



THE POTENTIAL OF URBAN FOREST PARK FOR SUSTAINABLE CITY

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Abstract

The potential of Urban Forest Park and publics' views are clearly pertinent in urban greening and sustainability, yet they are often ignored by certain countries. In line with this, the Town and Country Planning Department and National Landscape Department had taken steps by developing more urban parks and urban forest parks to enhance the quality and sustainability in urban environment. The study was conducted at FRIM (Forest Research Institution of Malaysia) with 375 respondents participated in this study. It is found that the respondents' evaluation on environmental, social and physical contribution at study area is associated with great and intense values for city sustainability. Public opinion and reason to come to the study area should be taken into account by professionals since they are the users and responsible to ensure the sustainability of urban forest for future generation. Even though the overall percentage of survey showed that public gave good expectation, however, the small percentage could be an eye opener as they assumed the existing setting will face big challenge to sustain in the future.

Keywords: urban forest; urban park; city sustainability; environmental evaluation

INTRODUCTION

Malaysia is turning into a sophisticated country and has experienced rapid urbanization process throughout the year. The increasing number of population in urban areas requires the people to have more pleasant and liveable

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environment (Noralizawati, 2009). In 2011, the world's population crossed over the 7 billion mark, and the United Nations Population Division projects this figure could reach 9.3 billion by 2050 and more than 10 billion by the end of the century (United Nation Conference on Sustainable Development, 2012).

As for Malaysia, it is predicted that by year 2020, 73% of the population will be urbanites (Nor A'aini and Kamarul'ain, 2007). In line with this, the National Town and Country Planning Department and Landscape Department had taken steps by developing more urban parks and urban forest parks to enhance the quality and sustainability in urban environment. Generally, urban forest parks can be found in gazetted forest areas of urban areas. As mentioned by Noor Azlin and Sabri (1997), these parks are designated areas for conservation of local flora and fauna as well as areas where environmental education and recreation can be conducted. They are also a great assets for the cities and urbanities (Sreetheran, 2007), created to preserve existing vegetation (Noralizawati, 2009), enhance natural environment (Noralizawati, 2011), for people to gain a positive psychology (Kaplan, 1973) and increase aesthetic values in city centre (Noriah, 2004).

Although achieving sustainable cities are crucial in the urbanization world (Yin and Siong, 2011), analysis of the landscape and natural environment literatures showed that these objective can be achieved through systematic planning on natural resource and urban forest parks have been given much attention for this (Chiesura, 2004; Noralizawati, 2011; Oku and Fukamachi, 2005 and OZguner and Kendle, 2007). The overview of landscape design research by previous researchers agreed that the urban forest park should naturally design and represent great diversity for biotic and abiotic components around the forest (Noralizawati, 2011 and OZguner and Kendle, 2007). The National Landscape Policies under the Housing and Local Government Ministry of Malaysia interprets these natural resources as national heritage areas which must be conserved and manage sustainably as an investment to benefit the nation. At a higher level, sustainable city approaches that is summarized by the committee of United Nation Conference on Sustainable Development as an important evidence-based for world recognition. Table 1 provides an indicative list of focus areas for priority attention.

Table 1: Focus areas for priority attention at Rio +20 as articulated by member states and major groups

Focus areas for priority attention	
1.	Green jobs, youth employment and social inclusion
2.	Energy access, efficiency, sustainability
3.	Food security, sustainable agriculture
4.	Water
5.	Sustainable city
6.	Management of the oceans, fisheries and other marine resources
7.	Improve resilience and disaster preparedness

Source: United Nation Conference on Sustainable Development, 2012

THE SUSTAINABLE CITY

The Bruntland Report 1987 defines sustainable development as a 'development which meets the needs of present generation without compromising the ability of future generation to meet their own needs'. Through studies in Hong Kong, Netherland, United Kingdom and Japan, the ability of urban parks as provider of social services and their importance for city sustainability has been addressed (Chiesura, 2004, Lo and Jim, 2010; Oku and Fukamachi, 2005 and Ozguner and Kendle, 2007). The potential of Urban Forest Park and publics' views are clearly pertinent in urban greening and sustainability, yet they are often ignored by certain countries. In a nutshell, the strategies for certain cities are mainly focus on man-made elements and built components. As mentioned by Yin and Siong (2010), the future of our cities lies in the action we make today. Thus, this aim should be clearly identified and understood by many urban residents in relationship with their surrounding landscapes.

It is known that urban forest parks carry lots of functions in urban environment. Besides important in environmental services such as stabilize the microclimate and air purification, the urban forest parks which were developed in the perimeters of forest reserve in the urban area offered many recreational activities, facilities and were beneficial for education purposes (Norlizawati, 2009). Oku and Fukamachi (2006) addressed that the presence of landscape setting and public choice of activities in forest parks contributes to the quality of life and sustain the communities in many ways. As an example, the Forest Recreational Park at FRIM (Forest Research Institution of Malaysia) has been developed the forest research area into a successful botanical garden, natural trail and recreational spot. This park has received high number of local and international visitors due to its natural setting, recreational facilities and ecological function towards environment. The Bukit Nanas Forest Reserve in Kuala Lumpur and Urban Forest Park in Kota Damansara and Johore Bahru

also becoming the green iconic for urban people too. These parks enrich their quality of life, reduce stress and encourage social integration among visitors.

THE URBAN FOREST PARK

According to Noor Azlin and Ahmad Nazaruddin (2003), the green areas within and near town municipality areas are termed as urban forest. Grey and Deneke (1986) defined urban forest to include all greenbelts, municipal watershed, recreation sites and roadsides. In Malaysia, over than 60% of its total land area is forested and the biodiversity is immense including the urban forest park. The urban forest is a concept that encompasses the natural landscape and series of vegetation of a city. It attempts to provide a different understanding regarding its naturalistic landscape pattern, low maintenance and self-sustaining green area as compared to modern and formal garden.

In 1986, Justice urged Kuala Lumpur to adopt the urban forest landscape concept since it still has lots of reserve forest in the middle of the city. He believed that this concept could be as foundation for better opportunity in greening and sustaining the Kuala Lumpur in future. And today, the Malaysian local planners have also set a plan to gazette more green spaces in master plan development and investigate the value of this Mother Nature which in turn is a key component for sustainable development. The degree for master plan that is ideal and equilibrium for green urban structure may also vary by the size of existing and proposed green space, population density, landscape quality and healthy life style of urban residents. The study was conducted at FRIM (Forest Research Institution of Malaysia). FRIM is located in the middle of Kepong City and surrounded by the Bukit Lagong Forest Reserve. The forest park represents naturalistic landscape pattern and it is maintained through the preservation of existing vegetation and well controlled by human influenced (Noralizawati, 2009). Here visitors will be rewarded with a breath-taking view of the surrounding forest. The sound of birds singing and the occasional shrill of insects tantalize the mind and makes one forget the hustle and bustle of Kepong City activities that surrounds the park.

METHODOLOGY

The data collections have been collected through a survey conducted among visitors at Forest Recreational Park at FRIM. The study used structured designed questionnaires to collect data from the visitors of the study area. Field study observations and a pilot test were done to obtain information on the improvement of the questionnaire. A face-to-face administration of the survey was done and visitors approached in the park were first informed about survey's objectives. Only willing visitors to participate will be taken as respondents for the study. The objectives will be limited to the following issues: (Section A) Demographic background question, (Section B) Reason for visiting the study area- instrumental, social or dispositional reasons, (Section C) Survey on environmental, social and physical contributions of the study area (Section D) Expectation towards urban forest park in meeting their current and future needs.

The survey was conducted on October until December 2011. The statistic of visitors as reported by Human Resource Division of FRIM is 200,000 every year and the monthly average is 16,666 visitors. For this research, there were 375 respondents participated in this study. These numbers projected based on a statistical table by Krejcie and Morgan (1970) cited from Sekaran (2003). They suggested that, if the population (N) is 16,666, the sample size (n) should be 375. The questionnaires have been distributed on both weekdays and weekends during the day and subjected to visitors that agreed to cooperate and spend their time for the survey. The results and findings from the survey provided rooms for urban planners, landscape architects, forest conservator, environmentalist and anybody who are interested to explore the potential of Urban Forest Park in sustaining the city.

RESULTS AND DISCUSSION

The value for the the Cronbach's alpha coefficients for the survey questionnaire is 0.70. According to Pallant (2005), the results between 0.70 – 0.80 shows an acceptable reliability of questionnaires development.

a) Demographic Background

From the demographic background data analysis, 53.3% of respondents were male and 46.7% were female. Malay ethnic represents 38.7% followed by 27.5% for Chinese, 30.9% for Indians. The international visitors that took part in this survey were determined as 0.5% from Sweden, 1.3 % from China and

1.1% from Japan. The average respondents were from 18 to 50 years old. Among all age groups, the highest percentage 40.2% which represents age from 18 to 30 and the lowest is 12.3% represents from 51 years old and above.

The average level of education of respondents is with degree which is 34.0%, and only 14.8% were graduated with Masters and 9.3% with PhD. Workers from private sectors represents 31.5% were the largest group in the distribution of respondents, followed by 30.1% for students, 23.7% for government servant and 14.7% for retired.

b) Respondents' Reason of Visiting

The result in Table 2, 3 and 4 shows the reason of visiting by the respondents. Under Table 2, 45.6% of them gave a 'very strong reason' and 33.3% gave a 'strong reason' answer for Instrumental Reason which is to get result that give benefit to their work and study. For the Social Reason in Table 3, it is reported high rating where 44.3% from the total respondents gave a 'very strong reason' and 39.7% gave a 'strong reason' to accompany or socialize with family and their friends. The Dispositional Reason in Table 4 includes the reason that they really interested with the place and like the recreational activities and 62.4% answered a 'very strong reason' and 26.9% for a 'strong reason'. The overview of the analysis concludes that majority of respondents rated a 'very strong reason' answer for all reason. The result of this study identified a high number respondents showed their interest towards the study area. These findings are also consistent with those of previous documenting people's preference and purpose when visiting forest landscape (Park, 2011; Matsuoka and Kaplan, 2007; Tsunetsugu et al., 2010). The previous research finding (Noralizawati, 2009; Noralizawati, 2011; Ozguner and Kendle, 2006; Todorova et. al, 2004) identified some differences between visitor's reason for visiting and their perception about the forest setting. These findings were taken into account and a set of qualitative analysis was done to measure their perception and several answers on benefits and potentials of study area were identified.

Table 2: Instrumental Reason (to get a result that give benefit to work/study)

Answer	Frequency	Percentage
Very weak reason	11	2.9
Weak reason	57	15.3
Strong reason	125	33.3
Very strong reason	171	45.6
Not a reason	11	2.9
Total	375	100.0

Table 3: Social Reason (to accompany or socialize with family/friend)

Answer	Frequency	Percentage
Very weak reason	19	5.1
Weak reason	30	8.0
Strong reason	149	39.7
Very strong reason	166	44.3
Not a reason	11	2.9
Total	375	100.0

Table 4: Dispositional Reason (really interested with the place and like the recreational activities)

Answer	Frequency	Percentage
Very weak reason	0	0
Weak reason	40	10.7
Strong reason	101	26.9
Very strong reason	234	62.4
Not a reason	0	0
Total	375	100.0

Figure 1 shows the percentage of most mentioned keywords from the survey. Under Instrumental Reason, the feeling of 'Escape from busy city' accounts for almost 79.4% of the data obtained. It has been agreed by Chiesura (2004) that a park experience may escape people from hectic and busy city as well as provide a sense of peacefulness and relax our mind. 'Love the nature scenery' accounts 64.0% from total respondents. This finding is associated with previous research done by Noralizawati (2009) where the strongly preferred sceneries such as water, dense and matured tree scene were highly rated and according to Hull and Stewart (1995) and Yang and Brown (1992), as in naturalistic landscape, these natural elements are always stated as a positive focal point for visitors. 42.7% told that they also came to the study area to 'Relax their mind'. This is supported by Schroeder (1986) that natural environments with vegetation and water induce relaxed and less stressful compared with urban scenes with no vegetation. The 'Research and education benefits' answer represents 31.2% and majority of the answers were given by school and university students as well as researcher from government and private companies. It is associated with the status of FRIM which is known as the best place to gain and practice knowledge.

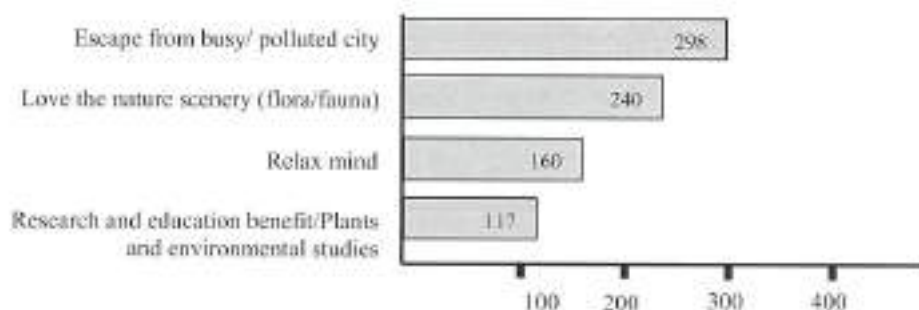


Figure 1: Keywords for Instrumental Reason (to get a result that give benefit to work and study)

A strong relationship has been identified in Figure 2 where the Social Reason somehow plays an important role for the respondents. The reason for 'Family/friends gathering' indicates 52.3% and 'School/university academic trip' reason indicates 51.2%. Those results portrays that the ability of urban forest parks to function as social network. As stated by Coley et al., (1997) nature encourages the use of outdoor spaces, increase social integration and interaction. The reason for 'To get privacy' accounts 41.1% in this study. This finding supported research done by Hammit (2002) that parks can also be a place for people to find degrees of privacy. Noralizawati (2009) found in her previous study that the feeling of privacy also associated with viewing nature and restoring mental and spiritual activities. 13.3% of the respondents answer to 'Make new friend/Share ideas'. As explained by Conway (1991) the interaction among the park visitors can prevent social tensions thus improving the physical and moral conditions of urban citizens.

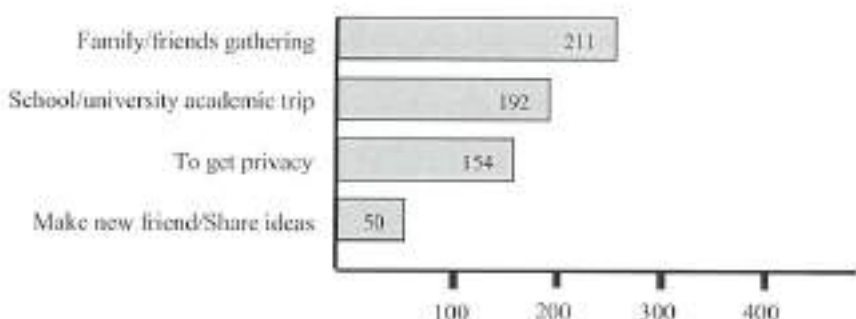


Figure 2: Keywords for Social Reason (to accompany or socialize with family and friend)

Figure 3 shows the Dispositional category results and it is identified that the 'Like the natural forest setting' is the most liked reason gave by the respondents and indicates 80.5% from the survey. Study conducted by Park (2011) identified the natural setting is the most preferable for urban residents and Chiesura (2004) stated that the presence of natural assets (i.e. urban parks and forest) and components (i.e. tree, water) in urban contexts contributes to the quality of life and visual. The reason for 'Exercise/recreation/meditation' represents 53.3%. Through an observation, some respondents reported that they had a passion for physical activities and it shows that the tendency of visiting the study area is getting higher when it is associated with activities and proper facilities. As highlighted by Noralizawati (2010) and Oku and Fukamachi (2006) the increasing demands for forested areas is for the one that provide good recreational facilities. 57.1% represents for 'Green and well preserved' reason and 53.3% for 'Fresh air/unpolluted water'. It has been identified that the relationship of people and preference towards study area spans a wide range of environmental benefits.

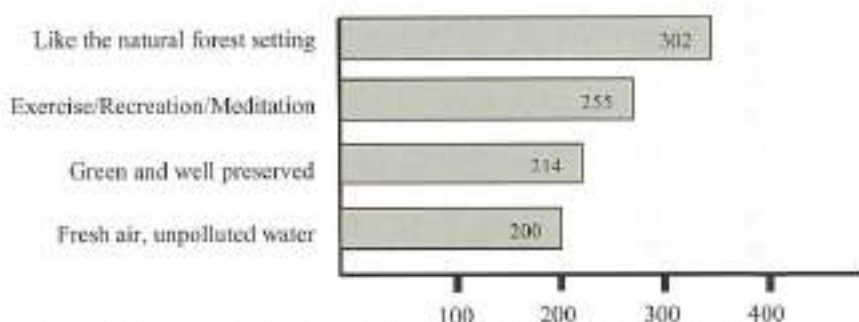


Figure 3: Keywords for Dispositional Reason (really interested with the place)

c) Survey on Environmental, Social and Physical Contributions

It is found that the respondents' evaluation on environmental contribution at study area is associated with great and intense environmental values. 33.5% of respondents mentioned that the forest setting could balance the urban ecosystem, 29.0% of respondents agreed the forest setting could filter air pollution around the city, while 26.6% of respondents believed it is rich with biodiversity and 10.9% said they like the forest setting and green landscape. This is clearly showed that the biodiversity and forest ecosystem that listed under this component will play a vital role in facilitating sustainable city. Furthermore, according to research article by FRIM Research Unit, an analysis on carbon footprint on June 2012 identified the level of Carbon dioxide

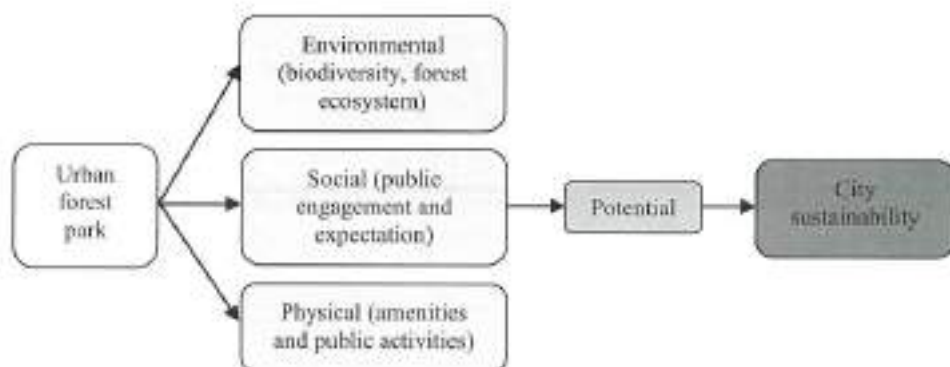
emission of FRIM Research and Design activities was 50 times less than the amount of Carbon dioxide sequestered by the dipterocap trees in FRIM. From this environmental finding, it is clearly shows that the FRIM Forest Recreational Park has a high potential as a tool in developing a sustainable city. Survey on social contribution reported a growing body of evidence indicating that exposure and social activities at urban forest park have beneficial effects on respondents. 42.4% of respondents agreed that the study area provides space for public engagement either formal or informal way. 25.1% of respondents mentioned certain spaces as appropriate for recreation and safe for children, disable person and senior citizens. 17.8% stated it serves as a resource for relief and escape from troubles and tensions and aid in our daily lives. 9.1% said the study area is the best place to be away from crowded city, 5.6% mentioned the place offers them to think through personal matters and share confidence and intimacies with family and friends. From the findings, it is confirmed that respondents' interpretation are valuable and should be taken into account by professionals since they are the users and responsible to ensure the sustainability of urban forest for future generation. Research finding on the physical aspects should be considered as an important contribution just like environment and social. 48% of respondents mentioned they like the landscape character such as landforms, vegetation and water forms and 31.2% stated a well arrangement of facilities for recreational purposes. 13.4% of respondents suggested the management to preserve and protect the flora and fauna, 7.4% suggested the management to upgrade the research facilities and educate public on the function of study area. According to them also, the public choice of activities is very much depending on the safety, functionality and information that provides for them. Therefore, proper design guidelines must be introduced to ensure the suitability and maximize the usage of facilities in the urban forest setting.

d) Expectation in Meeting Respondents' Current and Future Needs

The final section is the result on respondent's expectation. Regarding the study area in meeting their current and future needs, it is reported that 66% of them indicated high expectation regarding the capability in protecting natural resource, improve the environment quality and sustaining future needs. As mentioned by Chiesura (2004), the nature fulfills important in-material human needs as well. Only 22% gave low expectation and predict the potential of existing place would shrink since it is located in a middle of the city that exposed to lots of urbanization impact and 8% showed mixed feeling towards the question.

CONCLUSION

According to previous findings above, the researcher illustrates the relationship between urban forest park and city sustainability as shown in Figure 4. Those components play an important role to support the sustainability and healthy urban forest; it must be preserved and avoided from any distraction. This is supported by the World's Civil Society Organizations and as listed by them, the sustainable development goals should make an agreement on healthy forest, green cities and also public participation programme (United Nation Conference on Sustainable Development, 2012). Public expectation and their reasons to come to the study area should be taken into account. Even though the overall percentage of survey showed that public gave good expectation, however, the small percentage could be an eye opener as they assumed the existing setting will face big challenge to sustain in the future. It is hoped that the identified potentials in Urban Forest Park and positive public involvement can serve as reference criteria for local planners, landscape architects, park managers and other related professionals to envision more sustainable city strategies in the future.



Source: Researchers, 2012

Figure 4: Relationship between Urban Forest Park and City Sustainability

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