

Factors affecting user's perception towards Tasek Bera wetland area in Pahang

(Faktor yang memberi kesan kepada persepsi pengguna terhadap kawasan tanah lembap Tasik Bera di Pahang)

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Abstract

This study attempted to explore the underlying dimensions that affect the environmental perception among users towards Tasek Bera wetland area. In line with that, the study provided the surface responses and demands by users subject to the needs of efficient resource management and development. The exploratory factor analysis (EFA) has been applied to identify the dimensions that can really affect the environmental perception towards this wetland area. The study found that environmental perception among the users can be influenced by two from five dimensional structures namely agricultural activities and society benefit, and plus the compliance items to measure environmental perception itself. It also reveals the necessities to further develop and manage the wetland area in sustainable manner. Further research should be considered to gather more information on environmental perception dimensions in the context of Malaysian users. Those two dimensions of environmental perception that represent a valid instrument to measure the environmental perception should be referred by the resource managers of Tasek Bera wetland area in managing the richness of biodiversity efficiently. This research is important in line with the increasing environmental concern among Malaysians and the excessive deterioration of natural resources in Tasek Bera wetland area.

Introduction

Perception is essentially influenced by two main elements of sensory experience and two steps of recognition and response on the stimulus. Characteristics in surrounding formed the perception as a result of these two major elements. Generally, there are three underlying dimensions that can affect,

alter or affect the environmental perception namely physical characteristics of the environment, social organisation and norms, as well as characteristics of the people (Gifford 2007). These three dimensions have been adapted in this study to reveal the perception of the environment as widely used in many previous studies.

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The fundamental environmental perception framework emphasises the multidimensionality of individual characteristics, which are influenced by attitude, interest, motive, expectation and many other external variables. The physical characteristics for a subject of the environment play a very important role in shaping the public perceptions of the natural environment (Evenson et al. 2006) and the role played by social and organisational norms in society also cannot be ignored (Gifford 2007).

The destruction of tropical environments widespread attention lately has to be seen in the worries by the community. These concerns would result in building perceptions and concerns of the community in taking care of their natural environment that essentially give them many direct and indirect benefits. The increasing public's attention to the specific issues of environmental destruction has sparked increased efforts among policy makers and natural resource managers to be more aggressive and effective.

Referendum and pressure from users who are concerned can be seen in environmental issues such as deforestation of tropical rain forest and the threat of marine ecosystems. As a result of the initiative of NGOs and policy makers, there are efforts of preservation and conservation. The exploitation of natural resources in an efficient way with integrity and transparent management is essential in maintaining ecosystem functions and prolonged the extraction of natural resources since efficient exploitation of natural resources consequently affects future consumption and utilisation (Rahim et al. 2012). Although less publicity have been received before, the wetland area as a vital component of natural resources has been increasingly viewed and highlighted mainly in the numerous literatures at local and global level for their environmental degradation and natural deterioration issues.

Wetland basically consists of a variety of ecosystem functions that can yield economic returns from harvested renewable-resources, which can be used and marketed, such as forest products and tourism or recreational benefits. It may also be the subject of researches and education, the natural sources of water supply, wildlife habitat and natural production of fish stocks. Many indirect benefits of wetlands are invaluable as flood mitigation, prevention of saltwater intrusion, maintenance of base flow in the river, sediment and nutrient removal, removal of toxins, groundwater flow, carbon sinks and groundwater discharge. For example, it is estimated that 5,800 t carbon/ha can be stored in a 10 m deep peat swamp, which is 300 – 500 t/ha more compared to other types of tropical forest (UNDP 2006). Peat land often acts as a natural gene bank and preserves potentially useful types of plant species. On a global scale, peat swamp forests occupy most of the Asian wetland areas which contribute to atmospheric carbon storage and help to slow down the process of global warming.

Tasek Bera wetland area is a natural freshwater lake marsh located in the middle of the water catchment the area of the south central part of Peninsular Malaysia, Pahang. The area has been recognised internationally as one of gazetted Ramsar site in 1995 with a total area of 31,120 ha. Consequently, Tasek Bera and the surrounding forest were gazetted as a forest reserve by the Pahang state government to protect and conserve the area that full of precious natural resources. However currently, Tasek Bera and the unique natural forest were very disturbed by the activities of illegal-commercial cultivation, logging and over-exploitation by humans. Threat to the flora and fauna of the Tasek Bera wetlands was a critical issue and very disturbing. The mass media have reported on the aggressive encroachment and on-going forests conversion.

The continuous episode of Tasek Bera destructions have been reported by Chong (2007) regarding the deterioration

of quality and quantity of water in the lake. The main causes of the decline occurring include runoff containing nutrient-rich water from nearby plantation, sewage from communities living around the lake, logging and oil emissions from motor boat (Sharip and Zakaria 2008). Human activities such as shifting cultivation, destruction of watersheds, logging operations; erosion and sedimentation have affected and threatened many valuable species of flora and fauna at Tasek Bera wetland area (Norma-Rashid et al. 2001).

Although it may seem like both the human activities and natural causes have led the deterioration in the wetland area, direct human interventions are the major contributor to the destruction of this valuable ecosystem. More importantly, the forest conversion to agricultural land and rural settlements, excessive forestry uses and activities of human beings, clearly has led to remarkable recent losses of wetland habitat (Rahim et al. 2012). Destructions that occurred either widely published by the media or not, surely have an impact on the formation of public perception on the issues of environmental degradation especially Tasek Bera wetlands area.

This study attempted to explore the underlying dimensions or factors that are related to the environmental perception among users towards Tasek Bera wetland area. This research is important in line with the obvious continuous reveals either by mass media or orally viral among the people regarding the environmental issues of Tasek Bera wetland area. Thus, the exploration of the dimensions that affecting the environmental perception would hopefully initiate the efforts in preserving and efficiently resource managing the wetland area.

Methodology

Sampling procedure

Structured questionnaires have been developed and distributed to the respondents in targeted sites: town of Bera and Temerloh,

villages in Tasek Bera territory and Tasek Bera wetland area itself using convenience sampling by six trained enumerators. Every single respondent got a brief explanation from interviewers about the study purposes or objectives and guidelines in answering the questionnaires. A total of 533 sets of questionnaires were used after data screening processes and proceeded to perform the exploratory factor analysis.

The determination of respondents was referred from the significant assessment of the appropriate sample size (Sudman 1976) and the exploratory factor analysis used in this study was determined according to Hair et al. (2006). Respondents were asked using a structured build questionnaire which implies both Malay language and English language. Revision and pilot study indicated no discrepancies between the English and Malay version of questionnaire. The content and items of the questionnaire have also been discussed extensively among the researchers and the reliabilities of the collected data were also evaluated by Cronbach's Alpha Coefficient, indicating their high validity.

Method of analysis

The Cronbach's alpha coefficient was used to assess the reliability of the 4 point Likert scale (Strongly agree – Strongly disagree) in the survey by investigating the internal consistency of the responses for the items given. Further to the analysis, exploratory factor analysis (EFA) was performed to identify the components internalising the 30 items for affection towards environmental perception. Factor analysis is a suitable statistical tool for estimating the underlying factor pattern for a number of attributes which have been consolidated into a manageable sort for analysis (Kim and Mueller 1978). EFA was used as the factor extraction method and varimax normalisation was used as the rotation method only after the Kaiser-Mayer-Olkin (KMO) test was conducted to satisfy the analysis needs and requirements.

Bartlett's test of Sphericity and KMO test of sampling adequacy were initially performed on the data to confirm the appropriateness of conducting factor analysis (Tabachnick et al. 2001). The underlying dimensions occurred in EFA were then analysed using the Pearson Product-Moment Correlation to determine the positive or negative relationships between the components emerged with the environmental perception (ENVPERC) which have been developed by the accumulation of few question's values using the 4 point Likert scale.

Results

Respondents' characteristics

Almost 64% of the respondents were male, and 46% of the respondents' ages were between 26 – 35 years (*Table 1*). The average age of respondents was about 35 years old with standard deviation of 10.547. The results also found that 49% of the respondents had passed secondary school, 82% were full-time employed, and 33.8% earned monthly household income between RM1,001 and RM2,000. Most of the respondents (70%) were originated from Pahang with 44% were Bera's residents.

Significant difference in the ratio of household income among the respondents was expected from the outset since targeted respondents were in the rural area. However, other categories of household income were segregated fairly among the respondents. Most of the respondents were fully employed as most of them are farmers and local visitors that came to Tasek Bera to enjoy the natural environment.

Only 10% of the respondents have visited Tasek Bera wetland area more than five times while 29% have never visited the place. Most of them (44%) have visited the wetland area between 2 and 5 times and 17% had only been there once.

Table 1. Respondents' characteristics (n = 533)

	Percentage
Age	
<25	16.1
26 – 35	45.8
36 – 45	22.5
46 – 55	10.5
>55	5.1
Gender	
Male	63.4
Female	36.6
Education level	
Primary school	6.9
Secondary school	48.6
College diploma	19.1
University degree	25.3
Work status	
Employment full-time	82.4
Unemployment/looking for job	5.6
Home duties	7.7
Full-time student	3.4
Retired	0.9
Household income	
<RM1000	19.5
RM1001 – RM2000	33.8
RM2001 – RM3000	20.3
RM3001 – RM4000	9.8
RM4001 – RM5000	5.8
>RM5000	10.9
Origin	
Bera	44.1
Other districts of Pahang	25.7
Other states of Malaysia	30.2

Dimensions affecting environmental perception

The reliability analysis was conducted to ensure the internal consistency was at least maintained if not improved. The Cronbach's α based on standardised items showed a reliable and stable value for all of the items measured. As can be seen in *Table 2*, Kaiser Mayer-Olkin measure of sampling adequacy test for the set of predetermined items, environmental perception reached values of at least 0.892 while Bartlett's test of Sphericity was statistically significant, $\chi^2 = 7304.754$, $p = .000$. The KMO values mean that the degrees of common

variance among the items are meritorious (Kaiser 1974).

Based on the cross-factor loadings in the rotated component matrix, the interpretation of the factors was summarised. The advantages of varimax rotation were the stabilisation and unaffected on eigenvalue

Table 2. Kaiser-Mayer-Olkin (KMO) and Bartlett's Test of sphericity

Kaiser-Mayer-Olkin measure of sampling adequacy	Bartlett's Test of sphericity and significance
.892	7304.754 <i>p</i> = .000

Bartlett's Test of sphericity significant level *p* <0.000 and Kaiser-Meyer-Olkin measure of sampling adequacy >0.60

Table 3. Component matrix of items based on factor

	Component				
	1	2	3	4	5
Ecosystem benefit (ECOBEN)	.779 .777 .753 .732 .710 .679 .564				
Agriculture activities (AGRACT)		.832 .791 .737 .714 .660 .658 .537			
Efficient management (EFFMAN)			.851 .763 .753		
Society benefit (SOCBEN)				.722 .716 .590 .557	
Biodiversity conservation (BIOCON)					.595 .579 .446 .427
Eigenvalue	7.614	5.077	1.651	1.417	1.131
% of variance explained	25.879	17.923	6.504	4.723	3.771

Factor loading >.40, eigenvalue >1 and total variance explained >60%

and the percentage of total variance (dimensions of factors) because the angle of each factor remain and not change by the rotation. Two components from both of salient referents and evaluation of the outcomes were adapted for further analysis which succeed the suppress value of factor loading based on sample size (Hair et al. 2006). The EFA in data extraction performed five factors or components namely: ECOBEN, AGRACT, EFFMAN, SOCBEN and BIOCON, with eigenvalue above 1.0 and total variance explained of approximately closed to 60% (Table 3). Eigenvalue was the column sum of squares for a factor which also represented the amount of variance accounted for by a factor (Hair et al. 2006).

Table 4. Correlation coefficients between variables and environmental perception

Variable	Coefficients	<i>p</i> -value
ECOBEN	-.055	.200
AGRACT	.594**	.000
EFFMAN	-.005	.902
SOCBEN	.285**	.000
BIOCON	-.031	.477

**Correlation is significant at the .01 (1-tailed).

*Correlation is significant at the .05 (1-tailed)

Ecosystem benefit (ECOBEN) basically refers to the direct and indirect benefits that can be derived from the wetland ecosystem itself. The important role of stabilising the ecosystem through its natural reactions towards environment-hazardous activities and increasing emission is a vital component in keeping the environment as better as it is. The factor of ecosystem benefit has been found as one of the components that may contribute to the development of the user's environmental perception. Agriculture activities (AGRACT) appears as one of the component that has been taken into the consideration among the wetland users in determining their perception towards Tasek Bera wetland area. Currently, a lot of deterioration issues of this wetland area have been addressed through mass media and other informative medium such as scientific journals and non-scientific articles. That news may contribute to the construction of the perception among the people whom enjoyed the natural environment of the wetland area before.

An effective organisation usually depends on the competency of the set or arrangement made by the manager. As to Tasek Bera wetland area, Efficient management (EFFMAN) appeared as one of the components that may affect and related to the construction of environmental perception. Currently, Tasek Bera Ramsar Site Management Unit under PERHILITAN with the cooperation from Forest Department has been appointed as the responsible agency to manage the wetland area.

Another component that emerged from factor analysis was society benefit (SOCBEN). This component basically refers to the benefits that could be gained from the wetland area. For example, local people collect the forest products and sell it in the market as fresh as it is or process it to other end products. Last component emerged from analysis was biodiversity conservation (BIOCON) which possess the conservation actions that already made or plan to be implemented there. Few conservation plans that already structured for this wetland area show some positive impacts. However, further actions and pro-active improvements need to be considered as the constraints and problems faced by the wetland area also getting varied.

There were positive relationships between the AGRACT and SOCBEN with ENVPERC with coefficient of correlations of .594 and .285 (*Table 4*). The null hypothesis can be rejected at the .01 significance level. However, the other three dimensions namely ECOBEN, EFFMAN and BIOCON were not significantly correlated to the environmental perception. The coefficient correlations of these three dimensions were negative (-.055, -.005 and -.031) for such direct relationships examination.

Discussion

Two dimensions from five that emerged from exploratory factor analysis were positive and significantly related with the environmental perception while ecosystem benefit, efficient management and biodiversity conservation are negative and insignificant. The initial assumption of the study; 5 dimensions would has relationships with environmental perception but turn out that only agricultural activities and society benefit dimensions significantly related with the environmental perception towards Tasek Bera wetland area among the users.

Agricultural activities appeared to be the most dimension concerned towards environmental perception in which the

interaction between perceiver and the target, Tasek Bera wetland area takes place. It has a relationship with the perceiver's impression of the target; described as the characteristics of the situation. The strength of the situational cues also affects social perception. Some situations provide strong cues as to appropriate behaviour. Environmental perceptions are malleable across situations and concern for environmental problems is fundamentally linked to the degree to which people view themselves as part of the natural environment (Schultz 2002).

The situation-specific cognitions are direct determinants of specific related behaviours (Bamberg 2003); which explain that the character of situation potentially affect the environmental perception either in direct or in indirect manner. Furthermore, environmental perception can be affected by the consequences in the discovery of environmental sciences, publicity and commentaries about the findings, and the notion of openness which is closely related to the political system that is able to influence people and thus can affect the perception of personal responsibility (Stern 2000). Rationally, an individual's perception of the subject requires the sequence of processes, events or whatever related to the subject matter.

The society benefit turns out to be the mirror of the society's attitude towards their environment. The strength in defending the advantages or gains that can be derived from the natural resources of Tasek Bera for the people to form the attitude over time. Physical or intangible benefits to the society have been seen as an important dimension in determining the environmental perception towards Tasek Bera wetland area respectively. Perception of the subject seen or described by an individual is very affected by their personal characteristics. An individual's attitude itself is a major influence in determining the environmental perception. It forms an inclination towards the appropriate perception on attitude held

by a person. Initial attitudes characterised by high accessibility were likely to have biased people's interpretations of any information about the subject discussed or seen (Fazio and Williams 1986). The fundamental mind set and tendencies are undeniably affect the perception-decision although bribed by other external influences repeatedly.

Attitude is also very closely related to the 'interest' in which the focus of our attention appears to be affected by our interests because individual interests differ considerably, what one person notices in a situation can differ from what other perceive. It could build up the self-attitudinal aspect on a person. In other words, as traditionally since the early age, people have already consumed products and services from the wetland area either it can be measured monetarily or not. Their principle or perception have been built even before the deterioration takes place in which society always enjoy the benefit of the biodiversity and it is not good to take it away from them through the destruction and deterioration.

Conclusion

The dimensions explored would be the door in opening the detail discussions for future studies as either legal or illegal agricultural activities in Tasek Bera wetland area appeared to be the main component in developing the society's environmental perception. The issues of environmental degradations due to the excessive land exploitations for agriculture purposes really build up the views of people towards on what really happen in this wetland that rich with the biodiversity. Over the years the aggressive encroachments for agricultural activities have been seen helplessly. The society benefit should be addressed in any events or management decisions especially that related closely to the natural resource management such in Tasek Bera wetland area. Equilibrium intersection of society benefit maximisation along with economic growth needs and sustainable environmental

demands should be the main consideration among the resource managers and policy makers in truly manage the resources transparently and with integrity.

References

- Bamberg, S. (2003). How does environmental concern influence specific environmentally related behaviors? A new answer to an old question. *Journal of environmental psychology* 23(1): 21 – 32
- Chong, G. (2007). Tasek Bera: Past, present and future, Colloquium on Lakes and Reservoir Management, Status and Issues. 2 – 3 August 2007. Putrajaya, Malaysia
- Evenson, K.R., Birnbaum, A.S., Bedimo-Rung, A.L., Sallis, J.F., Voorhees, C.C., Ring, K. et al. (2006). Girls' perception of physical environmental factors and transportation: reliability and association with physical activity and active transport to school. *International Journal of Behavioral Nutrition and Physical Activity* 3(1): 28
- Fazio, R.H. and Williams, C.J. (1986). Attitude accessibility as a moderator of the attitude perception and attitude behavior relations: An investigation of the 1984 presidential election. *Journal of Personality and Social Psychology* 51(3): 505
- Gifford, R. (2007). *Environmental psychology: Principles and practice*: Optimal books Colville, WA
- Hair, J., Black, W., Babin, B., Anderson, R. and Tatham, R. (2006). *Multivariate data analysis: A global perspective* (7th ed.), Upper Saddle River, New Jersey: Pearson Prentice Hall
- Kaiser, H.F. (1974). An index of factorial simplicity. *Psychometrika* 39(1): 31 – 36
- Kim, J.O. and Mueller, C.W. (1978). *Factor analysis: Statistical methods and practical issues* (Vol. 14): Sage
- Norma-Rashid, Y., Mohd-Sofian, A. and Zakaria-Ismail, M. (2001). Diversity and distribution of Odonata (dragonflies and damselflies) in the fresh water swamp lake Tasek Bera, Malaysia. *Hydrobiologia* 459(1): 135 – 146
- Rahim, H., Serin, T. and Wahab, M.A.M.A. (2012). Tasek Bera Forest Reserve in Pahang: Deplete or Conserve. *Economic and Technology Management Review* 8: 61 – 70
- Schultz, P. (2002). New Environmental theories: Empathizing with nature: The effects of perspective taking on concern for environmental issues. *Journal of social issue* 56(3): 391 – 406
- Sharip, Z. and Zakaria, S. (2008). Lakes and reservoir in Malaysia: Management and research challenges. Paper presented at the The 12th World Lake Conference
- Stern, P.C. (2000). New environmental theories: toward a coherent theory of environmentally significant behavior. *Journal of Social Issue* 56(3): 407 – 424
- Sudman, S. (1976). *Applied sampling*. New York: Academic Press
- Tabachnick, B.G., Fidell, L.S. and Osterlind, S.J. (2001). *Using multivariate statistics*, 5th Edition, Pearson
- UNDP (2006). Malaysia's Peat Swamp Forests: Conservation and Sustainable. United Nations Development Programme

Abstrak

Kajian ini bertujuan untuk meneroka dimensi asas yang memberi kesan persepsi alam sekitar di kalangan pengguna terhadap kawasan tanah lembap Tasek Bera. Selaras itu, kajian ini juga memberikan gambaran permukaan dan permintaan oleh pengguna menjurus kepada keperluan pengurusan sumber dan pembangunan yang cekap. Analisis faktor penerokaan (EFA) telah digunakan untuk mengenal pasti dimensi yang benar-benar boleh memberi kesan kepada persepsi alam sekitar terhadap kawasan tanah lembap ini. Kajian ini mendapati bahawa aspek alam sekitar dalam kalangan pengguna boleh dipengaruhi oleh dua daripada lima struktur dimensi iaitu aktiviti pertanian dan manfaat masyarakat, serta ditambah dengan item khusus untuk mengukur persepsi alam sekitar itu sendiri. Ia juga mendedahkan keperluan dalam membangunkan dan menguruskan kawasan tanah lembap dengan cara yang mapan. Penyelidikan selanjutnya perlu dipertimbangkan untuk mengumpul maklumat lanjut mengenai dimensi persepsi alam sekitar dalam konteks pengguna Malaysia. Kedua-dua dimensi persepsi alam sekitar yang mewakili instrumen yang diiktiraf untuk mengukur persepsi alam sekitar hendaklah dirujuk oleh pengurus sumber kawasan tanah lembap Tasek Bera dalam menguruskan kepelbagaian biodiversiti dengan efisien. Kajian ini penting sejajar dengan peningkatan kebimbangan terhadap alam sekitar dalam kalangan rakyat Malaysia dan kemerosotan sumber asli yang melampau di kawasan tanah lembap Tasek Bera.