

## Evaluation of Mangrove Ecosystem Rehabilitation Program in Limbatihu Village District Paguyaman Pantai, Boalemo Regency

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### Abstract

This research was conducted in the village of Limbatihu which runs from January to March 2015 with the aim of this study was to determine the success of the program of rehabilitation of mangrove ecosystems in the District Limbatihu village district was Paguyaman Beach. The method used is a survey method, interviews, and collecting secondary and primary data to support research conducted by the researchers. The data analysis used descriptive analysis to look at the program of rehabilitation of mangrove ecosystems. The results of this study address that the program of rehabilitation of mangrove ecosystems in the village Limbatihu known to succeed because with the support of local communities and government local village, the successful rehabilitation of the mangrove ecosystem can be seen the value of the participation of the government and local communities to support the implementation of rehabilitation activities carried out by Japesda.

**Keywords:** *Rehabilitation Program, Mangrove Ecosystems, Rural Limbatihu*

### I. INTRODUCTION

The district was one of the districts in the province of Gorontalo. Southern part of the district was directly adjacent to the Gulf of Tomini. Administratively, this area consists of 7 (seven) sub-districts Paguyaman Beach, District Paguyaman, District Dulupi, District Tilamuta, District Botumoito, District Wonosari, District Mananggu. Subdistrict Paguyaman beach has several villages located in the coastal area of the Gulf of Tomini. One of them is the village Limbatihu. As the region is located in the coastal village of Limbatihu certainly has the potential of fisheries resources.

Mangrove forest ecosystem is a coastal plant communities that have enormous benefits, such as certain types of fish spawning areas, the breeding fish economical, provider of nutrients and nutrients as well as physical functions such as maintaining the coastal area from abrasion. In general, defects that occur in mangrove forests is basically due to ignorance of the majority community of the importance of the mangrove ecosystem resources of coastal areas.

In general rehabilitation are measures to replant part or, sometimes, the entire structure or functional characteristics of an ecosystem that has been lost, or

substitution of alternative qualities or characteristics than those that currently exist with the view that they have more social, economic or ecological value than the previous condition of damaged or degraded.

Rehabilitation of mangrove ecosystems in question here is the mangrove planting activity conducted along the coast, especially beaches of mangrove forests have been lost or damaged. Planting mangrove in coastal forests have been removed and the damaged coastal mangrove intended to reforest the beach (Kordi, 1993). Rehabilitasi mangrove forests are needed to restore the coastal environment in the village Limbatihu and restore habitat for flora and fauna that live in the mangrove forest mangrove forest ecosystem. With the implementation of the rehabilitation of the mangrove ecosystem to create an environment of mangrove forest ecosystems good and powerful function for the life of the people in the village Limbatihu in particular, and society in general Paguyaman Beach.

Mangrove ecosystem rehabilitation activities carried out in the village of the District Limbatihu Paguyaman beach with an area of 1 Ha land rehabilitated. Mangrove species planted are *Ceriops* and the amount of 10,000 trees planted with a spacing of 1x1 m. The rehabilitation activities carried out by Japesda and local government and local

communities. This rehabilitation initiative implemented in 2010 and currently mangrove already five years old.

Given the importance of Mangrove Ecosystem against organisms that live diekosistem mangrove, and lack of information about the Rehabilitation of Mangrove Ecosystem of various parties, both the Department of Fisheries and Maritime Affairs and related agencies and the local community, the need for research on the Evaluation Program for Rehabilitation of Mangrove Ecosystem in Limbatihu Village, District Paguyaman Beach, the district was.

The purpose of this research activity are: To know the community and local government participation in the program of rehabilitation of mangrove ecosystems; to determine the public perception of the success of the program; to determine the percentage of mangrove living; and to determine the public perception of surveillance rehabilitation of mangrove ecosystems.

## II. RESEARCH METHODS

Implementation of this research was conducted for two months starting from January to March 2015 is located in the village of Limbatihu, District Paguyaman Beach, the district was.

This research was conducted using a survey method. The survey is the observation to obtain information on a specific problem in a specific area or location. Survey methods that perform data processing by collecting primary data and secondary data. The survey was conducted with the aim to provide a snapshot of something that will be analyzed. In the survey, information was collected from respondents using a questionnaire. Questionnaires were given lists of questions relating to rehabilitation of mangrove ecosystems (Wiratha, 2006).

Conducting in-depth interviews (*depth interview*) with some community leaders and residents who are considered to have an understanding or experience in the research sites to obtain information on the mangrove ecosystem rehabilitation and socio-economic characteristics of the community in the village of the District Limbatihu district was Paguyaman Beach.

Pengambilan the data to get the number of mangrove were planted by Japesda using 10x10 m transect

The population of the research object is the entire community that resides or has long been settled in the village of Limbatihu. Based on recent data from the Office of the Village (2013), amounting to as many as 1947 lives and as many as 500 families (KK). The sampling method as respondents who used the population who live in the village Limbatihusalah one way to determine the number of samples is to use the formula in use Sevilla, Consuelo G. et. al. (2007).

Based on the source data retrieval, data can be grouped menjadidua types of primary data and secondary data.

Analysis of the data used is descriptive analysis. This analysis is used to describe the characteristics of the respondents, the Mangrove Ecosystem Rehabilitation in the Village Limbatihu, District Paguyaman Beach. (Hasan, 2002).

Explaining is a form of descriptive research study aimed at describing fenomena-existing phenomena, both natural phenomena and the phenomenon of the activity of the respondent. The phenomenon could be the shape, activity, characteristics, changes, an association, the similarities and differences between one phenomenon with other phenomena (Sukmadinata, 2006).

Descriptive study by Etna Widodo and Mukhtar (2000) most are not intended to test a specific hypothesis, but rather describe what a symptom, variable, or circumstances. However, by no means all descriptive study did not use a hypothesis. The use of hypotheses in a descriptive study is not intended to be tested but how trying to find something that is meant as an alternative to overcome the problem of the research through scientific procedures.

Descriptive research is not confined to the issue of collection and compilation of data, but also includes the analysis and interpretation of the meaning of the data. Therefore, descriptive research may take the form of comparative research, a study that compares the phenomena or symptoms of the phenomenon or other symptoms, or in the form of studies quantified by conducting classification research, setting standards, and relationships position one element with another element

## III. RESULT AND DISCUSSION

### A. General Overview of Research Site

Previous Village Limbatihu still part of the village Limba Bubaa, later in 1946 split off into a village called Limbatihu. Limbatihu village itself is divided

into 5 Hamlet. To be able to reach the village of Limbatihu at that time could only be passed with the passing of the sea, while on land can only be reached through the path.

Later in 1980 the access road from Saripi to Limbatihu opened with pengerasaan construction. Like the other regions as well, Limbatihu also been becoming a colony Dutch colonial residents. Some evidence such as oil plantation (now belonging HGU) and hamlets Il Bontula still known by the name derived from the word Koronisasi colonial. At approximately 1993 also in the village Limba and Lomuli opened independently by the community pond of approximately 8 ha, but did not provide maximum results that go unpunished. Limbatihu village also experienced widespread flooding that claimed the lives of 4 people, but lately sometimes even each year the rainy season will cause flooding upstream in the downstream area in Hamlet I Limba. Usually coincides with mud and rubbish that resulted in the silting which empties into the bay waters Limba.

The historical record Limbatihu village was once the largest seaweed producer in Gorontalo province. So that there is an increase in the economy at the community level that can be directly felt the impact, even became the slogan "Goodbye Poverty". But it did not last long just from years 2000-2003, because of all the seaweed cultivation in these locations attacked pests, better known by Ais-ais that until now has not been found handling. Now there are two villages which is a division of the village of Desa Bukit Limbatihu work in 2003 and 2005 tahaun Towayu village.

Limbatihu village is one of the villages located on the coast of the Gulf of Tomini with an area of 5600 Ha  $\pm$  with hilly topography of the area, which has the potential of natural resources have not been managed well. The village is still a part of the District of Paguyaman the West Coast bordering the District of Dulupi

In general, the District Paguyaman beach has pontensi in the field of fisheries and agriculture / planters. In 2002 through 2008 the villagers Limbatihu develop seaweed farming the results convincing to kesejahteraan the villagers Limbatihu especially those living on the coast, but in mid-2008 seaweed farming was damaged, so the cultivation of seaweed is not further developed up to now.

Limbatihu village has tourism potential which is located on the island of Limba, but until now there has been mendapatkat serious concern on the part of local and provincial governments to develop the travel. Additionally in the village Limbatihu also be one of the fishing. In addition to the potential for

fisheries, in the village of Limbatihu also has potential in agriculture / planters that produce commodities such as fruits, vegetables, and has the largest coconut plantation in District Paguyaman Beach. As for commodities contained in the Village Limbatihu namely mango, jackfruit, chillies, corn oil and others

#### **B. Characteristics of Respondents by Educational**

Most respondents who reside in the village Limbatihu, District Paguyaman Beach, the district was to have an education at the primary / equal as much as 25 respondents and the second most educated senior high school / equivalent as much as 16 respondents, and low levels of education exist in the undergraduate category by 3 respondents. This means that respondents' awareness is low in accepting new technologies. Various factors cause belakng background of the lack of education is due to the low standard of living and economy, as well as public awareness of the importance of education. The level of education is very mempengaruhi mindset of the people in the implementation of the ideas obtained. People in the village Limbatihu although most only up to primary education level / equivalent but wishes to obtain information to improve the motivation of thought patterns.

#### **C. Characteristics of Respondents by Age**

Age or age is a time measures the time the existence of the object or creature, both living and dead, age is one factor that berpengaruh a job and thought patterns. Respondents with increasing age is increasing anyway experience.

Age was lowest for the first respondents aged 15-20 years, and 21-25 years was 8 respondents and 19 respondents are 26-30 years old, and most respondents at the age of 31-40 out of 20.

#### **D. Characteristics Respondents According to Jobs**

Based on the results of questionnaires obtained livelihoods of the people who reside in the village Limbatihu, District Paguyaman beach mostly fishermen and farmers. The classification is based livelihood can be seen in Table 3 below.

The livelihoods of residents in the village of the District Limbatihu Paguyaman beach is a fisherman by 35 respondents, 7 respondents community as much as farmers, self-employed 5 respondents while only 3 respondents PNS so the conclusion that the people in the village Limbatihu mostly fishermen.

#### **E. Land that Rehabilitated**

Land use mangroves for aquaculture is expected to start early 1990 with a small scale as

identified in satellite imagery (Damanik, 2010). In recent years occurred clearing new shrimp farms in several locations with a small scale. When the survey was conducted, ditemukan open lands near the settlements close to the mainland, especially like in the Village District of Paguyaan Beach Limbatiu that still leaves some residual pematangnya construction. In several other places, the former land overgrown with mangrove ponds start naturally. In the village of Limbatiu own rehabilitation activities by Japesda in cooperation with local authorities and involving the local community, the area of land rehabilitated 1 Ha.

#### F. Comparison Mangrove Five Years Ago

Respondents who answered strongly agree as many as 36 respondents, and only 14 respondents answered agree, based on interviews in the field that the mangroves were planted by Japesda already bagus. Mangrove planted by japesda now aged five years, prior to the rehabilitation of mangrove ecosystems in the village Limbaitu on tide, sea water can commemorate yard people had, after the presence of ecosystem rehabilitation activities undertaken by Japesda mangrove is now helpful to society Limbatiu village, mangrove been able to deter the tide.

#### G. Public Perception Of Rehabilitation program of Mangrove Ecosystems

Respondents who answered strongly agree the rehabilitation of mangrove ecosystems as much as 40 respondents, while as many as 10 respondents answered agree. Therefore, the rehabilitation of mangrove ecosystems successful due to the support of local communities and local governments.

#### H. Public Perception Of Supervision Rehabilitation of Mangrove Ecosystem

Based on table 6 that respondents who answered strongly agree with the supervision of the rehabilitation program of mangrove ecosystems as much as 41 respondents, while respondents who agree as much as 9 respondents. Based on the results kuensiner deployed at the site of the research that people who reside in the village participated dalam Limbatiu pemngawasan mangroves have been planted by Japesda.

#### I. Public Perception On Participation In Mangrove Ecosystem Rehabilitation in the Village Limbatiu

Community participation are agreed in the activity of the Mangrove Ecosystem Rehabilitation dilaksanakan by Japesda. In this case the public to participate in the implementation of the rehabilitation program of mangrove ecosystems as much as 47 respondents from since perenjanaan to

implementation, while only 3 respondents answered agree. Results from this study that the community in the village Limbatiu largely participate in the implementation of rehabilitation activities undertaken by the mangrove ecosystem japesda.

Rehabilitation is usually a project of the Department of Forestry or the local government. But the results are not in accordance with cost and energy spent. One reason is the lack of an active part of society. People still tend to be used as objects and not as subjects in these activities. As a result, after the project is completed, feel already exhausted also a sense of responsibility.

People feel do not share (because it is not involved in the process) have their land rehabilitation. If it is a mangrove forest, the people feel there is nothing else to watch, so they can take or cut them down freely. They assume that mangrove forests are government property not owned by the community. Such was the thought of most coastal communities near forests mangropve (Savitri and Khazali, 1999). If this happens, rehabilitation efforts spent a lot of cost, time, and energy becomes less significant and unsustainable.

To avoid this, the public should be involved actively. *Button-up* approach needs to be encouraged, given that coastal communities as a spearhead in the implementation of these activities (Sudarmadji, 2001; Rahmawaty, 2006). Should mangrove ecosystem restoration is the cost of government, while the planning, implementation and evaluation of the success and sustainable utilization entrusted to the public. In the execution may also be involved alongside NGOs village officials, community leaders and community leaders / indigenous and researcher. The coastal communities as a whole needs to get the sense that the mangrove forest to be rehabilitated will be owned by the community and for the community (Rahmawaty, 2006). Thus the public feel has a share in such activities, so that their status will change, that is, not only as workers but also feel ownership.

#### J. About Public Perception Government Participation In Mangrove Ecosystem Rehabilitation in the Village Limbatiu

Memjawab respondents strongly agree as many as 49 respondents, so the local government is very supportive in the implementation of rehabilitation activities, while only one respondent agrees. That the local government is to support the implementation of the rehabilitation of mangrove ekosistem carried by Japesda.

#### **K. What percentage of the Living Mangrove**

That mangroves planted by Japesda and local government 8745 the tree of life, is now already five years old mangrove and mangrove high average of 232.85 cm, and mangrove 8:25 cm in diameter. So the rehabilitation activities undertaken by Japesda and local government work because the mortality rate is only small.

#### **L. Rehabilitation Program Benefits**

Respondents who stated mangrove rehabilitation program was very helpful as many as 47 respondents who answered strongly agreed, while 3 respondents agreed. The results of the study conducted by researchers attribute that ecosystem rehabilitation program conducted by Japesda very beneficial for the people who live on the coast itself.

Mangrove ecosystem rehabilitation program intended to restore or improve the quality of stands that have been damaged as well as maintain it. This is done in order to maintain forest functions well as a timber, guard sea water intrusion, abrasion, as well as life support is maintained (Aqsa Muhammad, 2010).

Mangrove ecosystem rehabilitation is part of the mangrove forest management system that is an integral part of the integrated coastal zone management which is placed on the frame of the Watershed (DAS) as a management unit. Implementation of rehabilitation of mangrove forests that are intended to restore damaged forest resources so as to function optimally in providing benefits to all stakeholders, ensuring the balance of the environment and water management Watershed (DAS) and the coastal areas, the continuity of the mangrove resource-based industries. These objectives can be achieved if the handling of the region carried out correctly, strong institutions and appropriate rehabilitation technology-oriented clear use (DKP, 2010).

#### **M. Public Perception Of Rehabitasi Mangrove Ecosystem**

That the people who reside in the village Limbatihu before the presence of mangrove ecosystem rehabilitation program implemented by Japesda cooperate with the local government at the same time also involves the local community, the village of Limbatihu are familiar with the term mangrove ecosystem of mangrove trees. With the rehabilitation of mangrove ecosystems society perceived that this program is very beneficial to the communities residing in the village Limbatihu because it can restore the ecosystem began to decrease, and useful also on the biota of the living environment of the mangrove ecosystem, such as foraging fish,

spawning, physical function of mangrove forests as guard the coastline from erosion in order to remain stable.

This perception is enough should be maintained and enhanced in order to better through a variety of activities that can make them believe that mangroves are needed by people who live in coastal areas that have a dependency of coastal resources to support community life itself.

#### **IV. CONCLUSION AND SUGGESTION**

Based on the results of this research and discussion, it can be concluded that in the evaluation of mangrove ecosystem rehabilitation program in the District Paguyaman Limbatihu Village Beach district was as follows:

1. Based on the results of the study strongly agreed that community participation in the activity of the Mangrove Ecosystem Rehabilitation dilaksanakan by Japesda. In this case the public to participate in the implementation of the rehabilitation program of mangrove ecosystems as much as 47 respondents from since perencanaan to implementation, while only 3 respondents answered agree. Results from this study that the community in the village Limbatihu largely participate in the implementation of rehabilitation activities undertaken by the mangrove ecosystem Japesda.
2. Based on the results of research that respondents who strongly agreed menjawab as much as 49 respondents, so the local government is very supportive in the implementation of rehabilitation activities, while only one respondent agrees. Sentempat government that strongly supports the implementation of ekosistem mangrove rehabilitation activities carried on by Japesda
3. That mangroves planted by Japesda and Pemerintah 8745 setempan living tree, is now already five years old mangrove and mangrove high average of 232.83 cm, and mangrove 8:25 cm in diameter. So the rehabilitation activities undertaken by Japesda and local government work because the mortality rate is only small.
4. Based on the results of research that respondents who answered strongly agree with the supervision of the rehabilitation program of mangrove ecosystems as much as 41 respondents, while respondents who

agree as much as 9 respondents. Based on the results of questionnaires were distributed at the study site that people who reside in the village participated dalam Limbatiu pemngawasan mangroves have been planted by Japesda.

1. The local government in order to further improve active role in providing information about the benefits of mangrove ecosystems on the local community
2. So that people in the village Limbatiu brick pa increase knowledge about the importance of ecosystems mangrove.

The advice in the implementation of mangrove ecosystem rehabilitation program is as follows:

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