Environmental Attitudes on Setiu Wetlands, Malaysia

Suziana Hassan[1], Søren B. Olsen[2],
Syamsul Herman Mohammad Afandi[3,4], Bo J. Thorsen[2,5]

[1] Faculty of Agriculture and Food Science, Universiti Putra Malaysia Bintulu Campus, Malaysia.
[2] Department of Food and Resource Economics, Faculty of Science University of Copenhagen, Denmark.
[3] Faculty of Forestry, Universiti Putra Malaysia, Malaysia.
[4] Institute of Tropical Forestry and Forest Product, Universiti Putra Malaysia, Malaysia.
[5] Center for Macroecology, Evolution, and Climate, University of Copenhagen, Denmark.

suzi@upm.edu.my

Abstract

This study addresses the attitudes of the urban and rural dwellers towards Setiu Wetlands conservation. The New Ecological Paradigm (NEP) scale is adopted to measure the degree of environmental concern. A series of factor analysis and regression is applied to analyze the urban-rural attitudes and to suggest three factors structure of attitudes to wetland conservation. The urban-rural residential variable is able to predict in part the overall NEP scores and element of anti-anthropocentrism which suggesting the urban communities are more positive towards wetland conservation. Hence, further outreach efforts in rural population are worthwhile to raise conservation awareness.

Keywords: Setiu Wetlands conservation; urban-rural attitudes, New Ecological Paradigm.

1.0 Introduction

Management of natural resources such as wetlands encompassed a varied spectrum of social components such as community participation, politics, poverty elimination, cultural, and improving the quality of life that now becomes the crucial factors in ecological protection (Eshliki & Kaboudi, 2012; Hajduová, Andrejovský, & Beslerová, 2014). Despite many management initiatives, segregation of the public opinions will degrade the performance in environmental planning (Datta, Chattopadhyay, & Guha, 2012). Public preferences have an economic standing in any decision relating to environmental change. Consideration of welfare gains in rural and urban dweller on the hypothetical conservation project is a worthy initiative in resource management strategies. Population's attitudes towards natural resources are sometimes positive because, in the some rural area, they have the belief that conservation could create economic benefits for them (Mbaiwa & Stronza, 2011; Rahman, Hasshim, & Rozali, 2015). It is a common practice nowadays to include local views and interests along with the other stakeholder groups into the natural resource planning and management process (Bandara & Tisdell, 2003). Many studies have found different attitudes towards the environment between the rural and urban populations (Badola, Barthwal, & Hussain, 2012; Bandara & Tisdell, 2003; Datta et al., 2012; Mbaiwa & Stronza, 2011). Therefore, the study and analysis of different preferences towards Setiu Wetlands conservation could inform conservation manager and planner. This paper builds based on existing studies on revised version of New Ecological Paradigm (NEP) scales which has been established by Dunlap, Liere, Mertig, & Jones (2000) to measure the environmental attitudes. Initially, the NEP items are divided into five core facets that are 'limit to economic growth (LEG)', 'anti-anthropocentrism (AA)', the 'fragility of nature balance (FNB)', 'rejection of human exemptionalisme (HE)', and the 'possibility of potentially catastrophic environmental changes' or 'eco-crisis (ECO)'. The essential focus of this paper is to access the different attitudes held by urban and rural populations using NEP scale as the measurement tool. Thus, we explicitly test the influence of resident area on environmental attitudes and link their concerns to Setiu Wetland (SW) planning and management. In the next section, we briefly review the studies addressing the general context of wetland conservation, an overview of the NEP Scales, and finally the urban-rural attitudes towards conservation. Then we present how the study is designed and analysed to get meaningful outputs. Finally, we described the results and discussed it before concluding in the last section.

2.0 Literature Review

The context of wetland valuation for conservation

Wetlands have frequently been misunderstood as unproductive areas, and converted to agriculture or industrial uses and often being undervalued in decisions relating to their use (Brander et al., 2012). Although reduced in extent, Southeast Asia's remaining natural and semi-natural wetlands that support tremendous biodiversity wealth, including many endemics and threatened species. In Malaysia, six wetlands have been recognized as a Ramsar sites i.e. Tasik Bera, Tanjung Piai, Pulau Kukup, Sungai Pulai, Kuching Wetland, and Lower

Kinabatangan-Segama Wetland (Asean Center Biodiversity, 2011). The vast amount of natural resources endowed in Malaysia includes rich of wetland forest, which is most diverse and complex ecosystems on the earth. These natural resources have been identified to provide habitats for many species, and they have significant impacts on the region e.g. towards hydrological, biological and ecological roles in the ecosystem (Ibrahim, Aziz, & Hanifah, 2012; Ibrahim, Hua, Aziz, & Hanifah, 2013; Kasawani & Kamaruzaman, 2009). However, these areas are continuously cleared for cultivation of cash crops, particularly for palm oil and other agricultural products to meet domestic and international demands. Little data is available on the Malaysia's wetlands status thus hindering the management and development strategies. SW in Terengganu is one of the unvalued and continually degraded because relatively without strategic administration and lack of published documentation. It was claimed to be a unique and beautiful area because of the combination of nine interconnected ecosystems and is a habitat for a diversity flora and fauna (Amin & Hasan, 2003). However, to the date, only a few published documents that highlight the inherent and potential value of this wetland (Azmi, 2014; Nik Fuad Kamil, 2008).

Urban and rural attitudes on environmental conservation
An effective natural resources management is only possible if attitudes and perceptions of the communities around the wetlands can be assessed (Badola et al., 2012). In many developing countries, resident's negative attitudes on conservation has caused to the failure of biodiversity conservation (Mbaiwa & Stronza, 2011). Marginalized populations in Asia are often engaged in livelihood activities such as mangrove cutting, shrimp catching along riverbanks, and development of aquaculture farms. It is comparable to SW where the local people are practicing small-scale economic activities like crab fisheries in mangrove area for their live supports. It is undeniable that the rural communities may feel challenged if conservation project placed in their area while urban dwellers in general mostly favor wetlands protection (Bandara & Tisdell, 2003). For that reason, support for wetland conservation projects depends on these public's attitudes and such knowledge is useful for policy decisions.

New Ecological Paradigm
The revised NEP scale first developed by Dunlap et al., (2000) is composed of 15 Likert-scale statements (Table 1) intended to measure five core facets of individuals' attitudes towards the environment. Many studies have conducted and applied this NEP scales to measure environmental attitudes and found it is useful in clarifying the value bases of environmental concern (Amburgey & Thoman, 2012; de Groot & Steg, 2008; Dunlap, 2008; Hawcroft & Milfont, 2010;, Pienaar, Lew, & Wallmo, 2013; Schultz & Zelenzy, 1999; Stern & Dietz, 1994. In the recent, Pienaar, Lew, & Wallmo (2015) also tested the effect of survey context in measuring environmental attitudes and had applied the NEP scales. The integration of socio-demographic variables and environmental attitudes has been suggested to describe meaningful management strategies for wetland protection (Cordano, Welcomer, & Scherer, 2003).

Table 1. The Revised New Ecological Scale

Items	NEP Statements	Environmental Facets
NEP 1	Approaching limits of earth.	LEG
NEP 2	Humans have the right to modify the environment.	AA
NEP 3	Human interfere is disastrous.	FNB
NEP 4	Human ingenuity is sufficient.	HE
NEP 5	Humans abuse the environment.	ECO
NEP 6	The Earth has plenty of resources	LEG
NEP 7	Plants and animals have equal rights.	AA
NEP 8	The balance of nature is strong.	FNB
NEP 9	Human are still subject to the laws of nature.	HE
NEP 10	The "ecological crisis" has been exaggerated.	ECO
NEP 11	The earth has very limited room and resources.	LEG
NEP 12	Humans were meant to rule the nature.	AA
NEP 13	Nature is very delicate and easily upset.	FNB
NEP 14	Humans will control nature.	HE
NEP 15	We will experience a major catastrophe.	ECO

Source: Authors had simplified the text from Dunlap et al., (2000)

3.0 Methodology

Respondents were described with detailed information about elements of conservation in SW i.e. environmental protection, biodiversity, recreational services, and controlling the risk of floods in the area to elicit their environmental attitudes. Then, the fifteen NEP statements were asked according to 5-point Likert Scales together with the socio-demographic section. The full-scale data collection was carried out from July 2014 until September 2014 using a face-to-face interview recruitment strategy across villages and towns in adjacent to the wetlands. This sampling strategy was chosen since it is a possible way since a web-based survey would suffer heavily from coverage problems, and complete telephone or address listings are not available to obtain a suitable sampling frame. Furthermore, the respondents' concerns and questions could be addressed, and any clarification can be made on the spot. The sample was drawn using a systematic random sampling method. Specific locations were selected due to the time and cost constraints as well as accessibility factors. The classification of the urban-rural area is based on the value of the property and other modern facilities such as public schooling, shopping centers, and recreation sites. A total of 1137

respondents completed the survey questions.

The data were analysed using Statistical Package for Social Study (SPSS) version 22.0. We initially conduct a factor analysis to test for the dimensionality of the NEP scale using a measure of internal consistency and homogeneity tests. Then, the effect of the rural and urban residence variable on the NEP scores was predicted by ordinary least squares (OLS) regression analysis. In this regression model, the effect of residence area was dummy coded with a variable name is 'Urban'. The value 1 represents for the urban people and 0 for rural people. In term of gender, the variable name is 'Male' is represented as a dummy. Other explanatory variables were also included to test whether the resident area can be a significant predictor of the environmental attitudes.

4.0 Findings and Discussions

Descriptive analyses

Table 2 shows selected socio-demographic information collected in the survey. The largest share of respondents (69.2%) live in the urban area while the rest of the respondents (30.8%) live in the rural area at the time survey. Regarding the gender, more female were interviewed in the urban area but more male in the rural sites. This difference is possible because the time restriction for the man in the urban area due official working hours during the interview sessions. In contrary to the rural area, they have no time constraints because most of them are a fisherman and self-employed. The mean age of urban and rural respondents were 37 years and 42 years respectively. The minimum and maximum age were interviewed in both area were 19 and 73 years old. Urban people hold a higher level of education as compared to the rural residents. It was as expected due to the quality of facilities and social components provided which discriminate the quality of life in this area (Herrera, Buitrago, Lorenzo, & Badea, 2015). The majority of respondents in both group, at least, finished their primary school. The largest share of rural respondents earned below the lowest income rate per anum, RM 12,000 (58.6%). Meanwhile, in the urban area, there was an almost similar share of income earning between the lowest and middle level. There were 14.5% of urban residents in the highest income bracket, in contrast to only 4.9% of rural people. It's hard to get urban and rural household income become more comparable due to the cost of living thus creates significant income disparities between the two (Shi & Chuliang, 2010). The mean household size was five and six people in urban and rural households respectively. The minimum number of household size was a single person while the maximum in the house is 13 and 16 in urban and rural households. That is prevalent in a country like Malaysia where some parents have more than five children. In the some family, the children are not leaving their parents' house until they get married or having a spouse. A study claimed that be living together with offspring and parents could increase the sense of belongingness in community members (Zhang & Lin, 2012).

Table 2. Socio demographic variables separated by residence area.

Variables	Urban		Rural	
	Frequency (787)	Percentage (69.2)	Frequency (350)	Percentage (30.8)
Gender				
Male	370	47	193	55.1
Female	417	53	157	44.9
Education				
Primary	35	4.4	78	22.3
Secondary	461	58.6	191	54.6
Diploma	119	15.1	34	9.7
Bach Degree	153	19.4	40	11.4
Post-graduate	18	2.3	4	1.1
None	1	0.1	3	0.9
Income / year (RM*)				
< RM 12000	305	38.8	205	58.6
RM 12000- RM 24000	265	33.7	93	26.6
RM 24000- RM 36000	103	13.1	35	10
> RM 36000	114	14.5	17	4.9
	Mean	Min / Max	Mean	Min / Max
Age	37	19 / 73	42	19 / 73
Household size	5	1/13	6	1/16

Note: At the time of data collection, the currency exchange was USD 1 = RM 3.20 (2014)

Dimensionality of the NEP items

Before we proceed to the main test of factor analysis and regression, the NEP items were scaled and analysed for the reliability of the data. Cronbach's alpha for this NEP's data is 0.571 which indicates that the data are almost characterized by internal consistency and homogeneity. A good reliability test of a particular data set with Cronbach's alphas of 0.84 to 0.89 will show a very clear factor structure, however, close to 0.60 is rather weak but still acceptable. The reason is some respondent were unfamiliar with the NEP statements (Abdullah, Said, & Omar, 2014; Costello & Osborne, 2005). An exploratory factor analysis using the Principle Component Analysis (PCA) on the fifteen NEP items had identified the eigenvectors that contributed most to underlying factors about the environmental concern. The test measure of Kaiser-Meyer-Olkin is 0.711, surpassed a minimum index of 0.6 for good factor analysis. The Bartlett test also showed a significant value for factor analysis to be considered appropriate with *p*-value is lower than 0.05.

We can conclude that the sample available here is suitable for factor analysis though perhaps not very firmly structured. The orthogonal VARIMAX rotation method was selected because we believe no correlation between variables to another in the correlation matrix.

Based on the first output of factor analysis for this data set, five factors with an eigenvalue greater than one were retained. However, reanalysing and evaluating performance, we restricted to three factors so that the data analysed were more meaningful and interpretable. In the environmental literature, it is discussed that three different value orientations are relevant for understanding environmental beliefs and intentions (de Groot & Steg, 2008). All the three factors loading is accounting for 39.3% of total variance in the NEP scales. Only items with factor loading more than 0.45 were retained and used for further analysis. The three NEP scales component are renamed according to wetlands conservation suitability and based on the top two loaded items for each factor. The rotated factor loads sorted by the size and the new component names as presented in Table 3.

Table 3. The components of environmental attitudes

NEP Items	Factor 1 Pro-environ-mentalist	Factor 2 Economic Growth	Factor 3 Anti-anthropocentric	Mean	S.d.
EP15	0.72			4.02	0.94
EP5	0.70			3.68	1.05
EP13	0.68			3.89	0.92
EP3	0.67			3.73	1.06
EP1	0.54			3.21	1.06
EP11	0.48			3.14	1.00
EP6		0.72		4.26	0.72
EP7		0.68		4.36	0.69
EP14		0.51		3.98	0.75
EP8			0.58	3.03	1.12
EP2			0.55	3.55	1.08
EP12			0.49	3.51	1.01
EP9			0.48	3.72	0.99
EP10			0.45	2.68	0.94
EP4			0.44	3.61	0.94
Eigenvalue	2.72	1.78	1.40		
% variance	18.10	11.86	9.30		
Cumulative % variance	18.10	29.96	39.26		
Cronbach's alfa	0.70	0.46	0.43		

Extraction method: Principle Component Analysis (PCA). Rotation: Varimax with Kaiser Normalization.

Divergent of attitudes towards wetlands conservation
The regression models are shown in Table 4. The first model indicates a regression of the individual's total scores on the residential and socio-demographic variables. The rest of the

models are a regression of each of the three conservation attitudes as weighted in the factors 1 (pro-environmentalist), 2 (economic growth), and 3 (anti-anthropocentric) on the selected variables. The goodness-of-fit measure, R^2 are relatively small across the models as is often the case for microdata. It implies the dimension reduce on NEP-based scales here do not explain high variations. Thus, we cannot further describe the explaining the variances in the model. Only selected variables were included in the models since our foundation focus is to assess the effects of urban and rural dwellers on the wetland conservation.

The mean coefficient of the resident area is significantly different from zero in the total score of NEP and the 'anti-anthropocentric' facet. The effects of positive direction indicate that the urban people hold positive attitudes on the overall scores and 'anti-anthropocentric' compared to rural dwellers. The result is also supporting by studies in Fransson & Gärling (1999) and Pienaar et al. (2015) found the residence area affects the environmental concern. In the 'anti-anthropocentric' segment, those who live in urban express higher awareness of the fragility of the nature balance as compared to rural communities. These urban people are also less likely to believe in human's ability to manage the environment. On the other hand, there are no differences between urban and rural on the 'pro-environmentalist' and 'economic growth.' Both urban and rural are believe that the ecology crisis can cause catastrophic. There is also a similar attitude about space and resources scarcity on the planet. It is also agreed by researchers like Mombo, Speelman, Hella, & Van Huylenbroeck (2013) stated the sustainability of the natural resource and ecosystems are under severe threat due to human impact, advances in new technologies, increasing population and economic growth. All respondents are agree on limiting the economic growth should be considered in conserving the wetlands. They also think plants and animals have rights to exist as the human does.

In overall, the older respondents tend to have a lower level of concerns on environment and lower beliefs in the inadequate earth resources. Contrary with Pienaar et al. (2015) which the eldest are more concern with resource constraints and environmental fragility. Male respondent holds slightly lower attitudes on the environment as compared to female. However, the effects of gender are not marked on all models for wetland conservations. Respondents from larger households tend to hold positive attitudes towards ecology and natural conservation as well as the resource constraints. This finding is consistent with the prior research Johnson, Bowker, & Cordell (2004) on the nature participation. The mean for all environmental variables revealed a consistent and mildly positive attitudes on environment issues. This estimates could, therefore, be a useful instrument to understand better the human attitudes and beliefs on the environment, specifically for wetland conservation.

Table 4: Regression of environmental attitudes results with standard error in parentheses.

Socio-demographic variables	Total NEP Score	Pro-environ-mentalist	Economic Growth	Anti-anthropocentric
(Constant)	53.90* (0.713)	0.012 (0.131)	0.243 (0.130)	-0.356* (0.131)
Urban	0.79* (0.362)	0.036 (0.066)	0.035 (0.066)	0.139* (0.066)

Age	-0.027* (0.013)	-0.003 (0.002)	-0.012* (0.002)	0.004 (0.002)
Male	-0.236 (0.329)	-0.096 (0.060)	0.105 (0.060)	-0.001 (0.060)
Household Number	0.220* (0.076)	0.029* (0.014)	0.028* (0.014)	0.024 (0.014)
Mean Score	54.36	21.67	12.60	20.01
Adjusted R-squared	0.011	0.005	0.020	0.004
ANOVA, F	4.165*	2.313	6.713*	2.126

*significant at 5% level

5.0 Conclusion

The empirical analyses presented in this paper explored urban and rural people's attitudes towards SW conservation a measured by the NEP scales. The majority of the respondent that is urban people have positive attitudes towards all wetlands conservation aspects as compared to rural respondents. These urban people hold stronger attitudes on the overall NEP and the element of 'anti-anthropocentric'. However, the pro-environmentalist and economic growth groups are not significantly different from rural people. The input of selected socio-demographic variables also demonstrates significant influences on the environmental attitudes regarding age and number of the household. In particular, the wetland conservation is inclined by different types of residents area. Taking into account the rural residents' opinion prior to the planning and management is the most crucial point for a successful conservation. This types of dwellers have potential implications for decision makers because they tend to hold negative attitudes on conservation if their welfare being neglected. A strategic plan for outreach efforts on the rural communities would potentially elevate their support for conservation of SW before conducting management actions. It is suggested for future studies to investigate the level of concern and familiarity with a current issue regarding wetland conservation. It also recommended for coming study to measure rural preferences and what would benefits for their livelihoods from the SW.

Acknowledgement

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