REGULAR ARTICLE

CONNECTING COMMUNITY CHARACTERISTICS AND WILLINGNESS TO PARTICIPATE IN GREEN-BLUE SPACE MANAGEMENT: A PRELIMINARY STUDY AT TAIPING LAKE GARDEN, PERAK, MALAYSIA

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ABSTRACT

Urban communities have long been interested in managing their local green-blue spaces, especially in developed countries. Community participation can make significant contributions to achieve sustainable cities and communities. However, in developing countries, it can be challenging to engage the community in green-blue space management without information on how much they are willing to participate. This paper aims to explore the relationship between community profiles and visit characteristics with their willingness to participate in managing urban green-blue spaces. Data were gathered through a preliminary survey of visitors at Taiping Lake Garden, Perak. A random sample, compromising 31 respondents, was chosen for a questionnaire survey. The comparison between willingness to participate in green-blue space management and community profiles were evaluated using ANOVA and independent sample t-test. The results suggest that community willingness to participate in green-blue space management are encouraging. Majority of the respondents (64.5%) demonstrate high interest to take part in co-managing Taiping Lake Garden with the local authority as well as other stakeholders. In conclusion, this paper offers useful information to understand the strategy in the sustainable management of urban green-blue spaces for community development and can enhance the willingness to engage in sustainability or stewardship actions especially in developing countries.

***Keywords**: Community, green-blue space, management, stewardship, willingness to participate*

1. INTRODUCTION

The world is going through rapid urbanisation, with the percentage of people living in cities are expected to increase from 50% in 2010 to nearly 70% by 2050 (United Nations, 2013). In Southeast Asia, the urban expansion rate is 2.8% higher than many urbanised regions (Cohen, 2006; United Nations, 2012). The shift to urbanization will inevitably result in emerging issues such as the lack of urban green space (parks, lake gardens) in densified cities and the removal of green space when densifying urban areas, especially for Asian cities (Haaland & van den Bosch, 2015).

Urban areas provide a range of benefits to sustain and improve the quality of life through urban ecosystem services (Klimanova et al., 2018). Urban green-blue space includes vegetated areas in cities, like urban parks, gardens, and greenways with the blue element, such as lakes and rivers. With increased attention focusing on the potential and role of urban green and blue spaces to help promote physical activities (Coombes et al., 2010), better mental health in adults (Gascon et al., 2015), social interaction (Arnberger, 2012), promote a sense of community (Nath et al., 2018) and stress reduction (Mantler & Logan, 2015), there is an urgent need to understand better how urban ecosystems are experienced and how urban community can participate in managing their own green-blue spaces. Moreover, green-blue spaces can encourage pro-environmental behaviours and stewardship from local urban communities. According to Zhang et al. (2020), community participation is the most significant predictor of pro-environmental behaviors. When people are willing to take care of their parks or gardens, it often increases their ecosystem functioning, and in turn, the ecosystem services will provide back to them (Jennings et al., 2019). The communities can manage and ensure that the benefits provided by the ecosystems can be well enjoyed (Bakar, Rahim, & Nasir, 2020). Besides, engaging people in the management and stewardship of the parks or green spaces can generate significant value (Romolini et al., 2019). Therefore, this preliminary study aims to find out community willingness to participate in urban green space management as well as to compare their willingness with their profiles and visit characteristics.

2. LITERATURE REVIEW

Urban green space planning and management is an important aspect that needs to be taken into consideration when addressing sustainable cities and communities. Stakeholder involvement and encouraging community participation are fundamental to the management of green and blue spaces and making sure that urban planning is according to the users' and residents' needs (Hordijk, 2013; Jim, 2013). However, there is a lack of collaboration between different actors with the local community in the management of green-blue spaces even they are aware and ready to take responsibility to conserve and manage such areas (Hassan & Mombo, 2017). Not only that, the involvement of the community in the co-development processes often depends on what the local governments do, encourage, and allow (Revi et al., 2014). Participatory approaches can improve the governance of urban green-blue spaces. Still, many developing countries do not have the institutional structures and policies that promote the participation of a range of non-state actors (Alam & Lovett, 2019).

In addition, community participation in green-blue space maintenance and management can be a way of improving the physical environment as well as developing some social capital in the neighbourhood (Mohapatra & Mohamed, 2013). All stakeholders including local community need to increase their participation to improve the attainment of green space area (Wantouw et al., 2014). Local communities are likely to willing to take care of their own green space in order to get more tangible and intangible benefits from the ecosystem (Nasir & Rahim, 2020). Co-management approaches are seen to be adapted in order to better understand the complex social and ecological systems in urban green-blue spaces. This approach could accommodate the interests of all stakeholders. As a preliminary study, this study adopts co-management variable developed by Wantow et al. (2014) focusing more on the community's willingness to participate in managing green-blue space if the city council or local authority are prepared to provide information about the importance of such spaces, good relationship with the city council, support and if the council helps the community to find problem-solving related to the management.

Furthermore, different socioeconomic backgrounds have different opinions and aspirations about community participation in green-blue space management. Urban communities with higher socioeconomic status were more motivated to get involved in the management of urban green-blue space (Mohapatra & Mohamed, 2013). Community participation can make significant contributions to achieve sustainable cities and communities. However, it can be challenging to engage the community in green-blue space management in developing countries without providing them with information on how much they are willing to participate. Thus, this paper aims to explore the comparison between community profiles and visit characteristics with their willingness to manage urban green-blue spaces.

3. METHODOLOGY

3.1 Study Area

Taiping Lake Garden (coordinates of 4o51'18.99" N 100o 44'52.09" E) is located at the northern Perak, Malaysia and covers 64 hectares, filled with 2,300 trees and the unique sight of the drooping branches of the 100 years old trees (Thani et al., 2015). It was the first public garden established during the British rule in Malaysia and it was formerly a tin mine. Now, Taiping Lake Garden serves as Environmentally Sensitive Areas that is focusing more on recreation as well as a cooling agent (green lungs) to Taiping city. Taiping is the capital town of Larut, Matang, and Selama district. According to Department of Statistics Malaysia, the total population of Larut, Matang, and Selama district in 2016 was 356,000. Taiping Lake Garden Taiping Lake Garden receives natural water supply from land drains or streams that flow directly into the lake at Alamanda Pond and Island Pond. There are almost 10 lakes and small ponds making Taiping Lake Park one of the main attractions in Perak due to the biodiversity, not only for locals to enjoy, but also to attract local and foreign tourists.

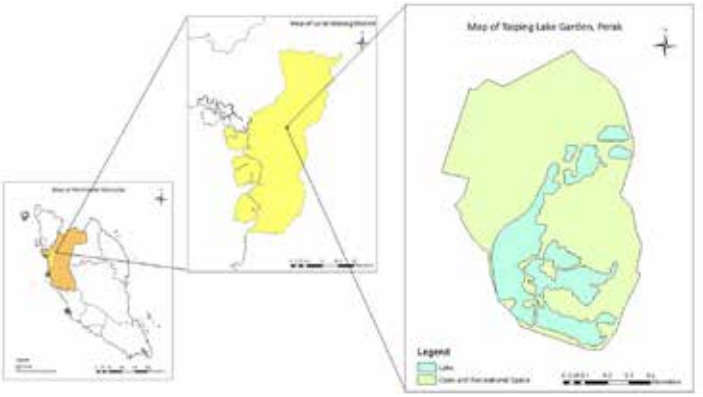

Figure 1: *Map of Study Area (Taiping Lake Garden, Perak)*

3.2 Questionnaire Survey and Sampling Method

The preliminary study adopts a quantitative approach using a survey questionnaire to analyse the community who visits Taiping Lake Garden for their recreational activities during the month of December 2019. The survey was pilot tested for

clarity by 31 respondents by using simple random sampling. According to Johanson and Brooks (2010), minimum sample required for pilot study is 30 samples. Mooney and Duval (1993) noted that when using random sampling technique, 30 samples is recognized as a reasonable minimum sample size for bootstrapped confidence intervals. The questionnaire was divided into two parts; the first part had questions on demographic characteristics, and the second part compromised questions on community willingness to participate in the green-blue space management. The community willingness to participate in the management of the green-blue space were evaluated using nine items of the Likert scale which were constructed based on the literature review. The Likert scale ranged from "strongly disagree (1)" to "strongly agree (5)".

3.3 Statistical Analysis

The data collected from the respondents' answers were statistically analysed using the IBM Statistical Package for Social Science (SPSS) statistical software version 24. The data distributions for this pilot study were normally distributed, therefore, we resorted to a parametric test. Sample sizes that is greater than 30 generally produce a normal distribution of sample (Uttley, 2019). The analysis was accomplished using the Analysis of Variance (ANOVA) and independent sample t-test. In the independent sample t-test, the means of two groups are compared to check whether they are significantly different from each other, while ANOVA is used to compare means when there are more than two groups of respondents. In this study, the willingness to participate in green-blue space management was taken as the dependent variable while the other variables (e.g., demographic profiles) were taken as independent variables. Besides, the Likert scale scores were interpreted to determine the level of willingness to participate in green-blue space management.

4. RESULT & DISCUSSION

4.1 Demographic Profile

Table 1 gives a summary of the demographic profile of the respondents. The data was collected from a total of 31 visitors at Taiping Lake Garden as part of a preliminary study. The respondents are mainly females and only around 29.0% are males. The highest number of respondents comprises 10 respondents (32.3%) aged between 18-30 years old followed by 29.0% respondents who are less than 18 years old and around 12.9% of them are more than 50 years old. Majority of the respondents has at least graduated from secondary school (58.1%) followed by 25.8% having at least a diploma or STPM. In terms of time spent at Taiping Lake Garden, majority of the respondents (58.1%) spend two hours at Taiping Lake Garden and most of them only visit Taiping Lake Garden once a month (45.2%). In addition, 61.3% of the respondents live more than seven kilometers from Taiping Lake Garden but it is not in Taiping city itself.

Table 1: *Demographic profiles*

Variable	No. of Respondents (f)	Percentage (%)
Gender		
Male	9	29.0
Female	22	71.0
Age (years old)		
< 18	9	29.0
18 – 30	10	32.3
31 – 40	5	16.1
41 – 50	3	9.7
> 50	4	12.9
Level of Education		
No formal education	1	3.2
Secondary school	18	58.1
STPM/Diploma	8	25.8
Bachelor's degree	4	12.9
Time Spent at TLG		
1 hour	3	9.7
2 hours	18	58.1
3 hours	10	32.3
Frequency of Visits		
Everyday	3	9.7
Once a week	5	16.1
More than once a week	4	12.9
Once a month	14	45.2
Others	4	12.9
Distance to Taiping Lake Garden		
<4 km	7	22.6
4 – 7 km	5	16.1
> 7 km	19	61.3

4.2 Community Willingness and Ability to Participate in Taiping Lake Garden Management

The findings indicated that most of the respondents (64.5%) scored a relatively high level in their willingness to participate in managing Taiping Lake Garden (Table 2). This means that the respondents are already aware of the significance of participation in the management of Taiping Lake Garden. Besides, this also perhaps suggests that respondents at Taiping Lake Garden are equal in the sense of stewardship and so willing to participate. This could be a good indicator for a better understanding of how they would like to participate and the catalyst for them to participate in the future. For instance, in Bangkok, one way to participate in green space development is through payment and their willingness to pay is affected by bid amount, gender, age and income (Bejranonda & Attanandana, 2011). This finding is similar to other related studies; for example, Hassan & Mombo (2017) found that 55.8% of the respondents were willing to participate in conserving open spaces while the rest were neutral. Shan (2012) found that about 76% of the respondents were ready or very keen to participate in the planning, management, and design of urban green spaces in Guangzhou, China.

Table 2: *Level of Willingness to Participate in Taiping Lake Garden (TLG) management*

Level of Willingness	Score	No. of respondents (f)	Percentage (%)
Moderate	10 – 15	11	35.5
High	16 – 20	20	64.5

Further analysis was conducted to determine the respondents' potential or ability to participate in Taiping Lake Garden management. Almost all respondents who participated in the preliminary survey showed their potential and ability to participate in the management of Taiping Lake Garden. Table 3 presents the results of the respondents' ability to participate in the management. With regard to ability, the respondents rank taking care of plants and participate in clean-up events as the most important ability required if they want to participate in the management of Taiping Lake Garden. All the respondents (100%) are willing to spend their time taking care of the plants and participate in clean-up events at Taiping Lake Garden. Our results demonstrated that the ability of the respondents to contribute their time in participating in Taiping Lake Garden's management is considerably keen on participating in activities directly connected to the environment. Their behavior might influence such abilities because behavior is directly related to the environment in which they act (Baber, 2018). Besides engaging in a decision-making process, participating in discussions and giving financial contributions are ranked third and fourth respectively as the abilities that the respondents possess. It is interesting to note that 77% of the respondents express their willingness to contribute financially toward the maintenance of Taiping Lake Garden. A similar pattern of results was obtained in Nath et al. (2018), showing that the respondents in their study were willing to contribute to a park management's fund if requested by the management. However, our result is different from Rupprecht et al. (2015) because they reported that their respondents were hesitant to contribute money for urban nature preservation, even though they valued urban nature. Therefore, it must be pointed out that our result indicated that the respondents might have a higher awareness of the importance of urban green spaces for them to make monetary contributes toward its maintenance to ensure that the urban green space remains attractive so that the community could enjoy a clean and safe green space.

Table 3: *Ability to Participate in TLG Management*

Statement	Ratings (W)					∑W*N	RII	Rank
	1	2	3	4	5			
Engage in a decision-making process.	0	1	3	17	10	129	0.83	3rd
Participating in discussion and regular meetings.	0	1	6	17	7	123	0.79	4th
Taking care of plants.	0	0	0	19	12	136	0.88	1st
Financial contribution for maintenance.	0	3	4	16	8	122	0.79	4th
Participating in clean-up events.	0	0	0	18	13	137	0.88	1st

The study also tried to explore whether the different groups of respondents in terms of their characteristics differed in their willingness to participate in management. The results of the independent sample t-test indicate that there are statistically significant differences in the willingness to participate in managing TLG between male (M=17.3333, SD=2.73861) and female (M=15.5909, SD=1.29685) conditions; $t(29) = 2.429$, $p < .05$. It was found that males tend to show a higher willingness to take part in the management of the space. The result is consistent with the result of a previous study, in which male visitors were more concerned with service quality and natural or cultural landscape resources (Liu & Chuang, 2018), hence are more likely to take part to manage green-blue space by themselves.

Table 4: *Independent sample t-test between gender and willingness to participate*

	N	Mean	SD	t	df	Sig.
Male	9	17.3333	2.73861	2.429	29	.022
Female	22	15.5909	1.29685			

** p-Value at the 0.05 level of significance*

One-way ANOVA test was employed for variables of more than two groups to represent the community characteristics of visitors to Taiping Lake Garden such as age, education level, time spent at TLG, frequency of visits and distance to TLG. As a result, the variables which indicate statistically significant differences that could be observed were age and time spent at TLG. Table 5 – 10 present the results obtained.

Further observation of the data through post hoc analysis reveals that only the mean score for the respondents aged less than 18 years old (M=3.0000, SD=.0000) shows significant differences between respondents aged between 18 to 30 years old (M=2.4000, SD=.5164) with p = .034. However, there is no differences between the groups aged between 31 to 40 years old, 41 to 50 years old and more than 50 years old. In addition, the post hoc analysis also reveals that only the mean score for the respondents who spend their time for at least one hour at the TLG (M=2.0000, SD=.0000) is significantly different when compared to respondents who spent two hours at TLG (M=2.7222, SD=.4609) with p = .041. However, there were no differences between the groups that spend 3 hours of their time at TLG. This indicates that respondents who are younger than 18 years old and who spent at least two hours have a higher willingness to engage in the management of TLG compared to the other groups. This might be because younger people tend to meet with their friends or interact with their own group in the green space. For them, parks provide settings for socializing with friends and allow them to have their own space where they can be together, free from control and away from the adult urban state gaze (van Aalst & Brands, 2020). Thus, age differences and time spent at TLG should be taken into account when encouraging community participation in green-blue space management, especially among youth.

Table 5: *Descriptives of ANOVA between Age and Willingness to Participate in TLG Management*

Age	N	Mean	SD
< 18	9	3.0000	.0000
18 – 30	10	2.4000	.5164
31 – 40	5	2.4000	.5477
41 – 50	3	3.0000	.0000
> 50	4	2.5000	.5773
Total	31	2.6452	.4863

Table 6: *Analysis of Variance (one-way ANOVA) between Age and Willingness to Participate in TLG Management*

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.497	4	.624	3.528	.020
Within Groups	4.600	26	.177		
Total	7.097	30			

Table 7: *Multiple Comparisons of Willingness to Participate by Age*

	Age	Mean Difference	Sig.	Statistically significant from
1	< 18	.60000*	.034	2
2	18 – 30	-.60000*	.034	1

**The mean difference is significant at the 0.05 level.*

Table 8: *Descriptives of ANOVA between Age and Willingness to Participate in TLG Management*

Time Spent at TLG	N	Mean	SD
1 hour	3	2.0000	.0000
2 hours	18	2.7222	.4609
3 hours	10	2.7000	.4831
Total	31	2.6452	.4864

Table 9: *Analysis of Variance (one-way ANOVA) between Time Spent and Willingness to Participate in TLG Management*

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.386	2	.693	3.397	.048
Within Groups	5.711	28	.204		
Total	7.097	30			

Table 10: *Multiple Comparisons of Willingness to Participate by Time Spent at TLG*

	Time Spent	Mean Difference	Sig.	Statistically significant from
1	1 hour	-.72222*	.041	2
2	2 hours	.72222*	.041	1

**The mean difference is significant at the 0.05 level.*

Notably, in the analysis of this study, community willingness to participate in green-blue space management is based on four criteria. First, the majority of the respondents are interested in getting involved in the management of green-blue space if the city council provide information about the importance of green-blue space, support and helps them to solve problems related to green-blue space management and if they have a good relationship with the council or authorities. Second, some management or stewardship activities that connect people directly with nature may simultaneously impact the benefits that will be perceived. Third, comprehensive information on the facts and figures about the city or green space itself is essential to give an insight to the community regarding the current quality and status of the area. According to Mathers et al. (2015), communities have long been interested in managing green spaces. Thus, they are likely to be more interested in maintaining and managing the green-blue space if they become more aware of the current quality status. Fourth, more education is also needed to raise community awareness about the laws and roles of different actors concerning green and blue space management (Hassan & Mombo, 2017). Finally, the low-level community participation group has low education and lacks environmental science knowledge (Zhang et al., 2020).

Moreover, in line with previous research, Zambrano et al. (2019) proposed an approach for urban green space management compromising three components, namely (a) scientific knowledge, (b) community interaction with the environment, and (c) management decision. The criteria in this study and the proposed approach could be further explored to look at the relationship between the community's willingness to participate in the stewardship actions and management as well as how their participation can influence the decision about the management of the green-blue space. For example, if their use of green space included recreation or play rather than purely exercise or transit, their willingness to engage positively with stewardship activities can be enhanced (Lamond & Everett, 2019). In their studies, Alam and Lovett (2019) found that the community plays a crucial role to take over management as their right and their civic duty. Thus, policies that can support active participation among the community in managing their own green-blue space have the potential to enhance social and environmental outcomes and become the main driver for decision making for urban planners, managers and communities. Not only that, but it also requires active collaboration among actors while taking the management goals into account.

5. CONCLUSION

The study presented can only be considered the first step in collecting more comprehensive information on community participation in urban green space management. It is encouraging to see that community willingness to participate in green-blue space management is significant. However, only the age and time spent at Taiping Lake Garden were statistically significant. Therefore, policymakers and decision-making bodies must consider these factors when designing the participatory management approach to tackle community willingness to participate in the management efforts of green and blue spaces within urban settings. This paper offers valuable information to understand the strategy in the sustainable management of urban green-blue areas for community development. It can enhance the willingness to engage in sustainability or stewardship actions, especially in developing countries.

ACKNOWLEDGEMENT

The authors would like to acknowledge the funding received from the research grant titled Bundled Urban Green-Blue Space Benefits: Development of Education for Sustainable Development (ESD) Module for Sustainable Urban Planning, Research University (RU) Grant from the Universiti Sains Malaysia (1001/PHUMANITI/8016002).

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