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DETERMINATION ANALYSIS OF CAPTURE FISHERIES RESOURCES OF COASTAL COMMUNITY WELFARE IN EASTERN INDONESIA REGION: REVISION OF PANDORA BOX MODELL

Gigih Pratomo

Universitas Wijaya Kusuma Surabaya

Dukuh Kupang XXV Number 54 Surabaya, East Java, Indonesia

gigih.pratomo@gmail.com

Mega Rosdiana

Universitas Wijaya Kusuma Surabaya

Dukuh Kupang XXV Number 54 Surabaya, East Java, Indonesia

mega.rosdiana@gmail.com

ABSTRACT

Eastern Indonesia Region has abundant marine resources and fisheries, especially in the Eastern Indonesia Region. Indonesia's marine potential is in contrast to its contribution to the economy which is classified as low and the limited employment opportunities for coastal communities. This study aims to identify the influence of capture fisheries resource determinants on the level of welfare of coastal communities in eastern Indonesia region through revision of Pandora box modell. This study uses a quantitative approach with secondary data obtained from literature studies and documentation. The variables used in this study are the Gross Regional Domestic Product, road infrastructure, electricity infrastructure, number of fishing vessel motors, human development index, and area of aquaculture. Data analysis techniques using multiple linear regression with panel data. The results show that road infrastructure and electricity infrastructure have a significant and positive effect on the level of community welfare in the Eastern Indonesia Region. Ship infrastructure has a significant negative effect on the welfare of the people of the Eastern Indonesia Region.

Keywords: natural resource, welfare, coastal area, infrastructure

INTRODUCTION

Mastery of large resources will have an impact on exploitation that negatively affects the economy (Pratomo, Mahmudah, and Wardhono, 2011). Indonesia has abundant natural resources, one of which is marine wealth and fisheries, especially in the Eastern Indonesia Region. This is indicated by the magnitude of Indonesia's maritime potential reaching 1.2 trillion US dollars per year covering 11 sectors, namely capture fisheries, aquaculture, fishery products processing industry, marine



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biotechnology industry, mining and energy, marine tourism sector, mangrove forest, sea transportation, regional resources of small islands, and non-conventional natural resources (Puryono, 2016). Indonesia's large marine potential is basically able to provide welfare to the people in the region. The reality of Indonesia's high marine potential is in contrast to the contribution contributed by the fisheries sector to the national total GDP of less than 3 percent, and contributing 10 percent of employment. High marine potential without significant contribution to the economy indicates a large exploitation of marine resources without control and supervision. Exploration and exploitation of natural resources with high intensity will lead to the enactment of nature curse in the economic sector (Qori'ah, Pratomo and Indrawati, 2011). Nature Curse is shown by the low welfare of the people in coastal areas despite the potential for large marine wealth.

The problem of nature curses can be solved by infrastructure development in an area. The government formulates policies to improve the welfare of the community by developing physical and socio-economic infrastructure in all regions, especially in the Eastern Indonesia Region. The Indonesian government policy is formulated in the Millennium Development Goals (MDG's) by carrying out activities to support the economic activities of fishermen and other coastal communities. The formulation of the Millennium Development Goals policy in the fisheries sector aims to avoid the enactment of the resource curse that arises due to an exploitation of marine wealth. The exploitation of resources in an economic sector provides a consequence of the existence of Pandora Box (Wardhono, Pratomo, Qori'ah, and Yulia Indrawati, 2011). Pandora's Box will make a negative contribution to the level of community welfare that is directly related to exploited natural resources.

Supporting infrastructure in the Eastern Indonesia Region is classified as low in quality and quantity. Road and electricity infrastructure have low quantity and quality if compared to other regions in Indonesia. Road and electricity infrastructure are supporting the economic activities of the community to facilitate the production, distribution and consumption systems. Road and electricity infrastructure are also important suggestions for efforts to increase investment and development of



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companies that are able to create jobs for the community. Infrastructure that is directly related to coastal communities is a means of fishing vessels. The majority of Indonesian fishermen have motor boats with sizes below 10 Gross Ton (GT) which provide obstacles to explore and exploit Indonesia's natural marine resources. Ships under 10 GT cannot sail to the middle of the sea because they are vulnerable to high waves of water and strong winds. The supporting limitations of the fisheries sector have caused the community to not be able to optimally exploit Indonesia's marine wealth. Low optimization of marine wealth results in the contribution of the fisheries sector in the low eastern Indonesia region which will bring systemic poverty within the region.

Coastal communities close to large fishery resources tend to have poverty problems (Pratomo, 2017). Coastal communities are identical with poverty problems caused by limited aspects of education, knowledge, productivity and income. Poverty is a condition where people cannot meet basic needs which consist of the need for food, clothing and shelter. These needs can be fulfilled through community income obtained after productive economic activities. However, the lack of employment opportunities in Indonesia's coastal areas is generally the cause of the inability of coastal communities to fulfill their needs. Employment opportunities that are not able to absorb large numbers of workers cause many low-income people who do not even have income. This is an indicator of poverty in coastal communities. This study aims to identify the determinants of capture fisheries resources on the level of welfare of coastal communities in eastern Indonesia region through the Revision of Pandora Box Modell.

LITERATURE REVIEW

Economic Development and Economic Growth

Economic growth is the development of economic activity that causes the production of public goods and services to increase so that it will increase the prosperity of the community (Sukirno, 2015). Factors that influence are the availability of natural resources and the quality of human resources. Natural resources are a basic



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factor of a society's activities. The factor of human resources is a secondary factor for managing natural resources through labor to create capital capitalization. Kuznets (in Todaro and Smith, 2009) shows that economic growth will be achieved if a region has an indicator of 1) high per capita income; 2) high productivity of human resources; 3) the transformation of the economic structure; 4) there is a transformation of socio-cultural ideology; 5) ability to expand markets; (6) awareness that economic growth is temporary. High and sustainable economic growth is a condition needed for economic development, so that it can be used as one of the important indicators to analyze a country's economic development. An economy can be said to have experienced growth or growth if the Gross Gross Domestic Product (GDP) and Gross Gross Regional Regional (GDRP) are higher than those achieved in the previous period. If a country's economic growth has increased, there will be an increase in employment opportunities, welfare, productivity and income distribution.

Economic growth is the impact of economic development. Development must be viewed as a multidimensional process that includes a variety of fundamental changes to social structure, attitudes of the community, and national institutions, in addition to pursuing accelerated economic growth, handling income inequality, and alleviating poverty (Todaro, 2009: 18). The agricultural sector has an important role in economic development, namely: 1) Providing greater food surpluses to the increasing population of the population; 2) Increase the demand for industrial products, thereby encouraging the expansion of the secondary and tertiary sectors; 3) Providing additional foreign exchange income for the import of capital goods for development through the export of sustainable agricultural products; 4) Increase village income to mobilize the government; 5) Improve the welfare of rural communities.

Natural Resources and Pandora Box

Natural resources are raw materials provided by nature and are needed by the community in meeting their life needs (Menard, 1974; Randall, 1987). Natural resources provide a concept of scarcity in the economy that creates fluctuations in the price of goods and services. Rare goods will have a high value but the goods that are widely



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circulated in the market will have a low value. This price fluctuation creates a market mechanism in determining the balance in the economy. Natural resource management must consider the efficiency associated with sustainable development so that natural resources have a positive impact in the future. Management of natural resources in developing countries relies heavily on natural resources which in the future will lead to a natural curse (Humphreys, 2007). The resource curse is caused by economic growth in an area that is sluggish compared to the costs or losses of exploitation of these resources. Another factor is that countries that use natural resources tend to be slow to innovate in the economy. The World Bank (1993) shows a contradictory phenomenon between the development and exploitation of resources and environmental sustainability. In the long run the resource curse will occur in a country rich in natural resources that cannot preserve the environment.

Pandora's box when linked to the economy is a condition in which a dominant and natural resource sector in certain conditions will have a negative impact on the economy. It is intended that Pandora's Box will reflect the negative impact of the exploitation of these resources continuously without considering the rules of sustainable development. Mastery of large resources will have an impact on exploitation that negatively affects the economy (Pratomo, Mahmudah, and Wardhono, 2011). Exploration and exploitation of natural resources with high intensity will lead to the enactment of nature curse in the economic sector (Qori'ah, Pratomo and Indrawati, 2011). Pandora's Box will make a negative contribution to the level of community welfare that is directly related to exploited natural resources.

MATERIALS AND METHODS

This study uses a quantitative research approach. The data used in this research is secondary data. The data used in this study include Gross Regional Domestic Product, road infrastructure, electricity infrastructure, number of fishing motorboats, human development index, and area of aquaculture. Data sources were obtained from the publication of the Central Statistics Agency, Bank Indonesia, the Financial Services Authority and the Ministry of Maritime Affairs and Fisheries of the



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Republic of Indonesia. The population of this study is 4 (four) Provinces in the Eastern Indonesia Region. The sampling technique of this research is purposive sampling, namely the selection of samples based on several criteria, among others: 1) Provinces receiving BLM funds for PNPM Mandiri KP programs; 2) Provinces with a proportion of coastal areas $\geq 5\%$ compared to the total provincial area; 3) The contribution of the Fisheries Sub-sector GRDP $\geq 1\%$ to the total provincial GRDP for the period 2005-2016. Based on the selection criteria, the research samples obtained were 4 provinces, namely Maluku, North Maluku, Papua and West Papua.

The analysis technique of this study uses multiple linear regression analysis with the following equation:

$$\text{GDRP}_{it} = \alpha_0 + \alpha_1 \text{Road}_{it} + \alpha_2 \text{Electricity}_{it} + \alpha_3 \text{Boat}_{it} + \alpha_4 \text{HDI}_{it} + \alpha_5 \text{Area}_{it} + \varepsilon_{it}$$

define:

GDRP_{it} : Fisheries Sub-Regional Gross Domestic Product in the i - province in the year- t ;

Road_{it} : the amount of road infrastructure in the i - province in the year- t ;

Electricity_{it} : the amount of electricity installed in the i - province in the year- t ;

Boat_{it} : the number of fishing boats in the i - province in the year- t ;

HDI_{it} : The Human Development Index in the i - province in the year- t ;

Area_{it} : the area of fisheries in the i - province in the year- t ;

α_0 : constant;

$\alpha_1 \dots \alpha_5$: parameter

ε_{it} : error standart

Selection of the panel data model using the chow test and the Hausmann test. Test panel data models using classical assumptions that include linearity, multicollinearity, heteroscedasticity, autocorrelation, normality. Test the research hypothesis using t-statistical test, statistical F test, and Determination Coefficient (R^2).

RESULTS AND DISCUSSION



RESULTS

The selection of the panel data model is done by using the chow test and the Hausman test. Chow tests are performed to determine the choice of fixed effects model (FEM) or Common effects model (CEM) models. Hausmann Test Test is done to determine the right model used between the fixed effect model (FEM) or random effects model (REM). Following are the results of the selection of the research model:

Table 1 The Results of Chow and Hausmann Test of Revision of Pandora Box Modell

Criteria	Value	Comparasion	Result
Prob. F α 5%	0.0010 0.05	Prob. F < α 5%	FEM
Prob. Chi-square α 5%	0.0002 0.05	Prob. Chi-square < α 5%	FEM

Source: processed data 2018

Based on the results of the Chow test and the Hausman test, it is shown that the research model is Revision of Pandora box model using fixed effects model (FEM). This is indicated by the F-probability value of 0.0010 which is smaller than α of 5%. On the other hand, the chi square probability value of 0.0002 is smaller than α of 5%.

The results showed that the road and electricity variables had a significant and positive effect on the level of welfare of coastal communities in the Eastern Indonesia Region. This is indicated by the probability value of the road variable of 0.0244, the variable of electricity is 0.0000 which is smaller when compared with the value of α of 5% or 0.05. The results of the analysis show that if the improvement of road infrastructure by 1 Km will increase the Gross Regional Domestic Product (GRDP) of Eastern Indonesia Region by 0.030830 Billion Rupiah, but if the road infrastructure has decreased such as road damage of 1 Km it will reduce the Gross Regional Domestic Product (GRDP) Eastern Indonesia Region of 0.030830 Billion Rupiah. If there is an increase in the electricity infrastructure of 1 KVA, it will increase the Gross Regional Domestic Product (GRDP) of Eastern Indonesia Region by 117.5536 Billion Rupiah, but if there is a decrease in electricity infrastructure by 1 KVA it will reduce the Gross



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Regional Domestic Product (GRDP) of Eastern Indonesia Region 117.5536 Billion Rupiah.

Table 2 Estimation Result of Revision of Pandora Box Model*

Variable	Coefficient	T-Stat	Probability	α	Result
Road	0,030830	2,341037	0,0244	0,05	Significant
Electricity	117,5536	5,477168	0,0000	0,05	Significant
Boat	-2,194368	-3,164771	0,0030	0,05	Significant
HDI	-913,8687	-0,887072	0,3805	0,05	Not Significant
Area	0,186759	0,549468	0,5858	0,05	Not Significant
C	82492,64	1,207732	0,2344	0,05	Not Significant
F-statistic	38.52312				
Prob(F-statistic)	0.000000				
R-squared	0.887668				
Adjusted R-squared	0.864625				

Source: processed data 2018

Information:

* Passed the classical assumption of linearity, multicollinearity, autocorrelation, heteroscedasticity and normality

Ship have a significant and negative influence on the level of welfare of coastal communities in the Eastern Indonesia Region. This has an impact if there is an increase in the number of fishing boats by 1 unit, it will reduce the Gross Regional Domestic Product (GRDP) of Eastern Indonesia Region by 2.194368 billion Rupiah, but if there is an increase in the number of fishing vessels by 1 unit, it will increase Gross Regional Domestic Product (GRDP) East Indonesia Region 2,194368 Billion Rupiah. The Human Development Index (HDI) and Fisheries Cultivation Area variables have no significant effect on the level of welfare of coastal communities in the Eastern Indonesia Region. Fluctuations in the HDI and Area values will not affect the level of welfare of coastal communities in the Eastern Indonesia Region.

Based on the results of the F test, it is known that the probability value of F is 0.000000 smaller than the value of α of 5% (0.05). This shows that the variables of road, electricity, ship, HDI and area simultaneously have a significant effect on PRDB during the period 2005-2016. The coefficient of determination used is adjusted R-



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squared of 0.864%. This shows that the variables of road, electricity, ship, HDI and area can explain the GRDP of the Eastern Indonesia Region for the period of 2005-2016 of 86.4%, the remaining 13.6% is explained by other variables not included in the model.

DISCUSSION

Road infrastructure development is the right policy applied to the Eastern Indonesia Region not only limited to coastal areas but also inland areas. This is based on road quantity and road quality in the entire low eastern Indonesia region. Road development will have a positive impact on the economy, social and culture. The positive impact of road infrastructure development is the smooth running of economic activities, the decline in the prices of goods and services, the improvement of community welfare and the addition of the economic sector. Road infrastructure is needed by all business entities and communities in creating economic activities that contribute positively to the economy. Production, distribution and consumption activities will be more smooth with the development of road infrastructure. The prices of goods and services in the Eastern Indonesia Region tend to be higher than other regions in Indonesia due to the limitations of decent roads in the distribution of goods and services to the region. Obstacles in the distribution channel make the supply chain of goods and services inefficient. Inefficiency results in people having to pay more for goods and services than market prices due to high distribution costs. Inefficiency will reduce the level of community welfare in the Eastern Indonesia Region. Road infrastructure development will increase efficiency so that the price of fuel for vehicles and other goods in the economy will experience a periodic decline. The economic sector that was previously not utilized by coastal communities East Indonesia Region can be optimized to become a base sector and source of income. Optimizing other economic sectors will increase people's income which reflects the improvement of welfare. The community will be able to explore the region to the countryside and inland in the Eastern Indonesia Region.



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The development of road infrastructure will stimulate the community in distributing and marketing the marine wealth that is not limited to local but also regional and national regions. Road development will facilitate fishermen and coastal communities in marketing their local products which so far have only been consumed by local areas. Local consumption and limited distribution channels result in lower bargaining power of fishermen and other coastal communities than other business actors in the fisheries sector. This is because the sea products obtained are traditional and not durable. Products that are not durable are utilized by other businesses to reduce the price of these products. Fishermen do not have an alternative option to sell their products so that they get prices below market prices. Fishermen receive welfare losses due to the limitations of road infrastructure because they are not able to expand their product marketing area. Good road infrastructure supports fishermen to collaborate in selling their products at regional and national levels to obtain higher prices.

Electricity infrastructure development is the Indonesian government's development priority in the Eastern Indonesia Region. This is due to limited public access to use electricity infrastructure. Eastern Indonesia has limited infrastructure in urban areas and the majority of coastal communities have not received adequate and adequate electricity supply. Low electricity supply causes obstacles to economic activity in all economic sectors of the region. Electricity is the primary need of the community for the needs of life and supporting the fish processing industry. Low electricity infrastructure has resulted in the community not being able to utilize electrical equipment that helps the fisheries sector. The majority of fishermen do not have refrigerators to store fish catches and other marine assets so they can last a long time and have a stable price. The development of electricity infrastructure provides the potential for coastal communities to utilize access to electricity for the engineering of fish catches and other marine products through home industries to further process marine products. Further processing of marine products with adequate electricity infrastructure will increase the added value of the price of farmers' marine product.



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Government policy implemented by providing ship assistance to fishermen in the Eastern Indonesia Region in the long run will reduce the level of welfare of coastal communities. This is because the majority of ships provided are motorized vessels that have low capacity and sea coverage. The majority of fishermen have motorboats with sizes below 10 Gross Ton (GT) which provide obstacles to explore and exploit Indonesia's marine natural resources. This obstacle is caused by ships under 10 GT cannot sail to the middle of the sea because they are vulnerable to high water waves and strong winds. Therefore, the government must increase the capacity and quality of motorboats to support fishermen's activities in exploring and exploiting marine products in Eastern Indonesia. Fishing motorboats must have equipment that has advanced technology to create efficiency and optimization in their business activities. If the motorboat used is still limited to when the size of 10 Gross Ton (GT), the increase in fishery products will give a negative contribution because the results of marine wealth will not be used by Indonesian fishermen but by foreign fishermen who carry out illegal fishing. Illegal fishing will result in overfishing in the Eastern Indonesia Region which in the long run will lead to the enactment of a resource curse. The resource curse is caused by an explosion of fishermen's problems continuously stored in Pandora's box in the marine economy of Eastern Indonesia.

CONCLUSION

Based on the results of the study it was shown that the variables of road and electricity infrastructure research had a significant positive effect on the level of community welfare in the Eastern Indonesia Region for the period 2005-2016 which was reflected by the GRDP. Ship Infrastructure variables have a significant negative effect on the level of community welfare in the Eastern Indonesia Region for the period 2005-2016 which is reflected by the GRDP. The government is increasing infrastructure development not only in quality but also in quantity, especially in relation to roads and electricity, which is the basis for driving the economy. The government increased ship ownership capital assistance to fishermen in the Eastern Indonesia Region which has a size of more than 10 GT in order to be able to sail further for



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exploitation and exploitation of lau fishery products / catch Indonesia. If the motorboat used is still limited to when the size of 10 Gross Ton (GT), the increase in fishery products will give a negative contribution because the results of marine wealth will not be used by Indonesian fishermen but by foreign fishermen who carry out illegal fishing. Illegal fishing will result in overfishing in the Eastern Indonesia Region which in the long run will lead to the enactment of a resource curse. The resource curse is caused by an explosion of fishermen's problems continuously stored in Pandora's box in the marine economy of Eastern Indonesia.

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