

Knowledge, Attitude and Community Participation Towards Mangrove Forest Protection in the Coastal Area of Pinrang Regency, South Sulawesi Province, Indonesia

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Abstract

This research aims to determine the knowledge and participation attitudes of coastal communities towards the law on mangrove forest protection in the coastal area of Pinrang Regency. Respondents for this research were 50 people selected by purposive sampling method. The research variables are: 1) Community knowledge of mangrove forest protection laws, 2) Community attitudes towards enforcement of mangrove forest protection laws, and 3) Community participation in mangrove forest law enforcement. Data collection techniques used questionnaires and interviews. The data analysis technique is quantitative descriptive. The research results show that: 1) As many as 76% of respondents do not know about the law on mangrove forest protection, 2) As many as 74% of respondents agree with enforcing the law on mangrove forest protection, and 3) As many as 62% of respondents do not participate in enforcing mangrove forest laws.

Keywords: Knowledge, Attitude, Law, Protection, Mangrove.

INTRODUCTION

Indonesia's development cannot be separated from the role of natural resources in the life of the state and society. Natural resources, in accordance with the mandate of the 1945 Constitution, Article 33 paragraph (3), are controlled by the state and used as much as possible for the prosperity of the people. The essence and purpose of Article 33 paragraph (3) of the 1945 Constitution is to achieve state goals, more directed at increasing overall welfare in the sense of utilizing the natural wealth contained within Indonesia's land so that its management does not damage the environment. So the development target desired by this article is how to include the environment as the basis for its considerations. This is in line with Chapter III paragraph 6 of the National Long Term Development Plan 2005 - 2025 which regulates that improving development management can maintain a balance between the utilization, sustainable existence and usefulness of natural resources and the environment while maintaining the function of carrying capacity and comfort in life in the future. present and future.

The National Long Term Development Plan shows evidence that the government in the current era of reformation is expected to be able to utilize the environment by maintaining a balance of carrying capacity and comfort functions for the present and the future. In Article 1 paragraph (1) of Law Number 32 of 2009 concerning Environmental

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Management regulates that the environment is a unified scope with all objects, forces and living creatures including humans and their behavior which affects nature itself, the continuity of life and welfare of humans and other living creatures.

In Government Regulation Number 45 of 2004 Article 1 paragraph (1) concerning Debt Protection regulates that forest protection is an effort to prevent and limit damage to forests, forest areas and forest products, caused by human actions, livestock, forest fires, pests and diseases, as well as defend and protect the state rights of communities and individuals over forests, forest areas, forest products, investments and instruments related to forest management.

Forests as national development capital have real benefits for the lives and livelihoods of the Indonesian people, including ecological, socio-cultural and economic benefits in a balanced and dynamic manner. In order to obtain optimal benefits from forests for the welfare of society, their use must still take into account their characteristics and vulnerabilities, and it is not justified to change their main functions as protection, production and conservation. To maintain the continuity of the basic functions of forests, it is also necessary to carry out rehabilitation efforts aimed at not only improving forest quality, but also increasing community empowerment and welfare, in this case community participation is the core of its success.

One type of forest that is very important to protect and maintain is mangrove forests. This forest is located along the coast and is a source of livelihood for the majority of Indonesian people who live around it. Mangrove forests as a unique ecosystem are a very potential natural resource and are a unique forest ecosystem, especially because of their position as a transition between land ecosystems and marine ecosystems. Mangroves support a diversity of flora and fauna which play an important role in human survival, both from an ecological and socio-economic perspective. Judging from its function, mangrove forests have multiple benefits, namely: 1) From an ecological perspective, mangrove forests function to support the physical environmental ecosystem and biota. In supporting the physical environmental ecosystem, mangrove forests function as wave barriers, wind barriers, flood barriers, pollution reducers and barriers to sea water intrusion. For environmental biota, mangrove forests function as a shelter, spawning place and breeding ground for various types of aquatic biota (shrimp, crabs and shellfish), mammals, reptiles and birds, all of which are difficult to value in money. 2) From a socio-economic perspective, mangrove forests are the mainstay of local communities, such as fishing for fish, shrimp, crabs and honey to meet their protein needs, and mangrove wood is also used by local communities to meet their needs for building materials and firewood. Apart from that, mangrove forest areas have the potential to generate increased income in the form of clearing land for fish and shrimp ponds which can also open up employment opportunities for the surrounding community.

THEORETICAL REVIEW

Understanding Mangrove Forests

The word Mangrove comes from Portuguese mangue and English grove, the word mangrove is used for forest or bush communities that grow on beaches/islands although several other species are associated with it. In Portuguese, the word mangrove is generally used for individual species and for forest communities consisting of mangrove species (Sarfanode, 1998). Mangrove forests are also called coastal forests or mangrove forests. The type of plant known as mangrove plantation forest consists of various types of plants whose lives depend on littoral habitat. If both are suitable, mangroves can grow very widely and form production forest areas. According to Nontji (2013) mangrove forests are a typical type of forest found along beaches or river estuaries which are influenced by sea tides, often called coastal forests, tidal forests, brackish forests or

mangrove forests. To avoid confusion, it is necessary to emphasize that the term mangrove should only be used for one type of plant, namely the *Rhizophora* genus, while the term mangrove is used for all plants that live in this unique environment. Because in this particular forest there are not only types of mangroves, the term mangrove forest is more popularly used to refer to this type of forest. All plants in this forest interact with their environment both biotically and abiotically. All of these interdependent systems form the mangrove ecosystem. Mangroves do not grow on steep, wavy beaches with strong tidal currents, because this does not allow the deposition of mud and sand, the substrates necessary for their growth.

According to Darsidi in Arsyad (2000) mangroves are forest vegetation that grows between the tides, but can also grow on coral beaches (dead coral land) on which a thin layer of sand or mud grows or muddy beaches with the characteristics; 1) Not influenced by climate; 2) Influenced by tides; 3) Land inundated by sea water; 4) The forest does not have rajuk; 5) Trees (can reach 40 meters high); 6) Tree types starting from sea to land; 7) Grows on the beach to form a path; 8) The trees form strong roots. According to Natsir (Daily Fajar 26 April 2013), mangrove forests or brackish forests, often also called coastal forests or tidal forests, are forest formations that are influenced by tides along the coastlines of tropical areas which are dominated by mangroves, fires, nipah, tancang and padada.

Functions of Mangrove Forests

One of the natural resources included in the conservation program which until now many people still do not know about its role in the chain of life is mangrove forests. For ordinary people, the use of mangrove forests is solely to support their daily needs, while their complex role in a series of ecological systems is unthinkable. Another prominent role of mangrove forests in the ecological system is also seen in the form of marine fisheries products, especially various types of fish and shrimp, where these biota use mangrove forests as shelter, spawning and foraging. Mangrove forests are a unique ecosystem and are a type of natural resource that contributes a lot to human life because they have various functions, the first being the physical function of keeping the coastline stable, protecting beaches and river cliffs, protecting the coast from sea erosion (abrasion), become a buffer area against sea water seepage (intrusion), process waste materials; the second biological function is as a spawning place and search for food for shrimp, fish, shellfish and other types of fish, a nesting place for birds, a natural habitat for various types of biota; and the third function, the economic function, namely as fuel (charcoal, firewood), building materials (roofing, beams), fisheries, agriculture, textiles (synthetic fibers), medicines, drinks (alcohol). Paper raw materials, trade export materials and other economic products (Salim, 1986).

Bangen, (2000) stated that the function of mangrove forests is, 1) as a wave absorber and coastal energy, protection from abrasion, mud retainer and sediment catcher, 2) producer of a number of varieties of mangrove tree leaves and branches, 3) nursery area 4) area search for food and spawning areas for various types of shrimp and other marine biota, 5) producers of wood for construction materials, firewood, charcoal raw materials and paper raw materials, 6) suppliers of fish larvae, shrimp, other marine biota, 7) and as tourist destination. Hardjosentono (Arsyad, 2000) stated that mangrove forests play a protective function, demonstrated by mangrove forests along the coast as a deterrent to sea waves, thereby protecting the coast from crashing waves. In addition, mangroves have the ability to improve the soil with their roots to calm the continuous movement of water, prevent the return or washing away of organic material from mud from rivers to the sea, and strengthen coastlines. Soerkatiko (2010) stated that the role and function of mangrove forests is very large, both in the form of direct and indirect benefits which are very important for the ecosystem of living creatures on land and other ecosystems, these roles include, a) as a source of forest production in the form of fuel, charcoal, tool wood, b) as a protector for beaches or coastal areas against the onslaught of waves, currents and wind,

c) as a productive producer of organic substances so that it is a food place for various types of fish and shrimp, d) as a place to spawn and raise young, baby fish, shrimp and other animals.

The mangrove forest ecosystem in Indonesia has the highest biodiversity in the world with a total number of species of 89. The high biodiversity of mangrove forests is a very valuable asset not only seen from its ecological function but also from its economic function. Mangrove forests are an important life-supporting ecosystem in coastal and marine areas. Apart from having an ecological function as a provider of nutrients for aquatic biota, a spawning place and nurturing place for various kinds of biota, preventing abrasion, raging hurricanes and tsunamis, absorbing waste, preventing sea water intrusion and other than that, mangrove forests also have economic functions such as providing wood and leaves, as a raw material for medicines and others (Dohuri et al 2012). In fact, Saenger et al (2001) have identified more than 70 types of uses of mangrove forests for human life, both direct products and indirect products.

Legal basis

Mangrove forest protection law, in general, is regulated in Law Number 32 of 2009 concerning Environmental Protection and Management, in Chapter II Article 2 regulates protection and management, then Chapter VI regulates the maintenance and conservation of natural resources, and Chapter specifically regulates community participation in managing and maintaining natural resources, including mangrove forest natural resources. Furthermore, Minister of Environment and Forestry Regulation Number P.23 of 2021, regulates forest and land rehabilitation. Then specifically for Mangrove forests, it is regulated in the Decree of the Minister of Environment Number 201 of 2014 concerning Standard Criteria and Guidelines for Determining Mangrove Damage and finally the Regulation of the Minister of Maritime Affairs and Fisheries of the Republic of Indonesia Number 24/Permen-Kp/2016 concerning Procedures for Rehabilitation of Coastal Areas and Small Islands. Apart from that, as a basis for implementation, it has also been regulated through SNI 7717:2011 concerning Mangrove surveying and mapping, SNI 7513:2008 concerning Handling of mangrove seeds and seedlings and SNI 7717:2020 concerning Specifications for geospatial information on mangroves at scale 1:25000 and 1: 50000.

The above matters are the legal basis for managing Mangrove forests. The problem is whether all the legal bases that have been established have been socialized or are they known to the community, especially coastal communities who are in direct contact with the Mangrove ecosystem? This problem is what prompted research, even on a small scale, in the coastal area of Pinrang Regency to find out the extent of the community's knowledge and attitudes towards the Mangrove forest protection law.

RESEARCH METHODS

This research aims to determine the knowledge and participation attitudes of coastal communities towards the law on mangrove forest protection in the coastal area of Pinrang Regency. Respondents for this research were 50 people selected by purposive sampling method. The research variables are: 1) Community knowledge of mangrove forest protection laws, 2) Community attitudes towards enforcement of mangrove forest protection laws, and 3) Community participation in mangrove forest law enforcement. Data collection techniques used questionnaires and interviews. Questionnaires were given to respondents to determine their knowledge, attitudes and participation, then interviews were conducted with community and government figures as a comparison to the questionnaire results from respondents. The data analysis technique was quantitative descriptive as a basis for drawing conclusions.

RESULTS AND DISCUSSION

Research result

Community knowledge about the existence of several regulations that protect the existence of mangrove forests will determine the achievement of sustainable mangrove and coastal forests. In this research, questionnaires were distributed to respondents to determine community knowledge about protection laws, or government regulations governing the protection of mangrove forests. The results of research on knowledge variables with knowledge Percentage Table 1

Table 1 Indicators of Community Knowledge about Mangrove Forest Protection Laws

Respondent's Answer	Frequency	Percentage
a. Know	4	8
b. Lack of Knowledge	8	16
c. Do not know	38	76
Amount	50	100

Source: Data Processing Results

The data in table 1 above shows that indicators of the level of public knowledge regarding the existence of Mangrove forest protection laws, of the 50 respondents who answered that they did not know, 38 (76%) answered that they did not know, 8 (16%) and only 4 (8%) answered that they did not know. Thus, it can be concluded that 76% of coastal communities in Pnrang Regency are not aware of the existence of mangrove forest protection laws. The results of these findings were then cross-checked with interviews with the Head of Duampanua District and confirmed that the community did not know about the existence of various regulations that protect mangrove forests.

To strengthen the researcher's argument that the community really does not know about the existence of a law on protecting Mangrove forests, the researcher then measured indicators regarding the community's obligation to protect Mangrove forests, with the results of the analysis in table 2 below.

Table 2 Indicators of Community Obligations to Protect Mangrove Forests.

Respondent's Answer	Frequency	Percentage
a. Know	4	8
b. Lack of Knowledge	8	16
c. Do not know	38	76
Amount	50	100

Source: Data Processing Results

The data in table 2 above shows that the indicator of the community's obligation to protect Mangrove forests, of the 50 respondents who answered they didn't know, 38 (76%) answered that they didn't know, 8 (16%) and only 4 (8%) answered that they didn't know. Thus, it can be concluded that 76% of coastal communities in Pnrang Regency are not aware of the community's obligation to protect mangrove forests. The results of these findings were then cross-checked with interviews with community leaders on behalf of Nurdin, (Prescom, 2023) and confirmed that the community did not know about the community's obligation to protect mangrove forests. Apart from that, the Head of the local Fisheries Service also explained that there are people who have ponds covering an area of 300 Ha. This is because there are no regulations or regional regulations that limit the size of ponds that individuals can own, so the area of mangrove forests is decreasing.

Attitude is a form of reaction of a person's feelings, whether supporting or not, agreeing or not, taking sides or not towards an object, which is sometimes accompanied by a tendency to act. Two indicators were asked about the community's attitude towards enforcing mangrove forest protection laws. The first concerns the provisions or determination of the width of the green belt or coastal border, which can be planted with mangrove plants as a barrier to the sea, and the second concerns the community's attitude when mangrove forest rehabilitation is carried out.

The results of the questionnaire or respondents' answers to the indicators for the provisions or determination of the width of the green belt or beach border can be seen in table 3 below.

Table 3 Community attitudes towards the provisions or determination of the width of the green belt or beach border

Respondent's Answer	Frequency	Percentage
a. Agree	37	74
b. Disagree	9	18
c. Don't agree	4	8
Amount	50	100

Source: Data Processing Results

The data in table 3 above shows that in the indicators of community attitudes towards the provisions on the width of green lanes or coastal borders, of the 50 respondents who answered agree, 37 (74%) answered that they disagreed, 9 (18%) and those who answered disagreed, 4 (8%). Thus, it can be concluded that 74% of coastal communities in Pnrang Regency agree with the provisions or determination of the width of the green belt or beach border. The results of these findings were then cross-checked with interviews with community leaders on behalf of Amal (Prescom, 2023) and confirmed that the community indeed agreed to the provisions or determination of the width of the green belt or beach border.

To strengthen the researcher's argument regarding community attitudes towards enforcing mangrove forest protection laws, the researcher then distributed a questionnaire to respondents regarding indicators of community attitudes when mangrove forest rehabilitation was carried out.

The results of the questionnaire or respondents' answers to indicators of community attitudes when mangrove forest rehabilitation is carried out can be seen in table 4 below.

Table 4 Indicators of Community Attitudes When Mangrove Forest Rehabilitation is carried out

Respondent's Answer	Frequency	Percentage
a. Agree	50	100
b. Disagree	0	0
c. Don't agree	0	0
Amount	50	100

Source: Data Processing Results

The data in table 4 above shows that the community strongly agrees with the rehabilitation or replanting of mangrove trees in critical locations, as evidenced by the 50 respondents, 50 (100%) of whom answered in the affirmative, which proves that the existence of mangrove trees is highly expected by the community. The results of these

findings were then cross-checked with interviews with the Head of Data Village, and it was confirmed that the community really agrees with the rehabilitation or replanting of mangrove trees in critical locations.

Concerning community participation in law enforcement for mangrove forest protection, it is measured by two indicators. The first concerns community participation in reporting to the authorities if they see irresponsible felling of mangrove trees, and the second concerns community participation in the context of rehabilitating or replanting mangrove forests on critical land.

To see community participation in indicators of community participation to report to the authorities if they see irresponsible felling of mangrove trees, you can see table 5 below.

Table 5 People Report if They Know or See Someone Cutting Down Mangrove Trees

Respondent's Answer	Frequency	Percentage
a. Once	0	0
b. Never	50	100
Amount	50	100

Source: Data Processing Results

Based on the data in table 5 above, it is known that all respondents answered that they never reported mangrove tree felling, that is, 50 respondents (100%) answered never. This shows that there is no community participation in law enforcement for the protection of Mangrove forests in the research area. The results of these findings, then cross-checked with interviews with community leaders on behalf of Syukur, (Prescom, 2023), confirmed that even if the community knew that mangrove forests had to be protected and were aware of the cutting down of mangrove trees, they would definitely not dare to prohibit or report it because the perpetrators were also from The people who are supposed to set an example but instead they are the ones who do the most.

Furthermore, researchers distributed questionnaires related to community participation in the context of rehabilitation or replanting of mangrove forests on critical land, which can be seen in table 6 below.

Table 6 Community Participation in Implementing Rehabilitation by Planting Mangrove Forests on critical land

Respondent's Answer	Frequency	Percentage
a. Once	19	38
b. Never	31	62
Amount	50	100

Source: Data Processing Results

The data in table 6 above shows that community participation in implementing mangrove forest rehabilitation is still low, namely of the 50 respondents, only 19 (38%) answered never and 31 (62%) answered never. The results of these findings were then cross-checked with an interview with the Head of Data Village, and it was confirmed that during the rehabilitation or planting of mangrove trees, not all of the community was involved, because the funds for the project implemented by Bappedalda were limited, so only some community members were called because they were paid or paid according to the number of trees planted.

Discussion

Based on the research results presented above, the three main variables studied were: 1) Community knowledge of mangrove forest protection laws, 2) Community attitudes towards enforcement of mangrove forest protection laws, and 3) Community participation in mangrove forest law enforcement. The research results show that: 1) As many as 76% of respondents do not know about the law on mangrove forest protection, 2) As many as 74% of respondents agree with enforcing the law on mangrove forest protection, and 3) As many as 62% of respondents do not participate in enforcing mangrove forest laws. The results of this research are supported by the research results of Wattimena et al (2021), which explains that the regulations related to coastal area management as regulated in Law No. 1 of 2014, have not been implemented optimally in the field, marked by the destruction of Mangrove forests, especially in coastal areas. Piru Village, West Seram Regency.

Apart from that, the results of research conducted by Hasriani Hamid (2022), the conclusions of his research results, among other things, explain that regarding legal knowledge of management and supervision of mangrove forests in the Laenteng area of Makassar City, it was found that the level of damage that occurred in the Lantebung area of Makassar City with the ratio of canopy cover 0-50% and is a high level of damage. Abdhy et al (2022) explain that: Mangroves have high economic and ecological value but are vulnerable to damage if they are not used wisely. Based on One Map Mangrove data, the area of Indonesia's mangrove ecosystem is 3.5 million hectares, consisting of 2.2 million ha within the area and 1.3 million ha outside the mangrove area. For this reason, forests, especially mangrove forests, are at the forefront and must be protected and managed as a long-term investment owned by Indonesia. Furthermore, Rasyid et al (2022) explained that the monitoring of mangrove forests that has been carried out by the relevant agencies is currently not optimal and the impact of pollution of the mangrove forests on Pannikiang Island in the city of Parepare is very detrimental both ecologically and socio-economically. This is also in line with the results of research by Ervina et al (2018) which explains that the total area of mangrove forest areas based on function in Pohuwato Regency is 15,600.81 Ha, while the mangrove forest area that has been converted into fish farming is 7,679.64 ha. Regional Regulation Number 13 of 2013 concerning Mangrove Ecosystem Management determines areas that can be used as pond businesses, namely protected areas limited to no more than 5 percent of the total area and fish cultivation areas that are in other use areas. From the data obtained, all pond businesses in mangrove forest areas do not have environmental permits required by Law Number 32 of 2009 concerning Environmental Protection and Management.

From several research results presented above, it is in line with the results of this research, namely that in general public awareness of enforcing the law to protect mangrove forests is still far from what was expected. For example, in Pohuwato Regency, which already has a Regional Regulation regarding Mangrove ecosystem management, it is still not being complied with, what's more, this research location is in the Coastal area of Pinrang Regency where there is no Regional Regulation to regulate Mangrove ecosystem management, so it is feared that in the future the destruction of mangrove forests will continue. especially managed by the community and converted into ponds which in the eyes of the community are much more promising from an economic perspective, for certain people, especially those who have capital.

CONCLUSION

Based on the results and discussion above, it can be concluded that from the three variables examined in this research, it can be concluded as follows: 1) As many as 76% of respondents do not know the law for protecting mangrove forests in the coastal areas of Pinrang Regency 2) As many as 74% of respondents agree with law enforcement

protection of mangrove forests, and 3) As many as 62% of respondents did not participate in enforcing mangrove forest laws. The conclusions of this research are also in line with and supported by the results of other research, as stated in the discussion above.

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