events – in particular, increased heat – as well as increased droughts, often associated with water scarcity and air pollution, and the potential spread of diseases can have widespread negative impacts on people’s health, livelihoods and assets. Cities are highly vulnerable to climate change, due to their high concentration of population and economic activities, public services and infrastructures. Local governments play an important role in adapting to existing and emerging threats facing their cities.

### **3.5 Natural resources sustainable management**

Resource-efficient cities combine greater productivity and innovation with lower costs and reduced environmental impacts. The sustainable management of natural resources and materials and waste prevention is a key to the transition towards a green economy with the success of sustainable produced goods and services and the ensuing cost reductions. They are essential of the following nature: – organize separate collection and recycling of plastics, bio-waste, glass, cardboard packaging, paper, – organize the recycling, upcycling, composting of collected products, – develop specific actions targeted to the building sector, – encourage sustainable practices in forestry, agriculture, fishery and extractive activities, – develop specific actions to protect the services offered, – protect energy, clean air, and water resources, and – encourage the shift from “consumer” to “user” and from “owner” to “share.”

### **3.6 Protect, preserve and manage water resources**

Water resources are under increasing pressure in many parts of the world including in Malaysia. If agriculture is the leading source of pollution and water consumption, cities also have a role to play in: – maintaining and developing the vegetation cover and more generally

avoiding soil sealing. A fully functioning soil stores 400mm of precipitation per hectare. – ensuring excellent wastewater collection and treatment. – protecting wetlands and river basin from urban development.

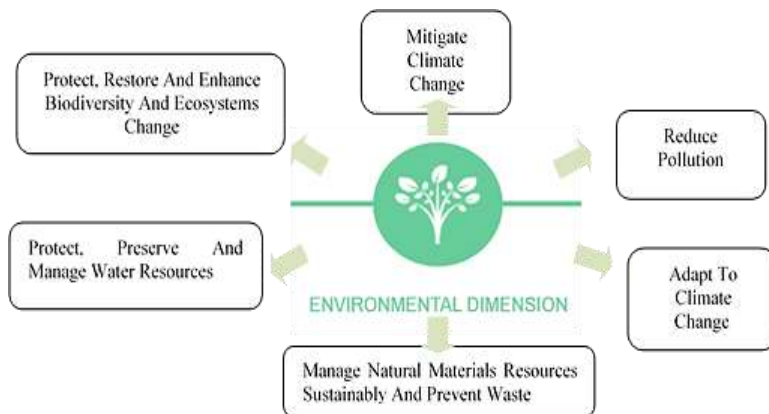


Figure 2: Management of renewable resources

(Source: Adapted from *The Reference Framework for Sustainable Cities: 5 Dimensions and 30 Objectives for a European Vision of Tomorrow's Cities*, (2017))

#### 4.0 Comparative analysis of framework

Green neighbourhood as being discussed extensively in the literature can be divided into three main agendas namely sustainability, global climate change and design and planning application. The content analysis depicts the below patterns of argument with subjective and objective implications.

Table 1: Sustainability Agenda

Sustainability Agenda	Criteria	Subjective and Objective Impacts	Evaluation remarks
Sources: EU, Denis(2011), International Energy Agency(2014), Girardet(2009).	Economy; Society well-being; Environmental concerns	Community economic development; Social capital development and quality of life; Protection of biodiversity, renewable and non-renewable resources.	Valid and positive; sustainability as a common goal for the better future for all is widely accepted but the implementation of the ideas seems crawling in the development agenda.

Table 2: Climate Change Agenda

Climate Change Agenda	Criteria	Subjective and Objective Impacts	Evaluation remarks
Sources: EU Vision, IEA(International Energy Agency(2014),	Reduce pollution emission;	Increase and improve measures of mitigation in natural resources protection and add mechanisms	Valid and positive ; previously the climate change agenda looks unimaginable to be installed in reality.

IPCC(International Panel of Climate Change, 2014), Park et al (2013).	Mitigation measures; Protection of land, water and air resources; Safeguarding biodiversity and ecosystem	preventing further damages of climate change; Protection of biodiversity, renewable and non-renewable resources.
---	---	--

Table 3: Design and Planning Application

Design and Planning Application	Criteria	Subjective and Objective Impacts	Evaluation remarks
Sources: EU Vision, JPBD(Jabatan Perancang Bandar dan Desa, Semenanjung Malaysia, Park et al (2013), Arshad (2012), Ng et al (2012), Qureshi & Ho, 2011).	Walkability and connectivity; green infrastructure; safety zone; mixed use development; street network; streetscape; neighbourhood design; public open space ; neighbourhood centre.	People-friendly design; Safe and protection of human being, flora and fauna; comfort; Positive interaction among inhabitants, less pollutants; meeting the needs of daily life; sense of community and increase quality of life.	Valid and positive; Built environment started with panning and designing with the visions of the doer rather than the agendas for the community at a small unit; Visioning the people as the end receiver would change the whole planning and design paradigm.

The above comparative analysis enhances the importance of the integration of the agenda in the green neighborhood to ensure its comprehensiveness and inclusive in nature and encompasses the good and valid agenda in the making. Thus the elements are equal threats in the dimension of criteria evaluation and assessment of the green neighborhood.

## 5.0 Proposed model of an adaptive model of green neighbourhood

The proposed model absorbs three main agendas as being widely discussed and argued in the literature by various experts, professionals, and researchers around the world. It embraces the agenda of sustainability, which targets the importance of safeguarding of present and future generation on the pertaining issues of environment, society, and economy. Green neighborhood established the nexus of sustainable agenda in its end product for the well-being of human beings, flora and fauna and the world's inhabitants. Reduction of pollution, carbon footprint, consumption of resources and protection of biodiversity some of the factors that consequently impact the global climate change. The two criteria mentioned earlier should embed to design and planning application in details of planning and designing aspects. This includes built environment components in a neighborhood such as an infrastructure, pedestrian, walkways, buildings, street network, landscaping and vegetation cover.

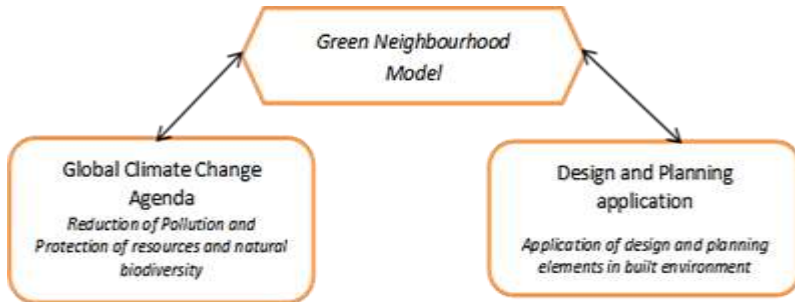


Figure 3: The proposed model for green neighbourhood

## 6.0 Conclusion

The integration of micro and macro level of criteria is the essence in the green neighborhood agenda. It is paramount for the future decision makers, planners and designers adopt and implements the noble idea of seemingly global in nature to the small scale application as in the green neighborhood. The small and community-based green neighborhood are the real impacts on the ground that portrays the application and indicates the success or failure of the implementation. This indication provides vital information for further improvement and cycle of continuous upgrading the built environment for a better world in the future. Future research will focus on the impacts and application in zoom in application and assessment on the ground on the neighbourhood scale for further enhancement of green neighbourhood agenda.

## Acknowledgement

This research was supported in part by LESTARI Grant, Research Management Unit of Universiti Teknologi MARA (UiTM) (600-IRMI/DANA 5/3/LESTARI (12/2016)).

## References

A. Martos, R.Pacheco-Torres, J.Ordonez, E.Jadraque-Gago, (2016), *Towards Successful Environmental Performance Of Sustainable Cities: Intervening Sectors*. Department Of Engineering Construction And Project Management, University Of Granada, Spain.

Andras Reith and Melinda Orova, (2015), *Ecological Indicators: Do green neighbourhood ratings cover sustainability?*, 48 (2015) 660–672, ABUD Engineering Ltd., 29. Lónyay St., Budapest 1093, Hungary.

Caroline Bergelin, Ayehlet Cooper, Desirae Hoffman, Fan Huang, Marcus Jones, Daniel Power, Julia Raskin (2012), *Creating Sustainable Neighborhood Design for Legacy Cities: A New Framework for Sustainability Assessment*.

Comparative Analysis of Material Criteria in Neighborhood Sustainability Assessment Tools and Urban Design Guidelines: Cases of the UK, the US, Japan, and Korea, (2016), retrieved on 15 November at



[www.mdpi.com/journal/sustainability](http://www.mdpi.com/journal/sustainability).

Gary Haq and Anne Owen, (2011), *York Green Neighbourhood Challenge A Targeted Social Marketing Approach for Community Pro-Environmental Behavioural Change*, Stockholm Environment Institute.

Green Healthy Neighbourhood Part 2 and Part 3, (2017), City of Chicago.

Ideal Neighbourhood Indicators (2017).

International Panel on Climate Change (IPCC), (2014), UN.

Jiyoung Park and Jungwon Yoon, (2015), *Sustainability : Comparative Analysis of Material Criteria in Neighborhood Sustainability Assessment Tools and Urban Design Guidelines: Cases of the UK, the US, Japan, and Korea*.

MIP, (2011), Federal Department of Town and Country Planning Department, Guideline and Framework for Green Township In Malaysia.

Nicola Wheeler, (2011), *National Housing Federation, Greener Neighbourhoods: A good practice guide to managing green space*, The University of Sheffield.

Raji Banani, Maria M. Vahdati, Mehdi Shahrestani, Derek Clements-Croome, (2016). *The development of building assessment criteria framework for sustainable non-residential buildings in Saudi Arabia*, School of the Built Environment, University of Reading, UK.

S. Nurul Akmal, Z. Rosilawati, A. Faizah and M.N. Norzailawati, (2014) *Factors that Contribute to Green Neighbourhood*, *International Journal of Property Sciences Vol. 4 Issue 1*, Department of Urban and Regional Planning, Faculty of Built Environment, University of Malaya, Kuala Lumpur, Malaysia.

Sharifi Ayyoob, (2013), *Sustainability At The Neighborhood Level: Assessment Tools And The Pursuit of Sustainability*, Department Of Environmental Engineering And Architecture Graduate School Of Environmental Studies Nagoya University.

Tavel, Michael., (2012). *Climate Responsive Urbanism. In Neis, Hans Joachim et. al, (Ed.), Generative Process, Patterns, and the Urban Challenge*. Portland, OR: PUARL Press.

The EcoDistricts™(2013), Framework: Building Blocks of Sustainable Cities.

The Reference Framework For Sustainable Cities, 5 Dimensions And 30 Objectives For A European Vision Of Tomorrow's Cities, (2017).

Wangel, J. et al.(2016), *Environmental Impact Assessment Review* 56 (2016) pp. 200–213.