Blue Economy Analysis in Improving the Lifestyle of Coastal Fisherman With BUMDes/Kampung as Intervening Variables

Abdul Hakim[1], Hj. Syarifatul Syadiah[2]

1. Faculty of Economics and Business, University of 17 August 1945, Surabaya, Indonesia
2. Faculty of Economics and Business, University of 17 August 1945, Surabaya, Indonesia
Email : diejournal@gmail.com

Abstract

Based on the Blue Economy analysis in improving the standard of living of fishermen on the coast of Berau Regency, it can be concluded that by optimizing marine resources it is very beneficial for the survival of the people on the coast and by using a work system and measuring time and by using the Global Positioning System (GPS) as a tool. fish detectors are very impactful and helpful in the results obtained by fishermen, this can be seen from the increase in fish catches obtained by fishermen. By utilizing technology such as fishing vessels with engine power, work systems and time used as well as the use of the Global Positioning System (GPS) as a fish detection tool, the results obtained are very helpful. A large catch but not supported by an appropriate selling price will harm fishermen so that fishermen remain at the poverty level where the fishermen's catches are directly sold to the middlemen whose prices are determined by the middlemen so that regardless of the fisherman's results, it still does not provide the fishermen's welfare. However, with innovation and government policies towards the establishment of Village/Kampung-Owned Enterprises that play a role in buying fishermen's catch at a better price, it will benefit fishermen, this can be seen from the results obtained by fishermen before the existence of BUMDes/Kampung and after the existence of BUMDes such as for Traditional Fishermen from income before the existence of BUMDes/Kampung is Rp. 17,747,200 to Rp. 21.507.200, - after the existence of BUMDes/Kampung, and so on for motorcycle fishermen from the results of Rp. 73.160.000,- to Rp. 88.66. 000,- and Modern Fishermen from Rp. 191,264,000,- to Rp. 322,464,000,- This means that the existence of Village/Kampung-Owned Enterprises is very helpful for fishermen in obtaining fish catches and this will spur fishermen to seek or utilize marine resources to the fullest.

Keywords*: Blue Economy, Coastal Fishermen, Technology and BUMDes*

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INTRODUCTION

In the context of economic recovery and transformation after the Covid-19 pandemic, Indonesia needs to have a new approach and look for new sources of economic growth that are more inclusive and sustainable. Blue Economy is one of the answers, with economic potential that needs to be optimized, considering that Indonesia is an archipelagic country with 65 percent of Indonesia's total area in the form of sea. The joint Statement of the Minister of National Development Planning/Head of Bappenas Suharso Monoarfa with the Swedish Minister of Environment and Climate Per Bolund and the Swedish Minister of Infrastructure Thomas Eneroth signed in Stockholm, Sweden, stated their commitment to cooperation in developing the Blue Economy in Indonesia.

This commitment continues during the Sweden-Indonesia Sustainability Partnership Week through the launch of the Blue Economy Development Framework for Indonesia's Economic Transformation. "This book was prepared by the Ministry of National Development Planning/Bappenas together with the Organization for Economic Co-operation and Development (OECD) as a reference for stakeholders in defining the blue economy as a new engine for sustainable and inclusive Indonesian economic growth. The potential of the Blue Economy is estimated at USD 1.33 billion and is able to absorb 45 million jobs," said Minister Suharso.

This Blue Economic Development Framework is an elaboration of the mandate of Indonesia's National Long-Term Development Plan (RPJPN) 2005-2025, specifically realizing Indonesia as a sovereign, advanced, and resilient archipelagic country through the implementation of sustainable development, as well as the Indonesian National Medium-Term Development Plan (RPJMN). 2020-2024 which emphasizes the importance of good marine management to achieve the sustainable development agenda. The Blue Economy Development Framework also supports global initiatives in achieving the 2030 Agenda on Sustainability Development Goals, in particular, the Goals are:

1. Conserving and Sustainably Utilizing Marine and Ocean Resources for Sustainable Development and supporting the Goals
2. Access to Affordable, Sustainable, and Modern Energy for All,
3. Inclusive and Sustainable Economic Growth, Productive and Comprehensive Job Opportunities, and Decent Work for All,
4. Infrastructure, Inclusive and Sustainable Industries, Innovation, and
5. Global Partnership for Sustainable Development. "The Blue Economic Development Framework is directed at optimizing the modalities that Indonesia has as an archipelagic country with a diversity of marine resources, and Indonesia's political and economic strategic position in the region,"

LITERATURE REVIEW

a. Blue Economics

In the last decade, "Blue Economy (BE)" or "Ocean/Ocean Economy" has been widely advocated by various interested parties as a concept or strategy to protect the world's oceans and water resources. The concept of BE has its origins in the United Nations Conference on Sustainable

Development held in Rio de Janeiro in 2012. The term 'Blue Economy' has been used in different ways and similar terms such as "ocean economy" or "ocean economy" are used without a clear definition. In a concept paper, the United Nations offers a general definition of a "Blue Economy" as an ocean economy that aims to "improve human well-being and social equity, which while sign significantly uses environmental risks and ecological scarcity. Recently, the World Bank defined a "Blue Economy" as "the sustainable use of marine resources for economic growth, livelihood enhancement, and employment while maintaining the health of marine ecosystems.

According to Pauli (2010) th,e concept of the blue economy was developed to answer the challenge that the world economic system tends to be exploitative and damaging to the environment. Based on this, a new economic model is needed to encourage the implementation of sustainable development through a framework that imitates the way ecosystems work. The blue economy concept is relevant to be applied to the fisheries sector through innovative and creative business development based on the principles of efficiency in nature, without wasted waste, creating entrepreneurial opportunities, and creating jobs, with creativity and innovation. The concept of the blue economy was raised based on empirical experience that through creativity and innovation economic activities can be managed without damaging the environment, otherwise, it, can produce an economic benefit and save the environment from damage. The concept was introduced to answer the challenge, that the current world economic system tends to be exploitative and tends to damage the environment due to human greed. Environmental damage is not only caused by waste from industrial or household sources, but is also caused by the exploitation of natural resources that exceed their capacity and natural carrying capacity. Through this understanding, national economic resources should be managed sustainably. Human resources are the key to success in implementing the blue economy concept in developing fisheries for increasing community welfare. In addition, human resources are a central factor in an institution (Arizona, Riniwati & Harahap, 2013).

Blue Economy is a tool that can be used to improve economic conditions that are currently not good and create more activities in the form of a sustainable model. Providing the best solution by transferring the economy and generating a better community for the future. The essence of the Blue Economy is Sustainable Development which is a correction and enrichment of the Green Economy with the motto "Blue Sky - Blue Ocean" where the economy grows, the people prosper, but the sky and sea remain blue.

The blue economy is a concept of optimizing aquatic resources that aims to increase economic growth through various innovative and creative activities while ensuring business sustainability and environmental sustainability. Blue Economy does not have to be a Marine Economy but this concept is very suitable for development in the marine and fisheries sector. According to Jusuf (2012), the blue economy can be seen as an activity that relies on the comprehensive development of the people's economy in order to achieve overall national development. The blue economy-based development approach will

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synergize with the implementation of the triple track strategy, namely pro-poor (poverty alleviation), pro-growth (growth), pro-job (labor absorption) and propro-environment reserving the environment) programs.

This priority in economic development (Apriliani, 2014), explains that the priority of all alternative programs in realizing the Blue Economy is community empowerment programs in Indonesia to monitor and control marine resources. However, the problem of poverty cannot be solved easily, because poverty is a multidimensional problem that covers various aspects of life, not only covering the economic side, but also the social and cultural side. The number of rural poor is caused by the lack of supporting infrastructure, as well as the problem of limited access of the population to transportation, health and education facilities and infrastructure. Geographical conditions greatly affect the level of their economy. Sara (2014), explained that in formulation, planning and management of integrated coastal areas including coastal management and marine environmental resources and services should be carried out comprehensively, have plans and objectives,

b. Poverty

Poverty can be interpreted as a condition where there is an inability to meet basic needs such as food, clothing, shelter, and drinking water. It is closely related to the quality of life. Bappenas (2004) defines poverty as a condition in which a person or group of people, men and women, are unable to fulfill their basic rights to maintain and develop a dignified life. The basic rights of rural communities include the fulfillment of food, health, education, employment, housing, clean water, land, natural resources and environmental needs, a sense of security from treatment or threats of violence and the right to participate in socio-political life, both for both women and men. According to (Chambers, (*powerless*), Vulnerability of dealing with situations emergency (state *of emergency*),

Fisherman Community Poverty If you look at it clearly, there are actually many factors that cause poverty in fishing communities, apart from internal factors, there are also external factors. According to (Kusnadi, 2003), distinguishing the causes of fishermen's poverty in two groups, namely internal fishermen poverty and external fishermen poverty. (2) limited capability of business capital and fishing technology; (3) working relationships in arrest organizations that are often less favorable to workers; (4) difficulties in diversifying fishing business; (5) high dependence on fishing occupations; and (6) a lifestyle that is seen as extravagant, so that it is less oriented towards the future.

c. Economic Empowerment of Coastal Village Communities in Poverty Alleviation

Alternative strategies and policies that are pro-poor are an absolute necessity for poverty alleviation. In addition, alternative strategies and policies to reduce poverty in rural communities including coastal villages can be carried out by providing broad opportunities for the community to obtain adequate education and health services. In addition, it also strengthens the executive and legislative commitments to improve the governance structure and pushes the

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regional development agenda to prioritize poverty alleviation as the main priority scale. Policies and programs that favor the poor need to be focused on the real economic sector and must use a pro-poor paradigm.

d. Village Owned Enterprises/BUMDes

The definition of BUMDes or Village-Owned Enterprises according to Permendagri No. 39 of 2010 concerning BUMDes is a village business formed/established by the village government whose capital ownership and management is carried out by the village government and the community. Village-Owned Enterprises (BUMDES) which in Berau Regency are called BUMK (Village Owned Enterprises) are village business institutions managed by the community and village government in an effort to strengthen the village economy and are formed based on the needs and potential of the village.

According to Law Number 32 of 2004 concerning Regional Government, villages can establish business entities according to the potential and needs of the village. It is also explained in Government Regulation Number 72 of 2005 concerning Villages that to increase village and community income, the village government can establish Village-Owned Enterprises in accordance with the needs and potential of the village. This means that the formation of BUMDES is based on the needs, potential, and capacity of the village, as an effort to improve community welfare.

The establishment of BUMDes as stated in Permendesa PDTT No. 4 of 2015 concerning the Establishment, Management and Management, and Dissolution of Village-Owned Enterprises, has the following roles, characteristics, and objectives:

1. **Role of BUMDes:**
   a. Increasing the welfare of the community and the village government BUMDes.
   b. Assist in supervising the implementation of village economic activity organizers.
   c. Assist the village government in efforts to develop natural and human potential sources in the village to be developed into sources of economic resources
   d. Become a village government media to realize the development plan, especially in the economic field.

2. **Main Characteristics of BUMDes:**
   a. This business entity is owned by the village and is jointly managed
   b. Capital sourced from the village by 51% and from the community by 49% through equity participation (shares or share)
   c. Its operation uses a business philosophy rooted in local culture
   d. The line of business that is run based on market potential and information
   e. The profits obtained are aimed at improving the welfare of members (Equity Equity) and the community through village policies
   f. Facilitated by the Provincial Government, Regency Government and Village Government.

g. Operationalization is jointly controlled by BPD, Village Government and Members).

3. Purpose of Establishment of BUMDes Four important objectives of establishing BUMDes are:

a. Improving the Village Economy
b. Increase Village Original Income
c. Improving the management of village potential in accordance with community needs
d. Become the backbone of village economic growth and equity.

To be able to achieve the four objectives of BUMDes above, among others, it must be done by meeting the needs (productive and consumptive) of the community through goods and services managed by the community and the village government. This institution is also required to be able to provide services to non-members (parties outside the village) by placing prices and services according to market standards. This means that there is an institutional mechanism that is mutually agreed upon, so as not to cause distortion of the rural economy caused by the efforts of BUMDes.

The coastal area of Berau Regency is located in the sub-districts of Biduk-Biduk, Talisayan, Derawan and Maratua islands which are geographically directly adjacent to the ocean. Derawan Island District is famous as a tourist destination that has very beautiful beaches and panoramas and has several clusters of islands such as Sangalaki Island.

Table 1. Map of Berau Regency, Development of Fishing Production, Aquaculture Production in Berau Regency
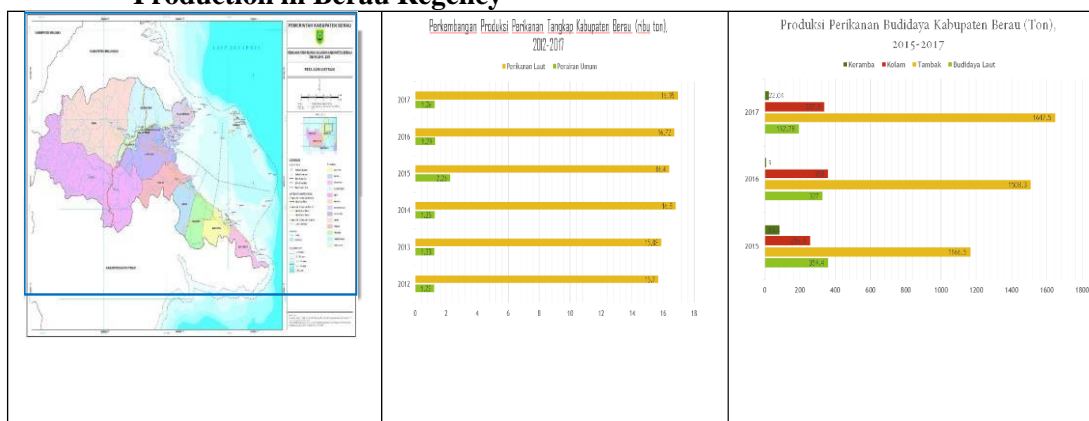
Source: Berau Statistics in Figures, 2018

e. **Fishery Potential**

Fishery is one of the leading commodities of Berau Regency. In fact, most of the people living in coastal areas make the fishery sector (fishermen) their main livelihood. During the period 2012 to 2017, capture fisheries production in Berau

Regency increased by 7.70 percent with an average annual increase of 1.50 percent.

Apart from capture fisheries, a small portion of fish production in Berau Regency comes from aquaculture whose production continued to increase during 2015 to 2017. The biggest contributor to aquaculture production was pond aquaculture which in 2017 reached 1,647.50 tons or 74 .88 percent of the total aquaculture production.

f. **Fisherman**

Fishermen can be divided into two, namely modern fishermen and traditional fishermen. These two types of fishermen have some differences and similarities.

1. Traditional fishermen According to Bonefasius Kemong in the journal Livelihood System of Traditional Fishermen of the Kamoro Nation in Tipuka Village, Mapurujaya District, Mimika Regency, Papua Province (2015), traditional fishermen are fishermen who utilize water resources using traditional equipment. Traditional fishermen do not use technology and do not rely on more modern equipment. Therefore, usually the equipment used is still relatively simple and is much safer for the environment. Traditional fishermen use boats without engines or canoes (small boats) to go sailing to the sea. To catch fish, traditional fishermen use nets or nets that have been brought and then spread to the area around their boats.

2. Modern fishermen are fishermen who utilize water resources using modern equipment. Modern fishermen use motorized boats or large ships that use fuel, to sail to the sea. To catch fish, modern fishermen use fish detection radar and nets. Sometimes they also use a large net.

3. Similarities and differences between modern and traditional fishermen The following are the similarities and differences between modern and traditional fishermen, namely: Similarities between modern and traditional fishermen. The common goal is to catch fish to fulfill their daily needs. Sometimes the tools used are the same, namely using a net to catch fish. Facing the ocean waves. Must pay attention to the weather when going sailing.

4. Differences between modern and traditional fishermen Modern fishermen use boats or motorized boats. While traditional fishermen use boats or canoes. Modern fishermen use engine power to move their boats. While traditional fishermen use wind power. Modern fishermen can sail to more distant places. Meanwhile, traditional fishermen have limited fishing areas. Modern fishermen can use radar to detect fish. While traditional fishermen do not use it.

g. **Production (Catch) Fish**

In carrying out fishing activities, fishermen use several types of fishing fleets, namely boats without motors, outboard motor boats and motor boats. Differences in fishing fleets and work equipment used by fishermen mean that there are differences in technology in catching fish which in this study are grouped into modern technology and traditional technology. Fishermen who use modern technology are characterized by the use of motorized boats as a fishing fleet accompanied by *global positioning system*(GPS) as a direction indicator and *fish*

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finder (detecting the presence of fish). Meanwhile, fishermen who use traditional technology, the fishing fleet used is not equipped with GPS and GPS *fish finder*. Another factor that can affect the production (fish catch) by fishermen is the season. It was stated by (Srikanthan, 2013) that despite technological advances in the 20th century, weather and seasons are still key factors in determining fishery production. Based on the theoretical basis described above
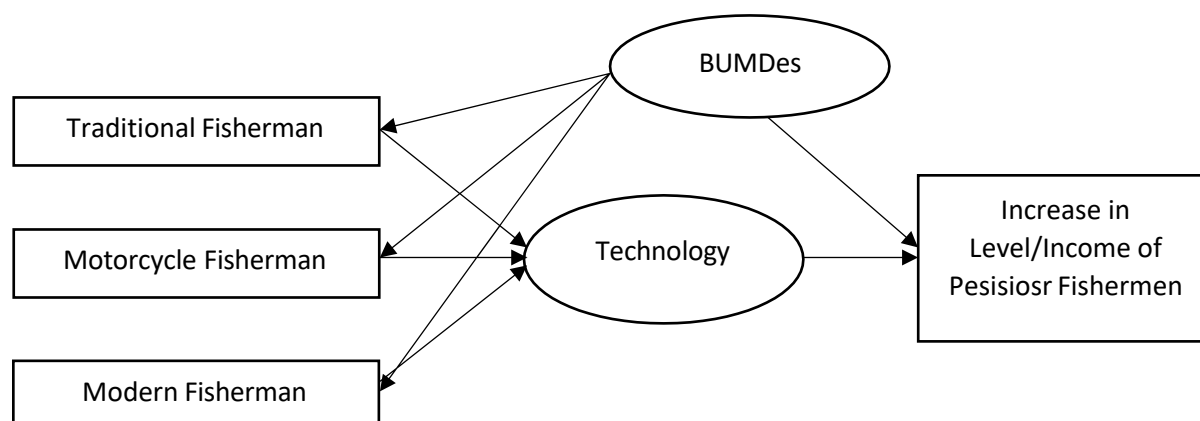
Research methods

The research sample is part of the population. A sample survey is a procedure in which only a part of the population is taken and used to determine the desired characteristics and characteristics of the population (Nazir, 2002). The population in this study is to classify the strata of the fishing fleet used, namely boats without motors, outboard motor boats and 5-10 GT motor boats totaling 578 fishing fleets. Determination of the number of samples based on the Solvin formula with a sampling allowance of 10%. Thus, the research sample was 95 fishermen. Sampling in each sub-district is based on the strata of the fishing fleet.

$$n = \frac{N}{1 + Ne^2}$$

The data needed in this study are primary data and secondary data. Primary data in the form of direct data collected through interviews with respondents and using tools, namely a list of questions (questionnaires) and observation, namely observing directly things related to research, such as boat/motor boat equipment used by fishermen to catch fish, social life of fishing communities. and also the behavior of the fishermen themselves.

The conceptual framework of this research is

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Hypothesis

The hypothesis put forward for this title is that the Blue Economic Analysis (Bumdes) can improve the standard of living of traditional fishermen, motorbike fishermen and modern fishermen on the coast of Berau Regency.

Results and Discussion

In general, coastal areas have several potentials in the fields of fisheries and marine, trade, marine tourism, and the marine industry (Apriliani, 2014). In the national context, the potential and natural wealth accumulated on the surface, in and under the ocean is one of the supporting factors to increase the rate of economic growth in Indonesia (Ervianto, 2016). To manage marine resources sustainably, the blue economy becomes an attractive alternative to bridge environmental problems and economic interests that often occur in Indonesian waters.

Berau Regency has the potential for demersal fisheries such as grouper, snapper, and octopus. Demersal fish are fish that usually live in the demersal zone, such as the bottom of the sea or lake. This fish is an important economic fish in Berau City. However, with so much demand, fish stocks are running low over time, so there needs to be firm efforts to bridge the problem of demand and supply with blue economic activities that are sustainable and eco-friendly.

The level of fishermen's welfare is largely determined by the catch or what is commonly referred to as the production of the catch. The number of catches also directly affects the amount of income received so that fishermen are able to meet their daily needs.

The survey results describe the characteristics of fishermen in the research location, this is considered important in answering research questions.

a. Characteristics of Respondents

Characteristics of fishermen is a condition or general description of fishermen in the research area, which includes age, education, fishermen's dependents, and experience of fishermen. The productive age population is the population who carries out production from an economic perspective, where all their needs are borne by themselves. The age of the fishermen includes into productive age with an average age of 35-48 years and the fishermen have an average number of dependents of 4 people. Furthermore, judging from the level of education of the fishermen in this research area, the most dominant are elementary to high school graduates. A total of 95 samples of fishermen stated that they had worked for an average of 21 years, which means that the 95 samples had a long enough level of work experience to work as fishermen.

b. Work

In addition to the use of equipment by fishermen, fishermen also have to pay for the purchase of diesel fuel, food, bait, drinks and snacks when going to sea. The operational cost for a boat without a motor in 1 trip costs Rp. 350,000, while for a motor boat it is Rp. 2,300,000 per trip, while for motor boats (< 5 GT) it is

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Rp. 9,400,000, - per trip and for motor boats (5 – 10 GT) of IDR 21,000,000 per trip.

c. Total manpower

The use of labor in fishing activities is usually referred to as ABK (Children of the Ship). The amount of crew needed is highly adjusted to the type of ship used, therefore not all ships use crew members or they work alone, this can be seen in the types of boats without motors. For boats without motors, the number of crew members used is 1 (one) person, motor boats are 3-4 (three-four) people, motor boats (<5 GT) are 9-11 (nine-eleven) people and motor boats (< 5-10 GT) as many as 12-14 (twelve-fourteen) people.

d. Number of days at sea/Long at sea

The duration of fishing activities is on average 5-6 days per week with a length of 10-12 hours per day. Fishing activities are generally carried out in the afternoon and return to the pier or mainland in the morning with the catch of fish to be traded.

e. Technology Use

The technology referred to in this study is the equipment used by fishermen in carrying out fishing activities such as the use of a global positioning system (GPS) as a directional tool, radio and fish finder (a tool to detect the presence of fish). This type of equipment is included in modern technology. The results of the study show that most fishermen who have motorized boats ranging from < 5 GT to 5-10 GT use technology*GPS*and*fish finder,*and radio as a means of communication. Of the 95 fishermen respondents, 47 respondents have used technology, while the remaining 48 respondents are traditional fishermen.

f. Number of catches once at sea

The amount of operating costs in catching fish used varies greatly, and the types of fish vary greatly, each type of ship including the number of catches for the type of boat without a motor as much as 47 Kg per trip, with a catch value of Rp. 554,600 per trip. For the type of motorized boat, the number of catches reaches 200 Kg per trip, with a catch value of Rp. 2,360,000 per trip. For motor boats 5 – 10 GT the number of catches reaches 2,890 per trip with a catch value of Rp. 34,102,000 per trip.

Based on the data above, the researcher will use the SPSS20.0 program to describe the data changes before and after the existence of BUMDes are as follows:

A. Traditional Fisherman's Income

Table 2. Descriptive Statistical Analysis of Increasing Income of Traditional Fishermen

Descriptive Statistics

	N	Minimum	Maximum	mean	Std. Deviation
NTtraditional	32	100000.00	117500.00	1152000.00	111734,508
Valid N (listwise)	32				

Source: Primary Data Processed, 2022

Based on the data above, it can be seen that the increase in the income of traditional fishermen after the existence of BUMDes is a minimum of Rp.

100,000.00, while the maximum data for changes in income is an increase of Rp. 117,500.00 while the mean or average increase in income with the existence of BUMDES funds is Rp. 115,200.00.

Table 3. Total Income of Traditional Fishing Community Using BUMDes Funds

Number of Respondents	Total income		Total Boost	%
	Before Using Funds BUMDes	After Using Funds BUMDes		
32	IDR 17,747,200	IDR 21,507,200	IDR 3,760,000	21.19%

Source: BUMDES Archives of Berau Regency

Based on the data above, it can be seen that the total increase in the income of traditional fishermen is Rp. 3,760,000 to Rp 21,507,200 or an increase of 21.19% from income before using BUMDES funds. So that it can be known together that BUMDES funds play an important role in increasing the income of traditional fishermen.

B. Motor Fisherman Income

Table 4. Descriptive Statistical Analysis of Motor Fisherman Income Increase

Descriptive Statistics

	N	Minimum	Maximum	mean	Std. Deviation
NTtraditional	31	200000.00	500000.00	675255.00	421734,859
Valid N (listwise)	31				

Source: Primary Data Processed, 2022

Based on the data above, it can be seen that the increase in income of motor fishermen after the existence of BUMDes is a minimum of Rp. 200,000,000.00 while the maximum data of changes in income increase is Rp. 500,000.00 while the mean or average increase in income with the presence of BUMDES funds is Rp. 675,255.00.

Table 5. Total Income of Motorcycle Fishermen Using BUMDes Funds

Number of Respondents	Total income		Total Boost	%
	Before Using Funds BUMDes	After Using Funds BUMDes		
31	Rp 73.160.000	IDR 88,660,000	IDR 15,500,000	21.18%

Source: BUMDES Archives of Berau Regency

Based on the data above, it can be seen that the total increase in the income of motorcycle fishermen is Rp. 15,500,000.00 to Rp. 88,660,000.00 or an increase of 21.18% of the income before using BUMDES funds. So it can be seen together that BUMDES funds play an important role in increasing the income of motor fishermen.

C. Modern Fisherman

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Table 6. Descriptive Statistical Analysis of Income Increase of Modern Fishermen

Descriptive Statistics

	N	Minimum	Maximum	mean	Std. Deviation
NTtraditional	32	2000000.00	5000000.00	7225000.00	6721734,7345
Valid N (listwise)	32				

Source: Primary Data Processed, 2022

Based on the data above, it can be seen that the increase in the income of motorcycle fishermen after the existence of BUMDes is a minimum of IDR 2,000,000.00 while the maximum data for changes in income increases is IDR. 5,000,000.00 while the mean or average increase in income with the existence of BUMDES funds is Rp. 7,225,000.00.

Table 7. Total Income of Modern Fishing Community Using BUMDes Funds

Number of Respondents	Total income		Total Boost	%
	Before Using Funds BUMDes	**After Using Funds** BUMDes		
32	Rp 191,264,000	Rp 322,464,000	Rp. 131.200.000	68.6%

Source: BUMDES Archives of Berau Regency

Based on the data above, it can be seen that the total increase in the income of modern fishermen is Rp. 131,200,000 to Rp 322,464,000 or an increase of 68.6% of income before using BUMDES funds. So it can be seen together that BUMDES funds play an important role in increasing the income of modern fishermen.

Table 8. Increase in Fishermen's Income During BUMDes

Fisherman	Number of Respondents	Total income		Total Boost	Percentage
		Before Using funds BUMDes	**After Using funds BUMDes**		
Traditional	32	17,747,200	21,507,200	3,760,000	21.19%
Motorcycle	31	73.160,000	88,660,000	15,500,000	21.18%
Modern	32	191,264,000	322,464,000	131.200.000	68.6%

Source: BUMDes Berau

Based on the table above, it is known that the percentage increase in fishermen's income has increased relatively for traditional fishermen and motor fishermen, and there is a significant increase for modern fishermen. The highest increase occurred in modern fishermen who had a percentage increase of 68.6%% with an increase of Rp. 131.200.000. Thus, the existence of BUMDes in Berau

district, especially in fishing villages, has a significant positive impact on fishermen's income.
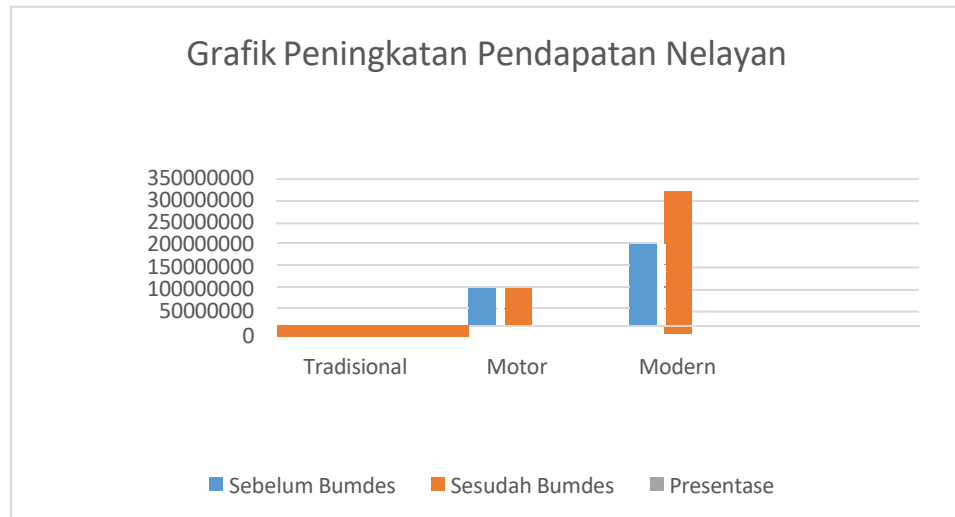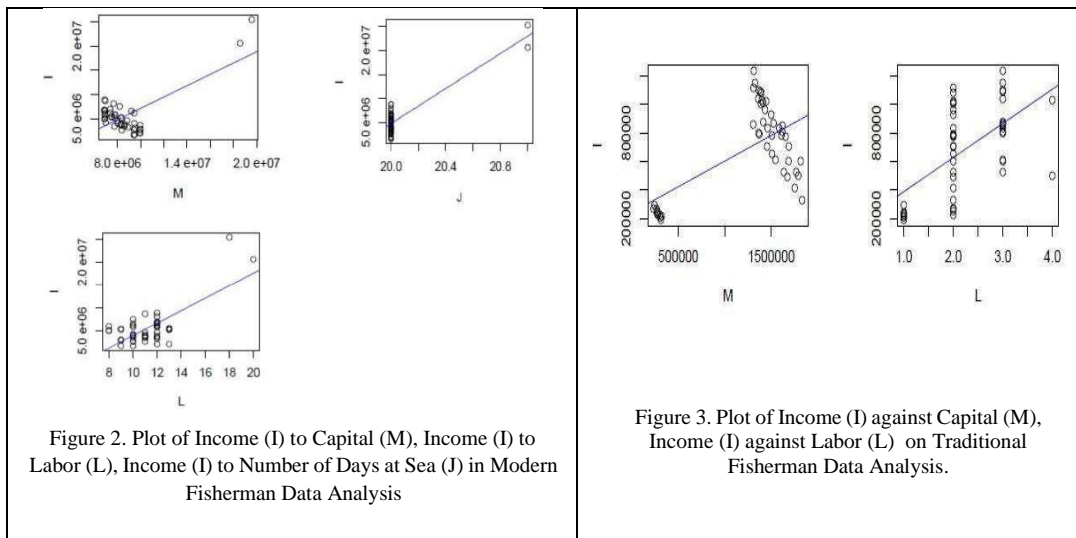

Figure 1. Graph of Increasing Fishermen's Income

Based on the graph, it is clear that there is an increase in the income of fishermen, both traditional fishermen, motor fishermen, and modern fishermen, with the highest total income for modern fishermen of Rp. 322,464,000, while the lowest income for traditional fishermen is Rp. 21,507,200; this is due to the limited expertise of traditional fishermen in fishing.

According to Rosadi (2010), the first step that should be taken in applying linear regression is to form a plot between the dependent variable and each independent variable used in the research model. The purpose of plot formation is as an early detection of whether linear regression is suitable when applied. The plot between the dependent variable and the independent variable can be seen in the following figure:

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Figure 2. Plot of Income (I) to Capital (M), Income (I) to Labor (L), Income (I) to Number of Days at Sea (J) in Modern Fisherman Data Analysis

Figure 3. Plot of Income (I) against Capital (M), Income (I) against Labor (L) on Traditional Fisherman Data Analysis.

By observing Figure 1 and Figure 2 above the regression line plot above, it appears that linear regression is suitable to be applied because the relationship between the dependent variable and the independent variable is linear (can be represented by a straight line).

1. Classic assumption test
    a. Normality test
       The data normality test is an assumption required in multiple linear regression, the normality test is used to determine whether the residuals from the data are normally distributed or not by using the QQ-plot as follows:
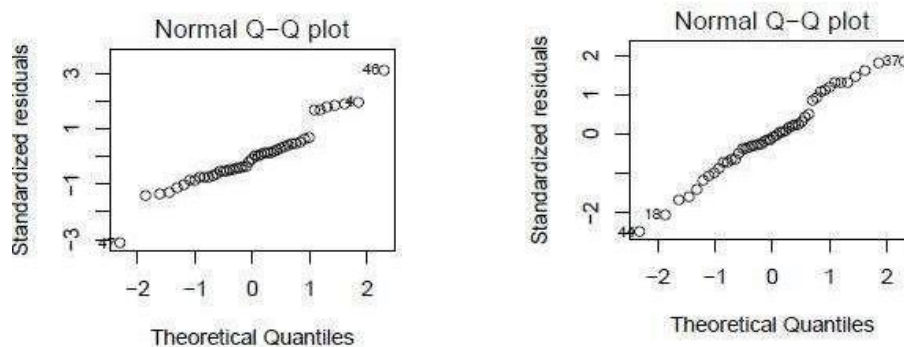

Figure 3. Normal QQ plot for modern and traditional fishermen

Figure 3 and above show that the sloping line that has been plotted is a normality line. According to Rosadi (2010) if the data points are around a straight line, it can be concluded that the residuals follow a normal distribution. The results of the Normal QQ plot test state that the assumption of normality is met.

b. Multicollinearity Test
    Multicollinearity is a condition in which one or more independent variables have a correlation or relationship with other independent variables or in

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other words one or more independent variables are a linear function of other independent variables.Next to To detect the presence of multicollinearity in multiple linear regression models, the . value can be used*variance inflation factor*(VIF) provided that if the VIF value exceeds 10, then multicollinearity occurs in the regression model. The output of the multicollinearity assumption test using VIF statistics can be seen in Table 3.

Table 9. Multicollinearity Test Results

No.	Multicollinearity assumption test output	VIF value		
		M	**L**	**J**
1.	Output for traditional fishermen	1.59615	1.59615	-
2.	Output for modern fishermen	5.5719	2.3592	6.95597

Source: Primary Data Processed

By observing table 3 above, the VIF value is less than 10. The test results on traditional fishermen and modern fishermen do not occur multicollinearity between the independent variables.

c. Heteroscedasticity Test

In regression analysis,*heteroscedasticity*means a situation where the diversity of the independent variables varies on the data we have. By using the Breusch Pagan test, the results obtained are as follows:

Table 4. Heteroscedasticity Test Results

Heteroscedasticity assumption test output	Breusch-Pagan test scores
Output for traditional fishermen	BP = 7.5062, df = 4, p-value = 0.1114
Output for modern fishermen	BP = 20.22, df = 6, p-value = 0.002530

Source: Primary Data Processed,

From table 4 above for modern fishermen, it is obtained that the Breusch-Pagan test value has a p-value of 0.002530 which is smaller than alpha 0.05, so it can be concluded that modern fishermen are not free from the assumption of heteroscedasticity. d. Autocorrelation Test

Autocorrelation in the regression model means that there is a correlation between sample members sorted by time of correlation. To find out the presence of autocorrelation in a regression model, it is done through testing the value of the Durbin Watson test (DW Test) with the following conditions(Algifari, 1997):

< 1.10 : There is autocorrelation1,   55 - 2.46 :No autocorrelation

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1.0 - 1.54   :Without conclusion   2.46 - 2,90 : Without conclusion

> 2.91: There is autocorrelation

Based on the estimation results, the results of the Durbin Watson test are obtainedcan be seen in Table 5.From table 5 above, it can be concluded that the estimation results of the model are free from autocorrelation symptoms.

Table 5. Autocorrelation Test Results

Assumption test output	
Autocorrelation	**Durbin Watson grades**
Output for traditional fishermen	DW = 1.8486, p-value = 0.2548
Output for modern fishermen	DW = 2.2002, p-value = 0.6926

Source: Primary Data Processed

CONCLUSION

Based on the Blue Economy analysis in increasing the standard of living of fishermen in the coastal district of Berau, a conclusion can be drawn that by optimizing marine resources it is very beneficial for the survival of the community on the coast and by using a work system and measured time as well as by using the Global Positioning System (GPS). as a fish detection tool, it is very impactful and helps in the results obtained by fishermen, it can be seen from the increase in fish catches obtained by fishermen. By utilizing technology such as fishing vessels with engine power, work systems and time used as well as the use of the Global Positioning System (GPSo) as a fish detection tool, it is very helpful in the results obtained. Large catches but not supported by an appropriate selling price will harm fishermen so that fishermen remain at the poverty level, but with innovation and government policies towards the establishment of Village/Kampung-Owned Enterprises which play a role in buying fishermen's catch at a better price it will benefit fishermen, it can be seen from the results obtained by fishermen before the Village/Kampung-Owned Enterprises and after the existence of Village/Kampung-Owned Enterprises such as for Traditional Fishermen from the proceeds of Rp. 17,747,200 to Rp. 21,507,200,- , for motorcycle fishermen from the proceeds of Rp. 73.160.000,- to Rp. 88.66-.000,- and Modern Fishermen from Rp. 191,264,000,- to Rp. 322,464,000.

SUGGESTION

The potential of marine and fisheries needs to be managed intelligently to generate benefits for the community both economically, socially and

environmentally. Regional development characterized by an archipelago based on a blue economy will succeed if the Government and local governments are committed, take sides, and are brave and firm in integrating land-based development programs/activities as a form of support for the acceleration of comprehensive marine development.

In an effort to ground the blue economy, the policy directions for programs/activities in each ministry/institution should merge with each other in a technical-coordinative manner. This condition is intended so that regulations/policies for economic-based development that are innovative and unique to Indonesia can be formulated, without having to abandon local wisdom and culture. Active involvement and participation of every element of society is important for optimizing the use of raw materials that are already available in the area so that there is an acceleration of economic development so that community welfare can be realized, especially for coastal communities who mostly work as fishermen.

Socialization of the use of modern fishing gear to traditional fishermen must continue to be carried out so that fishermen can educate and increase their fish catches so that in the end the integrity of the community's fish can be fulfilled and the standard of living of fishermen can increase.

Good infrastructure development, especially access to distribution and communication in the form of an internet network, should be provided by the government to support the process of developing marine potential in the Berau Regency area.

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