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Marine Fisheries Sector in Promoting Industrial Growth and Labor Absorption in Gorontalo Province, Indonesia

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Abstract
The contribution of agriculture, service, industry, trade, and finance sectors have numerous impacts in improving economics in a certain region for example in Gorontalo province of Indonesia. With its excellent programs in the agricultural sector, particularly the fisheries sub-sector, it is expected that it could trigger the other service sectors, especially in labor and industry. In analyzing the level of production that is created from marine fisheries sector, there should be a change in final demand which can be developed through the analysis of output multiplier. By analyzing the output multiplier of marine fisheries, it can be seen how much the contribution of marine fisheries sector is in supporting economic growth in Gorontalo province. From the analysis of the labor coefficient, it is obtained that the marine fisheries sector contributes 0.1571. It means that in order to produce one Rupiah (Indonesian Currency) of output, it needs 0.1571 fisheries sector workforce. The higher the coefficient of the labor sector, the higher absorption of labor in the concerned sector is needed. High labor coefficient generally occur in labor-intensive sectors, while the low coefficient of labor generally occurs in capital-intensive production process sectors which are done by utilizing high technology.
Keywords: Marine fisheries, Industrial growth, Labor absorption

1. Introduction

Entering the third millennium, many changes happen in governance system and management for the betterment of development. These changes also influence the emergence of new strategies namely decentralized approach to development. It brings the consequences of delegating authority from central to local government which well known as Regional Autonomy. It is a form of correction for any concentration of power that has led people into socioeconomic inequalities among groups, economic sectors and central and local government.

The emergence of regional autonomy cannot be separated from the demands of justice and the improvement of the people, especially in the area to improve the standard of living, respect for local, social and cultural conditions, and environmental sustainability. These changes directly affect other forms of management and utilization of marine resources. The Law Number 32 Year 2004 on Regional Government has shifted the sea area management authority from the central government to the regions. Local governments would have greater authority in planning the direction of its development.

On the other hand, local governments are increasingly required to be more independent in solving regional development problems. Autonomy also indicates that it is more important to develop region based on regional development planning approach than sectorial approach. Regional development planning approach considers the importance to integrate both sectorial and spatial as well as development actors within and between regions.

The integration of sectorial requires functional linkages and synergy among development sectors. Therefore, each development programs in the institutional sector is always held in the framework of regional development. One of the forms and the failure of the government in the past was the failure in creating a synergistic sectorial integration in the development of the region. Sectorial agencies at the regional are often just the extension of central sectorial agencies. As a result, government agencies fail to capture the complexity of development problems in a certain region which also impact on the level of local communities' participation.

The integration includes not only sectorial relationships between government agencies, but also between economic actors with widely have different backgrounds sector. Growing area indicated by inter-sectorial linkage region, in the sense of a transfer of input and output of goods and services among the most dynamic sectors. The integration of spatial interaction requires the presence of an optimal spatial structure in terms of the dynamic linkages between regions. Due to the potential of natural resources and socio-economic activities are spread unevenly and different, it is necessary to have an optimal mechanism of intra-and inter-region interactions. Due to limited resources, a development plan is always necessary to have priority based on an understanding that (1) each sector has a direct contribution to the achievement of different development goals (employment, regional income, etc.), (2) each sector has linkages with other sectors with different characteristics, and (3) sectorial activities are spread unevenly and specific, some sectors are likely to have a centralized and activities related to the distribution of natural resources, artificial infrastructure and social.

Based on the above Law on Regional Government, it is provide wider opportunities for each region particularly Gorontalo Province in order to optimize the management and the development of coastal and ocean

synergistically, organize, and explore the potential of existing resources, utilize, and control them in optimizing resource potential for the improvement of the livelihoods of the people in order to ensure environmental balance function.

One of the implications of Regional Autonomy is the development of marine fisheries and marine resources which are now to be one of the priorities in the development of Gorontalo province. In its development policy, it needs to be integrated with other economic sectors, so that development that is ego-sectors that could harm the interests of other sectors can be minimized. For this purpose, Gorontalo Province Input Output table in 2000 issued by the Central Bureau of Statistics (henceforth called BPS), Gorontalo province will be used as a planning study and regional economic analysis where the up-dating of the results table can be discovered in a reciprocal linkage system on regional economic both in the provision of input and output distribution.

The input which is needed in marine fisheries sector in the economic system such as: purchase of raw materials and auxiliary materials resulting from other economic sectors, wage and salary payments, tax payments, business surplus and depreciation, as well as imports from outside the province of Gorontalo. Furthermore, the output generated from marine fisheries distributed to: the other economic sectors as input, fulfilling the demands of households and government fixed capital formation, changes in stocks, and exports.

In such circumstances, the economic system will lead to an equilibrium region, the number of offers that is the sum of production and imports the entire system will be equal to the number of requests, which includes the elements of the system and export to foreign territory. This means that the input value equal to the amount of spending the income value of the whole sector. In the process towards equilibrium occurs propagation or round economic activity leading to a series of multiple impacts for various development indicators. From the regional economic system as outlined in the input-output table, it can be obtained a figure of the contribution, the relevance and impact of marine fisheries development in the region's economy. The results of the analysis relating to the IO tables can be further analyzed to obtain new information in relation to the region's economy.

From the above statement, it is understandable that in every region there are always sectors that are strategic, measured the size of the donations given in the region's economy as well as sectorial and spatial linkages. The developments of strategic sectors are significantly having both direct and indirect impacts. Indirect impacts caused by the development of the sector to the development of other sectors, and are spatially spread widely across the target area. Characteristics of the regional economic structure as indicated by the distribution sector donations, as well as sectorial and regional economic linkage region, can technically be described by using the Analysis Input-Output (IO Analysis) although with certain limitations (Nasution, Rustiadi, Saefulhakim, 2000:67)

The benefits of applying I-0 models in development planning include (Arsyad, 1999:98):

1. Give a production rate estimates and import corresponding to each other and according to the estimates of final demand to every sector of the economy.
2. Help allocate the investment required to achieve the level of production and provide a sharper test of the adequacy of available investment sources and to evaluate the need for educated labor.
3. Facilitate the analysis of imports and substitutes in various areas of the economy.
4. Estimate the direct need for capital, labor, and import and indirect needs of economic sectors.

1.1 Understanding Input Output Tables

Input-output analysis was first developed by Vassily W.Leontief in 1947. This technique is used to examine the linkages between industries in an effort for understanding the complexity of the economy and the condition to maintain a balance between supply and demand. This technique is also known as an inter-industry analysis.

Input output table is essentially a statistical description in the form of a matrix that presents the transactions of goods and services interrelations between one sector to other sectors in the economic activities of a region in a given period. With IO table, it can be seen how the output of an economic sector are distributed to particular sectors and how well the sector acquire the necessary inputs from other sectors. As a quantitative model, IO tables will give an overall picture on:

1. The economic structure of the region that includes the structure of output and value added in each sector.
2. The structure of intermediate inputs, i.e. transactions using a variety of goods and services by the production sectors.
3. Structure of the supply of goods and services, both in the form of production in the region as well as goods imported from or originating from other provinces.
4. The structure of demand for goods and services, both demand between the various sectors of production and final demand for consumption, investment and exports.

IO table compilation process itself will give you an idea of how much the consistency among the different data sources are used, making it useful for assessing the quality of statistical data compatibility and weaknesses and possibilities for the improvement of statistical development in the future.

1.2 Assumptions and Limitations

To use input-output models, the three basic assumptions below must be fulfilled, namely:

1. The assumption of uniformity / homogeneity, which requires that each sector produces a single output to a single input structure, and that there is no similar or substitute goods produced by other sectors.
2. The assumption of proportionality / proportionality, which requires that in the production process, the relationship between the input to the output is a function of proportional (linear) that each type of input that is absorbed by a particular sector goes up or down proportionally to the increase or decrease in the output of the sector.
3. Assumptions summation / additives, an assumption which states that the total effect on the various sectors of production operations resulting from each sector separately, and the sum of the effects of each activity. This means that outside input, output system, all outside influences are ignored.

Given these assumptions, the IO tables have limitations, such as: for input output ratio remains constant throughout the analysis period, the manufacturer cannot adjust the input changes or change process. This relationship remained significant when a doubled input will produce a doubled output too. Such assumptions do not cover any changes in technology or productivity that may occur from time to time. Although it contains limitations, IO models remain a tool of economic analysis which are complete and comprehensive.

2. Methodology

To give a clearer picture of IO tables, below are shown the general form of the table. Broadly speaking, the IO table is divided into four quadrants:

Quadrant I, a matrix between the demand and intermediate inputs consisting of n rows and n columns of the production sector.

Quadrant II, is a matrix consisting of m columns of final demand (household consumption, government consumption, investment and exports) and supply, and rows of production sector.

Quadrant III, a matrix of value added or the primary input used by each sector (except imports) and referred to as the remuneration of production factors which include: wages, salaries, business surplus, depreciation, and net indirect taxes.

Quadrant IV, is an added value transfer between institutions, the same quadrant in this study is negligible. The general framework of Table I-0, can be seen in Table 1 (see after references).

Each quadrant is expressed in matrix form, (see table 1) is a set of the production sector in the quadrant I (which contains the manufacturers) utilizing a variety of resources to produce goods and services in a macro called endogenous production systems and sectors.

1. Output

The output is the value of all products (goods and services) generated by the production sector in the domestic area. Therefore the output is often also referred to as domestic output. The calculation is done by adding up the value of output of goods and services that have been produced by a sector of production, regardless of the perpetrator. So it may be the perpetrator of production in the domestic or foreign companies and residents. All products of goods and services that have been produced as part of the output, regardless of whether the product are sold or not. In the process of preparation of the input-output table output calculation has a very important role, namely as the Control Total (CT) whose value must be maintained in the process of reconciliation between sectors.

2. Input

Input is all goods and services required by the sector in its production activities. Input can be divided into two, namely intermediate inputs and primary inputs. Intermediate inputs are all goods and services used up in the production process. Goods and services used in the production process can be goods and services produced domestically or imported. While the primary input is the remuneration of the factors of production used in the production activities. Primary inputs in practice in the form of salary / wages, business surplus, depreciation of capital goods, and indirect tax net.

3. Final Demand and Imports

Final demand is the demand for goods and services used for the purposes of final consumption. Final demand consists of household consumption, government consumption, fixed capital formation, changes in stocks, and exports. Goods and services used to meet the final demand for goods and services can be produced domestically and imported. Especially for export demand can only be met from domestic production. Export and import in the context of input-output table is a transaction that occurs between residents in a particular area by residents outside the region. However exclusively for direct purchases made by residents is treated specially. Direct purchases in the domestic market by a foreign resident is treated as an export transaction, otherwise direct purchases by residents of an area that is done outside of the region to be treated as an import transaction.

4. Multiplier Matrix

In a macro-economic model, there is a terminology which is known as multiplier that describes the impacts on endogenous variables due to changes in exogenous variables. The example of this multiplier is national income

multiplier defined as 1 / (1 - MPC) where MPC = marginal propensity to consume. The multiplier explains that changes in national income is determined by the change in the MPC; the bigger the MPC, the greater the national income.

Similar to multiplier on macroeconomic models described above, the matrix multiplier on I-O tables also describe the changes that occur in the various endogenous variables as a result of changes in one or several exogenous variables. The matrix multiplier in I-O tables used to perform impact analysis, such as the analysis of the impact of output, NTB impact analysis, impact analysis inputs, labor impact analysis and linkage analysis (power distribution and the degree of sensitivity).

The impact multipliers can be interpreted as an effect that occurs either directly or indirectly to various economic activities in the country as a result of a change in the exogenous variables of the national economy.

3. Results and Discussion

To analyze the level of production that is created from marine fisheries sector will be possible if there is a change in final demand which can be developed through the analysis of the multiplier output (output multiplier). By analyzing the output multiplier of marine fisheries, it can be seen how much the contribution of marine fisheries sector can spur economic growth in Gorontalo province. The magnitude of the output multiplier shows how much the increase in total output if there is worth one unit of final demand.

In table 2 (see after references), it is shown that the marine fisheries sector output multiplier is 155.380 ranks 6th out of 36 sector classification. Values shown from the calculation of the output multiplier analysis of the fisheries sector is 155.380, meaning if there is a fisheries sector final demand value Rp. 1 million, then the total of regional production will increase to Rp. 155.380 million. Besides, it is closely related to the lack of processing of the catch fish (multiplier effect is small), it is also caused by some of the fish catch are sold in other region outside Gorontalo.

Values presented in table 3(see after references) is a sensitivity analysis that has the sense that if a number of investments, for example in the form of fixed capital invested in the sector will be increased as much as the amount of investment, multiplied by the number of coefficients, so if there is an investment of Rp. 50 million to be invested in the marine fisheries sector, the magnitude of the change in investment of Rp. 50 million will result in changes in output in the marine fisheries sector of Rp. 1.9 billion (Rp. 38 million x Rp. 50 million) in the same way, it will happen when the funds are invested in other sectors.

3.1 Impact of Import Needs

Goods and services export are the component of final demand. The magnitude of the influence of exports of goods and services to the creation of domestic output is equal to $X = (I\text{-}A^d)^{-1} F_E$. Because goods and services exported in their production processes, among others also use imported input goods and services, it also affects the level of export import needs. The value of imports affected by the final demand as shown in Table 4 (see after references).

Based on the results mentioned in table 4, it can be seen that the marine fisheries sector imports are influenced by household consumption (301) which was Rp. 138 million, government consumption (302) RP. 0, fixed capital formation Rp. 0, RP stock changes. 35 million, and exports of goods and services was Rp. 291 million.

3.2 Coefficient of Labor

The meaning of the coefficient of labor depends on the units used for labor and output. From table 5 the labor coefficient obtained for marine fisheries sector was 0.1571. This means that in order to produce a Rupiah (Rp) of output, it is required 0.1571 fisheries sector workforce. To see large numbers of the number of labor required to produce one unit of output can be seen in table 5 (see after references). The coefficient of labor sector is an indicator to view the absorption of labor in each sector. The higher the coefficient of the labor sector in certain sector, shows the higher absorption of labor in that sector because more and more labor are needed to produce one unit of output. In the contrary, certain sector shows lower labor coefficient indicates the lower the absorption of labor. High labor coefficient generally occurs in labor-intensive sectors, while the low coefficient of labor generally occurs in capital-intensive production process sector which is done by using high technology.

4. Conclusion

Considering the above explanation and analysis, it is clear that marine fisheries sector have positive and significant influence to the improvement of industrial growth and labor absorption in Gorontalo Province. Therefore, it is better to suggest that Government of Gorontalo province supported by all elements of its communities, Central Government of Indonesia and Districts/Regencies in this province should pay attention to optimize this kind of natural resources for the betterment of quality and quantity of living standard of its society.

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Table 1. Forms General Framework Table I-0

I *(n x n)* Transaction among Sectors / Activities	**II** *(n x m)* Final Demands and Import
III *(p x n)* Primary Input	IV *(p x m)*

Source: BPS Gorontalo, 1995

Table 2. Ten Largest Sectors by Output Multiplier Value in Gorontalo Province in 2001

Rank	Code	Sector	Output Multiplier
1	18	Building	348,031
2	19	Resailer	288,459
3	1	Tabama	256,118
4	32	Public Service	214,696
5	8	Food and Beverage Industry, tobacco, au	169,552
6	6	Marine Fisheries	155,380
7	2	Horticulture	144,967
8	4	Forestry	138,826
9	7	Mining	122,959
10	10	Wooden and Forestry Industry	116,589
		Average	**78.83**

Source : Syamsir Djafar Kiayi (2004:69)

Table 3 Output that Influenced by Type Final Demand

Code	Sector	Final Demand					
		301	302	303	304	305	306
01	Agriculture	217,490	6,547	61,430	6,159	368,692	660,319
02	Marine Fisheries	46,180	12	38	11,822	97,328	155,380
03	Mining	6,718	525	6,634	11,397	97,685	122,959
04	Industry	196,851	44,034	147,311	2,477	119,049	509,720
05	LAG	20,066	1,502	2,308	75	1,948	25,898
06	Building	60,567	11,525	251,212	2,034	22,692	348,031
07	Trade	166,526	18,816	113,313	1,124	59,906	359,684
08	Transportation	125,961	7,300	18,701	-1,301	45,718	196,379
09	Finance	102,053	5,960	9,596	667	18,351	136,636
10	Services	178,127	119,945	2,362	220	22,098	322,751

Sources: Syamsir Djafar Kiayi (2004:70)
Description:
301 = Household Consumption Expenditure
302 = Government Consumption Expenditure
303 = Fixed Capital Expenditure
304 = Changes in stock
305 = Exports of Goods and Services
306 = Total Final Demand

Table 4 Imports Impacted by Final Demand

Code	Sector	Final Demand					
		301	302	303	304	305	306
01	Agriculture	1,064	150	1,684	-1,024	3,476	5,349
02	Marine Fisheries	138	0	0	35	291	465
03	Mining	28	2	28	48	414	521
04	Industry	83,270	20,147	105,655	423	49,594	259,092
05	LAG	227	31	47	1	125	430
06	Building	0	0	0	0	0	0
07	Trade	913	301	311	5	1,848	3,380
08	Transportation	14,633	2,183	1,477	23	20,017	38,336
09	Finance	45,988	9,147	6,241	258	13,804	75,439
10	Service	152,221	115,665	1,883	115	5,393	275,318

Sources: Syamsir Djafar Kiayi (2004:74)

Table 5 Coefficient of Labor

Sector	Output (Rp)	Labor (Person)	Labor Coefficient
Agriculture	660,319	142,980	0.2165
Marine Fisheries	155,380	24,412	0.1571
Mining	122,959	5,991	0.0487
Industry	509,720	22,072	0.04.33
LAG	25,898	8,709	0.3362
Building	348,031	126	0.0003
Trade	359,684	39,155	0.1088
Transportation	196,379	13,917	0.0708
Finance	136,636	2,748	0.0201
Service	322,751	34,688	0.1075
Jumlah	**294,796**	**2,837,757**	**1.1092**

Source : Kiayi (2004:74)

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