Coastal development in North Gorontalo District, Gorontalo Province

Alfi Sahri R. Baruadi[1]

Faculty of Fisheries and Marine Affairs, Department of Aquatic Resources Management

Gorontalo State University,

Jalan Jenderal Sudirman no 6 Gorontalo City, 96128

Abstract

This research will be implemented in North Gorontalo District, Gorontalo Province. Time research is planned to be done onMay 2020 until July 2020. The research objectives are to Determine the priority development of coastal communities and formulate regional policy strategies needed to support community development areas in coastal areas in North Gorontalo District. This research conducted a quantitative research model that is casuistic and built on several theories measurements issued. Several institutions are concerned with coastal areas' planning development; samples taken in 3 districts from the population of the sub-district homogeneous, By purposive Samplingand data analysis using AHP analysis.

Keywords: Coastal Area, Coastal Community, regional development, AHP, North Gorontalo

INTRODUCTION

1.1 Background

Indonesia is the largest archipelago country in the world. The territorial area of 7.1 million km² is dominated by the sea, approximately 5.4 million km². Its territory is 33 provinces, 440 districts/cities, located along the sea coast as common property, having high biodiversity. Geographically, ecosystems' structure and typology are dominated by oceans, the fourth-longest coastline in the world after the United States, Canada, and the Russian Federation. Coastal and marine resources are natural resources that can be used effectively for economic development and the prosperity of the nation. The change in the orientation of the development of the Indonesian nation from "Land-Based Orientation" to "Ocean Based Orientation" is a necessity as a Prime mover for national economic growth (Ridhlo, 2016)[1].

It is hoped that the development of coastal areas and marine resources in the North Gorontalo District can trigger economic growth. North Gorontalo Regency, which has the most extended coastal area, has a strategic position to generate economic benefits in foreign exchange from exports because the coastal area of the North Gorontalo Regency is the leading trade route area that connects several cities in Central Sulawesi and North Sulawesi. However, the development of coastal areas has also had a negative effect on the waters, especially the coastal

[1]Ridhlo, MA. 2016. Development of Coastal Areas With an Agropolitan Concept. Download: https://www.researchgate.net/publication/320705708. March 25, 2020

areas and the sea itself. Such a contribution will continue, especially when various community activities are not in accordance with the environment's ability and carrying capacities, such as capture fisheries activities, aquaculture, and the tourism industry whose various activities are solely for economic gain. Various utilization efforts must be carried out in a planned and appropriate manner to provide benefits for welfare, exceptionally accommodating coastal communities' welfare. The economic development of coastal communities in sub-districts located in the coastal area of North Gorontalo should as a social process. Namely, the first changes that occur continuously, secondly, efforts to increase the community's economic income with the implication of increasing per capita income that will continue in the long term. Third, improve and restructure the institutional system in various fields (economic, social, legal, political, cultural, etc.), especially in terms of organizational and regulatory improvements. Thus, economic development in coastal areas looks like a mechanism in which the interrelationships and mutual influence between the factors that cause economic development.

The economic growth of North Gorontalo District shows that continues to increase by development is not linear with the increase in the income of coastal communities. The various economic commodities of marine products are very potential, such as various types of fish that can be jerky, shredded, crackers, meatballs, and fish. Salted fish, anchovies, and Ebi shrimp, fish, seaweed farming, and other commodities have not contributed significantly to coastal communities' economic value with marine resources.

According to Nurlaili (2015)[2]This condition does not reflect high economic growth but is not accompanied by high social income mismatches. Increased investment, but unemployment did not decrease. The increasing development budget but poverty and underdevelopment is a fact. Coastal communities generally depend on the use of marine and coastal resources. In fact, by only depending on the use of marine resources, the community will also depend on the season. There are several marine life that also depends on the season.

Next Witarsa (2014)[3]Coastal communities generally work as fishermen. Fishers can be divided into two, namely small fishermen and large fishermen. The first is small fishermen who are characterized by using simple technology in the fishing gear and fleets used. Moreover, the labor used usually comes from the fisherman's own family. The second is large fishers characterized as having used modern fishing gear and fleets, while for the labor force that is generally used, they are hiring laborers or wage labor. Small fishers can only take advantage of existing resources in coastal areas where their catch tends to decrease every day and must also compete with fishers on a large scale.

Apart from that, seasonal and erratic fishing businesses also cause poor communities in coastal areas to be problematic from poverty and debt bondage. The poverty pressures that exist in the lives of coastal communities, more precisely traditional fishers, are caused by various factors, not only regarding the fishing season, limited equipment resources, or fish trade, which only deals with coastal areas but also due to the impact of fishery modernization encourages overexploitation. When this is done continuously, small fishermen will feel the impact it will be challenging to get a catch, and the level of income will decrease so that the number of poor people in coastal areas has increased from year to year.

[2] Nurlaili R (2015). Coastal Communities Are Not Prosperous. Whose fault? Blogging Kompasiana. Jakarta. Download:https://www.kompasiana.com/rohminurlaili/5a01155fa4b06854b63ffee6/masyarakat-pesisir-tidak-sejahtera-salah-siapa. March 25, 2020)

[3] Witarsa (2014) Coastal Community Economic Development Model Based on Fishery Resources Co-Management in Pontianak Regency. Tanjung Pura University. Pontianak

1.2 Purpose and objectives

The general objective of the preparation of this document is to formulate a community development plan in coastal areas based on agribusiness and its development strategy in North Gorontalo District, while specifically, the objective is

1. Determine development priorities for coastal communities
2. Formulating regional policy strategies needed to support community development areas in coastal areas in North Gorontalo District

2.1. Coastal Areas and Oceans

The Coastal system is a place where the community lives and is full of human activities that affect marine habitats' ecosystem services; a marine fishery system is a place where humans interact and impact fishery activities. A sizeable continental shelf or coastal ecosystem comprises coastal and oceanic systems. Which provides several essential ecosystem services; there is at least 25% of primary productivity, 90-95% of the world's marine catch, 80% of carbonate production, 50% of world denitrification, 90% of world sediment mineralization (Alder 2004).[4]

There are various coastal systems in the continental shelf area, including freshwater and brackish water wetlands, mangrove forests, estuaries, swamps, lakes and salt ponds, rocky and muddy intertidal areas, beaches, and dunes, coral reef systems, seagrass meadows. , forests, inlets, bays, and nearshore waters on the continental shelf. Some of these coastal systems are highly productive (Alder, 2004). Meanwhile, according to the IUCN (2007)[5]Coastal ecosystems consist of mangroves, estuaries, coral reefs, dunes, beaches, and seagrass beds, complex and interdependent. They together are believed to produce ecosystem goods, which are used to meet food, construction, fuel, and income needs. And other uses. More importantly, coastal ecosystems serve the welfare of human life. In general, coastal areas are defined as transitional areas between terrestrial ecosystems and marine ecosystems that meet each other in a delicate balance (Beatly et al. 2002 in BAPPENAS 2004)[6], whereas in Law No.27 of 2007, concerning the management of coastal areas and small islands. The definition of management of coastal areas and small islands is a process of planning, exploiting, controlling, and controlling coastal resources and small islands between sectors, between government and local governments, between land and sea ecosystems, and between science and management for improving community welfare (Article 1, paragraph 1). The definition of a coastal area is an intermediate are terrestrial and marine ecosystems affected by changes on land and at sea (Article 1, paragraph 2). The Coastal Zone is unique, has high economic value, but its sustainability is threatened (Cicin-Sain and Knecht 1998)[7]. This is according to Adrianto (2004)[8]is a consequence due to the sharp increase in the intensity of economic activity in coastal areas. This means that we have to manage the coastal areas in such a way that the intensity of these activities is still below the capacity for the sustainability of natural ecosystems

[4] Alder J, T Agardy. 2004. Coastal Systems. Ecosystems and Human Well-being: Current State and Trends, Chapter 19. Colombo. Access, dated February 22, 2009.
[5][IUCN] International Union for Conservation of Nature. 2007. Coastal Ecosystem. Issue 4 April 2007. The World Conservation Union. Colombo
[6][BAPPENAS] National Development Planning Agency. 2004. Integrated Coastal Management in Indonesia. Jakarta
[7]Cicin-Sain B, RW Knecht. 1998. Integrated Coastal and Ocean Management. Washington. The USA. Island Press
[8], Adrianto L. 2004. Fisheries and Coastal Areas Management Policy. Collection of Working Papers of 2004. Bogor. PKSPL-IPB

2.2. Integration of Fisheries in Integrated Coastal Management

Coastal zone management, Coastal Area Management, and Integrated coastal management have been widely used as a more comprehensive approach to coastal management, the aim of which is to overcome the difficulties and limitations of implementing a sectoral approach and improving a sectoral approach. Especially in relation to aquaculture activities. Coastal area management requires multi-sector regulation and planning, so some form of coordinating body or authority to assess and balance ICM must also imply a mechanism for managing trans-boundary issues, for example, between land, coast, and oceans (GESAMP) 2001)[9]. Initiatives within CZM and ICM have different approaches depending on specific objectives, overall approach, geographic scope and sector, where to start, implementing agencies, and the influence of decision making and resource use in coastal areas. Management initiatives that will be undertaken may arise from academics, politicians, project funding, or direct responses to environmental problems or management development as needed (GESAMP 2001). The objectives usually include a reference to one or more of the following:

1. The availability of resources is optimal for competition and the function of activities.
2. Conflict resolution and minimization.

In a number of cases, ICM is also more directed at social and political goals, such as quality of life, more equitable distribution of economic benefits, social and intergenerational policies, and poverty alleviation. Cicin-Sains et al. 1995 compare several coastal management guidelines developed by five different international entities (IPCC 1994; OECD 1991; Pernetta and Elder 1993; UNEP 1995[10]; World Bank, 1993). Based on these comparisons, an "agreement adapted to the ICM guidelines was developed" (Table 2). In many aquaculture activities, it is a classic example of why ICM is needed; this is due to several things:

1. Coastal aquaculture is usually located at the boundary between land and sea.
2. Resource ownership or rights (land, water, and products) and administrative relationships, usually complex or ambiguous, especially in aquaculture locations.
3. Aquaculture can be seriously affected by water quality and habitat degradation caused by other activities.
4. Aquaculture itself may affect environmental quality and other uses through the conversion of natural habitats, through contaminating receiving waters with nutrients, organic substances, and potentially toxic chemicals (full of risks), and through the spread of disease.
5. Aquaculture, with inappropriate planning and area suitability, may result in negative feedback and pollute the cultivation site itself.

Very few examples of successful integration of aquaculture into ICM as a whole, and very few ICM initiatives are appropriately implemented, coastal aquaculture activities and their potential have been assessed, using coherent and consistent assessment criteria, which are cross-approved by agencies, who may have an interest. This comprehensive assessment in implementation takes much time and is a dilemma in most developing countries because the development of aquaculture has been carried out very quickly. In the case of aquaculture in Ecuador, due to

[9][GESAMP] Group of Experts on the Scientific Aspects of Marine Environmental Protection. 2001. Planning and Management for Sustainable coastal aquaculture development. (Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection) Rep. GESAMP, (68): 90p.

[10][UNEP] United National Environment Program. 1993. Training Manual on Assessment of Quantity and Type of Land-Based Pollution Discharges Into the Marine and Coastal Environment. RUC/EAS Technical Report Series No. 1.

population pressure, the development of shrimp culture has a significant negative impact on estuarine resources during the period when a long-term ICM project is underway; the same thing happened in Sri Lanka, where shrimp farming has recently developed uncontrollably. As a consequence, the receiving environment becomes less useful and self-polluting, although awareness of the importance of ICM is increasing, and various ICM initiatives in this area have been carried out.

The strengths of the ICM in its implementation are described as follows.

1. The exact values and concerns of all stakeholders are taken into account.
2. Related agencies are encouraged to communicate with each other, coordinate, and cooperate.
3. A broad range of essential information and opinions is readily available to decision-makers.
4. Less technical guidance compared to sectoral approaches.
5. More "bottom-up" than "top-down," the implementation is correct).
6. Potential development activities are assessed objectively, using various criteria. A wide range, potential development activities are assessed objectively, using various criteria, which can also be used for the development of other potential resources, not only for the same sector.
7. Conflict resolution and balancing interests as specific goals.
8. Must produce policies and legislation that are consistent between different levels and sectors of government.

Apart from the strengths of ICM, there are also several weaknesses that have been evaluated as follows.

1. The possibility of using existing institutional skills and expertise is inadequate; the newly formed agency needs to learn a lot; it is possible that past mistakes can be repeated or solve problems in the old way.
2. Due to institutional changes, there may be risks in the institution (confusion due to greater authority and responsibility, and lack of institutional capacity).
3. It takes much time, effort, and money.
4. The likelihood of producing an excess of judgment and a lack of understanding of how research data should be used (e.g., to improve sector approaches).
5. The likelihood (at least in the early stages) of increased conflict due to different objectives and ways of assessing and views of resource use in coastal areas.

METODE RESEARCH

Research Approach

This research was conducted using a quantitative descriptive research model that is casuistic and is built on the theories of several measurements issued
by several institutions that are concerned with the planning and development of coastal areas

Place and time of research

ResearchThis will be implemented in North Gorontalo District, Gorontalo Province. Time research is planned to be carried out from May 2020 to July 2020.

Sampling Method

Populasi in this study is coastal areas that are scattered throughout the North Gorontalo District. The sample in this study was selected from a portion of the population that could represent the population. The number of samples taken was three districts from a homogeneous sub-district population (Singarimbun and Efendi, 1989)[11]. Sampling was carried out. Purposive Sampling, namely the area selected based on its ability to answer and provide information about the problem and research objectives. The area taken as the sample is because the researcher thinks that the coastal area has the information needed for his research. According to Arikunto (2006)[12], purposive Sampling is done by taking the subject not based on strata, random, or area but based on the existence of specific objectives. This technique is usually carried out for several considerations, for example, reasons for a limited time, workforce, and funds so that it cannot take large and distant samples.

Method of collecting data

The data needed in this study consists of primary data and secondary data. Primary data comes from information that supports the achievement of research objectives. Primary data can come from field information, community information, and documents relevant to the achievement of research objectives. Secondary data consists of data related to the management and utilization of coastal areas, both traditional and modern, and various other relevant documents.

Primary data were collected through observations and field surveys, interviews with key informants, namely people who were recorded as having lived in coastal areas for a long time. The in-depth interview process is carried out using an interview guide, which contains the main things that must be asked of the informant. Field notes were prepared based on interview transcripts or observational notes.

The materials used in this study are questionnaire sheets as interview material.

Research focus

Develop a coastal area development model using an integrated approach with indicatorsIndicators:

1. Governance
2. Empowerment program
3. Increase in the regional economy
4. Funding
5. Management
6. Social Program
7. Economic program

[11]Singarimbun, MS Efendi. 1989. Research Methods. LP3ES. Jakarta

[12], *Arikunto. 2006. Research Procedure A Practice Approach. Jakarta: PT. Rineka Cipta*

8. Increase in investment Strengthening local businesses

The research focus built on this research is as follows:

1. Mapping the problems of planning and developing coastal areas
2. Determine the carrying capacity of coastal areas, which are the main focus of research

Variable Definition and Measurement

Measurement of research variables or variables is carried out in accordance with the research objectives to be achieved. The variables and data sources used in the study are presented in Table 1.

Data analysis

1. Mapping the problems of planning and developing coastal areas**.**

Analysis of problems or problems in the development of coastal areas is an analysis of the mapping of biophysical and socio-economic problems that have the potential to hinder the planning and development of coastal areas in the North Gorontalo District. This analysis will be carried out descriptively. Analysis of the biophysical and socio-economic characteristics will be critical to determine the intervention for coastal area development and, at the same time, evaluate the coastal area development policies that have been carried out by local governments.

2. Coastal Area Supporting Capacity Analysis

For the purposes of this research, the carrying capacity measures that play a role in the development of coastal areas are water carrying capacity and food carrying capacity. The calculation between the availability and demand for water is carried out by referring to the Permen LH No. 17 of 2009 concerning guidelines for Determining Environmental Supporting Capacity in Regional Spatial Planning, as follows:

Analysis of determining the priority of coastal area development using an integrated approach

This analysis will be carried out using the process hierarchy analysis (AHP). This analysis is still directly related to the analysis of the factors that influence the planning and development of coastal areas. The results of the analysis of the influencing factors will be used by experts who will be interviewed to determine the right strategy in developing coastal areas

The following shows the steps for using AHP tools in developing a coastal area development model

1. **Defines the problem and determines the desired solution.**
   In this stage, we try to determine the problem we will solve in a clear, detailed, and easy to understand manner. From the existing problem, we try to determine a possible solution to the problem. The solution to the problem may be more than one. We will develop this solution further in the next stage.
2. **Create a hierarchical structure that begins with the primary objective**
   After compiling the main objectives as the top level, a hierarchical level will be arranged under it, namely the suitable criteria for considering or assessing the alternatives we provide and determining these alternatives. Each criterion has a different intensity.
3. **Combining opinions from multiple questionnaires with Geomean**.
   If the questionnaire is filled in by experts, then we will unify the opinions of the experts by using the geometric or geomantic mean equation where this calculation is

to provide a better average approach to the data obtained from the respondents' assessments in the questionnaire. The geometric mean is the average obtained by multiplying all the data in a sample group, then increasing the number of data samples. The geometric mean [illegible] ws.

$$GM = \sqrt[n]{(X1)(X2) \dots (Xn)}$$

Where
GM = Geometric Mean
X1 = 1st expert
X2 = 2nd expert
Xn = nth expert

4. Hierarchical structuring
   The arrangement of the hierarchical structure was carried out by starting the research objective, namely developing a coastal area development strategy consisting of
5. Create a matrix
   Creating a matrix for each aspect of the coastal area development model, after that, create a combined opinion matrix, which is a new matrix, whose elements are derived from the geometric mean of the elements of the coastal area development aspect matrix whose consistency ratio meets the requirements. The compilation of this combined matrix is to form a matrix that represents the matrix aspects of the strategy for implementing the coastal area development model.
6. AHP data processing
   Data processing uses mathematics in a hierarchical analysis process with the help of the Expert Choice program. The use of this software is used to determine the appropriate coastal area development criteria. The data from the research assessment results are processed to determine the priority vectors, as well as the consistency of the index and the consistency of the ratio of the individual opinion matrix. If the individual opinion matrix is inconsistent, then a revision of opinion is made. The consistent individual opinion matrix is used in the compilation of the joint opinion matrix, after which the data processing is carried out again until the system priority is obtained for each criterion of the coastal area development model. The pairwise comparison matrix is filled with values that can describe the relative importance of an element compared to other elements for a particular trait or criteria. The intensity of comparison to measure the level of importance (relative importance) is arranged on a scale of 1-9, where scale 1 shows the same level of importance (equal importance), and scale 9 shows that the first criterion has a very extreme level of importance (extremely more importance) than the second criterion in table 1.

Table 1. Comparison Scale in the Assessment of Criteria in the Pairwise Comparison Technique

Intensity Importance	Definition
1	*Equal*: The two elements being compared are equally important
3	*Moderate*: One element is slightly more important than the other
5	*Strong:* One element is essential compared to other elements
7	*Very strong:* One element is clearly more important than the other
9	*Extreme:* One absolute element is more important than the other elements
2,4,6,8	Intermediate values between two adjacent considerations
Reverse (1/2, 1/3, ¼, Etc.)	If for the element I get one number when compared to element j, then j has the opposite value compared to (i)

RESULTS AND DISCUSSION

1.1. The problem of coastal areas in Gorontalo District

1) Mangrove Forest Damage

ForestMangroves are tropical and subtropical coastal vegetation communities that are dominated by several types of mangrove trees that can grow and develop in muddy coastal tidal areas (Nontji, 1993). Mangroves grow on sheltered beaches or on flat beaches, usually where there are no river estuaries, usually growing widely. Mangroves do not grow on steep, wavy beaches with strong tidal currents, because this does not allow the deposition of silt from the sand, as the substrate needed for their growth (Nontji, 1993).

Mangroves are tree plants or plant communities that live between the sea and land, which are affected by tides. Mangrove habitats are often found at the meeting place between river estuaries and seawater, which then becomes a protector of the land and gigantic sea waves. The river flows freshwater for mangroves, and at high tide, the mangrove trees are surrounded by salt or brackish water (Murdiyanto, 2003)

According to Saparinto (2007), mangrove forests can physically function to keep the coastline stable, protect beaches and river cliffs from abrasion, reduce and resist tsunami storms, as a buffer area for intrusion or seepage of seawater into the land. Chemical functions as a cycle process that produces oxygen and absorbs carbon dioxide, as the processing of waste materials from industrial pollution and ships in the oceans. Biology function is a producer of decomposers, spawning ground or nursery ground for shrimp, crab, shellfish, as an area, nesting and breeding for birds and other animals, as a source of germplasm, as a natural habitat for various types of terrestrial and marine biota. Socio-economic functions, producing fuel, industrial raw materials, medicines, household furniture,

According to Baderan (2017), Mangrove damage in 2010 reached an increase of 41% from 21% in 2000, so that the total damage to mangroves in 2010 has reached 62%, where the mangrove area that has been damaged has reached 687.3 hectares, with damaged conditions. What happened was that it was damaged entirely without any mangrove vegetation, which was 551.5 hectares or 51% of the total mangrove forest area, while for those rare-damaged conditions, it was 135.8 hectares or 12% of the total mangrove forest area. Meanwhile, mangrove areas with good-very dense criteria were 341.8 hectares or 31% of the total area of mangrove forests in 2010, and mangrove conditions with good-moderate criteria were 64.6 hectares or 6% of the total mangrove area.

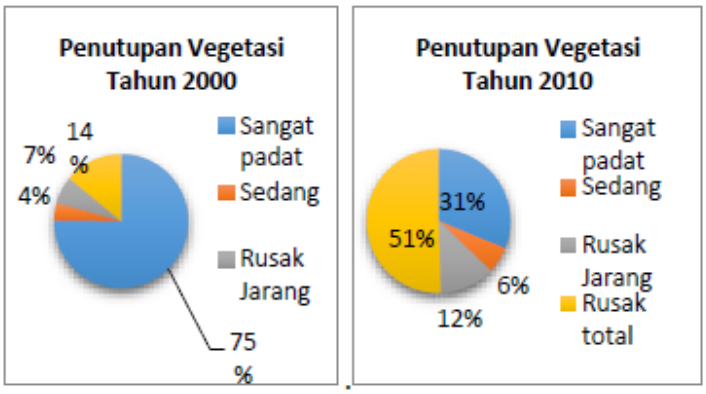

Figure 1. Changes in Mangrove Forest Cover in Kwandang Bay (Baderan, 2017)

In line with the findings above, the results of image analysis between 1996-2018 decreased mangrove forests by 30.65% in all areas of the North Gorontalo Regency. Primary mangrove forest cover in the forest area with the most extensive conversion of function, namely an area of 1275 ha or a decrease of 46.06%. The largest decrease in mangrove forest cover occurred in the period 1996-2000.

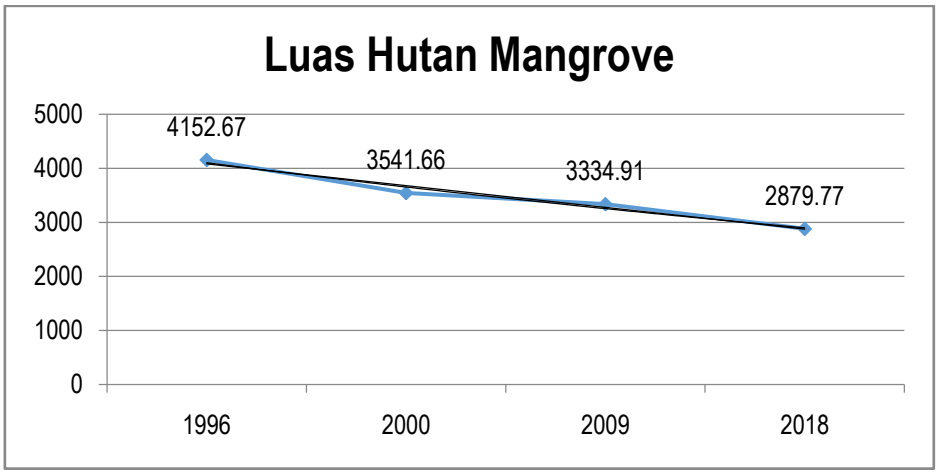

Figure 2. Changes in Mangrove Forest Cover in Kab. North Gorontalo

According to Triyanti *et al*. (2017), damage to mangrove forests in North Gorontalo has an impact on the loss of mangrove ecological value of IDR 18,205,000,890 / ha/year, the economic value of mangroves worth IDR 40,716,063 / ha/year, and socio-cultural value of IDR 20,341,259 / ha/year. North Gorontalo is damaged, so the total loss that must be borne is Rp. 18,266,058,212 / ha/year

2) Community Capacity in Coastal Areas

North Gorontalo District has enormous marine natural resource potential; this is evident from the length of the coastline of the North Gorontalo Regency, which reaches 198 km and is the longest coastline in Gorontalo Province. Another exciting potential to be analyzed is that the coast of Gorontalo Utara Regency is directly facing the Pacific Ocean, where there are East Asian countries, such as Japan, South Korea, and China, which master advanced technology as well as enormous market potentials. Based on data

from the North Gorontalo Fisheries and Marine Office, the coastal area of North Gorontalo reaches 75% of the total area of North Gorontalo

Based on the results of interviews with respondents conducted with coastal communities, that around 52% of people living in coastal areas work as fishermen, and some 32% are farmers, traders 4%, and ASN 4%. The typology of coastal communities tends to be heterogeneous. The background of the community, which is very different from the profession, brings the strength that all elements will help each other to develop the coastal area based on their background skills. A heterogeneous society of professions will form interdependence on the economy and will not stand alone. A heterogeneous society tends to create a more modern economic system than a homogeneous society. It is just that heterogeneous areas tend to form social clusters, which, if not appropriately managed, will lead to identity conflicts. The following shows the various backgrounds of coastal communities based on livelihoods in Figure 3.

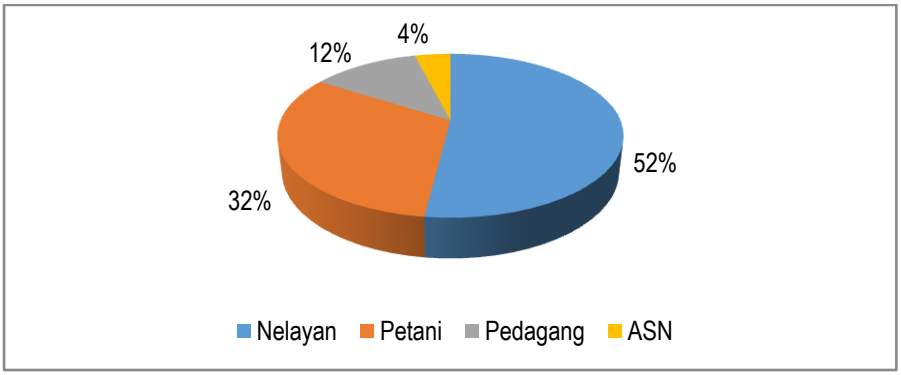

Figure 3. Percentage of Respondents in the Coastal Community of North Gorontalo

Furthermore, this study also describes the level of education of the people living in the coastal area of Gorontalo Regency. Based on the results of interviews with respondents with the educational background of coastal communities in the North Gorontalo District, generally, they are primary school graduates, as shown in Figure 4.

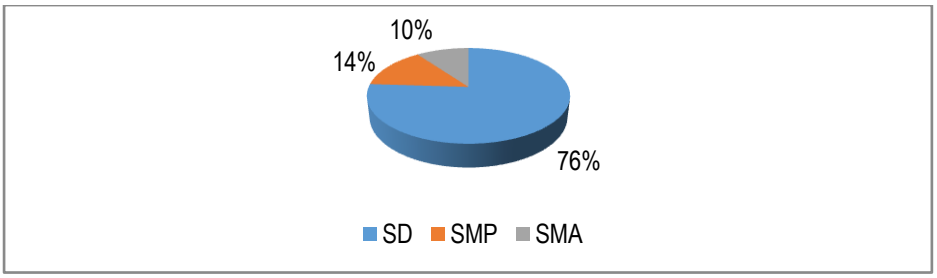

Figure 4. Percentage of the educational background of respondents in coastal communities

The description of the level of education in the coastal area of the North Gorontalo Regency shows that coastal communities still need access to education for junior high school and senior high school. The level of education dramatically influences the adaptation of coastal communities to technology and capital. According to Arseto (2019), who conducted research on the effect of education and technology on income with capital as a moderating variable in Tebing Tinggi City, found that the level of education and

technology partially affects the income of MSMEs in Tebing Tinggi City. Capital is able to moderate the influence of the level of education on the income of MSMEs in Tebing Tinggi City. Capital cannot moderate the influence of technology on MSME income in Tebing Tinggi City.

A low level of education will result in a low human resource capacity so that the opportunity to improve welfare will be smaller. Low education in rural areas, including coastal areas, is synonymous with poverty. So it is not surprising that the poverty rate in North Gorontalo District is still relatively high compared to the average poverty level at the Gorontalo Province level and at the national level. Even so, there is a trend of decreasing the poverty rate in the North Gorontalo District in Figure 5.

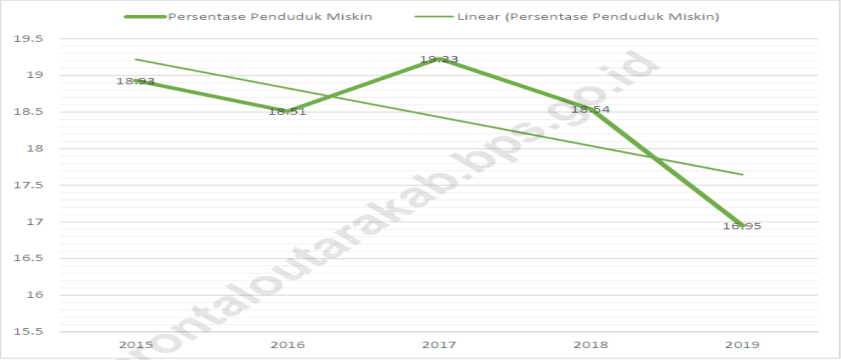

Figure 5. Poverty levels in North Gorontalo District

With the assumption that the poverty rate in North Gorontalo reaches 16.55%, the number of low-income families in the North Gorontalo Regency will reach 246 households. Besides the low education factor, several causes of poverty in coastal areas which cause the capacity of coastal communities to below are related to fishery production institutions in coastal areas, namely being unable to catch the types of fish that emerge sustainably. Due to the limited types of fishing gear they have, small fishers are unable to adapt themselves to be able to catch fish according to the current fishing season. Throughout the year, fishing gear is still used, although the types of fish that appear change according to the season. This condition makes the catch of small fishers become small. Fishers should always adjust their fishing gear to the characteristics of the emerging fish, as has been done by fishermen in several areas in Java. The second dominant factor, the cause of poverty in small fisherman households, is a program that does not take sides with small fishers. Various fishery development programs have so far been deemed not beneficial to small fishers and encourage over-exploitation of existing fishery resources. That the fisheries modernization program is felt to be more profitable for big fishers and less attention to / detrimental to small fishers, modernization of fishing equipment can only be enjoyed by large fishermen who have substantial capital and access to power. As it is known, small fishers find it very difficult to access adequate funding, mainly because the high loan interest rates given to fishers make it increasingly difficult for them to get out of poverty. The credit allocation function for the maritime and fisheries sector is relatively low compared to other countries. Indonesia is one of the countries with the highest loan interest rates, which is 12.6 percent. This figure is high compared to other Asian countries. Meanwhile, nationally, the total national banking credit allocation, which

was given to the marine and fisheries sector, was only about 0.29 percent of the total loan value of Rp. 2.6 trillion. As a result, Indonesian fishers find it difficult to compete with other countries. To overcome this, the government, through the banking operator, namely Bank Indonesia (BI), must be able to reduce loan interest rates for fishers and small-scale cultivators. Because not a few of them borrow money from moneylenders with an interest rate of five to 10 percent per month, which is considered high Meanwhile, nationally, the total national banking credit allocation, which was given to the marine and fisheries sector, was only about 0.29 percent of the total loan value of Rp. 2.6 trillion. As a result, Indonesian fishers find it difficult to compete with other countries. To overcome this, the government, through the banking operator, namely Bank Indonesia (BI), must be able to reduce loan interest rates for fishers and small scale cultivators. Because not a few of them borrow money from moneylenders with an interest rate of five to 10 percent per month, which is considered high Meanwhile, nationally, the total national banking credit allocation, which was given to the marine and fisheries sector, was only about 0.29 percent of the total loan value of Rp. 2.6 trillion. As a result, Indonesian fishers find it difficult to compete with other countries. To overcome this, the government, through the banking operator, namely Bank Indonesia (BI), must be able to reduce loan interest rates for fishers and small scale cultivators. Because not a few of them borrow money from moneylenders with an interest rate of five to 10 percent per month, which is considered high To overcome this, the government through the banking operator, namely Bank Indonesia (BI), must be able to reduce loan interest rates for fishers and small scale cultivators. Because not a few of them borrow money from moneylenders with an interest rate of five to 10 percent per month, which is considered high To overcome this, the government through the banking operator, namely Bank Indonesia (BI), must be able to reduce loan interest rates for fishers and small scale cultivators. Because not a few of them borrow money from moneylenders with an interest rate of five to 10 percent per month, which is considered high

Government policies that pursue increased productivity and ignore the interests of small fishers. Furthermore, this makes the household life of small fishers increasingly marginalized and lives in poverty. This is in line with the results of the research by Tindjabate (2001) in Poso District, Central Sulawesi, which shows that the process of impoverishment of traditional fishers occurs in the context of intense structural pressures stemming from Indonesian government policies in implementing the marine fisheries subsector development. The third dominant factor that causes poverty in fisherman households is an afterlife-oriented view of life only. The life perspective factor that exists in fishermen's household is a view that is more oriented to the life in the hereafter, while the daily life in the world let it run as it is, no need to think too hard but just relax, enjoy what is there. Because according to them, rich or poor, it is something deterministic about God's distribution authority. The fourth factor is the selling price of the catch, which is too cheap compared to the production cost. The quantity of production, mostly small and medium enterprises, is too low compared to large-scale fisheries entrepreneurs. There are also many reasons for low catch quantity, including the traditional methods that are still applied by most fishermen and cultivators. The activities starting from fishing, cultivation, processing, and trading activities, it is applied conventionally. For example, nationally, out of 625,633 fishing vessels, at least only 3. 811 units, which are classified as modern. The modern indicator itself is characterized by its capacity, which is above 30 gross tons (GT). The amount is around 0.6 percent, tiny.

Based on 2019 BPS data, there are 1,081 motorboats, 1,657 outboard motorboats, and 37 motorboats. The number of aquaculture households in the North Gorontalo District reaches 1,488 fishers. These fishermen households are spread across d 78 villages (156 villages in North Gorontalo District), which stretch from the western area of Tolinggula District to the east of Atinggola District.

Table 2. Number of boat ownership in each sub-district in North Gorontalo

sub-district	Boat Without Motor	Outboard Motor Boat	Motor Ships
Atinggola	35	138	-
Gentuma Raya	43	147	20
Tomilito	140	151	-
Kwandang	169	97	2
Ponelo Islands	109	260	-
Orchid	85	254	7
Monano	113	176	5
East Sumalata	121	153	2
Sumalata	120	173	1
Tolinggula	73	74	-
Biau	73	34	-
North Gorontalo	1,081	1,657	37
2015 year	649	1,678	55

Based on the data above, there is an increase in the number of boats without motorbikes in the North Gorontalo Regency, but the decrease occurred in the number of motorized boats and motorboats. Motorboats and motorboats have a larger fishing capacity than boats without a motor. Based on data from the Kwandang fish auction, Capture Fisheries Production in 2018 reached 25,013.29 tonnes; skipjack tuna is the type of fish with the most production, with production reaching 2,685.44 tonnes.

Even though the potential for capture fisheries in this area reaches 40,000 tons per year, The lack of supporting infrastructure owned by small fishermen and low access to capital causes the potential for capture fisheries to be not optimal. Based on the calculation of the Gorontalo District Government, the number of motorboats that must be owned by fishermen in order to achieve the catch. The maximum is 78 units of these fishing vessels with a capacity of 30 gross tons (GT).

The presence of poor communities and the less than optimal use of capture fisheries and aquaculture has made development in coastal areas not optimal; this can be seen from the data on the number of fishery processing industries in the North Gorontalo District which have not yet developed. Overall, the number of workers who work in the processing industry sector is only around 13%. Meanwhile, the most extensive labor absorption is in the agricultural sector. This indicates that the development of the Gorontalo District sector has not yet reached the downstream area, which means low streaming of agricultural and fishery products is not optimal as depicted in Figure 6:

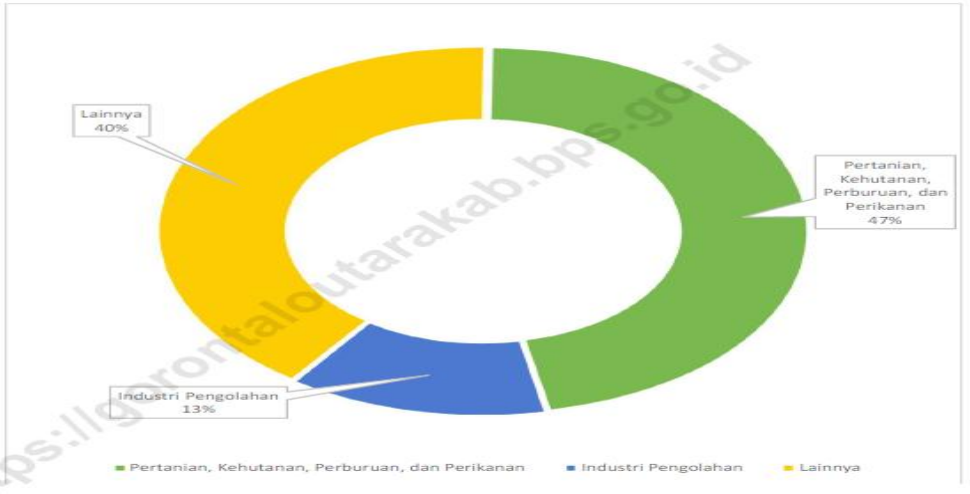

Figure 6. Number of workers who work in the agricultural, industrial and other sectors

The underdevelopment of low streaming in the North Gorontalo Regency can be seen from the contribution of the agriculture, fisheries, livestock, and forestry sectors to the GRDP of 52.16%.

CONCLUSION

Based on the results and discussion, the following can be concluded:

1. People living in coastal areas have limited access to business capital.
2. People who live in coastal areas have a relatively low level of education.
3. Fishery products in coastal areas do not yet have a standard.
4. Fishing technology has not been able to maximize all fisheries potential in marine areas.
5. The government must immediately build infrastructure that supports low streaming in coastal areas.
6. Encouraging increased capacity or volume of capture fisheries using technology that can be adapted by fishermen

REFERENCES

Belau, YH. 2015. Government Policy in Community Empowerment in Sugapa District, Intan Jaya District. Department of Governmental Science, Faculty of Social Sciences and Government Sciences, Sam Ratulangi University. Manado

Baderan, D., 2017. Spatial Distribution and Extent of Damage to Mangrove Forest in Kwandang Coastal Areas, North Gorontalo District, Gorontalo Province. GeoEco Journal Vol. 3, No. 1 (January 2017) p. 1-8

Dahuri, R., 2001. Management of Coastal and Ocean Spaces Along with the Implementation of Regional Autonomy. This paper was presented at the Workshop and Training on Spatial Planning for Provinces, Districts and Cities in the Context of Regional Autonomy, in collaboration with Bappeda Province and LPPM Unisba, Bandung 2-3 May 2001

Humune JP, Rumapea P, Palar N. (2010). Human Resource Development in Coastal Communities in Sangihe Islands Regency. Source:https://media.neliti.com/media/publications/93954-ID-pengembangan-sumber-daya-manusia-pada-ma.pdf

Katili., USA. 2009. Structure of Mangrove Vegetation in Kwandang District, North Gorontalo Regency. Journal of Pelangi Ilmu, ISSN: 1979-5262. Volume 2.

Mahmud M, Fitriyane L, Hendri I, Masayuki S. 2014. Assessment of Mercury Pollution on the Environment in the North Gorontalo District. PSL Gorontalo State University

Masyuri (2014). Non-Formal Financing of Capture Fisheries: The Case of Muncar and Bitung.Journal of Economics and Development Vol 22, No. 2, 2014

Riesti T, Maulana F, Radityo P, (2017). Total Value Of Mangrove Ecosystem In North Gorontalo Regency, Gorontalo Province. Community Socio-Economic Research E-Journal:http://ejournal.forda-mof.org/ejournal-litbang/index.php/JPSEK/article/view/1288

Ngabito, M., 2013. Suitability Analysis and Supporting Capacity of Saronde Island Ecotourism in the North Gorontalo District. Hasanuddin University Postgraduate Program. Makassar.

Hiola R, Herlina J, Koniyo R. 2014. The Welfare Model of Coastal Fishermen Community in North Gorontalo District. Superior Research Report of the Gorontalo State University of Higher Education

Septifitri, Daniel RM, Sugeng HW, Sulaeman M. 2010.Capture Fisheries Development Opportunity in South Sumatra Province. Journal of Fisheries Science Vol. 6, No. 1, 2010, 8-21

Tain, A., 2010. Causes of Fishermen Household Poverty in Fishing Areas of East Java. Journal of Humanity.Volume 7, Number 1, September 2011: 01 - 10

Utina R, Abubakar SK. 2013.Inventory of Vertebrate Bird Species in Coastal Areas that Accumulate Mercury from Community Mining Waste in the North Gorontalo District. Report on Fundamental Research Results of Gorontalo State University

Watterberg, A., S. Sumarto, L. Prittchett. 1999. "A National Snapshot of the Social Impact of Indonesia's Crisis". Bulletin of Indonesian Economic Studies Vol 35 No 5