JURNAL TATA LOKA; VOLUME 13; NOMOR 3; AGUSTUS 2011

GREEN OPEN SPACE PERFORMANCE AS URBAN RECREASTION RESOURCES IN PEKANBARU

Wahyu Hidayat

Faculty of Engineering, University of Riau
Kampus Bina Widya Km. 12,5 Simpang Baru, Pekanbaru 28293, Riau
Email: hidayat79_iium@yahoo.com

Received: July 7th, 2011 *Accepted: August 15th, 2011*

Abstract: Urban green open space has significant benefits for the condition of urban living and its community. The availability of accessible and attractive green spaces for recreation activities is an integral part of urban quality of life. This research aims to assess the effectiveness of green open space provision as recreation resource for urban citizens in Pekanbaru, Indonesia. This study presents the assessment of two elements which are equity and efficiency. These two elements are analyzed based on numerous independent variables such as number of the facility, distance to house, accessibility and public transportation availability for equity assessment and frequency of usage, attractiveness of facilities and safety level for efficiency assessment. The assessment of those variables is applied in three different subdistricts in Pekanbaru which are City Center, Sail and Tampan that represent different density categories. To achieve the objectives of this study, the method used to conduct the study is field survey by questionnaire and interview. Stratified random sampling was the method used in data collection through the distribution of questionnaire, and the tool used to analyse data is through the Statistical Package for Social Science (SPSS). The data was analysed using descriptive statistics to obtain frequency distributions, percentage and the level of equity and efficiency. Several types of test in SPSS data analysis are included to attain some significant information in the study such as Chi-Square test of independence and analysis of Correlation. The findings indicate that a majority of respondents were not satisfied with the distribution of green open space. This study also identified that the quality of green open space facilities was perceived by residents as at moderate level. This survey results indicate that there is significant relationship between subdistricts of respondents and the satisfaction level of green open space distribution. The study could be useful for decision makers, professionals and researchers related to urban and recreation planning to achieve a better quality of life.

Key words: green open space, effectiveness, equity, efficiency, urban recreation area.

INTRODUCTION

Open spaces and landscape in the city play the primary role of urban areas that provide main locations for human habitation and interaction. Planning for public space in the urban area is one of the needs to achieve a good living environment for community. Open space and parks form a crucial feature of livable cities. According to Wilkinson (2003), the concept of open space is usually considered in an urban context. Part of the challenge of sustaining a livable urban environment, is to ensure the maintenance of a choice of quality leisure experiences through the existence of a spectrum of recreation opportunities, with the flexibility to adapt to the dynamics of a changing city landscape and evolving socioeconomic and political relationships (Pigram, 1999). According to Gold (1988), an effective recreational experience in cities calls for opportunities to experience freedom, diversity, self-expression, challenge and enrichment. Servicing such opportunities provides much of the justification for providing open spaces within cities. In this context, an open space is a basic element in the structure and function of the built environment in meeting human needs. Thus, a new paradigm in park and recreation planning is stated that we must begin to think of the entire landscape as a recreational re-

source, and it is at this point particularly that park and recreation planning merges with land use planning in general.

In Indonesia, recently local governments attempted to initiate a greener city starting from the movement of a million trees planting which is called the green programme. Before that, Indonesia government has gazetted the Act No. 26, 2007 about space arrangement where one of the important parts is that local authority should provide at least 30 percent of the total area for green open spaces. From this allocation use of land, at least 20 percent of total area is for public green open space and 10 percent of total area is for private green open space. According to this Act, the distribution of green open space should be based on the distribution of population, service hierarchy and space pattern. Although the main purpose of this policy is based on the environmental consideration, local authorities need to consider broader role of open space for enhancing quality of life in urban area and to fulfill the needs of community such as recreation activities and leisure. In practice, although the standard number of green open spaces has been given, the policy of local authority in providing of green open space is more in fulfilling the minimum number of the area or its percentage in land use aspects. Meanwhile, the benefits of provision of green open spaces are not limited for the improvement of environment condition, it can be more beneficial economically and socially if those facilities are planned and designed to meet other human needs. According to Kraus (1990), recreation activity can provide strong feelings of pleasure and satisfaction. It could be achieved by the improvement of the quality of green open space facilities to ensure the effectiveness of those facilities for recreation area in the city.

In line with a better understanding of Indonesian government to improve the environment condition, especially green spaces performance in urban area, local authority needs to optimize this opportunity to give a wider dimension of quality of life in the city through provision of accessible and attractive green open spaces where it can be used by citizens for recreation. To identify the effectiveness of provision of green open spaces in urban area, especially its potential to be used as recreation resources, the assessment and monitoring need to be conducted as an attempt to span a bridge between scientific theories and planning practice. Through this study, the effectiveness of provision of public green open spaces to be used as urban recreation resources will be analysed. To assess the effectiveness of green open space provision in meeting the needs of the community for recreation, this study focuses on two main ideas. First, green open spaces as other public facilities should be distributed equally for all parts of city where it has implication to the aspect of accessibility. Second, to ensure its efficiency, the provision of green open space should be able to encourage the community to utilize those facilities as urban recreation resources. In other words, the provision of green open space should be able to offer more recreation opportunities for the community.

Methods

According to Kiminami, Button, & Nijkamp (2006), in designing a system of urban public service centers, planners should consider both equity and efficiency effects in selecting the size of each center and the spacing between centers. Very briefly, equity is indicated by the degree of equality in the distribution of services among the population, and the efficiency is indicated by the quantity of services consumed. The efficiency of alternative size and spacing combinations is measured by the per capita consumption of the public service. As the main purpose of this study is to assess the effectiveness of provision green open space, the researcher examined independent variables to achieve it. The independent variables that are grouped into two components namely equity and efficiency are illustrated in Table 1.

Table 1.Independent Variables Examined with the Effectiveness of Green Open Space

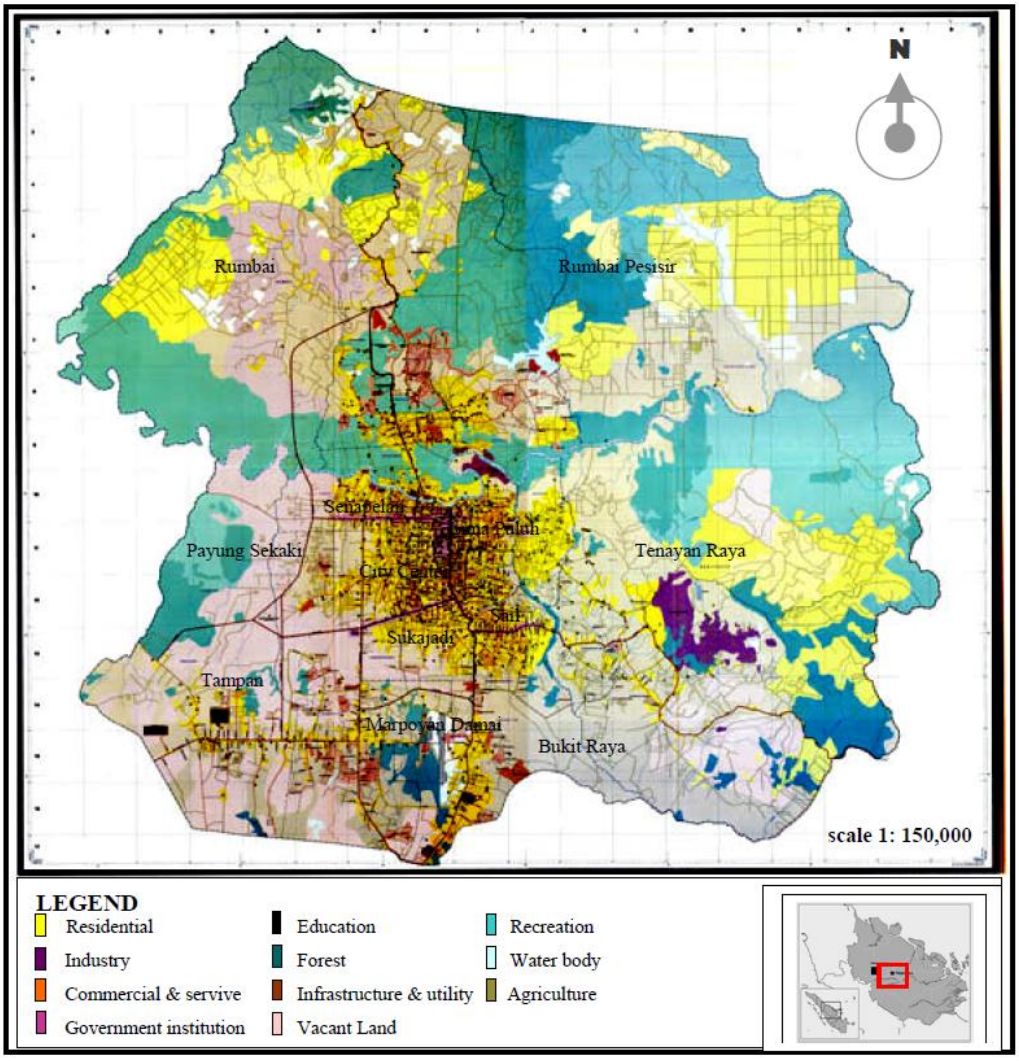
No.	Green Open Space Assessment	Independent Variables
1.	Equity Aspect	Distance To House Accessibility Public Transportation Availability
2.	Efficiency Aspect	Frequency Of Usage Type Of Activities Attractiveness Of Facility Safety Level

These variables are examined with the dependent variable which is the effectiveness of green open space provision for residents' recreation activities. The general hypothesis tested in this study is based on two main components that

determine the effectiveness of green open space provision as recreational facilities which are equity and efficiency aspect.

Sampling Methods

As the aim of this study is to get perception from urban residents about the role of this facility in their recreation needs, the population of the study is the residents of Pekanbaru. In this study, stratified random sampling is used to select the samples accordingly. Stratified random sampling is a method for obtaining a greater degree of representation, as it would decrease the probable sampling error. Regarding the study area, it is in Pekanbaru which has 12 subdistrict areas; thus, the sampling applied in the form of stratified random sampling according to each selected subdistrict in Pekanbaru. As the participants are geographically spread across the country or a state, it is common to stratify from geographical condition so that appropriate proportions of the selected sample come from the different regions of the country or state. It is also common to stratify on the rural, suburban, and urban characteristics of the sample if these are identifiable in the sampling frame. The research was conducted to get the views of residents on the effectiveness of green open space facility for recreation activities in three selected subdistrict in Pekanbaru.



Source: Master Plan of Pekanbaru 2007-2016

Figure 1. Administrative Map of Pekanbaru City, Indonesia

Pekanbaru as the capital of Riau province encompasses 63,226 hectares which is divided into 12 subdistrict areas with a population of 788,000 (Pekanbaru Master Plan, 2007). Based on the type of sampling used in the study which is stratified random sampling, the participant who participated in the questionnaire survey was categorized according to the density characteristic of the area. As the as-

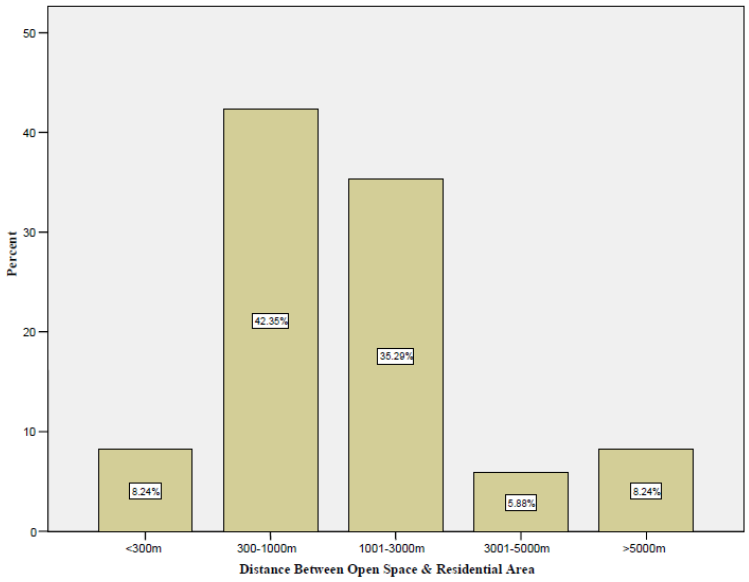
sumption of the study, there is a different policy of green open space provision and allocation between city center which is high density area with the areas located outside of city center which are categorized as medium and low density area.

The sample is chosen from the three selected subdistricts which are considered as representative of all population from 12 subdistricts in Pekanbaru. The three subdistricts where the study was conducted are:

i. City center, which covers 226.0 hectares with 33,080 inhabitants and it is categorized as high density area.
ii. Sail, which covers 326.0 hectares with 24,403 inhabitants and it is categorized as medium density area.
iii. Tampan, which covers 5,981 hectares with 89,875 populations and it is categorized as low density area.

From these three selected subdistricts, the sample of populations represents residents from three categories of area which are high, medium and low density area. The total population of these three subdistricts is 147,358 persons and based on the proportion of population number between the selected areas, it can be concluded that the city center population covers 22% of the selected subdistricts population, Sail population covers 17% of the selected subdistricts population, and Tampan population covers 61% of the selected subdistricts population. Due to this appropriate proportion, the sample of the study provides sufficient number of participant from all type of category of city parts. From the sample frame of the three subdistricts, the number of sample for each of the area was calculated by the percentage proportion. City center as a high density area which has the number of 22 % of population is represented by 22 residents. Sail as the representative of medium density area, has proportion of 17% of population and it is represented by 17 residents. Lastly, Tampan with category as low density area covers 61% of population and represented by 61 residents.

Table 2.Distance to Green Open Space from Residential Area



Data Analysis

Descriptive analysis is the main process that was taken in this study such as frequency distributions, cross tabulations, mean scores and standard deviations. The data analysis processes is aided by the use of quantitative data analysis computer program. In this study, the tool used to analyse data is through the Statistical Package for Social Science (SPSS). The data was analysed using descriptive statistics to obtain frequency distributions, percentage and the level of equity and efficiency. Several types of test in SPSS data analysis were included to attain some significant information in the study such as Chi-Square test of independence and analysis of Correlation.

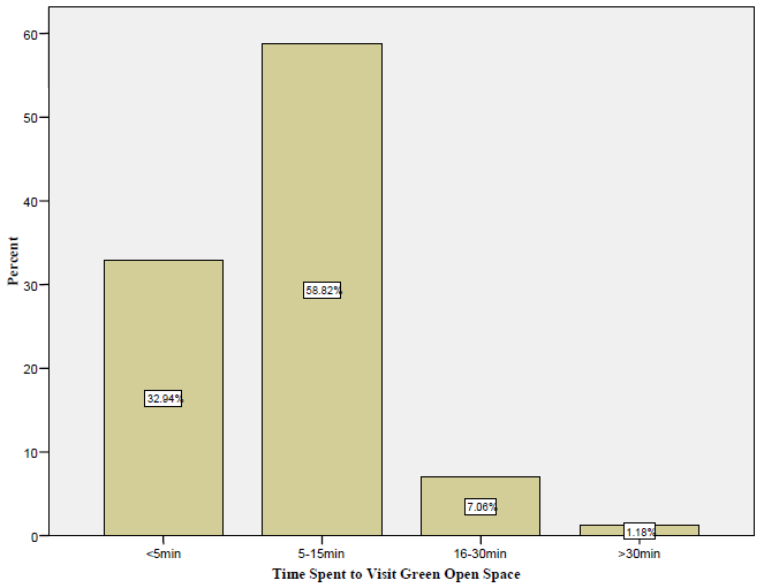
Results and Findings

Distance from Residential Area

The distance is one of the most important factors that influence the ability of the citizen to visit green open space. The ideal provision of green open space should be able to ensure the ability of citizen to access green open space by providing the facility at proper location and it can be accessed easily in terms of distance and time spent to reach green open space. The provision of green open space also should give equal opportunity for all citizens throughout the city to enjoy green open space facility.

From the respondents who were asked their opinion about the distance of their residential area from the nearest green open space, 42.35% of respondents stayed in the residential area with the distance of 300-1000 meters from green open space facility, and it is the biggest percentage of the distance classification. The distance of 1001-3000 meters represented the second of the biggest percentage of the respondents which covers 35.29%, followed by the distance of less than 300 meters and more than 5000 meters with same percentage of 8.24%. Meanwhile, the distance of 3001-5000 meters is represented by only 5.88% of respondents. According to the result of the survey, most of the respondents stayed in the distance 300 to 3000 meters from their home which covers 77.64% of respondents. On the other hand, the distance is closely related to the time that is spent to reach green open space. Based on the survey results on the respondents' perception about the time that they need to reach green open space as presented in figure 5.2, most of them spent 5 to 15 minutes to get the nearest green open space. It is represented by 58.82% of respondents and followed by respondents who need less than five minutes to reach the nearest green open space indicating 32.94%. Respondents who needed 16 to 30 minutes to reach the nearest green open space from their homes indicating 7.06% and only 1.18% of respondents who spent more than 30 minutes to get green open space.

Table 3.Time Spent to Reach Green Open Space from Residential Area



The Accessibility of Green Open Space

The assessment of the accessibility of green open space in this study identified the respondents' perception on how they access the facility. The question focused on the easiness of the accessibility of green open space, either it is easy to be accessed or not. From the survey results, 91.76% of respondents answered that it was easy to access green open space, 5.88% of them said that it was not easy to access green open space and the rest of respondents were not sure. The accessibility of green open space in the city influenced highly by mode of transport used by respondents to visit green open space and location of green open space provided. This study identified that with the available private transportation and the location of green open spaces mostly along main roads of the city, residents could access green open space easily. Although the re-

spondents who spent the time of 5 to 15 minutes were dominant in this study, the researcher also identified that most of the respondents drive their car and motorcycle to visit green open space. 71.76% of respondents' mode of transportation was car and motorcycle to visit green open space in the city. Meanwhile, respondents who preferred to walk in visiting green open space were represented by 25.88% respondents, and only 2.35% of them using bicycle as their mode of transportation to visit green open space.

Table 4.Mode of Transport Used to Visit Green Open Space

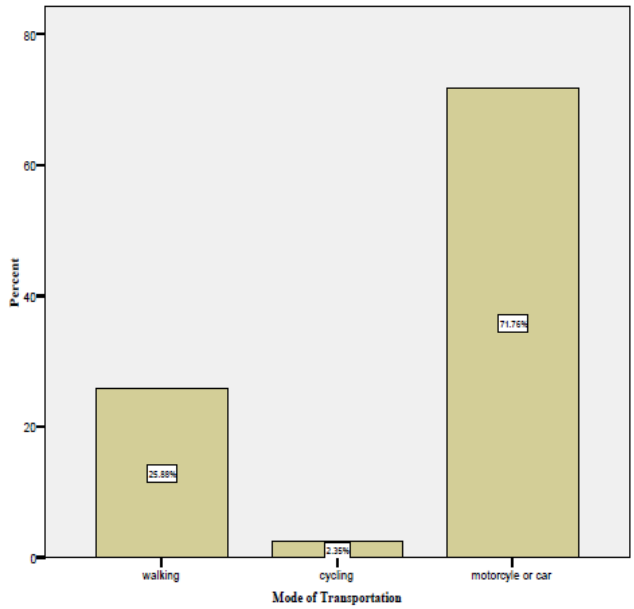
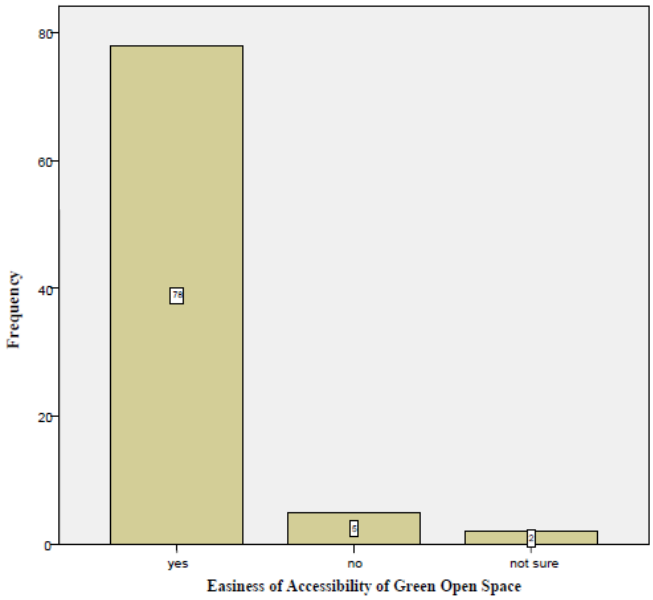


Table 5. Accessibility Level of Green Open Space



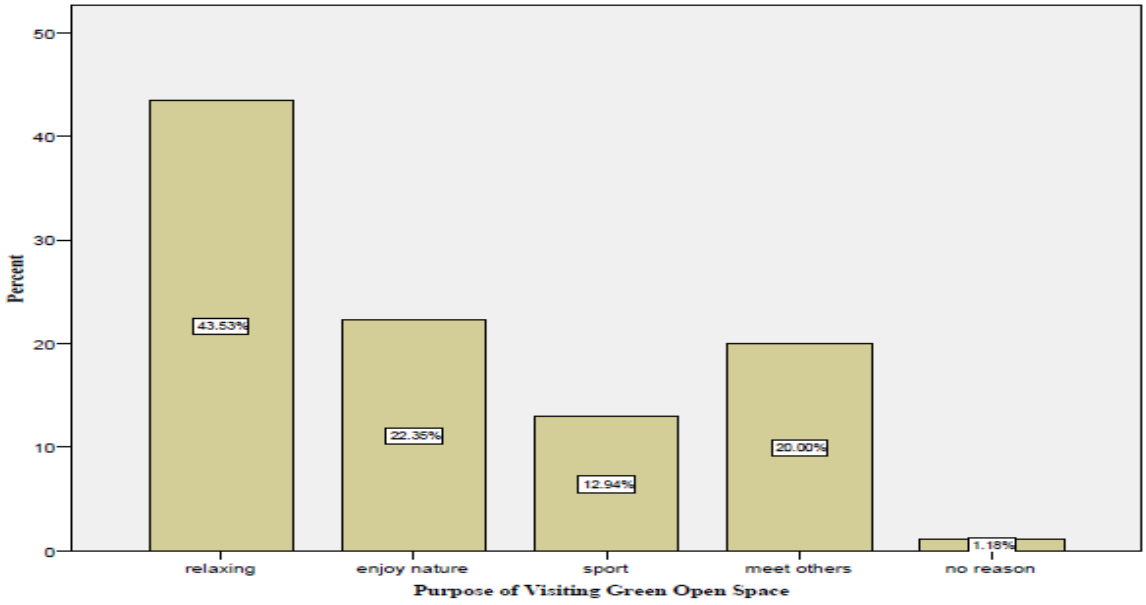
Frequency of Visit

According to the survey results, most of respondents visited green open space once a week and it was done during weekend. Respondents who visited green open space once a week cover 45.88% of total respondents. This is followed by 27.06% of respondents who visited green open space 1 to 2 times a month. Meanwhile respondents who visited green open space 2 to 3 times a week cover 22.35% of total respondents and only 4.71% of respondents who visited green open space everyday.

Purpose of Visit

Provision of green open space is aimed to improve quality of life of urban citizen. Green open spaces provide numerous types of facilities and activities for various age groups. This study identified that majority of respondents visited green open space for relaxing, which covers 43.53% of respondents. Respondents who wanted to enjoy the nature as their purpose cover 22.35% of total respondents. It is followed by the purpose to meet other people which are 20% and for sport and exercise purposes indicating 12.94% of respondents. Meanwhile, only 1.18% of respondents visited green open space with no reason.

Table 6.Purposes of Visit Green Open Space



Attractiveness of Green Open Space

The results of survey indicate that 49.41% of respondents satisfied with the design and the attractiveness of green open space. Meanwhile, respondents who stated opposite cover 45.88% of total respondents and the rest 4.71% of respondents were not sure. This study also identified some facilities in green open space that should be improved from respondents' point of view. As the most of respondents' mode of transportation is private transport, they wished local authority provide sufficient and free parking area. Other respondents stated that children playing equipment should be provided adequately in variety types of challenges.

Safety Level of Green Open Space

Safety is a part of precondition for use in determining people will be attracted to visit green open space. This study identified the respondents' perceptions regarding the safety level of green open space that they have visited. According to survey results, 71.76% of respondents admitted that they felt safe when visiting green open space and 25.88% of them felt unsafe when they visited the facility. Meanwhile, the rest of respondents which cover 2.35% were not sure. This study identified some elements that respondents stated about safety aspect in green open space are the safety of parking area, barrier for children especially in green open spaces which are located close to roads, lighting, and cleanliness of the facility.

Satisfaction Level of Green Open Space Performance

This study identified the satisfaction level of residents regarding the performance of green open space in the city. From the results of the survey, 86% of respondents were not satisfied with the distribution of green open space in the city in term of number of green open space that is provided by the local authority. Meanwhile 13% of respondents were satisfied with the provision and distribution of green open space in the city. The dissatisfied respondents also agreed that green open space need to be added in their area. Meanwhile, if the assessment of the satisfaction of green open space performance was done based on the respondents' subdistrict area, the results of the survey can be concluded that majority of respondents in all subdistrict were not satisfied with the distribution of green open space. From three selected subdistricts of respondents, city center has the highest number of respondents who were satisfied with the provision of green open space which was 6 respondents followed by Tampan with 4 respondents and Sail 1 respondent as highlighted in the Table 2.7. Meanwhile, from 73 respondents who were dissatisfied with the provision of green open space, 47 of them from Tampan, 15 from Sail and 11 from city center.

Table 7.Cross Tabulation between Subdistrict of Respondents with Satisfaction of Green Open Space Performance

Subdistrict of Respondence	Satisfaction Subdistrict of With Green Open Space Performance			Total
	Satisfied	Dissatisfied	Not Sure	
City Center	6 (33.33%)	11 (61.11%)	1 (5.56)	18 (100%)
Sail	1 (6.25%)	15 (93.75%)	0 (0%)	16 (100%)
Tampan	4 (7.84%)	47 (92.16%)	0 (0%)	51 (100%)
Total	11 (13%)	73 (86%)	1 (1%)	85 (100%)

The results from the cross tabulation performed between subdistricts of respondents and satisfaction with the distribution of green open space show that respondents from city center were not all satisfied with the provision of green open space, followed by respondents who stay in Tampan and Sail. This study also analyse the difference of respondents' perceptions between three subdistrics in the study area with the Chi Square Test of Independence. The Chi Square test examined the hypothesis on the satisfaction level of respondents between the three subdistricts. Based on the Chi-square test, the p-value obtained is less than 0.025, and it can be concluded that there is a significant relationship between subdistricts where respondents stay and satisfaction with green open space distribution.

CONCLUSION AND RECOMMENDATIONS

Based on the data analysis, some conclusions can be derived from its findings that achieve the objectives of the study and answer the research question which comprises of firstly the equity of green open space distribution among different parts of the city, secondly, the efficiency aspects in terms of utilization of green open space facilities and thirdly, satisfaction levels perceived by residents on the provision of green open space. The study has found and concluded that majority of respondents felt dissatisfied on the distribution of green open space. Specifically, this study analysed the variables related with the equity distribution of green open space. In term of the distance of green open space from residential area, majority of respondents stayed in the areas which have the distance more than 300 meters which means respondents can not reach green open space in 5 minute by walking from their home as the general standard that is used in many countries.

From the distance and mode of transportation that respondents used, it can be concluded that the provision of green open space is not effective to ensure the ability all citizens from all part of city to utilize green open space as recreational place. Majority of respondents also wanted to get additional green open space in their residential area. Nevertheless, some improvements regarding the planning and distribution of green open space should be considered and undertaken in the recommendation so as to further improve the equity of its allocation across the city. As the efficiency of recreation service can be measured in

person-hours of attendance, this study identified that majority of respondents visited and enjoyed green open space less than two hours. For the majority of respondents who visited green open space during the weekend, it can not be said that respondents felt comfort and enjoyed the facility provided. It can be concluded that the facility of green open space is not efficient as recreation resource for citizens.

Based on the conclusion above, the aspects that influence the ineffectiveness of green open space provision as recreation resource need to be taken into considerations in the recommendations for the improvement of its role for urban citizens' quality of life. The survey results revealed that respondents were dissatisfied with the distribution of green open space distribution and they wanted to have more green open space. The survey results also found that the aspects of equity distribution of green open space influence the effectiveness of the distance and time needed to visit green open space. Based on the aspects of the efficiency of green open space utilization, the survey results revealed that the attractiveness of green open space need to be improved to attract urban citizens visit green open space and stay longer for their recreational activities.

According to the survey result, respondents only spent their time less than two hours every weekend for their recreational activities. However, approaches to open space planning vary, and there is no general agreement on the desirable planning criteria as to how much open space is needed, where open spaces should be located or how they should be used (Maruani and Cohen, 2007). Planning for recreation addresses questions such as how much, what sort and where the open space is needed; thus it relates to parameters focused on users' needs, such as size and spatial distribution of open spaces, compatibility between potential uses and activities, accessibility, visibility and suitability to special needs. Proposals to improve the effectiveness of green open space provision as urban recreation resource in Pekanbaru shall include the following:

- Additional green open space facilities

  According to the summaries of this study which state that majority of respondents felt dissatisfied on the distribution of green open space. It means that the degree of equality in the distribution of green open space can not ensure the ability of residents to utilize green open spaces as recreation facilities. Due to this condition, additional of green open space is needed to improve the quality of life of residents. Integration of natural and built environment is a key objective of sustainable development (Carmona *et al*., 2003). Open space should be an integrated and important part of the urban design vision for a place, often as a key focus for public life. Public open space offers recreational opportunities, wildlife habitats, venues for special events, and the opportunities for the city to breathe.

- Improvement of green open space quality

  Green open spaces for recreation purposes should be designed well to fulfill the needs of visitors. In achieving an efficient provision of green open space, it should consider some aspects in the improvement of green open spaces quality such as the attractiveness and safety of those facilities. If those aspects are not fulfilled, people would not be attracted to utilize green open spaces as recreation resources in the city. The attractiveness of green open space for recreation activities also need to consider the different age of users. The facilities should be provided in different types and levels of challenges and experiences, so it can ensure the opportunities for all visitors to enjoy green open space as recreation area.

- Applying Functional Levels in Green Open Space Provision

  In line with the idea of Herzele (2003), the provision of green open space should ensure the ability of citizens to access it in different functional levels.The policy in the provision of green open space should provide equitable access to parks and open spaces to ensure that the type, location and quality of the infrastructure are evenly spread. However, urban greening should be evaluated in relation to the relevant functional scales, ranging from street to city level. To achieve better quality and quantity of green open space, local authority of Pekanbaru need to take consideration of applying the hierarchy development of green open space for recreational purposes.

REFERENCES

Carmona, M., Heath, T., Oc, T. & Tiesdell, S. (2003*). Public places, urban spaces: the dimension of urban design*. Burlington: Architectural Press.

Gold, Seymour M. (1980). *Recreation planning and design*. United State: McGraw- Hill.

Herzele, A.V., Wiedemann, T. (2003). A monitoring tool for the provision of accessible and attractive urban green spaces. *Journal of Landscape and Urban Planning, 63*, 109–126.Retrieved November 23, 2008.

Kiminami, L., Button, K., & Nijkamp, P. (2006). *Public facilities planning*. Cheltenham: Edward Elgar Publishing Ltd.

Kraus, Richard. (1990). Recreation and leisure in modern society. London: Harper Collins.

Maruani, T., Cohen, I.A. (2007). Open space planning models: A review of approaches and methods. *Journal of Landscape and Urban Planning, 81*, 1–13. Retrieved November 20, 2008.

Pemerintah Kota Pekanbaru. (2007). *Master Plan of Pekanbaru*. Pekanbaru: Author.

Pigram, J.J. & Jenkins, J.M. (1999). *Outdoor recreation management*. New York: Routledge.

Wilkinson, P. (2003). *Open space*. London: Routledg