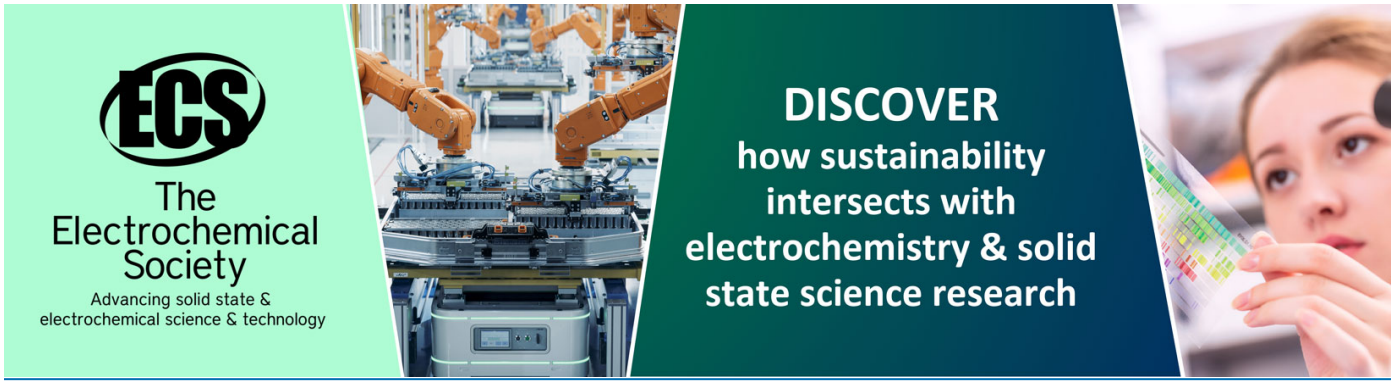
Community Perception and Participation of Mangrove Ecosystem in Ngurah Rai Forest Park Bali, Indonesia



Community Perception and Participation of Mangrove Ecosystem in Ngurah Rai Forest Park Bali, Indonesia

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Abstract. Ngurah Rai Forest Park (Taman Hutan Raya), Bali is one of the mangrove forest conservation areas in Indonesia. Usually Ngurah Rai Forest Park, Bali are utilized for the benefit of research, science, education, culture, cultural tourism and recreation. The aim in this study to: (1) analyze perception of the community around Ngurai Rai Forest Park about mangrove ecosystem; (2) analyze participation of the community around Ngurai Rai Forest Park about mangrove management; (3) analyze the correlation between perception and participation of the community around Ngurah Rai Forest Park. The research was conducted in July 2017 in Denpasar, Ngurah Rai Forest Park Bali. This paper was based on primary data taken using questionnaire with a predetermined analysis unit to interview the community in the study area. The result presented with quantitative and descriptive analysis.

1. Introduction

Indonesia has the largest mangrove forest in the world and also has the largest biodiversity and the most varied structures. Mangroves can grow throughout the island of Indonesia. This extraordinary natural heritage provides a great responsibility for Indonesians to preserve it [1]. Ecologically, mangrove forest is one of the core of coastal ecosystem that have a very important role in protecting the mainland. The existence of mangrove forests along the coast of an island can be a green belt and offer good protection to shorelines from hurricanes and other storm swell activity, even a tsunami wave. It has been widely studied by tsunami experts, mainly from Japan. Mangrove forest with a certain thickness and density of trees can reduce hit by the tsunami waves up to 50 percent. Similarly, they protect coastal areas behind them from severe wave damage and erosion [2]. Furthermore, mangrove forest also provide three other ecological functions, namely as a wildlife habitat, aquatics nurseries, and to maintain the water quality in clean condition, because the anaerobic mangrove sediments can trap heavy metals and pesticides without harm to the trees. As a result mangroves can incorporate, trap or immobilise inorganic nutrients, heavy metals or pesticides that would otherwise flow to the sea, degrading the quality of coastal waters [2].

Over the past three decades, Indonesia has lost 40 percent of its mangroves [3]. This means Indonesia has the fastest rate of mangrove destruction in the world [4]. Mangrove deforestation accounts for 6 percent of total annual forest loss in Indonesia, despite covering less than 2 percent of the country's total forest area. This equates to 0.05 million hectares (Mha) out of the total 0.84 Mha annual deforestation in Indonesia [5].

Mangrove forest referred to as mangrove swamp forest is an ecosystem that is constantly undergoing development pressure [6]. Mangroves grow optimally in coastal areas that have a large river estuaries

and deltas that flow of water contains a lot of mud. While in coastal areas that are not contained estuaries, mangrove forest growth was not optimal. The main causes of mangrove loss in Indonesia include conversion to shrimp ponds known as the "blue revolution", logging and conversion of land to agriculture or salt pans and degradation due to oil spills and pollution [3].

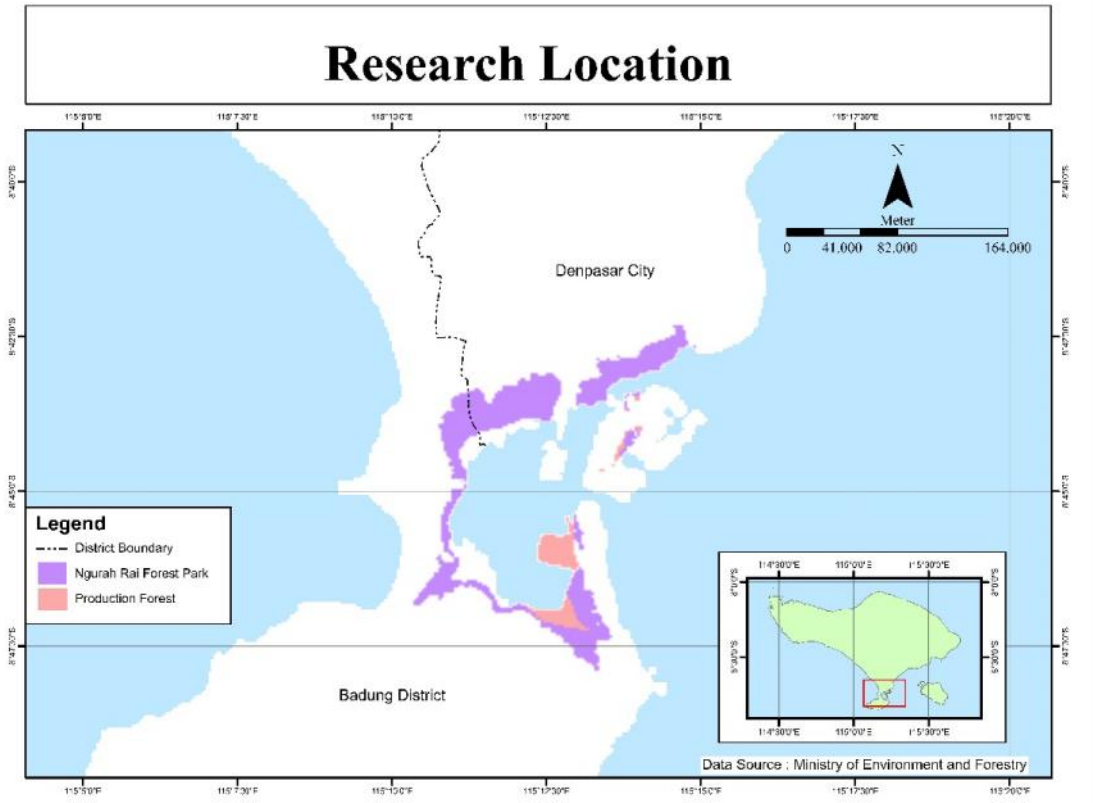

Figure 1. Research Location Map

According to Rumada [7] Ngurah Rai Forest Park, Bali is one of the mangrove forests in Indonesia. Tahura Ngurah Rai stipulated based on the Minister of Forestry Decree Number 554 / Kpts-II / 1993 in 1993 has an area of 1,373.50 Ha. Ngurah Rai Forest Park is a brackish forest-type that always lined with brackish water and tides. Ngurah Rai Forest Park (Taman Hutan Raya), Bali suffered damage as a waste disposal site, especially waste and forest encroachment by the community.

Communities living near Ngurah Rai Forest Park certainly have an important role in the management of mangrove forest ecosystems. However, the community can also play a role in the environmental destruction that occurs in Ngurah Rai Forest Park.

Human perceptions of the environment is a spatial perception that is as an interpretation of a setting (space) by individuals based on the background, culture, reason and experience of the individual. Thus each individual can have a different environmental perception of the same object because it depends on the background that is owned. Environmental perceptions related to spatial perception play a role in decision making in the context of migration, communication and transportation.

According to Sarwono (1992) in Umar (2009) [8] Human response to the environment depends on how the individual perceives his environment Perception of the environment affects individual relationships with their environment, such as community participation in environmental management include: (1) utilizing the environment, (2) preventing environmental damage (3) tackling environmental damage. Therefore, a study about perception and community participation in management of mangrove forest ecosystem at Ngurah Rai Forest Park need to be done.

2. Methods

The research location is around Ngurah Rai Forest Park (Taman Hutan Raya), Bali. The research was conducted in July 2017. The method used in this research is descriptive method and survey with quantitative approach.

quantitative research method is a research method based on philosophy positivism used to examine the population or a particular sample, sampling techniques are generally done randomly, data collection using research instruments, statistical data analysis with the purpose to test the hypothesis that has been established, while the survey method is a research method that takes a sample on the population and use the questionnaire as a tool that used to collect the primary data [9].

In this study, researches used questionnaire that some of the questions can be answered with a selection of available answers while some other questions can be answered in accordance of free thoughts. Moreover, researchers also used interview techniques.

The processing data method for this study is quantitative descriptive analysis. Descriptive analysis is a behavioral sensory evaluation approach that uses descriptive panels to measure a product's sensory characteristics. Panel members use their senses to identify perceived similarities and differences in products, and articulate those perceptions in their own words. Sensory evaluation is a science that measures, analyzes, and interprets the reactions of the senses of sight, smell, sound, taste, and texture (or kinesthesis) to products. It is a people science; i.e., people are essential to obtain information about products [10].

Descriptive research in this study is intended to get an overview of community perception linked to community participation in management of mangrove forest ecosystem at Ngurah Rai Forest Park. While the quantitative data was processed by SPSS (Statistical Product and Service Solutions).

3. Results and Discussion

Characteristics of Respondents in this study based on age groups, gender, length of stay, and highest level of education attainment.

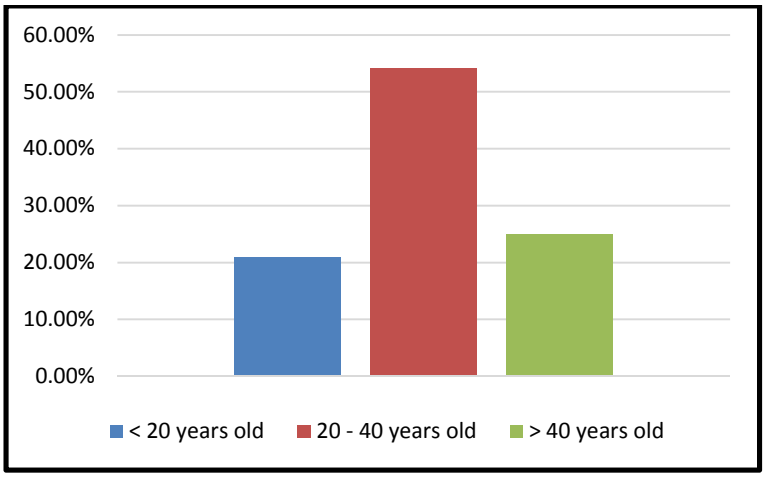

Figure 2. Age Groups

According Kozier (2004) in Sari (2016) [11], age is a factor that can affect person knowledge or perception. Someone sees a target and tries to give a perception interpretation of the object with different views. Individual characteristics such as age can influence the interpretation of a person perception, so that everyone of different ages has different perceptions of an object or stimulus. Age can affect person capability and mindset.

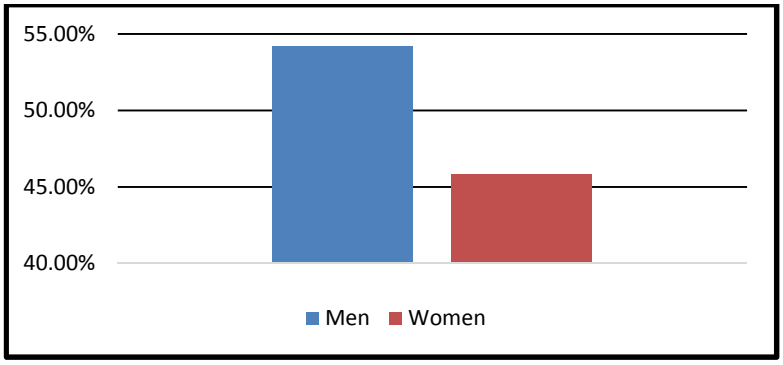

Figure 3. Gender

According to Muchlas (2005) in Sari (2016)[11], said that individual characteristics of a person such as gender can affect a person in giving interpretation of perception on an object or stimulus that someone sees. Can be concluded that the gender of men and women in perceiving about an object or stimulus are different. Gender differences tend to form different perceptions, resulting in different attitudes between men and women.

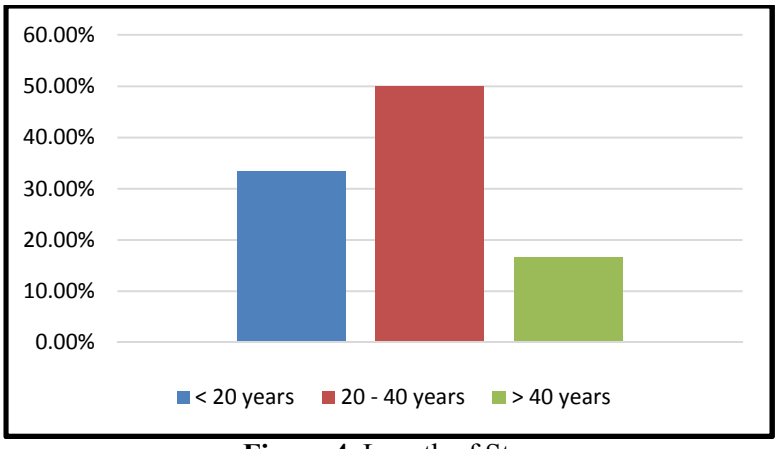

Figure 4. Length of Stay

The length of stay a person in a region will distinguish perceptions about the surrounding environment. Experience and knowledge during the stay in the region will have an impact in the form of perceptions of surronding environment.

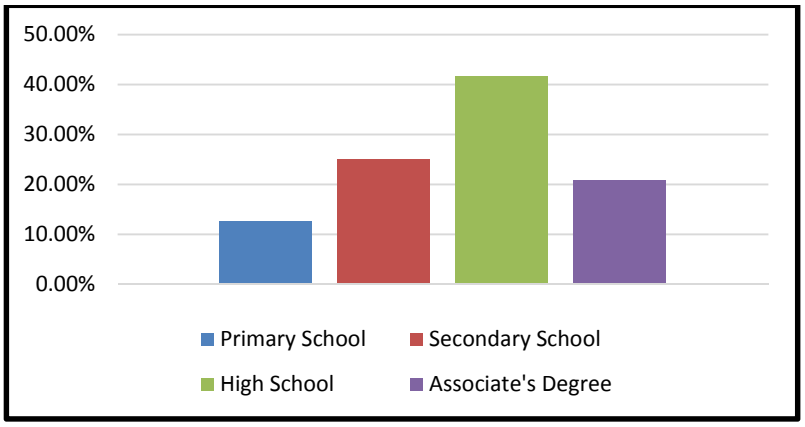

Figure 5. Highest Level of Education Attainment

Kurniawan (2008) in Sari (2016) [11] states that education has an important role in the formation of human intelligence as well as changes in behavior. A good level of education can affect the level of knowledge society in understanding the information. Education affects the learning process, the higher a person's education the easier it is for someone to receive information.

In this study, there are 3 parts of questions in the questionnaire which are about Insights and Knowledge about Mangrove, Perception about Mangrove, and Participation on Mangrove Management or Conservation.

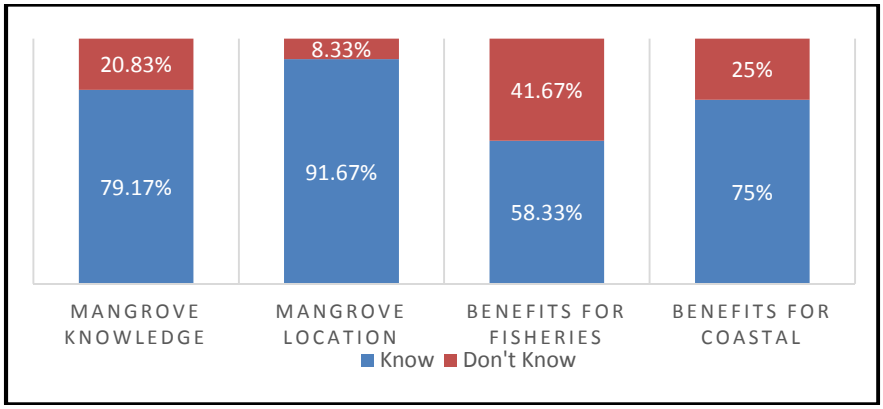

Figure 6. Insights and Knowledge about Mangrove

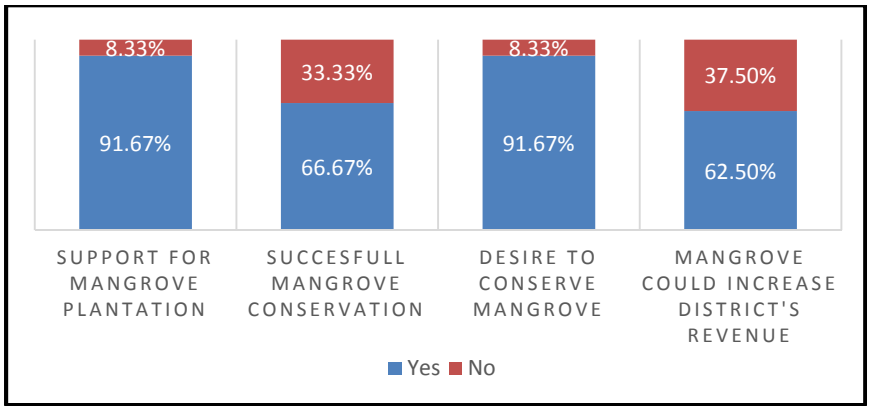

Figure 7. Perception about Mangrove

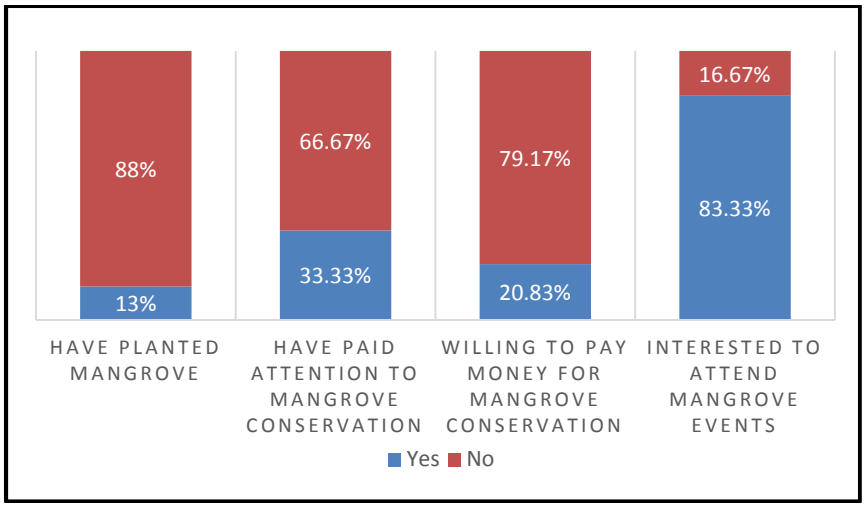

Figure 7. Participation on Mangrove Management or Conservation

Based on the result, community insights and knowledge about mangrove in a good category. More than 50% of the respondents said to know about mangrove knowledge, mangrove location, benefits for fisheries, and benefits for coastal. Furthermore, the community perception about mangrove ecosystem in a good category too. More than 60% of the respondents said yes to support for mangrove plantation, to have a succesfull mangrove conservation, desire to conserve mangrove, and mangrove could increase district's revenue. However, community participation on mangrove management or conservation in a bad category. More than 60% of the respondents said no to have planted mangrove, paid attention to mangrove conservation, and willingness to pay money for mangrove conservation. Even though, more than 80% of respondets said yes about interested to attend mangrove events. Lack of participation from the community caused by the lack of government to give a role to the community to help to make efforts on the management or conservation of mangrove ecosystems in Ngurah Rai Forest Park (Taman Hutan Raya), Bali.

After that, we discussed about the relationship between perception about mangrove with participation on mangrove management or conservation. Simple correlation analysis is used to describe the strength and direction of the relationship between the two variables. The method used is the Pearson product moment. Figures correlation ranged from -1 s / d +1. The closer to 1, the closer the correlation is perfect. While the negative and positive values indicate the direction of the relationship.

Hypothesis is:
H0: There is no relationship between the community perceptions with community participation
H1: There is a relationship between the community perceptions with community partcipation

Table 1. Correlation between the community perception with community participation

Correlations

		Perception	Participation
Perception	Pearson Correlation	1	,263
	Sig. (2-tailed)		,214
	N	24	24
Participation	Pearson Correlation	,263	1
	Sig. (2-tailed)	,214	
	N	24	24

From the analysis above correlation (r) obtained correlation between the community perceptions with community participation (r) is 0.263. This shows that the relationship between the community perceptions with community participation is low because it is located between the ranges of 0.20 to 0.399. The Sig. (2-Tailed) value is 0.214, this value is greater than 0.05. We can conclude that there is no statistically significant correlation between the two variables. That means, increases or decreases in one variable do not significantly relate to increases or decreases in your second variable. Which means that H0 is accepted or there is no relationship between the community perceptions with community participation.

4. Conclusion

Knowledge and perception of the community around Ngurah Rai Forest Park (Taman Hutan Raya), Bali in good category. However, good knowledge and perception are not in line with the lack of community participation in managing and conserving the mangrove ecosystem located in Ngurah Rai Forest Park (Taman Hutan Raya), Bali. One of the reasons why mangrove forest destruction happened because the lack of community participation in managing and conserving. Whereas if the mangrove ecosystem is maintained that will receive benefits are the people living near the mangrove ecosystem.

Government and non-government organizations should make efforts to provide community roles to manage and conserve the existing mangrove ecosystems in the Ngurah Rai Forest Park (Taman Hutan Raya), Bali. These efforts should be done gradually and followed by monitoring, moreveor these efforts

have a major impact on the mangrove ecosystem because the community actually has an important role in managing and conserving.

Acknowledgement
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