JEE 12 (1) 2023 : 160-170

Journal of Economic Education

http://journal.unnes.ac.id/sju/index.php/jeec

Analysis of the Impact of Fisheries and Maritime Investment on the Indonesian Economy with the Interregional Input Output (IRIO) approach

Yullian Haumahu✉

Development Economics Study Program, Faculty of Economics and Business, Diponegoro University

Article Info

Article History :
Received March 2023
Accepted April 2023
Published June 2023

Keywords:
spatially Fisherment Investment, IRIO, Impact Analysis

Abstract

To analyze the impact of fisherseries and marine investment on the economy with an interregional input output (IRIO) approach. This research uses an interregional input output (IRIO) approach. The secondary data used are ten provinces of Maluku and the IRIO tables obtained from the Central Statistics Agency. The data analysis used are the analysis of the IRIO model approach, needs analysis and investment impact analysis. The results show that the sectors included in the marine sector have a positive role in the regional economy in Indonesia. This is obtained from the degree of coefficient of direct and indirect linkage both to the backward and to the future. Marine development policy through increasing the final demand component () of marine has a positive impact on the economy and regional economy in Indonesia both sectorally and spatially.

✉ Correspondence :
Jl. Pleburan, City of Semarang, Central Java 50241, Indonesia
E-mail: yulian_haumahu@yahoo.com

p-ISSN 2301-7341
e-ISSN 2502-4485

INTRODUCTION

Maluku waters have high potential economic resources, as marine biological resources, minerals and marine tourism. The contribution of fisheries exports to total exports in Maluku Province is 59 percent and is the largest contributor among the contributing sub-sectors. Fishery exports are the most potential instrument in stimulating economic growth because of their carrying capacity.

Bearing in mind that if Maluku is made a national fish barn then regional growth and development will be more felt and will have a huge impact on both the region and the central government itself. Investment is one of the keys to the pace of economic growth, because in addition to encouraging a substantial and significant increase in output, it also directly and automatically increases an input demand, so that in the end it will increase employment opportunities as well in terms of social welfare as the end result of increased income. accepted by society. In Law Number 13 of 2014 concerning employment, expanding employment opportunities is the responsibility of all parties. Labor is one of the fundamental aspects of human life.

Another thing that is still a fundamental problem in future economic development is regional economic inequality, and also if it is linked more to the role of government policy. Based on the results of research conductedHadi (2001), it is known that the phenomenon of regional economic inequality in Indonesia is inseparable from the role and policies of the government. According toHadi (2001)Judging from the location of production, the industrial sector is oriented towards the domestic market which is centered on the western region. While the primary sector apart from the food crops sub-sector, is mostly found in Java Island, while in the East Region, namely forestry, fisheries and mining. This also has an impact on differences in the progress of infrastructure development in the two regions.

From writingHadi (2001)further explaining development policies that can have an impact on the level of investment that is disproportionate between regions. Investment activities are distinguished between government investment in the form of development spending for infrastructure and business investment. So far, the central government's allocation of development spending for regional development has not been based on an appropriate formulation.

Government intervention is needed to be more serious in overcoming this. Among other things, this can be done through efforts to increase regional economic activities, which are mainly carried out by utilizing the potential of natural resources more optimally, including the potential for fisheries and marine resources. In aggregate, marine makes a relatively large contribution to the national economy (Kusumastanto, 2002;Dahri, 2003;Fauzi, 2010). Contributions made by other sectors included in the maritime sector in the national economy.

One form of analysis tool that can be used in this case is the Inter Regional Input Output (IRIO) analysis. IRIO is a form of analysis tool that is used or used to measure economic linkages between regions. In this IRIO analysis, inter-sectoral linkages in a region with other regions can be seen using the inter-regional trade matrix. With IRIO analysis the flow of goods and services between sectors and also between regions can be known. InterRegional Input-Output (IRIO) has the advantage that IRIO is able to show the role of each region or region and the interdependence between regions and regions. Interreginal input-output (IRIO) besides being able to show sectoral independence structure,

Based on the description above, the researcher is interested in writing about the Linkage Analysis and Impact of Fisheries and Maritime Investment on the economy with the Interregional Input Output (IRIO) approach which aims to analyze the role of the fisheries and marine investment sector in the economy, analyze the impact of investment in the fisheries and marine sector on the economies of other regions.

RESEARCH METHODS

The research to be examined was carried out in Maluku Province. Secondary data were obtained from the Central Bureau of Statistics (BPS) and also from several other sources that could assist research whose data were deemed relevant to the

research being conducted. This study uses the Inter Regional Input Output (IRIO) model approach, where the observed area includes 34 provinces in it according to the 2016 Indonesia IRIO table(BPS., 2021). Which were then grouped into six main island regions including Java Island, Sumatra Island, Kalimantan Island, Bali Island and West Nusa Tenggara, Sulawesi Island, and Papua and Maluku Islands). The type of data that will be used in this research is in the form of secondary data obtained from BPS, namely Table IO Maluku Province and Table IRIO. The 2016 Indonesia IRIO table is a table developed by the National Planning and Development Agency / (Bappenas) which consists of 35 Provinces and 52 Industries within it. Data processing is carried out with three analyses, namely analysis of forward linkages, analysis of linkages between sectors, analysis of impacts between regions(Bappenas, 2011).

1. Analysis of future linkages. the formula is;

$$FLi = \sum \alpha ij \; n \; j=1 \qquad (1)$$

Where:

FLi = Direct linkage to the future of the economic sector (i)

aij = Element of Leontief's goodness matrix.

2. Backward linkage analysis Using the formula, namely:

$$BLi = \sum \alpha ij \; n \; j=1 \qquad (2)$$

Where:

BLj = Direct linkages to other economic sectors (j)

αij = Input coefficient matrix element.

3. Analyze Interrelationships Between Sectors.

a. Spread Power Index (IDP)

$IDP_j = \sum_i^n = 1gij \; / \; \frac{1}{n} \sum i \sum j \; gij$

b. Sensitivity Index(IDK)

$IDK_i = \sum_i^n = 1gij \; / \; \frac{1}{n} \sum_i \sum_j gij$

IDP and IDK are comparisons of impacts, both forward and backward, against the average value of the impact of all sectors. In other words, an IDP value > 1 means that the backward linkage of that sector is higher than the average value of the backward linkage of all sectors. On the other hand, IDK>1 means that the future linkage value of the sector is higher than the average value of all sectors.

4. Interregional impact analysis.

In the IRIO model, using the existing table, the total value of each impact can be seen by calculating the multiplier effect value in order to obtain a multiplier value for each indicator of output, income and added value. The equation used in calculating the multiplier effect is;

-Output Multiplier

$$Oj = \sum\nolimits_{-}i^{n} = 1aij$$

Information;

Oj = type I sector j output replacement value

Aij = inverse efficiency matrix of the open model input

-Income Multiplier

$$Wj = \sum\nolimits_{-}i^{n} = 1aij \; ej$$

$Wj^* = w/ej$

Information;

Wj = Sector j's ordinary income multiplier

Wj* = Type I income multiplier for sector j

Ej = Income coefficient

aij = inverse matrix of input coefficients in the open model

-Added Value Multiplier

$$Yj = \sum\nolimits_{-}i^{n} = 1 \; aij \; hj$$

$yj^* = y/hj$

Information;

yj = ordinary value added multiplier of sector j

yj* = Value Added Multiplier type I sector J

hj = Value Added Coefficient

aij = Inverse matrix of input coefficients in the open model.

RESULTS AND DISCUSSION

The Role of the Sea in the Regional Economy in Indonesia

The analysis of the role of maritime affairs in the regional economy in Indonesia in this case is intended as the role of the sectors included in the marine sector in the regional economy in Indonesia. This analysis of the role of the sea is focused on three parts, namely the analysis of maritime linkages in the regional economy in

Indonesia, the analysis of the maritime multiplier in the regional economy in Indonesia, and the analysis of the share of maritime affairs in regional economic growth and convergence in Indonesia. Linkage analysis is carried out through the concept of linkage by including direct effects and indirect effects or also called total linkage which includes total backward linkage (total dispersion power) and total forward linkage (total sensitivity degree).Nazara, 1997;West, 1982).

Backward and Forward Direct and Indirect Linkages of Maritime Affairs in the Regional Economy in Indonesia

Analysis of the direct and indirect backward linkages of the marine sector shows the direct and indirect effects of an increase in the final demand for one unit of output of the i-th marine sector in a region on the output of all economic sectors both in that region and in other regions. If the increase in output that occurs is more due to an increase in input demand by the marine sector, it means that the maritime sector will demand more output from other sectors to meet intermediate inputs in the 2nd maritime sector.i.

Table 1 . Direct and Indirect Linkages to the Rear of the Maritime and Non-Marine Sector in the Regional Economy in Indonesia, 2016

No	Sector	Coefficient of Direct and Indirect Back Linkage					
		Sumatra	Java	Borneo	Sulawesi	Bali-Nusteng	Papua-K. Maluku
I. Maritime Sectors							
Marine and Brackish Fisheries							
1	Fishery Catch the sea	1.35508	1.34335	1.36462	1.61232	1.40001	1.71847
2	Mariculture and Brackish Aquaculture	1.33986	1.33295	1.34308	1.66836	1.36013	1.20985
Mining and Quarrying at Sea or offshore							
3	Oil, gas and geothermal mining at sea or offshore	1.14770	1.10632	1.10117	1.18198	1.00000	1.14077
4	mining of tin ore, iron sand ore and coarse salt from the sea	1.36429	1.36601	1.32090	1.27793	1.37680	1.26747
Maritime Industry							
5	Extraction of petroleum from sea or offshore	1.70358	1.11829	1.75054	1.00000	1.00000	1.64889
6	Marine and brackish fishery product processing industry	2.03074	1.51620	1.61498	1.70535	2.37040	1.96280
7	Manufacture of sea and river conveyance, repair and equipment	1.51688	1.50476	1.44104	1.33934	1.28751	1.26049

8	Marine Building	1.71206	1.77933	1.52493	1.90083	1.84834	1.45188
9	Sea Water Transportation	1.72474	1.72880	1.77699	1.87125	1.67897	1.77334
Marine tourism							
10	Hotels and restaurants around the beach / coast	1.97721	1.78231	1.98347	1.93247	1.86081	1.91753
11	Marine Tourism Services	1.65050	1.46396	1.72318	1.78670	1.61755	1.82430
12	Other Marine Services	1.55170	1.42544	1.46623	1.56014	1.49871	1.47256
II. Non-Marine Sectors							
13	Agriculture without Marine and Brackish Fisheries	1.32576	1.31661	1.39583	1.31829	1.39433	1.30647
14	Mining, Quarrying and other Oil Refining	1.37824	1.18866	1.28485	1.00985	1.37680	1.27281
15	Non Maritime Industry	1.98868	1.87933	2.00411	2.02379	1.61140	2.13529
16	Electricity, Gas and Clean Water	1.96942	1.73531	1.89332	1.55062	1.42340	1.14230
17	Non-Marine Buildings	1.71206	1.77933	1.52493	1.90083	1.84834	1.45188
18	Trade, Hotels and other Restaurants	1.60280	1.50949	1.49343	1.56137	1.49779	1.51579
19	Other Transportation (Land and Air) and Communications	1.70083	1.61597	1.52164	1.68183	1.88720	1.54902
20	Finance, Public Administration and Defence	1.10785	1.23516	1.09771	1.10755	1.10602	1.04293
21	Other services	1.54838	1.42413	1.45716	1.55227	1.42945	1.46014

Based on the table above, it is known that the sectors covered in the maritime sector in each region have relatively different direct and indirect linkages to the back. In the following, the five marine sectors in each region that have the largest direct and indirect backward linkage coefficients are presented, namely the Sumatra Region in 2016. With a direct and indirect backward linkage coefficient of the above, it shows that the effect of increasing the final demand for one unit of output of the five marine sectors in the Sumatra Region will increase the output of all economic sectors respectively by 2.03074 units, 1.97721 units, 1.72474 units, 1.71206 units and 1.70358 units both in the region and other regions.

Java Region in 2016, with the coefficient of direct and indirect backward linkage of above, shows that the effect of increasing the final demand for one unit of output from the five maritime sectors in the Java Region will increase the output of all economic sectors respectively by 1.78231 units, 1.77933 units, 1.72880 units, 1.51620 units and 1.50476 units both in the region and other areas.

The Kalimantan Region in 2016, with the coefficient of direct and indirect backward linkage

of the above, shows that the effect of increasing the final demand for one unit of output from the five marine sectors in the Kalimantan Region will increase the output of all economic sectors by 1.98347 units respectively , 1.77699 units, 1.75054 units, 1.72318 units and 1.61498 units both in the region and other areas

Sulawesi Region in 2016, with the coefficient of direct and indirect backward linkage of above, shows that the effect of increasing the final demand for one unit of output from the five marine sectors in the Kalimantan Region will increase the output of all economic sectors respectively by 1.93247 units , 1.90083 units, 1.87125 units, 1.78670 units and 1.70535 units both in the region and other areas.

The Bali and Nusa Tenggara Regions in 2016, with the direct and indirect backward linkage coefficients of the above, show that the effect of increasing the final demand for one unit of output from the five marine sectors in the Bali and Nusa Tenggara Regions will increase the output of all economic sectors respectively. respectively 2.37040 units, 1.86081 units, 1.84834 units, 1.67897 units and 1.61755 units both in the region and other areas.

The Papua and Maluku Islands Region in 2016, with the direct and indirect backward linkage coefficient of above, shows that the effect of increasing the final demand for one unit of output from the five marine sectors in the Papua and Maluku Islands Region will increase the output of all economic sectors respectively. respectively 1.96268 units, 1.91753 units, 1.77334 units, 1.82430 units and 1.71847 units both in the region and other areas. Based on changes during the 2005-2010 period, the coefficient of direct and indirect linkage to the back of the maritime sectors of all regions in Indonesia (nationally) during that period, on average, has increased from 1.48 in 2005 to 1.54 or an average -the average during this period grew by 3.74%. This indicates that nationally, the maritime sectors of regions in Indonesia have experienced an increase in the direct and indirect effects of an increase in the final demand for one output unit of the marine sector i-th in a region on the output of all economic sectors in that region and other regions. ; thus causing an increase in output that occurred more due to an increase in demand for input by the marine sector which was greater than the previous year, which means that the marine sector will demand more output from other sectors than the previous year to meet the input between the i-th marine sector. the maritime sectors of regions in Indonesia experienced an increase in the direct and indirect effects of an increase in the final demand for one output unit of the i-th marine sector in a region towards the output of all economic sectors both in that region and in other regions; thus causing an increase in output that occurred more due to an increase in demand for input by the marine sector which was greater than the previous year, which means that the marine sector will demand more output from other sectors than the previous year to meet the input between the i-th marine sector. the maritime sectors of regions in Indonesia experienced an increase in the direct and indirect effects of an increase in the final demand for one output unit of the i-th marine sector in a region towards the output of all economic sectors both in that region and in other regions; thus causing an increase in output that occurred more due to an increase in demand for input by the marine sector which was greater than the previous year, which means that the marine sector will demand more output from other sectors than the previous year to meet the input between the i-th marine sector.

By region, the maritime sectors in most regions in Indonesia experienced an increase in the coefficient of direct and indirect backward linkage except for the Bali region which experienced a decrease in the coefficient of linkage. As shown in the table for the regions of Sumatra, Java, Kalimantan, Sulawesi and Papua-Maluku Islands experienced an increase in the coefficient of direct and indirect backward linkage, namely: respectively 6.86%, 7.71%, 1.52%, 1, 56%, and 6.22% while the Bali region experienced a decrease in the correlation coefficient of -2.44%.

Analysis of Direct and Indirect Forward Linkages

The sectors covered in the maritime sector have relatively different direct and indirect linkages based on their ranking. This can be seen from the five marine sectors with the largest direct and indirect backward linkage values in each region.

Table 2. Direct and Indirect Linkages to the Future of the Maritime and Non-Marine Sector in the Regional Economy in Indonesia, 2016

No	Sector	Coefficient of Direct and Indirect Back Linkage					
		Sumatra	Java	Borneo	Sulawesi	Bali-Nusteng	Papua-K. Maluku
I. Maritime Sectors							
Marine and Brackish Fisheries							
1	Fishery Catch the sea	1.42767	1.08003	1.13829	1.18756	1.04254	2.05793
2	Mariculture and Brackish Aquaculture	1.21999	1.04159	1.05084	1.15195	1.07066	1.00702
Mining and Quarrying at Sea or offshore							
3	Oil, gas and geothermal mining at sea or offshore	2.22631	1.22732	1.55359	1.05263	1.00000	1.61786
4	mining of tin ore, iron sand ore and coarse salt from the sea	1.02224	1.01134	1.05418	1.31151	1.01769	1.03769
Maritime Industry							
5	Extraction of petroleum from sea or offshore	1.54662	2.42919	1.62251	1.00000	1.00000	1.18341
6	Marine and brackish fishery product processing industry	1.21113	1.09683	1.05599	1.20292	1.02222	1.14942
7	Manufacture of sea and river conveyance, repair and equipment	1.00301	1.41586	1.00169	1.00926	1.00363	1.00155
8	Marine Building	1.00533	1.00906	1.00411	1.00695	1.23685	1.00190
9	Sea Water Transportation	1.16420	1.13043	1.40632	1.10056	1.08005	1.19030
Marine tourism							
10	Hotels and restaurants around the beach / coast	1.04496	1.13103	1.02522	1.02566	1.53377	1.02124
11	Marine Tourism Services	1.02187	!,04500	1.00633	1.01245	1.23325	1.00612
12	Other Marine Services	1.06807	1.13089	1.01684	1.03921	1.06834	1.01929
II. Non-Marine Sectors							
13	Agriculture without Marine and Brackish Fisheries	2.94359	2.14581	2.13843	2.03527	2.50140	3.61003
14	Mining, Quarrying and other Oil Refining	1.99934	1.78642	2.83509	1.00739	1.20229	1.69592

15	Non Maritime Industry	6.27883	11.25788	3.18610	2.70100	2.14517	1.62342
16	Electricity, Gas and Clean Water	1.25578	1.31732	1.13395	1.16825	1.14835	1.09275
17	Non-Marine Buildings	1.39605	1.69003	1.31853	1.54254	1.01768	1.14468
18	Trade, Hotels and other Restaurants	1.57120	3.34823	1.98123	2.11084	2.09813	1.76060
19	Other Transportation (Land and Air) and Communications	1.68194	1.75196	1.49837	1.47458	1.77823	1.30260
20	Finance, Public Administration and Defence	1.16042	1.82613	1.11620	1.28797	1.10384	1.10825
21	Other services	1.62004	2.21072	1.16157	1.38158	1.41515	1.17852

The Sumatra region in 2016, with the direct and indirect forward linkage coefficients of the above, shows that the effect of increasing the final demand for one unit of output from the five marine sectors in the Sumatra region will increase the output of all economic sectors by 2.22631 units respectively, 1.54662 units, 1.42767 units, 1.21999 units, 1.21113 units both in the region and in other regions.

The Java Region in 2016, with the coefficient of direct and indirect forward linkage of the above, shows that the effect of increasing the final demand for one unit of output from the five marine sectors in the Sumatra Region will increase the output of all economic sectors in a row by 2.42919 units, 1.41586 units, 1.13103 units, 1.13089 units, 1.13043 units both in the region and in other regions.

Kalimantan Region In 2016, with the direct and indirect forward linkage coefficients of the above, it shows that the effect of increasing the final demand for one unit of output from the five marine sectors in the Kalimantan Region will increase the output of all economic sectors respectively by 1.62551 units , 1.55359 units, 1.40632 units, 1.13829 units and 1.05599 units, both in the region and other areas.

The Sulawesi region in 2016, with the direct and indirect forward linkage coefficients of the above, shows that the effect of increasing the final demand for one unit of output from the five marine sectors in the Sulawesi region will increase the output of all economic sectors by 1.20292 units respectively. , 1.18756 units, 1.15195 units, 1.10056 units and 1.05263 units, both in the region and other areas.

The Bali and Nusa Tenggara Regions in 2016, with the coefficients of direct and indirect forward linkages of the above, show that the effect of increasing the final demand for one unit of output from the five maritime sectors in the Bali and Nusa Tenggara Regions will increase the output of all economic sectors respectively. respectively 1.53377 units, 1.23685 units, 1.23325 units, 1.08005 units and 1.07066 units, both in the region and other areas.

The Papua and Maluku Islands Region in 2016, with the direct and indirect forward linkage coefficients of the above, shows that the effect of increasing the final demand for one unit of output from the five marine sectors in the Papua and Maluku Islands Region will increase the output of all economic sectors respectively. respectively 2.05793 units, 1.61786 units, 1.19030 units, 1.18341 units and 1.14942 units, both in the region and other areas.

AnalysisImpactMarine Development Sector

The sectoral impact simulation in this study is intended to simulate the impact on the national economy as a result of marine development policies carried out by increasing the final demand component of the marine sectors, in this case consisting of investment, exports and household consumption in marine economic activities by two times. (increased by 100% from before) in all

regions. Sectoral Impacts Due to Changes in Marine Investment Table 87 presents sectoral impacts on output, gross added value and household income due to an increase in marine investment by two times (100% from the previous). The simulation results show that an increase in investment in the sectors covered by the maritime sector by 100% will increase output, gross added value and household income in all (national) economic sectors respectively 2.40%, 2.71% and 2.34%; and in the maritime sector respectively 15.40%, 13.46% and 14.27%. The five marine sectors that have the largest increase in output, gross added value and household income due to an increase in national marine investment by 100%, -- based on the simulation results on are: sector-6 (marine and brackish fishery product processing industry), sector-7 (industrial sea and river transportation equipment, repairs and equipment), sector-12 (other marine services), sector-5 (refining petroleum from sea or offshore), and sector-11 (marine tourism). In addition, there were three subsequent sectors that experienced a significant increase in output, namely: sector-10 (hotels and restaurants around the coast), sector-1 (sea capture fisheries), and sector-2 (marine and brackish aquaculture fisheries). The biggest increase in output was in the five sectors respectively 47.45%, 34.66%, 24.97%, 21.03% and 11.86%; and followed by the next three sectors at 6.74%, 7.73% and 7.74% respectively. The largest increase in gross value added was in the five largest sectors, respectively 54.91%, 34.54%, 23.46%, 21.54% and 9.37%; and then followed by the next three sectors each at 6.87%, 6.76%, 6.75%. Then the largest increase in household income was in the five sectors respectively 57.94%, 34.68%, 26.80%, 21.20% and 9.36%; in addition followed by the next three sectors respectively, 7.78%, 7.58%, and 7.56%. sectorally, a 100% change in marine investment in the national economy (all regions) has an impact on the tendency of changes in the coefficient of variation or the convergence tendency of output, gross added value and marine household income which is increasingly convergent for the sectors covered in the maritime sector (aggregate). This is indicated by changes in the coefficient of variation in output, gross added value and household income for the sectors covered in the maritime sector in aggregate, which are -0.08, -0.13 and -0.25 respectively. Changes in the coefficient of variation with a negative sign (-) for each output, gross added value and household income for all sectors, marine sectors and non-marine sectors. The more negative the change in the coefficient of variation means more lame, which means that the more convergent the output, gross added value and household income of these sectors after the change in marine investment is 100% for all regions in Indonesia. Conversely, if the change in the coefficient of variation is positive (+), it means that after a 100% change in maritime investment for all regions in Indonesia, the output, gross added value and household income of these sectors have an increasingly divergent tendency. When observed based on the change in the coefficient of variation (inequality), it can be seen that the impact of changes in marine investment has an impact on the degree of convergence tendency in the sectors covered in the maritime sector in aggregate which is greater in changes in household income compared to gross added value and output.

Spatial Impact Analysis of Marine Development

The idea of directing development activities and priorities to areas within Eastern Indonesia (KTI) has emerged since the 1990s.(Muchdie., 1998), this is mainly because the regions in the Western Region of Indonesia (KBI) dominate the economy compared to KTI. Since then, the central government has paid great attention to these areas in KTI, namely by relocating economic activities from KBI. This study, through simulation analysis, compares the impact of concentrating marine economic activities in KBI with the impact of moving these economic activities to KTI, and compares the two with simulations if economic activities are carried out in all regions of the Republic of Indonesia (KBI and KTI). These simulations are carried out using instruments for changes in the value of intermediate demand components, namely: due to changes in investment, exports, household consumption, and government consumption in the sectors covered in the marine sector. Each of these simulation results are presented in the following description. Spatial Impact Due to Changes in Maritime Investment The results of a maritime development policy

simulation carried out by doubling (increasing by 100%) good marine investment in all regions/NKRI (simulation-1), concentrating it only in areas covered in KBI (simulation- 2), or by concentrating it only in the areas covered in KTI (simulation-3), it turns out that it has the effect of increasing the creation of output, gross added value, and household income in these areas compared to the conditions before the simulation. For simulation-1, the percentage of output creation, gross added value and household income increased respectively by 2.40%, 2.71% and 2.31%; for simulation-2, increase by 2, 22%, 2.39% and 1.99%; and for simulation-3 increases by 0.45%, 0.52%, and 0.47%. Increase in the percentage of output value creation, gross value added and household income resulting from simulation-2 (by concentrating on increasing marine investment by 100% in the areas covered by KBI) which is relatively larger compared to the results from simulation-3 (by concentrating a 100% increase in marine investment in areas covered by KTI). However, the impact of the change in investment for the two simulations (KBI and KTI) was still able to have a spill-over effect on other regions. This means that although the increase in investment still provides an increase in the percentage value of output, gross added value and household income in other areas outside their own region (inter-region). This encourages an increase in the percentage value of output, gross added value and household income which is relatively larger in each region so that the result of changes in marine investment is 100% evenly distributed in all regions in Indonesia.

Policy Implications

The implications of the findings indicate that in order to increase regional economic growth in Indonesia above, it is necessary to intervene or intervene the government through policies which include the following efforts:

1. Encouraging the mobility of physical capital investment and human capital investment for all regions in Indonesia,
2. Increase the involvement of central and regional governments that are more tangible to encourage economic growth (per capita income) between provinces and main island regions in Indonesia, which is carried out by increasing the accumulation of investment in physical capital and accumulation of investment in human capital, as well as controlling population growth, depreciating capital but still being able to encourage the level of technological development, especially for the main island areas which are considered relatively weak or less advanced.

Improving the economy of provinces that are relatively undeveloped or underdeveloped through efforts to develop productive business sectors by optimally utilizing and managing resources accompanied by increasing economies of scale (economy of scale) by increasing the development of cooperation in economic activities between provinces in the main island region .

.

CONCLUSION

The sectors covered in the marine sector have a positive role in the regional economy in Indonesia. as shown from the degree of direct and indirect correlation coefficient both backward and forward. Marine development policies through increasing the components of final demand (investment, exports, household consumption and government consumption) in marine have a positive impact on the economy and regional economies in Indonesia both sectorally and spatially. Given that this research answers more about the role of the sea in terms of economic interests, so that the research results are still a macro study, it is suggested that further research is needed which can answer to what extent the components of final demand (investment, exports, household consumption and government consumption) still provide a positive contribution to the regional economy while at the same time addressing aspects of marine resource sustainability. Comprehensive follow-up research is needed concerning the macro-economic and micro-sectors covered in the marine sector.

REFERENCES

Bappenas. (2011). *Analisis Perspektif, Peramasalahan dan Dampak Dana Alokasi Khusus (DAK)*. Bappenas.

BPS. (2021). "Tabel Interregional Input-Output Indonesia Transaksi Domestik Atas Dasar Harga

Produsen Menurut 34 Provinsi dan 17 Lapangan Usaha, 2016 (Juta Rupiah)."

Dahuri, R. (2003). *Paradigma Baru Pembangunan Indonesia Berbasis Kelautan. Orasi Ilmiah Guru Besar tetap Bidang Pengelolaan Sumberdaya Pesisir dan lautan. Fakultas Perikanan dan Ilmu Kelautan.* Institut Pertanian Bogor.

Fauzi, A. (2010). *Ekonomi Perikanan: Teori, Kebijakan dan Pengelolaan*. Jakarta: PT Gramedia Pustaka Utama.

Hadi, S. (2001). *Studi Dampak Kebijaksanaan Pembangunan Terhadap Disparitas Ekonomi Antar Wilayah (Pendekatan Model Analisis Sistem Neraca Sosial Ekonomi).* Program Pascasarjana Institut Pertanian Bogor.

Kusumastanto, T. (2002). *Reposisi "Ocean Policy" dalam Pembangunan Ekonomi Indonesia di Era Otonomi Daerah. Orasi Ilmiah Guru Besar Tetap Bidang Ilmu Perikanan dan Kelautan.* Institut Pertanian Bogor.

Muchdie. (1998). Permodelan Struktur Ruang Ekonomi Indonesia: Penerapan Prosedur GIRIOT untuk Menusun Tabel Input-Output Daerah. *Ekonomi Dan Keuangan Indonesia*, *56*(3).

Nazara, S. (1997). *Analisis Input-Output*. Jakarta: Fakultas Ekonomi Universitas Indonesia.

West, G. R. and R. C. J. (1982). *An Interregional Input-Output Table for Queensland 1978/79: GRIT III. Report to the Department of Commercial and Industrial Development.* University of Queensland, St. Lucia.

Dahuri, R. (2003). *Paradigma Baru Pembangunan Indonesia Berbasis Kelautan*. Institut Pertanian Bogor.

Daryanto, A. (2000). Growth and Structural Change in the Indonesian Economy: An Input-Output Perspective. *Journal of Agricultural and Resource SocioEconomics*, *13*(3), 2–12.

Donbusch, R., Fisher, S., and Starrz, R. (2001). *Macroeconomics*. New York, USA: McGraw Hill Education.

Fadel Muhammad, d. (2014). Faktor yang Berhubungan dengan Kelelahan Kerja Pengemudi Pengangkut BBM di TBMM PT. Pertamina Parepare. *Jurnal Fkm*.

Fauzi, A. (2010). *Ekonomi Perikanan: Teori, Kebijakan dan Pengelolaan*. Jakarta: PT. Gramerdia Pustaka Utama.

Hadi, S. (2001). *Studi Dampak Kebijaksanaan Pembangunan Terhadap Disparitas Ekonomi Antar Wilayah (Pendekatan Model Analisis Sistem Neraca Sosial Ekonomi).* Institut Pertanian Bogor.

Jensen, R. . (1980). An Introspective Evaluation of teh Regional Input-Output technique.

Paper to the First World Regional Science Congress. Cambridge Massachusetts.

Jensen, R. . (1990). Constrtuction and Use of Regional Input-Output Models: Progress and Prospects. *International Regional Science Review*, *13*(2), 9–25.

Jhingan. (2000). *Ekonomi Pembangunan dan Perencanaan* (Terjemahan). Jakarta: PT.

Raja Grafindo Persada.

Kuncoro. M. (2004). *Pertumbuhan Ekonomi Dan Ketimpangan Antar Wilayah dalam Buku Otonomi Dan Pembangunan Daerah*. Jakarta: Erlangga.

Kuncoro, M. (2004). *Otonomi dan Pembangunan Daerah: Reformasi, Perencanaan, Strategi dan Peluang*. Jakarta: Erlangga.

Kusumastanto, T. (2002). *Reposisi ―Ocean Policy‖ dalam Pembangunan Ekonomi Indonesia di Era Otonomi Daerah*. Institut Pertanian Bogor.

Lahr, M. and E. D. (2001). *Input-Output Analysis: Frontier and Extensions* (W. Antony Rowe, Ltd. Chippenham, Ed.). Great Britains.

Luthfi. (2005). *Analisis Pengaruh Foreign Direct Investment dan Eksport terhadap Pertumbuhan Ekonomi*. Jakarta: FEUI.

Mankiw, N.G., Romer, D., and Weil, D. N. (1992). A Contribution to the Empirics of Economic Growth. *The Quarterly Journal of Economics*, *102*, 407–437.