World Academy of Science, Engineering and Technology
International Journal of Economics and Management Engineering
Vol:4, No:12, 2010

Tourist Awareness of Environmental and Recreational Behaviors at the Guandu Wetland, North Taiwan

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Open Science Index, Economics and Management Engineering Vol:4, No:12, 2010 publications.waset.org/10483/pdf

Abstract**—**The aim of this study is to discuss the relationship between tourist awareness of environmental issues and their own recreational behaviors in the Taipei Guandu Wetland. A total of 392 questionnaires were gathered for data analysis using descriptive statistics, t-testing, one-way analysis of variance (ANOVA) and least significant difference (LSD) post hoc comparisons. The results showed that most of the visitors there enjoying the beautiful scenery are 21 to 30 years old with a college education. The means and standard deviations indicate that tourists express a positive degree of cognition of environmental issues and recreational behaviors. They suggest that polluting the environment is harmful to the natural ecosystem and that the natural resources of ecotourism are fragile, as well as expressing a high degree of recognition of the need to protect wetlands. Most of respondents are cognizant of the regulations proposed by the Guandu Wetland administration which asks that users exercise self-control and follow recommended guidelines when traveling the wetland. There were significant differences in the degree of cognition related to the variables of age, number of visits and reasons for visiting. We found that most respondents with relatively high levels of education would like to learn more about the wetland and are supportive of its conservation.

Keywords**—**Guandu Wetland, environmental awareness, recreational behaviors, conservation.

I. INTRODUCTION

BASED on the World Conservation Congress in Montreal in 1996 protected marine and terrestrial habitats with high biodiversity are becoming popular tourist destinations throughout the world. Tourism is expected to double in the next twenty years and a growing share of that travel will affect national parks, protected areas and other nature conservation refuges [1]. It is necessary to change the way that people think about the conservation of species and ecosystem diversity. In many parts of the world, human activities exploit natural resources and processes, leading to the degradation of aquatic, terrestrial and atmospheric resources, and can cause irreversible loss of biological diversity [2-3]. Ecosystems change in response to the stress imposed by human use and, in turn, human societies try to adjust the behaviour affecting the ecosystems in response to the changes perceived in these systems [4].

There are numerous conceptual definitions of ecotourism. According to Boo (1991) [5] ecotourism is natural tourism that contributes to conservation by generating funds for protected areas, creating employment opportunities for local communities, and offering environmental educational opportunities. Lindberg and McKercher (1997) [6] defined it as tourism and recreation that is both nature-based and sustainable. Forestry Tasmania (1994) [7] defines ecotourism as nature-based tourism that is focused on provision of learning opportunities while providing local and regional benefits, while demonstrating environmental, social, cultural and economic sustainability. Ballantine and Egles (1994) [8] found that ecotourists tend to be middle aged, have relatively high incomes and levels of education, and express an interest in learning about the environment. They differ from mass tourists in terms of the benefits they seek from nature [9-11].

The Ramsar Convention uses a broad definition of the types of wetlands, including lakes and rivers, swamps and marshes, wet grasslands and peatlands, oases, estuaries, deltas and tidal flats, near-shore marine areas, mangroves and coral reefs, and human-made sites such as fish ponds, rice paddies, reservoirs, and salt pans.Wetlands are one of the most important types of ecosystems in the world. The reasons for their significance are not only their role in maintaining the regional and global ecological balance, but that they also provide a living environment for wild animals and plants [12]. Wetlands along the coasts of Taiwan are being threatened by habitat destruction caused by economic development. Many areas, primarily lagoons and intertidal flats, have already been destroyed due to land reclamation. Habitat degradation is caused by pollution, salt-water intrusion, flooding and land subsidence. Industrial and commercial developments have caused the most serious loss of wetlands [13-15].

Guandu, located in northern Taiwan, is an ecologically diverse area (Fig. 1). In summer and winter, the mangroves located on the estuary attract migratory birds from the Russian Federation. Bird watching serves as an attraction to a variety of people. The Guandu Wetland administration provides the

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public with different kinds of wetland environmental programs such as wetland science, nature study and nature experiences. The purpose of this study is to find out tourist understandings of environmental and recreational behaviors needed in order to protect, improve and restore wetland functions.

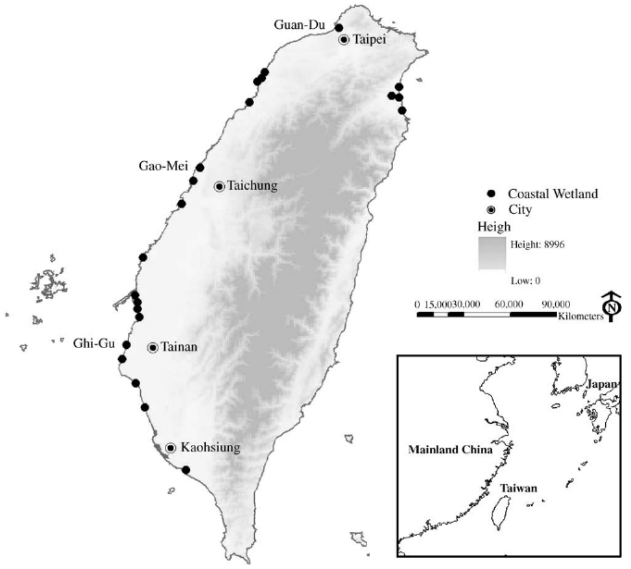


Fig.1 Map showing the study site locations (modified from Kerstetter et al., 2004). [16]

II. METHODS

Tourists were surveyed at Guandu Nature Park, which is an important wetland in northern Taiwan. We systematically surveyed tourists who were visiting the study site on weekends during August 2008. Weekends were chosen because this was when the number of visitors was highest. The purposive sampling technique was used to collect a sample of 400 tourists. A total of 392 questionnaires were completed. The response rate was 98.0% which is acceptable for social science research.

The survey instrument used in this study consisted of three sections. The first section of the questionnaire focused on the tourist's environmental understanding which included 8 separate items measured using a 5-point Likert scale. The response categories were: strongly agree (5), agree (4), neither agree nor disagree (3), disagree (2) and strongly disagree (1). The Cronbach's alpha reliability score was 0.846, indicating that these items were fairly reliable. The second section focused on tourist recreational behaviors consisting of 8 separate items measured using a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). We obtained a Cronbach's alpha score of 0.836 indicating that these items were fairly reliable. The third section comprised demographic and travel characteristic information such as gender, age, level of education and reasons for the visit.

Prior to the survey, a pre-test was done in order to check the reliability of the questionnaire. A total of 392 questionnaires were used for data analysis. Each survey took 20 min to complete on average. Data were analyzed using the Statistical Package for the Social Sciences. Mean and standard deviations were used to indicate agreement between environmental and recreational behaviors cognition. Independent Sample t-testing was used to test differences in cognition of environmental and recreational behaviors between males and females. One-way analysis of variance (ANOVA) testing with least significant difference (LSD) post hoc comparisons was used to test for differences in cognition of environmental and recreational behaviors based on age, level of education and travel purpose, etc.

III. RESULTS AND DISCUSSIONS

Of the 400 returned Guandu Wetland questionnaires, 392 were valid and usable. The relevant information for the range of important social descriptors (gender, age, education, number of visits, reasons for visits, and place of residence) is shown in Table 1. The profiles of visitors are as follows: females (55.1%) outnumbered males (44.9%). Ages ranged mainly from 21 to 30 years old (48.2%). More than half (74.7%) of the respondents had attained a university level of education. The results suggest that most respondents had relatively high levels of education. Most of the respondents were students (36.5%). Most people surveyed were first time (38.5%) or third time and above (38.3%) visitors to the Guandu Wetland. Enjoying the beautiful scenery was the major reason given for visiting. The place of residence of most respondents was northern Taiwan, which may be an indication that this destination is important for tourism.

TABLE I
PROFILE OF RESPONDENTS

Tourist demographics	Percentage
Gender	
Male	44.9
Female	55.1
Age	
Below 20	11.5
21-30	48.2
31-40	19.9
41-50	5.9
51-60	10.7
Above 61	3.8
Education	
elementary school	1.3
Junior high school	4.3
Senior high school	11.0
College	74.7
Master or doctorate degree	8.7
Number of visit	
1 time	38.5
2 times	16.6
3 times	6.6
Above 3 times	38.3

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TABLE I
PROFILE OF RESPONDENTS (CONTINUED)

Tourist demographics	Percentage
Reasons for visit	
To enjoy beautiful scenery	23.3
To satisfy curiosity	11.5
To be with my family or friends	16.1
To learn ecological knowledge	15.1
To experience ecological resources	6.4
To relax	16.8
To do research	1.5
To be with groups	4.1
Other	5.4
Place of residence	
North Taiwan	85.7
Central Taiwan	7.1
South Taiwan	1.5
East Taiwan	4.8
Islands of Taiwan	0.3
Other	0.5

The mean scores and standard deviations of the 8 environmental cognition items are listed in Table 2. It can be seen that the majority of respondents tend to have positive environmental understanding as shown by the mean of 3.95. The results found that the degree of understanding of "To pollute the environment is harmful to natural ecosystems", "The natural and cultural resources are fragile", "It is necessary to respect the habits of local wildlife during traveling." are higher than those of other items, indicating a highly degree of understanding of the need to protect wetlands. However, the large standard deviation of 0.87 suggests that some tourists disagree.

TABLE II
MEAN SCORES AND STANDARD DEVIATIONS OF 8 THE ENVIRONMENTAL COGNITION ITEMS

Items	Mean	SD
1.To pollute the environment is Harmful to natural ecosystems	4.35	0.84
2. One should take turns visiting natural areas	3.77	0.83
3. It is necessary to restrict the number of visitors	3.79	0.97
4..Natural and cultural resources are fragile	4.07	0.81
5. Interpretative education is very important	4.00	0.83
6. It is necessary to respect the habits of local wildlife while traveling	4.05	0.91
7. I want to understand the effects on the Ecosystem of exploiting wetlands	3.81	0.89
8. Wetland conservation is more important than economic development	3.8	1.01

The results shown in Table 3 indicate that most tourists tend to agree with the suggested recreational behaviors in the Guandu Wetland; the mean is 3.65. With respect to the recreational behaviors of respondents, they were most likely to agree that "I will actively help tourists to learn about the wetland," and "I am willing to accept the control policies." The behaviors with which they were least likely to agree was, "I will express my opinion to local administration if I find instances of environmental pollution or destruction".

TABLE III
MEAN SCORES AND STANDARD DEVIATIONS OF 8 RECREATIONAL BEHAVIOR COGNITION ITEMS

Items	Mean	SD
1. I will actively help other tourists to learn about the wetland	4.08	0.84
2. It is crowded to travel with many tourists	3.79	1.01
3. I will help to maintain the local environmental quality	3.59	0.94
4. I am willing to accept the control policies	4.18	0.89
5. I will spend money in the local area	3.42	0.93
6. I will express my opinion to local administration if I find instances of environmental pollution or destruction	3.33	0.91
7. I will join interpretative activities	3.47	0.9
8. I plan to join the conservation association and actively play a volunteer role	3.34	0.93

According to the t-values, there was no significant difference between male and female tourists. The results indicate that males and females feel the same degree of understanding of environmental and recreational behaviors.

One way analysis of variance testing was conducted to analyze the relationship between environmental cognition and recreational behavior cognition for the tourist demographic variables of age, education, number of visit and reasons for visit. The results are shown in Table 4, Table 5, Table 6, Table 7, Table 8 and Table 9.

The relationship between environmental cognition and recreational behavior cognition and age are shown in Table 4, Table 5. Table 4 shows the results with regard to environmental cognition; ANOVA testing did not show any significant differences between tourists of different ages. Table 5 shows that there are significant differences for the

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different ages. Tourists 21-30 years old demonstrate a lower degree of recreational behaviors than other groups perhaps because those in this age bracket have to work hard and have less time to join wetland recreational activities.

The results of ANOVA testing show that there are no significant differences between the different levels of education in relation to the degree of environmental awareness and recreational behaviors. Table 6 shows the results for the relationship between the number of visits and environmental awareness. There are significant differences between number of visit and environmental cognition which indicate that the degree of environmental awareness differs with the number of visits. Based on LSD procedure, tourists who visited the Guandu Wetland more than 3 times expressed a higher degree of environmental awareness than other groups which suggests that they tend to spend more time and have greater interest in wetland conservation.

The relationship between recreational behavior cognition and number of visit is shown in Table 7. There is a significant difference found between recreational behavior cognition and number of visits. According to the LSD results, tourists who visited the Guandu Wetland more than 3 times demonstrated a higher degree of recreational behavior than other groups. This result was consistent with the suggestion mentioned above.

As indicated in Table 8 and Table 9, the results of ANOVA testing shows significant differences among the 9 groups for reasons for visits regarding their degree of environmental cognition and recreational behaviors. On the basis of the LSD results, tourists who visited the Guandu Wetland to learn ecological knowledge expressed a higher degree of environmental awareness. Tourists who visited the Guandu Wetlands to experience ecological resources demonstrated a higher degree of recreational behaviors. The results suggest this group may be willing to accept the policies and be more supportive of wetland conservation.

TABLE IV
ANOVA RESULTS FOR AGE AND ENVIRONMENTAL AWARENESS

	n	Mean	SD	F ratio
20 years old and under	45	4.04	0.73	0.980
21-30 years old	189	3.97	0.58	
31-40 years old	78	3.83	0.62	
41-50 years old	23	3.99	0.63	
51-60 years old	42	4.00	0.66	
60 years old and older	15	4.03	0.67	

TABLE V
ANOVA RESULTS FOR AGE AND RECREATIONAL BEHAVIORS

	n	Mean	SD	F ratio
20 years old and under	45	3.84b	0.76	2.243*
21-30 years old	189	3.55a	0.53	
31-40 years old	78	3.71	0.66	
41-50 years old	23	3.65	0.72	
51-60 years old	42	3.74	0.73	
60 years old and older	15	3.78	0.62	

*significant at 0.05
a,b-indicates that there is a difference between these two groups

TABLE VI
ANOVA RESULTS FOR NUMBER OF VISIT AND ENVIRONMENTAL AWARENESS

	n	Mean	SD	F ratio
1 time	151	3.66b	0.64	12.393*
2 times	65	3.37b	0.47	
3 times	26	3.30b	0.58	
More than 3 times	150	3.84a	0.62	

*significant at 0.05
a, b-indicate that there is a difference between these two groups

TABLE VII
ANOVA RESULTS FOR NUMBER OF VISIT AND RECREATIONAL BEHAVIORS

	n	Mean	SD	F ratio
1 time	151	4.04b	0.58	15.744*
2 times	65	3.62b	0.60	
3 times	26	3.53b	0.59	
More than 3 times	150	4.10a	0.59	

*significant at 0.05
a, b-indicate that there is a difference between these two groups

TABLE VIII
ANOVA RESULTS FOR REASONS FOR VISITS AND ENVIRONMENTAL AWARENESS

	n	Mean	SD	F ratio
To enjoy beautiful scenery	91	3.69 b	0.65	4.630*
To satisfy my curiosity	45	3.35 b	0.57	
To be with family or friends	63	3.51 b	0.60	
To increase ecological knowledge	59	3.97a	0.71	
To experience ecological resources	25	3.89 b	0.55	
To relax	66	3.57 b	0.55	
To do research	6	3.85 b	0.80	
To be with a group	16	3.72 b	0.46	
Other	21	3.59 b	0.44	

*significant at 0.05
a, b-indicate that there is a difference between these two groups

TABLE VIIII
ANOVA RESULTS FOR REASONS FOR VISIT AND RECREATIONAL BEHAVIORS

	n	Mean	SD	F ratio
To enjoy beautiful scenery	91	3.99 b	0.64	5.633*
To satisfy curiosity	45	3.66 b	0.58	
To be with my family or friends	63	3.71 b	0.60	
To learn ecological knowledge	59	4.20 b	0.62	
To experience ecological resources	25	4.33 a	0.54	
To relax	66	3.92 b	0.56	
To research	6	4.17 b	0.71	
To be with groups	16	4.16 b	0.43	
Others	21	3.99 b	0.52	

*significant at 0.05
a,b-indicates that there is a difference between these two groups

IV. CONCLUSIONS

The results show that most of visitors there to enjoy the scenery were 21 to 30 years old and college educated. The means and standard deviations indicate that tourist expressed a positive degree of awareness of environmental and recreational behaviors. They feel that polluting the environment is harmful to the natural ecosystem and the natural resources of ecotourism are fragile, and express a high degree of recognition of the importance of protecting wetlands. Most of the respondents are willing to follow the regulations proposed by the administration of the Guandu Wetland which revealed a higher degree of self-control when traveling the wetlands. There were significant differences in degree of cognition related to the variables of age, number of visits and reasons for visiting. Tourist who visited the Guandu Wetlands to learn ecological knowledge and experience the ecological resources demonstrated a higher degree of environmental awareness and recreational behaviors. The results suggest that they may be willing to accept the policies and support Wetland conservation. We also found that most of the respondents had relatively high levels of education and would like to learn more about the wetlands and support conservation efforts.

ACKNOWLEDGMENT

This work was supported by the National Science Council of the Republic of China.

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