

Environmental Attitude on the Adoption Decision Mangrove Conservation: An Empirical Study on Communities in Special Region of Yogyakarta, Indonesia

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ABSTRACT

This study aims to analyze people's behavior decisions in mangrove conservation in Special Region of Yogyakarta Indonesia. This study uses the Theory of Planned Behavior. The decision to conserve mangroves is explained by perceived environmental responsibility, human nature orientation, environmental knowledge and environmental attitudes. The population in this study are individuals who have done mangrove conservation. Respondents for the research were chosen as purposive sampling. The final sample consists of 161 respondents. These results indicate that the model of mangrove conservation decisions can be accepted. Perceived environmental responsibility and environmental knowledge affects the environmental attitudes, and environmental attitude affects the decision of mangrove conservation.

Keywords: environmental attitude and adoption decision.

1. INTRODUCTION

Indonesia is an archipelago country surrounded by the sea. In the coastal areas of Indonesia has grown many mangrove plants. The mangrove forest thrives in the wide river mouth. Mangrove ecosystems have economic benefits derived from timber and non-timber. The mangrove ecosystem includes brackish water, shrimp farming and tourism. Mangrove forest products that are often exploited by humans are wood. Mangrove wood can be used as fuel, ship building, glue, dye for fabric, and as medicine. The mangrove plant in Special Region of Yogyakarta, used by local people as food and natural dye for batik. Many people do not know that mangrove fruit can be consumed and mangrove bark can be used as a dye fabric. Special Region of Yogyakarta has extensive mangrove conservation area. The planted conservation area is in the Baros area of 8 hectares, and the 9 hectare Pasirmentit conservation area. The total area of Baros and Pasirmentit beaches provided for mangroves reaches 132 hectares. Mangrove forest area requires 10 thousand mangrove trees per hectare.

Selection of mangrove plants is based on the consideration that mangroves are able to grow in the estuary of the river. Mangrove planting has the purpose to provide protection for the coastal edge from the danger of abrasion.

The first issue of this study is related to perceived environmental responsibility. Perceived environmental responsibilities can be defined as the actions of individuals or groups that promote the sustainable use of natural resources (Sivek and Hungerford, 1990). Meta-analyses of environmental-behavior studies have found that individuals who are more positively to the environment tend to participate more in pro-environment behavior (Hines, Hunderford and Tomera, 1987). Cherin and Jacob (2012), demonstrated the study by examining the importance of the impact of environmental responsibility on behavior. The results show that there is an influence of environmental responsibility on environmental attitudes.

The second issue is related to man nature orientation. According to Marcela, (2010), man nature orientation shows that humans can affect nature. Chan and Lau (2000) argue that Man-Nature Orientation can be used to predict human attitudes toward the environment. Chairy (2012) conducted research on the relationship of human attitudes toward green products in Indonesia. The results of his research recommend that research on environmentally friendly products should be deepened, emphasizing the relationship of man nature orientation with attitude. Research on this relationship is rarely done, especially in Indonesia Thus, the second issue of this study is to strengthen the generalization of man nature orientation relationship with environmental attitudes.

A third issue relates to environmental knowledge. Environmental knowledge is an individual's understanding of the environment. Good environmental knowledge will provide a positive picture of the benefits of protecting the environment (Molesworth and Suortti, 2002). Good environmental knowledge has an impact on positive attitudes toward pro-environment behavior. In the theory of adoption of innovation also explained that knowledge is very important in influencing the tendency of individuals to adopt (Brucks, 1985; Moreau, Lehmann, Markman, 2001). With regard to environmental knowledge, if one does not have the trust and knowledge of the environment, then the pro-environment behavior will be low. This happens because a person's knowledge of the environmental information is limited. In addition, one can not easily segregate positive and negative information. Low individual knowledge can have an impact on negative attitudes. This negative attitude will affect the negative intentions and ultimately the behavior will also be negative (Ajzen, 2001).

Attitudes in this study are related to one's preference to protect the environment. The attitude used in this study refers to the psychological and sociological concepts of how and why individuals make decisions about the environment.

Attitude variables have been incorporated into several studies, but the influence of attitudes related to pro-environment behavior is still rarely studied. Research on pro environmental behavior, has placed knowledge as an important consideration when exploring the determinants of pro environmental behavior. Pro environmental behavior has been defined as ecologically oriented behavior, environmentally conscious behavior, pro-environment behavior, eco-friendly behavior, and environmental behavior. This term is often used as a similar concept (Stern, 2000). Stern (2000), also notes that many researchers provide different definitions by focusing on individual intentions on the object, not the actual impact of the behavior specifically.

The Theory of Planned Behavior shows that human behavior can be explained by human attitudes. Associated with environmental attitudes, environmental attitudes can also affect behavior towards the environment. Ajzen (1988), argues that attitudes toward certain behaviors, subjective norms, and perceived levels of perceived control all contribute to behavioral intentions. Behavioral intentions and perceptions of individual behavior control produce actual behavior. Ajzen (1988), extensively develops planned behavioral theories,

arguing that attitudes toward certain behaviors, subjective norms about behavior (or individual social expectations of behavior), and the perceived level of control over those behaviors all contribute to behavior.

2. LITERATURE REVIEW AND HYPOTHESIS

Perceived environmental responsibility

Environmental responsibility can be defined as the actions of individuals or groups that promote the sustainable use of natural resources (Sivek and Hungerford, 1990). The Meta-analysis of pro environmental behavior found that individuals with more positive attitudes toward the environment were more likely to participate in pro-environment behavior (Hines, Hunderford and Tomera, 1987). People with environmental responsibility will show a good attitude towards the environment and recognize the importance of nature and the environment (Schultz, 2000; Stern, Dietz and Guagnano, 1995. Cherin and Jacob (2012), point out the importance of testing the impact of environmental responsibility on attitudes, this is due to changes in consumer attitudes toward the green lifestyle.

H1: Perceived environmental responsibility influences positively on Environmental Attitudes

Man Nature Orientation

Man-nature orientation is defined as the orientation of human relationships with the natural surroundings. People believe that humans have power over nature (Jandt, 2004). Chan and Lau (2000), stated that man nature orientation has a positive effect on attitudes when buying green products. Chan and Lau (2000) also conducted research on green product acceptance in China, one of the results showed that MNO had a significant positive effect on attitudes of 23 percent. Marcela (2010) in her study also stated that the human orientation towards nature has an effect on the attitude of using organic certificate technology. Klöckner (2011) points out that one's personal norm of ecology affects attitudes.

Hypothesis 2: Man nature orientation influences positively on Environmental Attitudes

Environmental Knowledge

Environmental knowledge can be defined as a common knowledge someone has about facts, concepts and relationships between the natural environment and the ecosystem (Fryxell and Lo, 2003). Knowledge is defined as the stage when people are aware of the product and gain some understanding of the function and benefits of the product. The important role of consumer knowledge of products in consumer decision making has been found in the literature and has been done in several studies (Brucks, 1985; Rao and Monroe, 1988; Sujana, 1985). What kind of knowledge has an influence on the information source preferences used for the decision making process (Brucks, 1985; Rao and Monroe, 1988). Knowledge directly affects the level of behavior control and perceived attitudes toward pro-environment behavior. Thøgersen (1996) in his research finds relevant issues that impact on the level of knowledge about the adoption of environmental labels.

Hypothesis 3: Environmental knowledge influences positively on Environmental Attitudes.

Environmental Attitudes

Many studies in the literature of behavioral psychology state that attitudes are important predictors of behavior, behavioral intentions are also an explanatory factor of each type of individual behavior. Environmental Attitudes once used a person to predict behavior on energy conservation, ecology and awareness to buy and use products (Mustafa 2007). The results of Chan's (2001) study show that attitudes toward purchasing green products by Chinese people are caused by environmental knowledge, ecological impact, and culture in consuming products. Research shows that different cultural contexts may have different environmental behaviors. Sugandini, et al (2017), conducted research emphasizing the behavior of natural batik crafters in adopting natural dyes in Imogiri SME, Special Region of Yogyakarta, Indonesia. This research discusses some issues related to factors influencing the adoption of natural dyes by batik crafters. Based on Planned Behavior Theory, this study adds perceived environmental responsibility factor, trialability, ease of use, and experience as factors influencing the adoption of natural dyes in batik making practice. The results showed that the attitude has a positive effect on the use of natural dyes on batik.

Hypothesis 4: Environmental Attitudes influences positively on adoption decision of mangrove conservation.

3. RESEARCH MODEL

This model predicts that the decision of mangrove conservation is directly influenced by the environmental attitude. The impact of perceived environmental responsibility, man nature orientation, and environmental knowledge on mangrove conservation adoption decisions will be mediated by environmental attitudes.

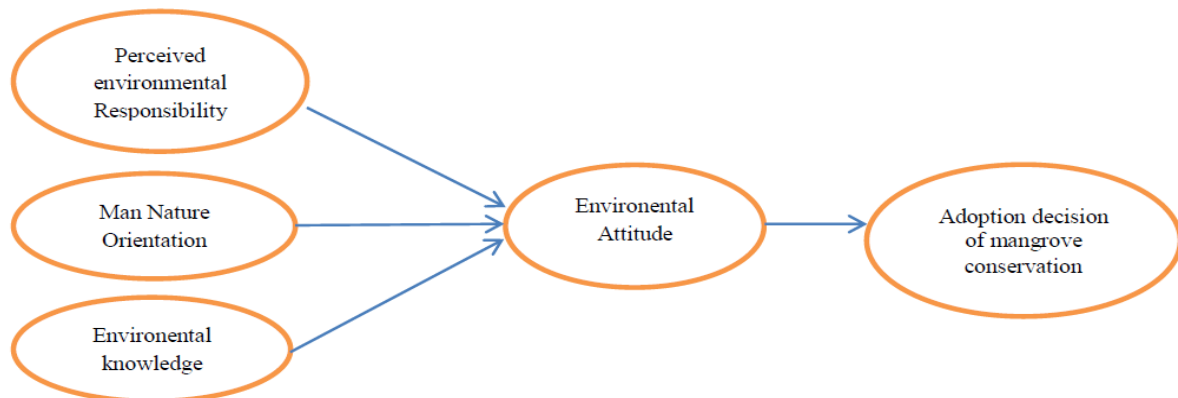


Figure 1: Research Model

4. RESEARCH METHODS

Research design

This study uses a quantitative design. The study was conducted in the form of surveys, using explanatory research approach or explanation that research studies to determine the causal relationship between the variables through hypothesis testing.

Population and sample

The populations in this study are all the community in the Baros and Pasirmedit, Special Region of Yogyakarta, Indonesia. The sampling method used in this research is nonprobability sampling. The respondents for the study were selected as a purposive sampling. Terms of the samples taken are the people who have been involved in the

conservation of mangrove forests in the last two years. The final sample consisted of 161 respondents. The sample contained 61% males and the approximate median age was 35. 65% of respondents are students, and 35% are laborers.

Research Variables

To ensure the reliability and validity in this study, the domain of each construct determined by looking for different types of libraries adoption and innovation in environmental settings. This extensive literature study also helps in generating samples of items for the questionnaire. This Construct illustrated in Table.1 below, operationalized by adjusting the items there were found in a variety of extensive research literature.

Tabel 1.

Operationalization of the construct and Indicators

Construct	Conceptual Definition	Indicator	Sources
Adoption decision of mangrove conservation	Basically people whose behavior reflects a relatively consistent and conscious concern for the mangrove conservation decision.	<ul style="list-style-type: none"> - Frequency of planting mangrove - Take the time to make a mangrove seedling - Keeping the mangrove from destruction 	Homer & Kahle (1988) Kilbourne & Pickett, 2008
Perceived environmental Responsibility	The actions of individuals or groups that promote the use of natural resources in a sustainable manner	<ul style="list-style-type: none"> - Concern for the environment - The responsibility for Global warming - Participation on environmental issues 	Sivek and Hungerford, 1990 Schultz, 2000 Cherin and Jacob, 2012
Man Nature Orientation	A human relationship with the natural surroundings or environmental	<ul style="list-style-type: none"> - Human beings need to understand the ways of nature and act accordingly. - We should maintain harmony with nature. - Human beings are only part of nature. 	Chan and Lau, 2000 Marcela, 2010 Klößner, 2011
Environmental knowledge	A general knowledge of the facts, concepts and the relationship between the natural environment with the ecosystem	<ul style="list-style-type: none"> - Understanding of nature conservation - Understanding of environmental protection - Understanding of environmental damage 	Fryxell and Lo, 2003 Chan and Lau, 2000 Flamm, 2006.
Environmental Attitude	A mental condition that is gained from experience, dynamically directing individual response to environmental.	<ul style="list-style-type: none"> - Like the idea of conservation of mangrove - Mangrove planting is a good idea. - Like to preserve mangrove forests 	Kaisera, Dokab, Hofstetterc, and Ranneyd, 2003 Chan and Lau, 2000 Homer & Kahle, 1988 Taylor & Todd, 1995.

Data Analysis Technique

The model used to analyze the data in this research is Structural Equation Modeling (SEM). Measurement models for perceived environmental responsibility, man nature orientation, environmental knowledge, environmental attitude and decisions of mangrove

conservation using confirmatory factor analysis. Measuring the influence of the independent variable on the dependent variable using path coefficient

Model Evaluation

Hair et al. (1998) explains that the pattern of "confirmatory" shows the procedure designed to evaluate the utility of testing hypotheses with the fit between theoretical models and empirical data. If the theoretical model describes the "good fit" with the data, then the model is considered as reinforced. Instead, a theoretical model not reinforced if the theory has a "poor fit" with the data. Amos can test whether the model "good fit" or "poor fit". So, "good fit" model we tested is very important in the use of structural equation modeling. Tests on a model developed by various criteria Goodness of Fit, the Chi-square, probability, RMSEA, GFI and TLI If the model is less relevant to the data carried two step approach to SEM.

Results Interpretation

To interpret the results measurement latent construct based on the significance level loading factor or coefficient lambda (λ), which is based on the probability value (p), is considered significant when the p value ≤ 0.05 . Further testing complete model derived from the entire construct and significant indicators to assess the effect of value, image, customer satisfaction and perceived quality on customer loyalty by observing the path coefficients (standardized regression), magnitude, and significance. Assessment of significance based on the probability value (p), the limit of significance used is the value of $p \leq 0.05$.

5. RESULT AND DISCUSSION

The analysis of the research was conducted in two phases. The first phase involved the validation of the model. The second phase involved the assessments and significance of the exogenous and endogenous variables towards decisions of mangrove conservation. Table 2 shows a summary of the overall model fit measures. Except for the χ^2 test result, all absolute measures were significant and considered acceptable. Since χ^2 statistics are sensitive to the number of subjects and require assumption of multivariate normal distribution, other measures are better to consider as criteria for model fitting. In addition to absolute values which are the root mean squared residual (RMR), the root mean squared error of approximation (RMSEA), the goodness-of-fit index (GFI), and the adjusted goodness-of-fit index (AGFI), and NFI as comparative fit measures were examined. Assessing all measures, the full general structural model was accepted and believed to be good enough to analyze the parameter estimates. Hypothesis testing was conducted within the context of the structural model. The test results by the two-step approach can be seen in the following table 2.

Table 2. Goodness-of-fit measures for SEM

Fit measures	Indeks goodness of fit	Recommended value	Value	Description
<i>Absolute fit measures</i>	Chi-Square	Small	3.108	Good
	χ^2	≥ 0.05	0,626	Good
	GFI	≥ 0.90	0,954	Good
	RMSEA	≤ 0.08	0,082	Good
<i>Incremental fit measures</i>	AGFI	≥ 0.90	0,912	Good
	CFI	≥ 0.90	0,930	Good
<i>Parsimonious fit measures</i>	Normed χ^2 (CMIN/DF)	$1 \leq \text{Normed } \chi^2 \leq 5$	0.539	Good

The results of this study indicate that the models developed to explain the decision mangrove conservation has been as expected. Perceived environmental responsibility (PER), man nature orientation (MNO) and Environmental knowledge (EK) have an influence on environmental attitudes (EA), and environmental attitude (EA) have an influence on the decisions of mangrove conservation.

Hypotheses were examined by confirming the presence of a statistically significant relationship in the predicted direction. The Influence of perceived environmental responsibility, man nature orientation, environmental knowledge on the environmental attitude is significant and the influence of environmental attitude towards decisions of mangrove conservation are also significant. The parameter estimates for the hypothesized paths, their t-values, and result of hypotheses are summarized in Table 3.

Table 3.
Parameter estimates, t-value, and results of hypotheses.

	Hypothesized path	Standardized estimate	CR	Result of hypotheses
H1	Environmental Attitudes \leftarrow PER	0.189	3.168	Supported
H2	Environmental Attitudes \leftarrow MNO	0.246	2.736	Supported
H3	Environmental Attitudes \leftarrow EK	0.232	3.510	Supported
H4	Adoption decisions of mangrove conservation \leftarrow EA	0.321	4.877	Supported

Hypothesis testing results indicate that the influence of perceived environmental responsibility towards the environmental attitude by 18,9 percent. The influence of man nature orientation towards environmental attitude by 24,6 percent. The influence of environmental knowledge toward environmental attitude by 23,2 percent. The influence environmental attitude towards decision of mangrove conservation by 32,1 percent. The results of this study may indicate that environmental attitude influences towards decisions of mangrove conservation is the most powerful. This finding is consistent with Homer and Kahle (1988) which states that the effect of hierarchy individual decision is passed through value-attitudes-behavior. The results of this study indicate that the attitude will determine the behavior. The research findings also support the research results. Kilbourne & Pickett, (2008) which states that environmental attitudes influences directly to the green consumer behavior, because attitudes are evaluative judgments consumers against an object or product of interest.

6. CONCLUSION AND LIMITATION

Conclusion

The results of this study indicate that the model of mangrove conservation adoption that is influenced by environmental attitude can be accepted and supported. Environmental attitude in this research is influenced perceived environmental responsibility, man nature orientation, and environmental knowledge. The influence of each of these variables is proven and significant. Environmental attitude has a dominant influence on the decision to adopt mangrove conservation. MNO also has a great influence on environmental attitudes, although the effect is not as big as the influence of environmental attitudes to the adoption of mangrove conservation. The results of this study also show support from previous research findings.

Limitation

Limitations of this study indicated the presence of the scope of research in a particular setting. This study can only be generalized to the scope of the studies that have criteria specific research subject and object. The research subjects were identified in this study is limited to coastal communities that voluntarily conserve mangrove. Object of research is also limited to the category of pro-environmental behavior.

The study also only analyzes the factors that influence conservation decisions from the aspect of environmental awareness, the perceived environmental responsibility, man nature orientation, environmental knowledge and environmental attitude. There are several other factors that could be used to predict the decision mangrove conservation as ecological behavior, feelings of responsibility for the environment (Kaiser, 1998), and the perceived seriousness of environmental problems (Cherian & Jacob, 2012).

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