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Review, Rethink, and Reconsider Human-Nature Interaction in the Urban Context

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Abstract

Human and nature are intimately linked with each other. However, such relationship is changing as a result of the drastic changes brought by rapid urbanization in the last few decades. This leads to the necessity in redefining and re-exploring the human-nature interaction, particularly in the urban context. By taking the lowland dipterocarp forest in a highly urbanized region in Malaysia—Klang Valley, as the topic of discussion, this chapter examines and discusses how human-nature interaction can vary with regard to different degree of naturalness. Having an understanding on such relationship is important as it can help in formulating a more compelling conservation goal that keeps both human and nature intact while at the same time appealing to and accepted by a wider range of audience.

Keywords: forest, naturalness, human-nature interaction, urban, quality of life

1. Introduction

Ecosystem is intimately linked to human well-being throughout human history [3]. Human depend on the services provided by ecosystem for their sustenance, livelihoods, and survival. Evidence shows that more than 1.35 billion people, in which many of them living in the indigenous communities or inhabit some of the biologically richest and most threatened areas on Earth, are depending on continued access to basic necessities provided by those ecosystems such as clean air and water, food, fuel, clothing, medicine, and shelter for fulfilling their physical, economic, and spiritual well-being [6]. Nevertheless, there is a sign of disengagement of humans from the natural environment in the last few hundred years, due to the enormous shift of people away from rural areas into cities [9]. According to the United Nations Population Division [19], more than 48% of people worldwide live in urban areas

currently, and it is projected to exceed 60% by 2030. Some developed countries have exceeded this figure. For example, in the USA, half of the population live in suburbs and an additional 30% live in urban centers (U.S. [21]); while in the UK, about 90% of the citizens live in cities [20]. A rapidly growing country like Malaysia is projected to reach 70% of the total population that live in the urban area by the year 2020 [7].

As this shift took place, human beings started to redefine their relationship with the natural world, where too often the nature is considered as expendable and the ecological processes that sustain us are hidden from view [11]. In a highly urbanized region, for example, the ways that urban dwellers have contact with the natural environment are through viewing the nature, spending leisure-time in the nature, or involving themselves in environmental conservation issues (**Figure 1**).

Their daily life, in terms of economic and social-cultural, is more likely influenced by the built environment than nature. Besides, in contrast to the rural or indigenous communities that depend largely on the provisioning services (food, jobs, raw materials, shelter, etc.) supplied by the natural environment, urban dwellers have much freedom of choice in finding substitutes for those services. Moreover, there are trade-offs between ecosystem services, in which different priorities are given to different ecosystem services in order to maximize the well-being of the urban dwellers. Therefore, disconnection may probably occur between certain ecosystem services and urban dwellers' well-being, and it is not surprising to find out whether the natural environment is not being considered as a main contributor to the urban dwellers' well-being.

The direct consequence of such disconnection is the intensified estrangement from the nature [11] and the gradual loss of people's appreciation to the nature regarding their reliance on the

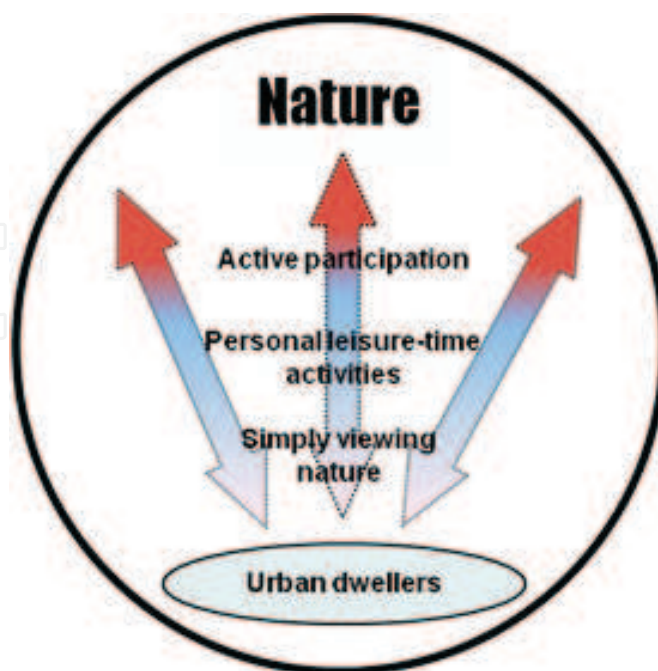


Figure 1. Ways of contact with nature from an urban community's perspective. Source: Adapted from [17].

natural environment [15]. This phenomenon was described by Pyle [14] as the “extinction of experience” syndrome, which is the formation of apathy towards environmental concerns as a result of people’s alienation from the nature due to the homogenization and reduction of local flora and fauna in their living place, following the quickening pace of artificial surface replacement and the permanent loss of a bunch of valuable natural habitat. However, as a species that has spent most of its existence hunting, gathering, and/or growing food, it is doubtful that human have been able psychologically to remove themselves from the nature [12].

It is believed that there is universal inborn human desire to re-establish the tenuous link with nature, which is referred to as biophilia by Wilson [23], a term to describe both negative and positive responses to elements of the nature that had survival value to our evolutionary predecessors. Although recent human history is characterized as a gradual shift from living in rural to living in cities; whenever there is a chance, most people would prefer to live close to the nature (i.e. waterfront, green park) because through human evolutionary past, the nature had survival value for obtaining food and water. Moreover, with the increasing knowledge and information about natural science and environmental issues, particularly the adverse impacts caused by human technology to the living system, people become more aware of their reliance on the biosphere. Consequently, this leads to the shift in values and perceptions of human-nature relationship. As the values shift to a more holistic perception of people’s relationship to nature, so will the people’s expectations shift to a greater desire to complement their urban lifestyle with elements of nature [12].

In this chapter, human-nature interaction in the urban context is explored by taking the lowland dipterocarp forest in a highly urbanized region in Malaysia—Klang Valley, as a topic of discussion. The chronology of the lowland forest degradation in the Klang Valley is reviewed first. Then, the challenges with regard to forest conservation from the national, state, and local level are discussed. Finally, the chapter is devoted to understand how different natural attributes of the urban nature may have influences on the human-nature interaction, thereby affecting people’s responses and expectations they placed on these remnants. The data used in the discussion include both primary and secondary sources, ranging from local community questionnaire survey to regional demographic, real estate, and land use statistics.

2. Lowland forest ecosystem and regional development in Malaysia

The lowland forest, or more precisely, the lowland dipterocarp forest (since it is mostly dominated by trees from the *Dipterocarpaceae* family) is one of the most complex, dense, and species-rich forests. These forests form a green girdle right around the Earth’s equator, representing the epitome of plant development below 300 m above sea level (**Figure 2**). On one hand, it has great value for wildlife conservation and scientific research; on the other, it is the type of forest that is under enormous threat due to its value for commercial timber extraction.

The contribution of lowland forest ecosystem to the regional development was mostly through providing land and forest resources (mainly timber). According to Vincent and Hadi [22] on the relationship between deforestation and agricultural expansion in Peninsular Malaysia, the

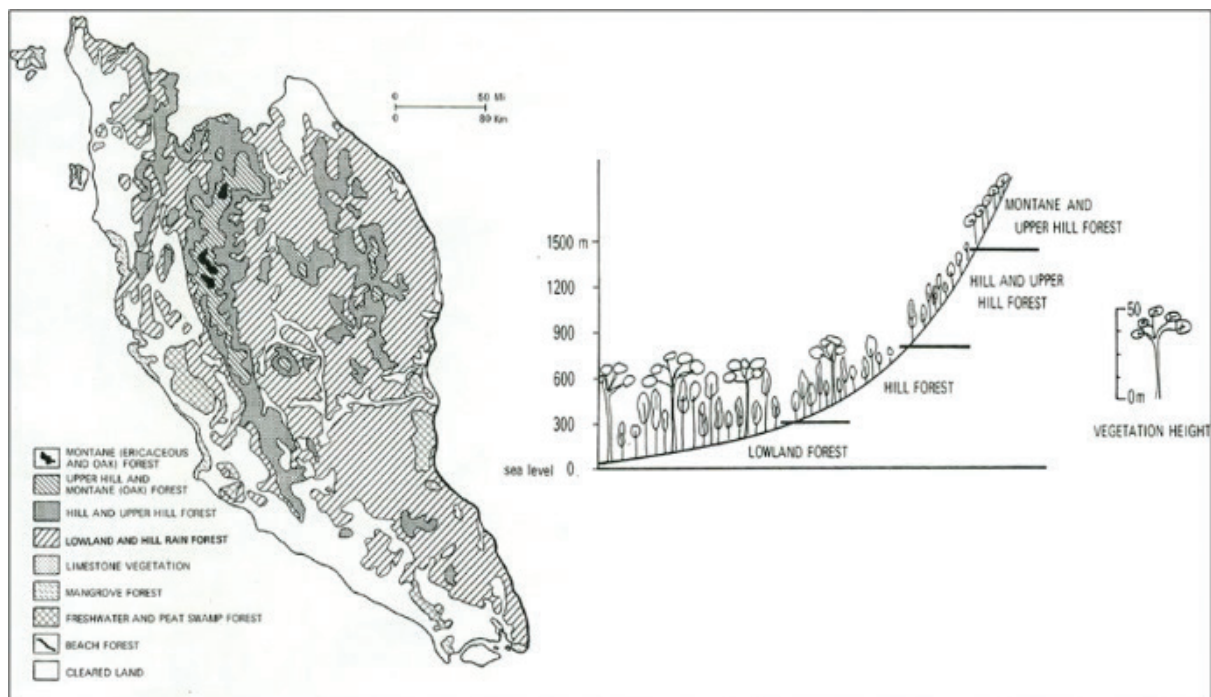


Figure 2. Varying forest structure with elevation in Peninsular Malaysia. Source: Adapted from [1].

agricultural expansion in the peninsula has gone through three distinct phases. The first phase (1904–1932) depicted the boom in rubber planting, where an annual average of 49,000 ha was opened up during this period for rubber estate. The second phase, between 1932 and 1966, saw the agricultural expansion slow down to an annual average of 24,000 ha, whereas the third phase (1966–1984) illustrated a renewed rapid agricultural expansion, at an average of some 57,000 ha a year, where the extensive tracts of natural forests have been cleared especially for the oil palm planting, which increased to some 1.12 million ha during the same period. As a whole, a total of 1.36 million ha of forests were lost to other uses from 1966 to 1984.

The conversion of forest into agricultural land use was intensified with the existence of the Federal Land Development Authority (FELDA). Established in 1956, FELDA has been the principal land development agency in the peninsula, where it has played a key role in transforming virgin forest land into plantations and settling landless families. By providing a package of physical, social, and technical infrastructure aimed at bringing the technological strengths of the plantation sector to smallholder agriculture, FELDA has successfully addressed rural poverty in the peninsula. Since its establishment, FELDA has developed over a million hectares of agricultural land, with over 70% planted with oil palm. FELDA's strategy was to develop forested land into viable plantations to settle landless families. Clearly, FELDA's impact on land use has been considerable, and the figures are somewhat impressive.

Apart from providing land resource for further development, natural forest was also an important source of log input for the domestic primary timber processing industry. The contribution of timber industry to the nation's economy had gained importance since decades

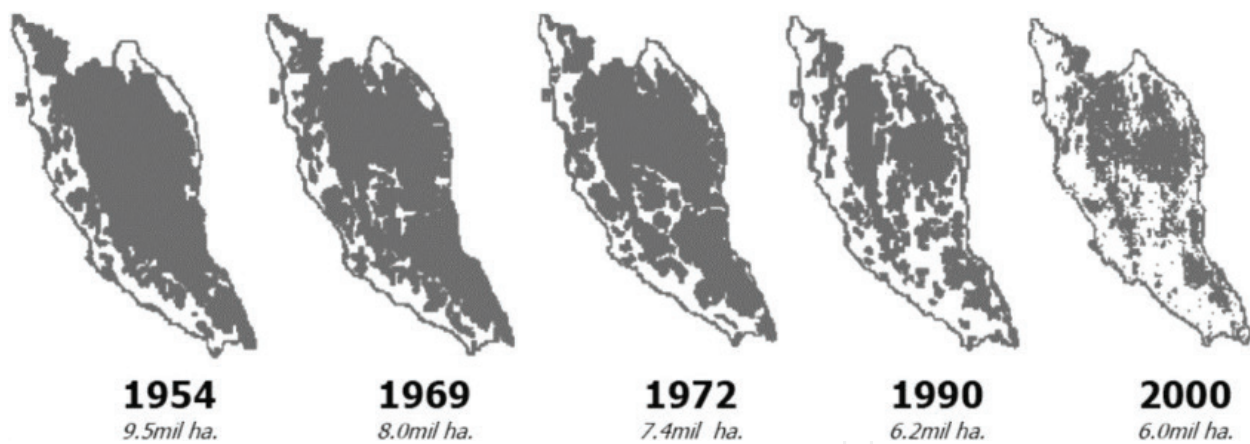


Figure 3. Fragmentation of natural forest cover in Peninsular Malaysia, 1954–2000. Source: National Physical Plan 2, Federal Department of Town and Country Planning.

ago. For example, in 1985, the export earnings from the timber sector were US\$ 1.9 billion and further increased to US\$ 5.4 billion in 1994, which accounted for about 9% of the nation's export earnings. In 2005, the total export of timber and timber products was valued at RM 21.51 billion or 4% of the country's total export earnings of RM 533.79 billion. In fact, in the same year, the forestry sector in Malaysia accounted for about 8.2% of the country's GDP of RM 262.17 billion and provided direct employment to 270,670 persons, representing 2.6% of the country's workforce [18].

As like other developing countries, the degradation of forest ecosystem in Peninsular Malaysia indicates a typical example of the excessive demand for ecosystem services stemming from economic growth, demographic changes, and individual choices. In another word, it is the trade-off being made from one service (provision of natural resources) to another service (ecological function). Under the impact of modernization, large area of forests has been whittled away in order to provide food (as forests turned into agricultural land), raw materials (such as timber), and land for the rapidly urbanizing population (**Figure 3**). Such fast disappearing of forest cover in Peninsular Malaysia has once worried Marshall [10], who expressed his concern by stating that "Nothing may remain of the lowland-dipterocarp forests by 1990 if deforestation continues in such ever-increasing rate." To date, the densely populated areas in Peninsular Malaysia today have less natural forest. The so-called undisturbed forests can only be found on the mountain or hilly areas, while most of the remaining lowland forests are either disturbed or secondary forests [13].

3. Development pressure and degradation of Forest ecosystem

Being one of the highly urbanized regions in Peninsular Malaysia, Klang Valley (**Figure 4**) has been undergoing dramatic transition in both demography and economics. One of the most outstanding features of urbanization in Klang Valley is the dramatic growth and dominance of the Kuala Lumpur city, and the strengthening of its influence within the settlement system

of the Peninsular Malaysia. As the country's capital, Kuala Lumpur first emerged in the late 1850s as a small trading port serving the tin mines in the Klang River Basin. With only a population about 2000 in 1870s, Kuala Lumpur further grew into a city as a result of the mining boom in the river basin and the successful development of rubber plantation in its surrounding areas. Continuing economic growth and modernization have made the city becoming more vital of its role as a political, administrative, and cultural significance in the country; and eventually, in 1974, Kuala Lumpur was proclaimed as a Federal Territory, together with the extension of its boundary from the original 93 to 243 km².

Klang Valley is formed as a result of spill over development of Kuala Lumpur to its surrounding areas. Originally, "Klang Valley" refers to the conurbation that embraces the Federal Territory of Kuala Lumpur, the dormitory-industrial city of Petaling Jaya, the Selangor state capital—Shah Alam, and the Klang city where Port Klang is located. But, throughout years of urbanization and the emergence of other new towns adjacent to the Kuala Lumpur-Port Klang development axis, the term "Klang Valley" eventually represents the combination of Kuala Lumpur and the other four surrounding districts of Selangor state – Petaling, Klang, Gombak, and Hulu Langat, with a total area of 424 km² and a population of nearly 6 million in 2010. Extensive land use change associated with the increasing urbanity has systematically seized the limited green area. Much of the original forest cover has been replaced by urban land use, and development has even encroached into the foothills [24]. Nearly 60% of the land in the region has undergone at least one change in land use from its original natural forest state as early as 1986, in which the major conversion has gone to the commercial plantation, followed by built-up area and mining.

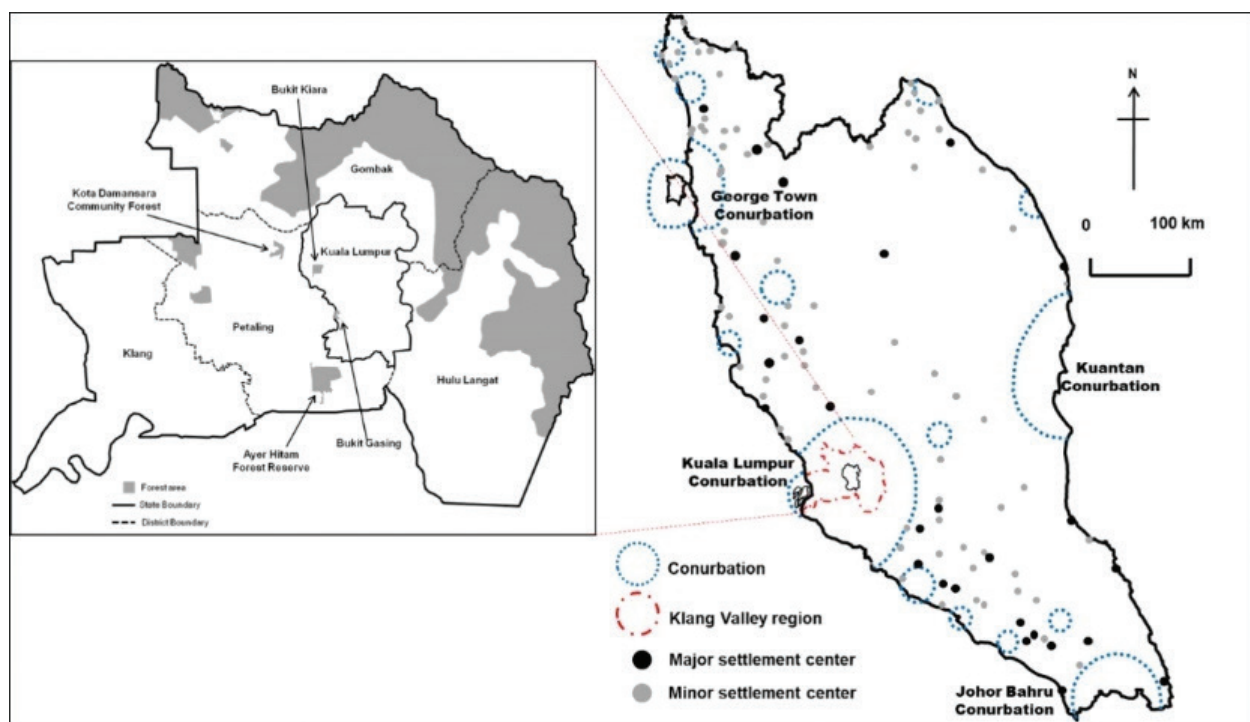


Figure 4. Location of Klang Valley and other conurbations in peninsular Malaysia.

The lowland forest in Klang Valley region was fragmented and further downsizing, and eventually sandwiched by the residential and commercial area. Only a few sites of small parcel lowland forest left in this region (<2% of the total land area), and all of them are located within the highest population density part of the region - Petaling district, facing the threat from housing development in their surrounding areas. For example, the Kota Damansara Community Forest (gazetted as forest reserve in 1898) located in the midst of Petaling Jaya, a satellite city of Kuala Lumpur, once sprawling over 6590 ha, has shrunk steadily over the years, where now only 321.7 ha is left. Parcel by parcel of forest land had been first converted into rubber plantations, and then into oil palm estates. While in the last 15 years, those parcels are mainly for the development of residential houses. Another typical example is the Ayer Hitam Forest Reserve (gazetted as forest reserve in 1906) located in Subang Jaya—a residential town in the Petaling district, where hectares of land from the forest reserve has been gradually converted into different uses, from originally 4270.7 ha in 1906–1176 ha in the present.

4. Challenges for lowland forest conservation in Klang Valley

The conservation value of the lowland forest is undeniable, and perhaps, invaluable to some extent. There have been a number of studies on the uniqueness of lowland forest in Peninsular Malaysia, such as those conducted by Forest Research Institute Malaysia (FRIM) at Pasoh Forest Reserve and at Ayer Hitam Forest Reserve by University Putra Malaysia. However, knowing the value of the forest is not enough as the intensity of the value is subject to change with different scales.

From the national point of view, 55.2% of Malaysia is still covered by forest in 2008, where 44.4, 57.4, and 65.5% of the Peninsular Malaysia, Sabah, and Sarawak are forested, respectively. These figures are arguable as they only give a general view of forest hectareage, regardless of the types of forest found in Malaysia such as lowland dipterocarp, hill dipterocarp, upper hill dipterocarp, oak-laurel, montane ericaceous, peat swamp, and mangrove forest; which lead to the conclusion that the country is still “green.” Furthermore, Malaysia has been recognized as one of the 12 megadiversity countries in the world by the 2001 Global Diversity Outlook as the country contains at least 60% of the world’s known species. States that have been listed as the main areas for endemism are from the East Malaysia (Sabah and Sarawak), which accounted for 67.9% of the total forested area in the country. Meanwhile, the Selangor state, where Klang Valley region is located, only contributes 1% of the total forested area (**Figure 5**). Thus, logically, more conservation efforts will be given to maintaining forest resources from those major contributors, particularly the two states from the East Malaysia that are playing the main role as the “reservoir” of the country’s species diversity, uniqueness, and abundance; while trade-offs is made with regard to small-scale remnant forests situated in urban area.

Apart from that, the existing forest policy and legislation are also conducive to lowland forest conversion. Under the Article 74 (2) of the Federal Constitution and Section 11 of the National

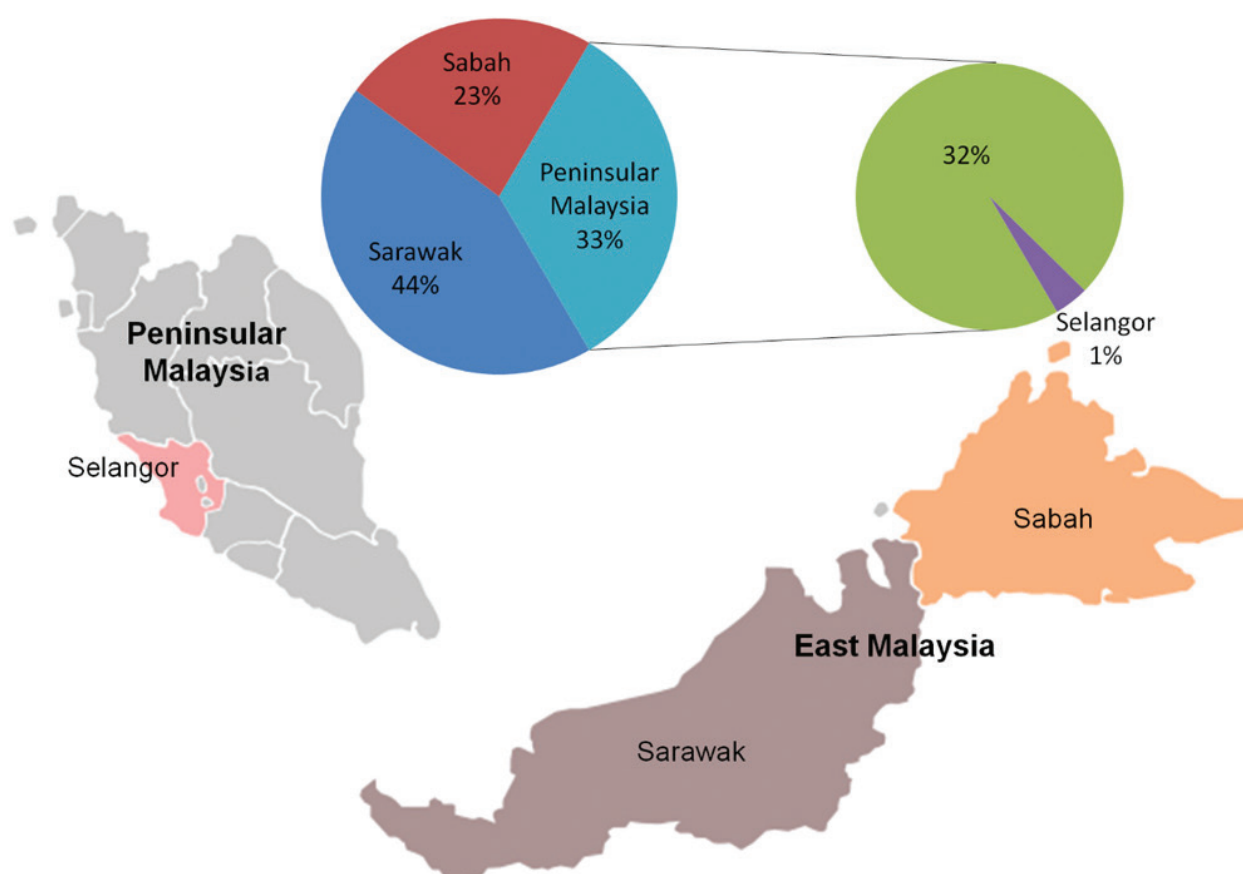


Figure 5. Share of forested area by major states in Malaysia.

Forestry Act (1993), the individual states are given exclusive jurisdiction over their respective forest land, in which reserved forests are considered as an alternative land use, and the individual state authority if satisfied that any land in a permanent reserved forest is no longer required for the purpose as classified under Section 10 of the National Forestry Act (1993) (such as timber production forest, soil protection forest, soil reclamation forest, flood control forest, water catchment forest, forest sanctuary for wildlife, virgin jungle forest, amenity forest, education forest research forest, and forest for federal purposes), and if the requirement for economic use of the reserved forest is higher than that it is being utilized, the state authority may excise that forest land from the permanent reserved forest. Since there are difficulties from the practical point of view in conserving small-sized remnant forests, coupled with the fact that conversion of forested land into other land uses, especially to housing development, is more promising in terms of higher rate of return on investment, these forested lands are always preferred to be whittled away for further development.

5. Human-nature interaction in Klang Valley

Despite its relatively lesser biodiversity as compared to those big-scale rural reserves, small-scale remnant forest in urban area is capable of providing a wide range of environmental

benefits that contribute to the liveability of modern city and the well-being of the urban dwellers, which are used to be overlooked in the past. Following the improved life standard, educational level, and the stressful of the urban environment, people's awareness, understanding, as well as appreciation to these urban natural environments, particularly those in their neighborhood, are becoming higher.

This is evidenced through a study conducted by the author in the surrounding residential areas of four remnant forests in Klang Valley region: (i) Bukit Kiara Forest Park (BKFP), (ii) Bukit Gasing Forest (BGF), (iii) Kota Damansara Community Forest (KDCF), and (iv) Ayer Hitam Forest (AHF) (**Table 1**), with regard to the connection and attachment between urban dwellers and remnant lowland forests in Klang Valley.

These forests are selected as study site because they are inner urban forests, surrounded by the residential/commercial areas, and subject to different local development pressure from the vicinity. Besides, the present forest condition and forest status also affects the selection of the study sites as well. Since the author wishes to examine the extent to which different forest naturalness may affect people's perception on the forest, each selected site was ensured to be unique and representative to its own structure/condition and management approach. For example, BKF is a botanical garden originated from the forest rehabilitation program from an abandon rubber estate; while AHF is a secondary disturbed forest, contributing to logged-and-treated activity between 1930 and 1965, which is then gazetted as a forest reserve and

Criteria	Forests			
	Bukit Kiara	Bukit Gasing	Kota Damansara	Ayer Hitam
Size (ha)	188.9	153.6	327	1176
Location based on local authority area	Kuala Lumpur	In between the boarder of Petaling Jaya and Kuala Lumpur	Petaling Jaya	Subang Jaya
Forest structure/condition	Forest rehabilitation program from an abandon rubber estate	Regenerating secondary forest, previously a rubber estate	Logged-over, regenerating secondary forest	Secondary disturbed forest
Degree of naturalness	High human input	Less human input	Less human input	Less human input
<p style="text-align: center;"><i>Degree of Naturalness Increasing</i></p> <p style="text-align: center;">Bukit Kiara Bukit Gasing Kota Damansara Ayer Hitam</p>				
Forest status	Federal park	Local park	State land forest	State land forest
Management system	Recreational park	Research and recreation forest park	Community forest	Research & education forest
Interaction with public	Directly contact	Directly contact	Directly contact	Restricted
Biological wealth	Plant: Mostly rubber tree Mammals: 3 species Reptiles: 2 species	Plant: 32 species Birds: about 100 species	Plant: 266 species Birds: 230 species Mammals: 10 species Reptiles & amphibians: 5 species	Plant: 430 species Timber tree: 127 species Medical plants: 98 species Moss species: 39 species Birds: 160 species Small mammals: 14 species Primates: 5 species Reptile: 10 species Amphibians: 18 species Fish: 10 species

Source: A compilation by the author from various unpublished local environmental report.

Table 1. Characteristics of the four selected study areas.

is leased to a university for the purposes of education, research, and extension. These two forests represent the extreme of man-made and natural continuum along the degree of naturalness. Both KDCF and BGF are placed in between such continuum, showing their tendency towards more “man-made” and “natural,” respectively.

Through questionnaire survey conducted among residents living in the surrounding area of the forests, the author found that size and the degree of naturalness of a forest does have influence on the way human interact with the nature. As high as 43% of the survey respondents living in the surrounding area of AHF did not realize the existence of AHF, as compared to 8, 10, and 13% of the respondents from BKFP, BGF, and KDF, respectively (**Figure 6**).

To note, the awareness of the forest existence among residents decreased with the increasing size of the forest as well as the higher degree of naturalness of the forest. When the respondents were asked whether the forests are in anyway contributing to their quality of life, similar trends of result were observed, in which 92% of the respondents living in the surrounding area of AHF perceived that their quality of life is not influenced by the forest, as compared to 8, 11, and 30% of the respondents from BKFP, BGF, and KDF, respectively (**Figure 7**).

These findings indicated that people tended not to consider the forest as a contributor to their life quality without direct contact with the forest. This is the case of AHF, where being gazetted as a research and educational forest, it is restricted to the public accessibility. While for other forests where people can have direct contact with, the tendency to take into consideration the forest as a determinant of their quality of life is increasing. This is because by having a direct contact with these forests, in fact, enables residents in the surrounding areas to develop a higher attachment to these remnants, thereby becoming more aware of the benefits provided by these remnants to their quality of life. However, due to the increase of human intrusion, the degree of naturalness of these forests was decreasing as well as their richness of biodiversity.

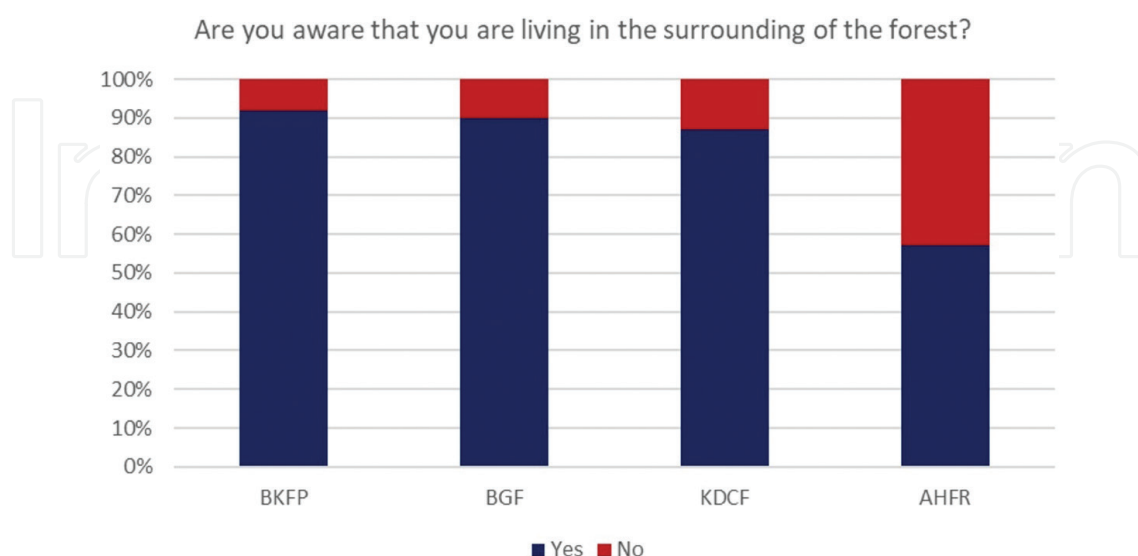


Figure 6. Awareness of the forest existence.

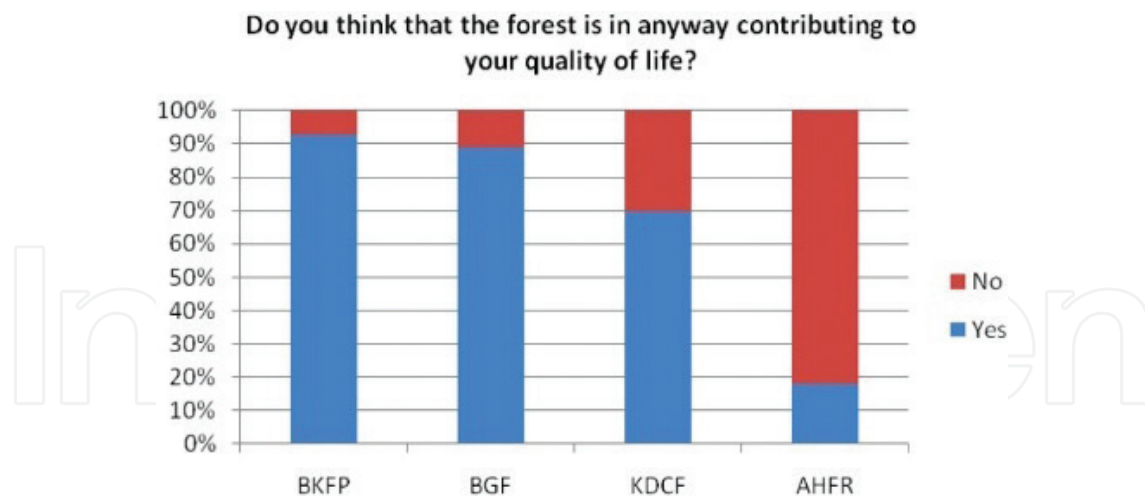


Figure 7. Perception on forest in benefiting quality of life.

The attachment of urban dwellers with urban natures can also be explored from the concept of “sense of place” as suggested by Shamai [16]. A sense of place is a piece of the whole environment which has been claimed by feelings. It is an umbrella concept that includes all the other concepts such as attachment to place, national identity, and regional awareness. Different levels of sense of place that imply an increasing intensity of feeling about a particular place at a given time can be measured and ranked on an ordinal scale [8]. According to Shamai [16], having a sense of place consists of three phases, where the first phase is belonging to a place, the middle phase is attachment to a place, and the highest phase is commitment to a place.

The author does not intend to explore in detail the concept of sense of place in the present study, but to use the “sense of place” concept as a guidance in assessing the level of “willingness to contribute” of the survey respondents towards the issue of conserving a small-scale urban nature. This is because the author opined that both conservation and attachment to a place share a lot of similarities. First, both of them required the commitment to a place, and this commitment can be depicted in a continuum, ranging from not having any feeling to a deep commitment towards a place. Second, both of them are dealing with the relationship of human to a place. While sense of place is a measure of how deep a person is attached to a place, it is also feasible to be used in measuring to what extent a person is willing to contribute in conserving a place. It is assumed that the higher or deeper a person is attached to a place, the more he/she is willing to contribute in the place conservation. Third, the essence of sense of place lies in the beholder’s senses and mind. This is also true for conservation, where it involves a person’s feelings, attitudes, and behavior towards a place which varies from person to person. As like Aiken and Leigh [2] said, “From the perspective of experience, conservation is a point of view, a state of mind, perhaps an emotive call to action; it implies a particular view of land and life.”

A scale of five level of willingness to contribute was used and it is shown in **Figure 8**. Respondents were asked to rate five statements which representing different level of willingness to contribute with a scale from 1 to 5, where 1 is ‘strongly disagree’ while 5 is ‘strongly agree’. Each statement

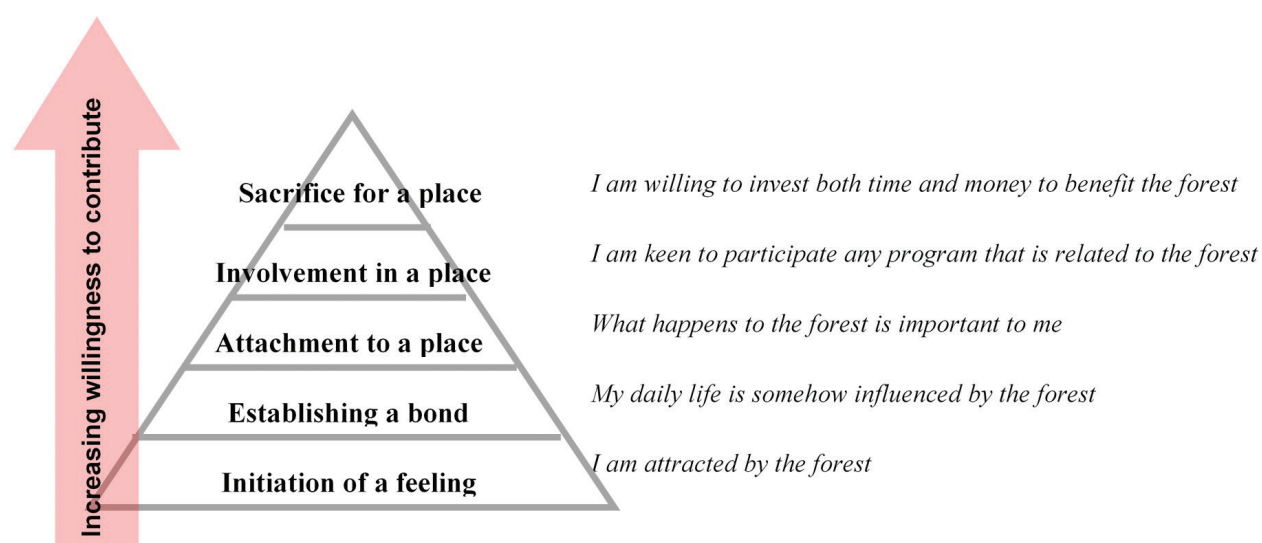


Figure 8. Level of willingness to contribute.

was assigned different weight that is compatible to its level of willingness to contribute. The rating given by the respondents for each statement was then multiplied with the assigned weighting and sum up to obtain an aggregate score of level of willingness to contribute. These aggregate scores were then divided into four groups; thus, four segments of respondents were obtained representing four levels of willingness to contribute: (i) high (>60), (ii) mid-high (46–60), (iii) mid-low (34–45), and low (<31).

As shown in **Figure 9**, the willingness to contribute was increasing along the natural and man-made gradient, where the highest level of willingness to contribute (with a score > 60) was leveling up, while the lowest level of willingness to contribute (with a score ≤ 30) was decreasing, as the forest becoming more and more “man-made” or “human-control.” This is reasonable because willingness to contribute tends to increase with the increase of a person’s attachment to a place. Through direct experience and engagement with the activities related to the forest, such as shaping the forest landscape and giving suggestion on forest management, a person will likely to imbue the forest with meaning. This meaning, in turn, may become a motivation for him/her to further contribute to benefit the forest which was deemed to be part of his/her life. Typical examples can be observed in both BGF and KDCF, where through direct engage in forest landscape design (either by gardening or by providing feedback to the management authority), the people’s attachment to the forest becomes stronger and have higher desire to voluntarily contribute their effort, time, or even money to conserve the forest.

The main point to be highlighted here is that naturalness does play an important role in influencing people’s responses and attachment they placed on the forest. The author successfully explores another aspect on how human interact with nature in the urban context, in addition to studies conducted by Foo [5], Foo and Kidokoro [6] and Farahwaheeda et al. [4]. Understanding people’s views and expectations on forests is the first and foremost step

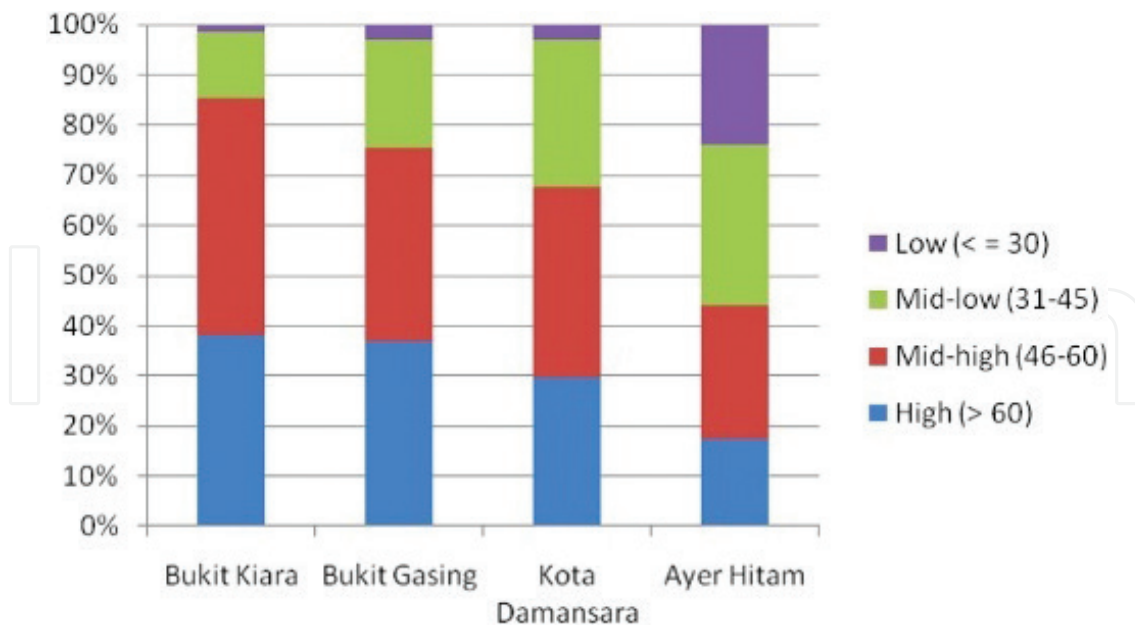


Figure 9. Distribution of attachment level on each study site.

in ensuring the success of forest conservation. Even though the scientific understandings on forestry have achieved a great improvement throughout these decades, the importance of people's responses to what forests are and how they should be managed is still playing an undeniable important role, particularly in conserving the declining (in size) and degrading (in biodiversity) urban natures.

With the increased environmental awareness and the realization of the adverse impacts posed by urbanization on them, urban dwellers become more appreciated with these remnants than before. Improving quality of life is not merely a matter of physical development. According to the World Health Organization (WHO, 1993), quality of life is defined as "an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns." If this is the case, the authorities must consider that people highly regard urban natures as a contributor to their quality of life, when making any decision upon converting these remnant forests into other uses.

6. Conclusion

Lowland forests in Malaysia have been fragmented and greatly reduced by conversion to plantations and urbanization. Being located in the country's highly urbanized region, the survival of the lowland forest is often subject to profound anthropogenic stresses and invasions. The understanding of the interaction between human and the natural environment can help in formulating a more compelling conservation goal that keeps both human and nature remain intact while at the same time appealing to and accepted by a wider

range of audience. To date, so far, efforts to natural environment conservation are mainly focused on large areas with less human presence, bio-diverse, and relatively untouched. As a result, much more challenges are expected to be encountered in conserving a natural environment within a highly urbanized area where lands have been a scarce resource for absorbing further development pressure. Besides, once the land was found to have economic value; pressure would promptly mount to have it excised from the protected status so that development could proceed. As the aim of development is to improve and enhance human well-being through land conversion, unless land conservation has a relatively stronger reason to convince the decision makers, otherwise decision is always made in favor to the former.

Therefore, the author suggests that an effective environmental conservation program must not only be based on the assessment of conservation value that most often derived from the ecological point of view, such as the number of threatened species, endemic plant species, etc. Instead, the understanding of the changes happened in the surrounding areas of the preserved site, such as land use and demographics change, economic and social activities, people's perception and attitudes towards the role and function of the preserved site, etc., is also necessary, in order for proper policy implication to be drawn and to be further used for strengthening the existing conservation value.

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