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The Climatology Effects on Outdoor Recreation Perception and Activity in Shah Alam

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Abstract

The involvement in outdoor recreation is believed depending on the climate condition. This study discovers whether the climatology factors; temperature, humidity, sunshine, rainfall and wind affecting the perception of recreationist to be involved in outdoor activity in Shah Alam particularly. These microclimatic observations outlined the consequence of recreational activity and perception of user with regards to the pattern and trend of outdoor recreational activities. The result suggested that the climate condition affecting their perception towards outdoor recreation activities involvement and the technical assessment showed contradictory.

Keywords: Weather; microclimat; outdoor recreation; urban park

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1. Introduction

Climatology factors are believed to influence the environmental variables that are the crucial for outdoor recreation activities. The type and activity involved the background and culture, and even the quality of recreation experiences. Equatorial-typed of weather in Malaysia is significantly unique due to the hot and wet combination. The complex climate enables the recreationist to choose and decide the type of activities that are suitable with surrounding environment. There are a few studies have been done and showed the association of physical activities and weather respectively in the seasonal-typed of countries (Suminski, Poston, Market, Hyder, and Sara, 2008; Humpel 2002; Booth, Owen, Bauman, Clavisi, dan Leslie, 2000). Other studies have reviewed about the effect of season and weather on physical activity (Tucker and Gilliland, 2007). Several researches were conducted does not discussed the variations of weather in terms of geographical locations. Most of it shows the impact of extreme and poor weather towards outdoor activities (Bélanger et al, 2009; Fisher et al, 2005; Nankervis, 1999).

The features of accessibility, design of the recreation area, and climatic factors has been studied to deter the factors of activities (Bestard and Font, 2009). The climatic factor in Malaysia seems insignificant for outdoor activity, therefore, the design and the usage of the public space for activities should promote the comfortableness. As the equatorial climate is hot and humid, there must the other way to encourage the public to involve with the activity without the judgment which climate to be considered. Hence, it is suggested even the urban form are more compact, the provided additional shade through the use of trees, covered walkways, pedestrian arcades, etc. will help improve the outdoor comfort (Johansson and Emmanuel, 2006).

The climatology factors in activity can also be seen correlated with physiologically needs. Several studies explain how the outdoor activity gives impact of their comfortableness for involvement. Those studies show how the user of the open space perceived the comfortableness by the surrounding environment (Thorsson et al., 2007; Fan and Tsang, 2008; Rotton and Cohn, 2004).

Nicholls (2007) also agree that society and environment might be impacted by extreme weather and climate events. Consequently, some research has demonstrated the systems to do certain assessment and forecasting of urban air pollution and urban emergency preparedness(Baklanov et al., 2007).

Thus, the aim of this study is to explore the visitors' of Taman Tasik Shah Alam perception regarding the weather and its relationship towards outdoor activities. The method adapted int his study involves comparing their behaviors, their preference of activity, and the involvement correlated with the climatic factors.

2. The Study

The ground data collections were conducted on 5th to 13th October 2009 using weather station instrumentation, structured interviews and visitors counter. The data taken from weather station are air temperature, relative humidity, rainfall and wind speed. The data were collected every five minutes from 1600 hour until 1900 hour. Only five days of the observed data is valid for the study. The tally counter was applied for collecting users' number of trespassing. The structured interviews were conducted within timeframe concurrently.

A point in Taman Tasik Shah Alam is chosen to place the weather station and the trespassing line for counting the frequency of the visitors. Study area of this research is chosen as it is the biggest public park and green area in Shah Alam. Taman Tasik Shah Alam is located at the heart of Shah Alam was called Sungai Renggam. The location of this study area is nearby Plaza AlamSentral, BangunanDarulEhsan and MajlisBandaraya Shah Alam. The site has been selected as it is the center of the most visitors enters the park. The hatch area shows the study area (Fig.1).
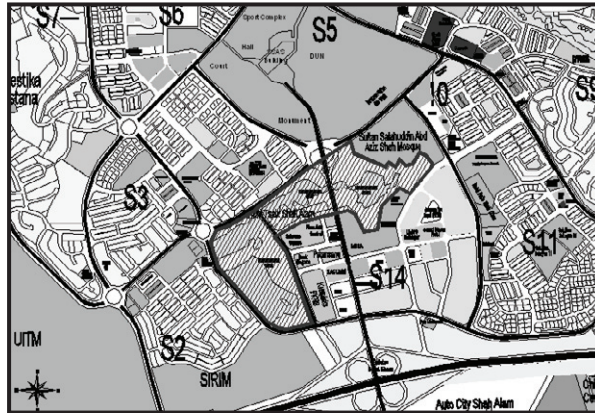
Fig. 1. Study area, Taman Tasik Shah Alam

2.1. Structured interviews

There are 303 respondents received during the actual semi-structured interview. The information requested consists of their profile, attitude towards outdoor activities and perception about the weather factors for them to be involved in outdoor activity. The question comprises of gender, age, occupation, education, marital status, their preference of activity and their perception about the weather with regards to their involvement in outdoor activities.

2.2. Microclimatic assessment

A portable weather station (Fig.2) that is equipped with data logging weather station was installed at a point in Taman Tasik Shah Alam. The position of weather station was chosen at the most open spaces in order to have a maximum sun. The solar panel of the weather station was installed facing the south to ensure the precise measurement of wind direction. The 3-Watt solar panel and 4AH sealed lead acid battery is used for the operation. The data recorded are air temperature, wind speed included peak and average speeds for the interval, rainfall, relative humidity and solar radiation. The data logger recorded the data at average of five minutes interval. The data retrieved at 1600 hours to 1900 hours for seven days from 5th to 13th October 2009.
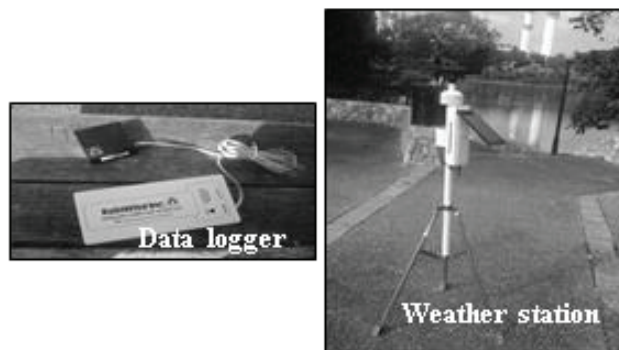

Fig.2. The weather station and data logger instruments

Table 1 shows how the microclimate pattern of Taman Tasik Shah Alam. The five days observation shows a quite similar range i.e. little bit cloudy, a day of rainfall and hot sun. Day 3 of the observation show a measurement of 1 mm rain fall per minute about 20 minute (1600 hours until 1620 hours). Fig. 3 shows (a) average value of air temperature, T_a and (b) the pattern of air temperature for the five days.

Table 1. Selected parameter of climatic data at Tasik Shah Alam

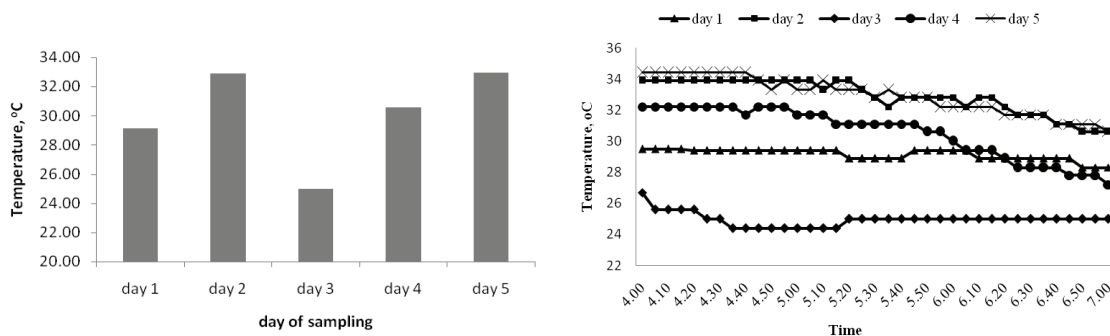| Day of Sampling	Temperature (°C)			Relative humidity (%)			Wind speed (ms^{-1})		
	Min	Max	Average	Min	Max	Average	Min	Max	Average
Day 1	28.3	29.5	29.1	65.0	75.0	69.5	0.0	1.8	0.8
Day 2	30.6	33.9	32.9	41.0	59.0	48.2	0.4	1.8	1.3
Day 3	24.4	26.7	25.0	90.0	100.0	97.0	0.0	2.7	0.5
Day 4	27.2	32.2	30.6	55.0	78.0	66.1	0.0	2.2	0.8
Day 5	30.6	34.4	32.9	44.0	54.0	47.6	0.0	1.8	0.7

Fig. 3. (a) Average Value of Temperature (three hours) for Different Day; (b) Pattern of Temperature for Different Day

2.3. Visitors trespassing counting

The visitors were counted by having a trespassing line and tab using tally counter. Visitors are recorded in every five minutes. Five minutes data acquisition was chosen to provide the correlation between weather station data and visitation data. The numbers of visitors were recorded using a form everyday with the interval five minutes.

3. Results and discussions

This study suggested that based on the respondents' feedback and ground data sampling, the outdoors activities does not significantly influenced by the weather and climate condition. However, the technical indicator (visitor counter) shows that the number of recreationist has decreased particularly during rainy day. On the other hand, other non-extreme weather factors i.e. cloudy, hot temperature, pollution remains insignificant in performing outdoor activities.

3.1. Visitor's Profile

Based on the structured interviews, more than half of visitors were male (52.1%) and the rest were female. Majority of the respondents were local visitors (81.2%) who stays in Shah Alam area and those staying outside of Shah Alam (18.8%) are mainly comes from Klang, Puchong and Subang Jaya.

Table 2. Visitors' Profile

Visitors' profiles	Frequency (N)	Percentage (%)
Gender		
Male	158	52.1
Female	145	47.9
Age		
Below 20	87	28.7
21-30	186	61.4
31-40	19	6.3
41-50	7	2.3
51-60	4	1.3
Above 60	0	0.0
State Of Residence		
Within Shah Alam	246	81.2
Outside Shah Alam	57	18.8
Occupation		
Professional	12	4.0
Executive/Manager	14	4.6
Self Employed	24	7.9
Civil Servant	31	10.2
Pensioner	2	0.7
Clerk/Supervisor	12	4.0
Unemployed	79	26.1
Others	129	42.6
Education Level		
Tertiary Education	200	66.0
Secondary Education	80	26.4
Primary Education	1	0.3
Others	22	7.3
Marital Status		
Married	44	14.5
Single	259	85.5

Most of the respondents fall under the 21 to 30 years old (61.4%) and still single (85.5%). In terms of occupation, others (students) and unemployed represent the biggest group who visit the Taman Tasik

Shah Alam which is 42.6% and 26.1%. This is closely followed by government servant and self-employed which is 10.2% and 7.9%.

In terms of education levels, more than 60% of the respondents attain at least tertiary education (those holding a diploma, bachelor degree and above) (see Table 2).

3.2. Visitor's Behavior at Taman Tasik Shah Alam

The majority of the visitors (34.3%) indicated that their participated recreation in Taman Tasik Shah Alam is 2-3 times in a week. Once a week also favored by respondents to came at Taman Tasik Shah Alam(Table 3).

Table 3. Frequency in Doing Recreation

Frequency in doing recreation	Frequency (N)	Percentage (%)
Everyday	21	6.9
Once a week	82	27.1
2-3 Times in a week	104	34.3
Once a month	65	21.5
Others	31	10.2

Table 4 shows how the activities that visitor's involved in Taman Tasik Shah Alam. Sightseeing is the main activities (53.8%). This is closely followed by Jogging (50.5%) and Exercising (12.2%).

Table 4. Visitor's Recreation Activities

Activities	Frequency (N)	Percentage (%)
Jogging	153	50.5
Sightseeing	163	53.8
Bicycle	12	4.0
Badminton	5	1.7
Football	3	1.0
Exercising	37	12.2
Kayaking	9	3.0
Others	19	6.3

3.3. Visitors' perception of the influences of climatology factors in outdoor activity

Correlation is the degree of association between two variables and it is represented in terms of a coefficient known as correlation coefficient. The range of the correlation coefficient (r) is it between -1 and +1. If the correlation coefficient (r) is negative, then the variables are inversely proportional and it is maximum when it is -1; if the coefficient is 0, there is no association between the variables. If the coefficient is positive, the variables are associated directly and maximum when it is +1 (Pearson, cited in R. Panneerselvam, 2007).

The correlation between the activities and elements of climatology factors test for the respondents was significant, r (301) = 0.0422, p< .0017 for jogging and air pollution. r (301) = 0.034, p< 0.012 for Cycling

and Cold temperature, r (301) = 0.015, p< 0.139 for Kayaking and Hot temperature, r (301) = 0.031, p< 0.124 for Other activities (e.g. picnic) with API and r (301) = 0.029, p< 0.126 for other activities and Odor gas. The number in the parentheses represents the degrees of freedom associated with the significance test, which is equal to the number of cases minus 2 (or $N - 2$). As shown on the output below, the number of cases for the visitors for this correlation is 303 and, therefore, the degrees of freedom are 303 – 2 = 301.

Substituting the values for each of the variables we find that the correlation coefficient;

$$(1) r = \frac{\sum x_i y_i - n\bar{x}\bar{y}}{(n-1)s_x s_y}$$

Table 5. Pearson Correlation (Activities*Climatology Factors)

Activities/Elements	Significant (2-TAILED)	Correlation
Jogging		
Air Pollution	0.042	-0.117
Bicycle		
Cold Temperature	0.034	0.122
Kayaking		
Hot Temperature	0.015	0.139
Others		
HLAPI	0.031	0.124
Odour Gas	0.029	0.126

* Correlation is significant at the 0.05 level (2 tailed); HLAPI(High level of Air Pollution Index)

3.4. Visitation and temperature

In this part of the study, the visitation shows a relationship with the temperature of the area. The two graphs show information about total number of visitors with average temperature at different times in Taman Tasik Shah Alam.
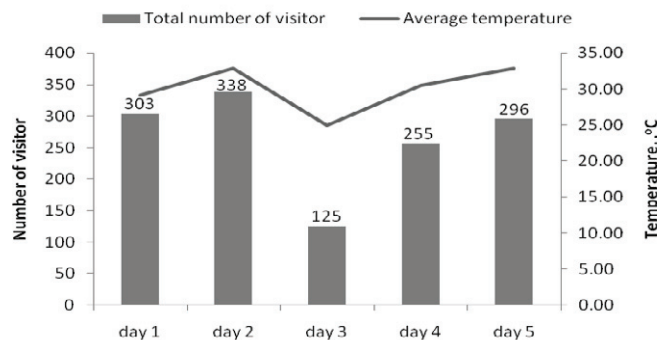

Fig. 5. Total number of visitors with average temperature

Overall, we can see that number of visitors is higher in the higher temperature,ranging from about 255 to 338 persons. Interestingly, we cansee that the daily pattern of visitation is approximately similar for four days, with a low number ataround 250 people for the fourthday.Hence, the day with lowest number of visitation about 125 people caused by the raining and it affected the temperature level (Fig. 5).
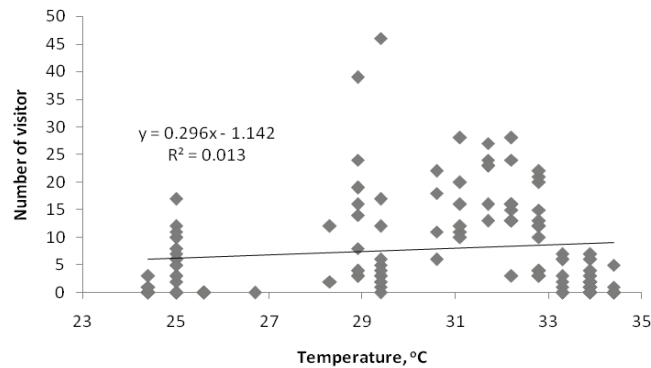

Fig. 6. Attendance and Temperature

Turning to the scatter chart (Fig. 6), we can see that temperature and number of visitors for five days. R2 shows one variable changes, the other variable tends to change in the same direction. The trends indicate that if the temperature increase, the number of visitors increases concurrently. Assessing the two graphs, it seems very clear that park usage is higher because of the moderate weather (hot and humid). People also possibly prefer outdoor activities during the hot sun without raining. The tendency of the decreased temperature level caused by raining caused the drop number of visitation.

Nicol (2004) suggests that most study related to tropical climate (hot and humid) not necessarily depend on the temperature as a variable since people adjusting their activity while considering the temperature. He also suggest that heat-balance model should consider the movement of people in doing activity as people tend to change their posture to affect heat balance by changing the surface area for convective and evaporative heat loss.

4. Conclusion

This study has shown that the people perceived weather as insignificant for the involvement in the outdoor activity, while, the technical data shows contradictory. This study also shows that there are several activities are highly dependent on weather condition.

The result embarks to present systematic data collection by counting the visitor correlated with the temperature conditions, and in doing so to infer some assumptions. Despite the fact that those data can be integrated, the relationship could be concluded that the way they behave is different by the way they perceived. There is a decline of visitors' number in low temperature when conditions can be more adverse than high temperature. Yet, the visitors agree that the weather not the only factor for them to have activity and get involved. This has shown that there are contradictory of human behaviour respond in the actual condition in compared to the quantitative analyses performed by the researchers.

On the other hand, provided the visitors with the facilities of park with the climate comfort created the idea which promotes them to involve more than now. It also suggested a few studies related the climate

comfort in Malaysian or other countries which have the same climate; hot and humid should be done. The correlation between the ecological factors and the design factors seems like not become conscious at all.

Nevertheless, while these factors (human and weather) represent the appraisal, there are somehow slightly stated that social factors could act as the factor of visitation. They might be not understand the weather, or not realize how it affects the daily activity. This study concluded that they realize it without concern how the weather contribute to their way of doing activities.

There is a room for further investigation on behavioural analyses of the recreationist. Perhaps towards surface temperature during the survey is conducted. Whether that can deprived, jeopardised or influenced their thoughts and what they have perceived. Surely, this will require scientist to acquire a real time data measurement and still results may suggested other way.

Acknowledgements

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