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BLUE ECONOMICS: MARINE FISHERIES AGROINDUSTRY DEVELOPMENT IN BANYUWANGI REGENCY

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ABSTRACT: *Exploitation of natural resources often creates environmental problems.This study aims to examine the application of the Blue Economy concept to the marine fisheries agro-industry. Specifically these objectives can be described as follows: (1) examine how the Blue Economy concept is applied; (2) Calculate the added value of lemuru fish; and (3) develop a strategy for developing marine fisheries agro-industry. This research uses a combination of quantitative and qualitative approaches. Data analysis methods used are descriptive methods, value added calculations and Analytical Hierarchy Process (AHP). Based on the results of research using descriptive methods, it shows that the marine fisheries agro-industry has implemented the concept of Blue Economy through the use of marine products with quite optimal. From the calculation of the value added using the Hayami method, it was found that the value added from fish canning was IDR 23,447,500 / tonne, cold storage IDR 2,400,000.00 / tonne, and fish meal processing IDR 1,300,000.00 - / tonne. Based on the results of the AHP analysis, it was found that the Human Resources factor (0.197), increased value added (0.249) and strengthening the existing agro-industry (0.481) were priorities in the development strategy of the marine fisheries agro-industry.*

INTRODUCTION

The Indonesian sea is one of the largest marine megadiversity areas in the world which has 8,500 species of fish, 555 species of seaweed and 950 species of marine biota. Indonesia's fishery resources are one of the natural resources and also a potential sector owned by the Indonesian nation, where the area of Indonesia consists of 2/3 of the sea, which means that Indonesia has considerable resources in the marine and fisheries sector. Therefore, many Indonesians depend on this sector for their survival. The fisheries sector plays an important role in supporting and driving the economy and opening up employment opportunities. Marine wealth and fishery resources that live in Indonesian waters have the highest level of biodiversity at 37% of fish species (RescueMHa, 2015).

The availability of abundant natural resources and exploitation will have a negative effect on the environment. Development continues to run followed by growth and the establishment of more and more industries throughout the country. In addition to having a positive impact on economic growth, development also has negative effects related to the carrying capacity and capacity of the environment. Industrial development that utilizes natural resources currently largely ignores the impact on the environment, even though the industrial sector is a major contributor to foreign exchange and fulfills the needs of human life.*BlueEconomy*developed to overcome an economic system that tends to be exploitative and damaging to the environment. Blue Economy (Gunter Pauli, 2010) is a concept or ideaeconomics that aims to improve people's welfare, social equality, reduce the risk of significant environmental damage as well as how to use natural resources (sea) efficiently without wasting waste and thereby have a good impact on the environment and create added value to the rest of the raw materials that have been processed . Marine fisheries agro-industry is a type of fishery product processing that has the potential to be developed, given the enormous potential of fish resources from marine waters.

The application of the Blue Economy concept to areas where there are many agro-industries is an important concept to apply. Bearing in mind that the Blue Economy concept does not only focus on the economic sector but on other fields such as social and environmental.One area that has great potential in a sustainable development plan is the coastal and marine areas. Coastal and marine areas have rich and varied

natural resources, both renewable and non-renewable. According to the Center for Data, Statistics and Information (2015) in East Java itself there are several fishing ports spread across East Java including Brondong, Surabaya, Probolinggo, Bawean and Muncar in Banyuwangi Regency. Among all these ports, the Muncar Fish Port is one of the largest fishing ports and has the closest location to Jember Regency and is a productive port.

Muncar Fishery Port is one of the largest fishing ports in East Java and is also a class C port. Fisheries in the Bali Strait waters are multi-species and produce more than 30 types of fishery products. The abundance of these resources is also supported by the large number of marine fisheries agro-industry. The existence of this fish processing agro-industry also has an impact on the unemployment rate, where the unemployment rate for the people of the Muncar coastal area is quite low. This is due to the large number of agro-industry that absorbs more than 13 thousand workers, the majority of whom come from the area (Purwaningsih, 2015).

With the concept of the Blue Economy, one of the objectives of which is to reduce emissions and waste, agro-industry can create creations and innovations through the development of processing fish caught into non-waste (zero waste), which means that there will be no raw materials left and will create added value. on the products produced. According to Hayami et al (1987) added value (value-added) is the added value of a commodity due to the treatment given to a commodity in question. Added value is also interpreted as the added value of an item that has gone through various processes including processing, transportation and storage which are also stages in the production process.

Muncar's capture fish processing agro-industry based on the capacity and production equipment can be classified into two groups, namely modern industry and traditional industry. This modern industrial group includes the fish canning industry, cold storage and the fish flour and oil industry. This modern industry uses lemuru fish as the main industrial raw material and also uses various machine tools and modern production support facilities. Meanwhile, traditional industrial groups include home industries and small industries that produce ice cream, paste, shrimp paste and salting. In contrast to modern industrial groups that use lemuru fish as their raw material, this traditional industrial group mostly uses non-lemuru fish as their raw material (Aji, 2018).

METHODOLOGY

Design or Research Design

This research uses an explorative descriptive approach. Exploratory descriptive approach is research with problem-solving efforts that are explored broadly about the causes or things that can influence the occurrence of facts that occur in the field. This type of research is descriptive qualitative. The method used is direct observation of the research object. This research uses an explorative descriptive approach.

Data Types and Sources

This study uses qualitative data types. Primary data and secondary data are the data used in this study. Primary data were obtained from interviews, filling out questionnaires and direct field observations and secondary data used were data published by the East Java Maritime Affairs and Fisheries Service, Gresik Regency Government and obtained from Banyuurip mangrove managers, Banyuurip Village office, Internet, literature (books and journals) that support this research.

Data analysis method

a. Qualitative Descriptive Method

This qualitative descriptive analysis is used to explain how the condition of the marine fisheries agro-industry in Muncar District, Banyuwangi Regency is based on the results of existing primary data and secondary data, as well as a description of the various conditions and socio-economic activities of the surrounding community.

b. Value Added Analysis

The basis for calculating added value analysis to find out the costs incurred in processing lemuru fish can be stated in the Hayami method calculation table below.

Table 1. Hayami method calculation procedure

No	Variable	Mark	Unit
1.	Output	A	tons/day
2.	Raw material	B	tons/day
3.	Labor	C	HOK/hr
4.	Conversion Factor	D = A/B	tons/day
5.	Direct Labor Coefficient	E = C/B	HOK/hr
6.	Output Price	F	IDR/hr
7.	Labor Average Wages	G	HOK/hr
8.	Raw material prices	H	IDR/hr
9.	Contribution of Other Inputs	I	IDR/hr
10.	Output Value	J = DxF	IDR/hr
11.	Value-added	K = J – H – I	IDR/hr
	Value Added Ratio	L(%) = (K/J) x 100%	%
12.	Labor Benefits	M = E x G	IDR/hr
	Labor Section	N(%) =(M/K) x 100%	%
13.	Profit	O = K – M	IDR/hr
	Profit Rate	P(%) = (O/K) x 100%	%
14.	Margin	Q = J - H	IDR/hr
	Direct Labor Income	R(%) = (M/Q) x 100%	%
	Contribution of Other Inputs	S(%) = (I/Q) x 100%	%
	Company Profits	T(%) = (O/Q) x 100%	%

Source:(Hayami Y, 1987)

c. Analytical Hierarchy Process(AHP)

The Analytical Hierarchy Process (AHP) is an analysis that can be used in decision making to understand the condition of a system and help make predictions in decision making. This method is also used in modeling problems and opinions, where problems have really been clearly stated, evaluated, discussed and prioritized for study (Saaty, 1980).

Hierarchy is an abstraction of the structure of a system, where the function of the hierarchy between components and their impact on the system as a whole can be studied. These abstractions have interrelated forms, all of which are arranged downwards from one peak (final goal, down to a sub-objective), then the driving factors (forces) that influence these sub-objectives, as well as actors and policies. -the policies, the strategies and the results of the strategy then arise related statements related to this hierarchy, how and to what extent an individual factor from a lower level in the hierarchy affects the top factor, namely the main goal, because this influence will not be uniform for all factors and for that it is necessary to identify the intensity.

RESULT AND DISCUSSION

General Description of Muncar District

Muncar Sub-District is one of the sub-districts in Banyuwangi Regency, precisely in the south of Banyuwangi Regency which is part of the 24 sub-districts in Banyuwangi Regency, located at coordinates on the map 08010' – 08050' South Latitude and 114025' – 114037' East Longitude. has a bay called Teluk Pangpang. Muncar District has regional boundaries with the surrounding areas as follows:

a. To the north: Rogojampi and Songgon Districts

b. To the south: Tegaldlimo and Cluring Districts
c. To the west: Srono District
d. To the east: the Bali Strait and Pang-Pang Bay

Figure 1. Map of Muncar District

Based on data from the Banyuwangi Regency National Land Agency, Muncar District has a slope of between 0-3 percent so that it is included in the sloping category with heights ranging from 15-50 meters above sea level. The area of Muncar District is 76.92 km2 which is traversed by several rivers such as the Bianu River with a length of 27.7 km which is the longest river that passes through Muncar District, the Bomo River with a length of 12 km, and the Lumbun River with a length of 9.97 km. Administratively, there are 10 villages in Muncar subdistrict, including the villages of Kedungrejo and Tembokrejo.

General Description of Fishermen in Muncar District

Muncar District is one of the areas in Banyuwangi Regency and is the largest fishery center area in Banyuwangi Regency. Most of the residents in Muncar Subdistrict work as fishermen, especially residents in Kedungrejo Village and this has been their livelihood for generations. This happens because the Muncar waters are directly adjacent to the Bali Strait and has a very large capture fisheries potential. It is known that geographically fishing communities are people who live, grow and develop in coastal areas, namely a transitional area between land and sea areas. This also underlies the rapidly growing number of fishermen in Muncar District because this area is directly adjacent to the Bali Strait so that most of the people work as fishermen.

The livelihood system as fishermen in Muncar District is divided into groups of fishermen based on ownership of capital and also the means of production. There are so-called skipper fishermen and labor fishermen. Skipper fishermen are those who have capital in the form of ships and equipment such as fishing gear and also those who provide the necessities for going to sea. The skipper fishermen are further divided into two groups, which are commonly referred to by the Muncar community as land skipper and sea skipper. A landlord is a capital owner who owns a ship and equipment for other fishing needs but does not directly go into the sea, while a sea skipper is a person who goes out to sea to show the position of the fish or is commonly referred to as a ship's captain. Meanwhile, labor fishermen are fishermen who join the skipper with status as laborers and their work is tied to the skipper. Labor fishermen are fully attached to their skipper, because they have a bond or bond that the skipper gives to labor fishermen so that they remain loyal to their skipper.

Conditions of Capture Fisheries in Muncar District

Capture fisheries production in Muncar District tends to fluctuate every year, this can be seen from the continued decline in the number of capture fisheries production in Muncar District over the past few years. At present the Muncar fishing community is experiencing a famine, a season when fish are very difficult to get so fishermen do not get their catch. There are various factors that cause the scarcity of fish in the waters of the Bali Strait, even though the Bali Strait area is known as the largest fish-producing area in Banyuwangi and East Java, especially for lemuru fish.

Some of the causes are the role of natural factors and human factors in it. Natural factors occur due to seasonal fluctuations which make fish movements unpredictable and fishermen find it difficult to see the position of the fish. In addition to natural factors, the human factor is also one of the causes of the scarcity of fish. This started when Muncar fishermen around 1980 – 1990 used fishing gear that was dangerous or not environmentally friendly, some even used chemicals. This condition was justified by Fisherman Muncar. The use of fishing gear and chemicals that are not environmentally friendly, will ultimately have a negative impact on the current condition of fish and waters where the water will also be polluted thereby disrupting the balance of the marine ecosystem.

Table 2. Capture fisheries production at sea in 2016

No.	Month	Production (Kg)	Production Value (Rp)
1	January	12,612,412	246,956,995,500
2	February	7,914,198	117,072,226,000
3	March	4,198,360	75,723,032,500
4	April	4,302,873	72,383,517,250
5	May	2,733,098	46,269,915,878
6	June	1,906,080	37,634,312,112
7	July	1,332,197	32,869,938,063
8	August	882,887	17,286,989,685
9	September	618,770	9,854,194,300
10	October	1,849,526	36,178,551,178
11	November	3,004,356	49,407,910,242
12	December	618,770	9,854,194,300

Source: Department of Maritime Affairs and Fisheries of Banyuwangi Regency (2016)

Application of the Blue Economy Concept

The capture fisheries system map identifies capture fisheries activities in Muncar District as well as material flows in the system, identifies parties directly related to capture fisheries, such as fishermen, fish processing industries, fish traders both on a small and large scale and also fish flour industry (fish waste processing). A map of the capture fisheries system in Muncar District is shown in Figure 2.

The picture shows how the fish catch is distributed to the hands of the customer, where fish caught by fishermen (slerek and axle fishermen) are landed first at the Capture Fisheries Port (PPP), but some are brought to TPI (Fish Auction Place) to be sold to collectors. Fish that are already in the PPP area are fish that have previously been sorted by fishermen on board. In Europe, the stages of handling these catches have been regulated in European Union Regulations which contain health regulations for fishermen on ships, conditions for handling fish on board, conditions for handling during landing, and conditions for management and packing (Le Ry, 2007).

After being landed at PPP Muncar, the catches are damaged and of low quality, or commonly known as waste, then they are sold to flour mills, both modern and traditional scale factories. However, the fish waste was just put there causing a foul odor and polluting the environment in the PPP area. It is better if the catches whose conditions are damaged are not landed at PPP so as not to cause a bad smell but instead go straight to the flour mill as in European countries, for example France (Witri, 2011).

In the next process, the fish landed at PPP Muncar are then distributed to several sectors before finally reaching the customer. Fishermen usually sell their catch to the fish processing industry, such as canning, steaming, cold storage, salting fish, making paste and shrimp paste. But there are also those who sell to suppliers who are then sold by the supplier to the industry. In addition to the industry, the catch is also sold to small traders (belantik) or to large traders (collectors). After being distributed to several sectors, then fish can be consumed by the wider community (consumers). In addition, fishermen also sell their catch directly to consumers. The catch is also distributed outside the region (city) with destinations such as Bali, Surabaya,

Jakarta, Magelang and Madura. However, there is no export activity at the Muncar port PPP. This happened because based on the Regulation of the Minister of Maritime Affairs and Fisheries Number: PER.16/MEN/2006 concerning Fishing Ports that one of the characteristics of coastal fishing ports is that there is no fish export.

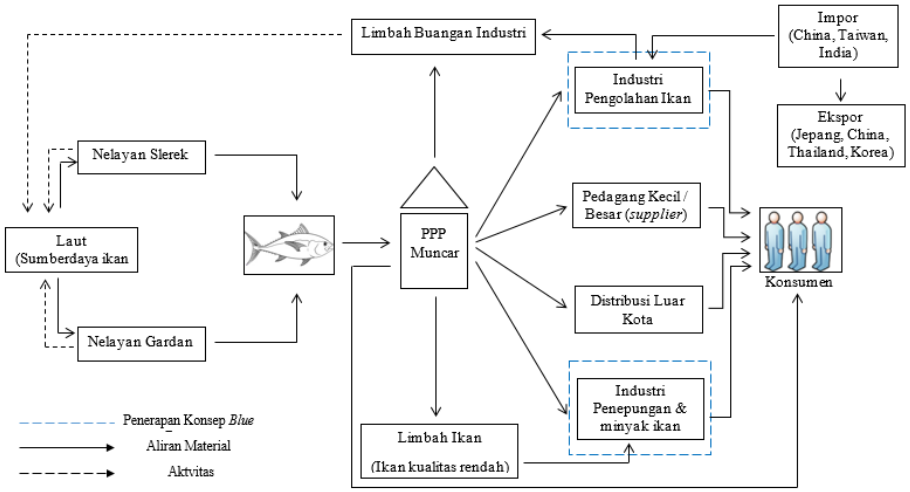
The fish processing industry does not always supply fish caught by Muncar fishermen, but also imports fish from other countries such as China, Taiwan and India to be processed and then exported again to several countries such as Japan, Thailand, China and Korea. This happens because the catch of fish in the Muncar waters which is also included in the Bali Strait continues to decrease every year, so that the supply of fish cannot meet the demand for fish, especially for industry. The type of fish that is most needed for the fish processing industry is lemuru fish which is processed by the canning industry to be made into sardines.

Muncar District was once one of the largest fish canning industry centers in Indonesia because of the abundance of lemuru fish on the Muncar beach. However, it is very different from the current conditions, where lemuru fish cannot be found anymore, so the supply of lemuru fish for the fish canning industry must be supplied from outside the region and even abroad. One of the causes of the scarcity of lemuru fish in Muncar is the lack of maintenance of coastal ecosystems and also the lack of sustainability of fisheries, causing lemuru fish which are commonly called sardines to disappear. Around the 1980s, netting lemuru in the waters of the Bali Strait was like netting fish in a pond, fish were very easy to find. With a simple boat, fishermen can catch up to a dozen tons of lemuru fish. Based on data from the East Java Maritime and Fisheries Service, the amount of fish caught by Muncar fishermen once reached 60,393 tonnes per year. Of these catches, lemuru or sardines are the most dominating, reaching 54,000 tonnes per year.

The disappearance of lemuru fish in the waters of the Bali Strait cannot be separated from human intervention, environmental management and a lack of natural resources. This is also the impact of the many fish processing factories that have been established around Muncar beach. The establishment of these factories was not accompanied by strict waste management supervision by the government, so that the exploitation of marine resources continued. The waste generated from industrial activities flows from the ditch to the river which empties into the Bali Strait and eventually pollutes the Bali Strait area. According to local fishermen, this waste is accused of being one of the causes of the increasing scarcity of fish in the waters of the Bali Strait because industrial waste disturbs marine resource ecosystems so that fish do not get food supplies because they have been polluted by waste.

Muncar fishermen also made ponds for fish around the beach, but the fish did not want to live and instead died after the seeds were spread into the water. This shows that the water quality in Muncar waters is no longer good for use as a place for marine biota to live and develop because it has been polluted by industrial activity waste. Intervention from the government is needed to manage capture fisheries resources in the Bali Strait waters to support a resource sustainability system. capture fisheries so that they can continue to be utilized without disturbing the balance of the ecosystem and still maintaining the sustainable potential of capture fisheries resources. This is also in line with efforts to improve the welfare of coastal communities, especially fishing communities.

Figure 2. Map of the Blue Economy Concept Implementation Syste



Fish Industry Tree

The concept of the Blue Economy is the answer to the problems that exist in this research area. The Blue Economy concept is a concept or ideaeconomy that aims to improve the welfare and social equality of the community, while significantly reducing the risk of environmental damage. Blue Economy is a concept of how to utilize natural resources (sea) efficiently without any wasted waste (zero waste) and thus will have a good impact on the environment and create added value to the rest of the raw materials that have been processed. The Blue Economy is very important to implement in areas where there are many processing industries, because the processing industry will leave some unused raw materials and will become waste. A real example of this research is the fish canning agro-industry in Muncar District, Banyuwangi Regency.

The fish canning agro-industry in Muncar uses lemuru fish, tuna and tuna as raw materials. And with complementary raw materials such as canned raw materials and sardine sauce raw materials. In Figure 4.4 the parts of fish used in canning the fish is the body of the fish, the oil produced in quality fish will be processed into fish oil, the skin on the fish can be processed into crackers, and the head and spines or fish bones are processed into fish meal. In 1 fish, the part of the fish that cannot be processed anymore to create added value is fish waste (Figure 4.4). Industrial waste or fish waste will be managed by each company. The waste will be thrown back into the sea after going through a neutralization process so that it is not harmful to the marine ecosystem. With this, waste industrial waste is still an environmental problem around fish processing factories and also the sea.

This discussion discusses the results of research analysis related to the theory of sustainable development which is centered on 3 pillars namely environmental, economic and social. This theory explains the development process which has the principle of "meeting present needs without compromising meeting the needs of future generations" (Brundtlan, 1978). And also regarding the relationship between the Blue Economy concept and sustainable development.

Based on the results of the analysis obtained regarding the application of the Blue Economy concept to the marine fisheries agro-industry in Muncar District, Banyuwangi Regency, it currently refers to the rules of the Blue Economy concept. This means that the coastal area in Muncar District, Banyuwangi Regency is included in the Blue Economy area category. Where Blue Economy (Gunter Pauli, 2010) isa concept that covers industrial processes or economic activities and on a larger scale can: (1) produce less waste into the environment, (2) minimize excessive use of natural resources so that it is more efficient (not exploitative), and (3) process waste into raw materials so that it has more added value. The coastal area in Muncar District, Banyuwangi Regency has implemented this concept with the existing agro-industry. The fish processing agro-industry in this area is the actor in implementing the Blue Economy concept because the agro-industry processes resources efficiently and minimizes wasted waste and creates added value in the products it produces.

Blue Economy implemented in order to realize sustainable and sustainable development of marine and fisheries. In accordance with the 3 pillars of sustainable development, the coastal area in Muncar District, Banyuwangi Regency has implemented the Blue Economy concept which also refers to sustainable development, which includes:

1. **Environment**

   Based on the rules of the Blue Economy concept, one of which aims to preserve natural resources and minimize wasted waste from economic activities such as fish processing, in the coastal area of Muncar District, Banyuwangi Regency has implemented it by empowering environmentally friendly agorindustries. Among them, the fish canning agro-industry which produces canned fish products, the clod storage agro-industry which produces frozen fish products and also as a storage place when catches are abundant, as well as the oil and fish meal agro-industry which produces fish flour and oil products. The three agro-industries are a chain of implementing the Blue Economy concept.

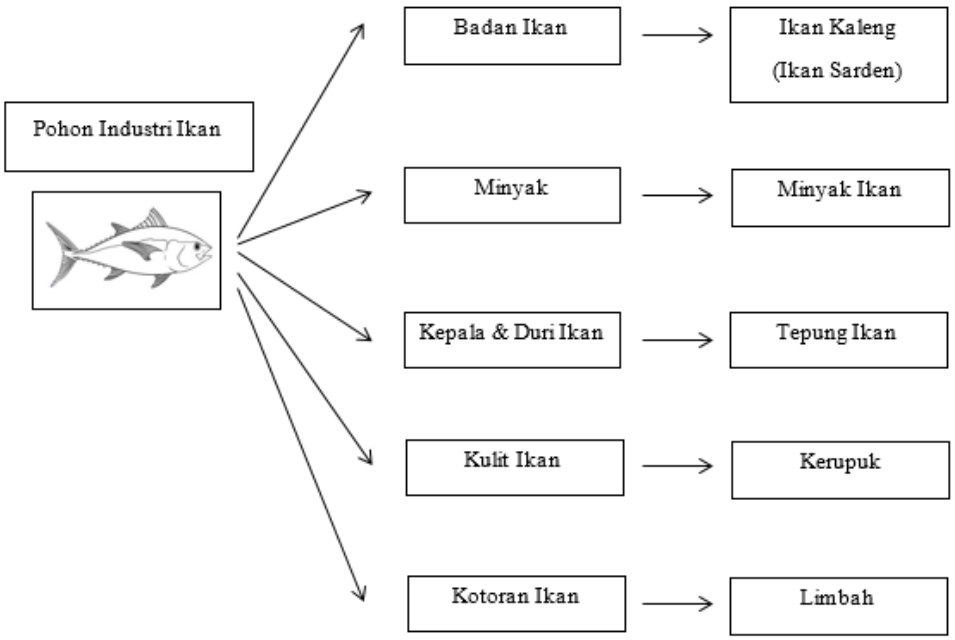
2. **Economy**

   Apart from having an impact on environmental aspects, the Blue Economy concept also has an impact on economic aspects. Where the results of marine resources are utilized optimally by not producing waste which will also produce added value to a product. This is related to the three chains of fish processing agro-industry and fish distribution to the fish processing agro-industry. With the added value generated by the agro-industry, it can maximize its production and also get more profits and not cause negative effects on the environment.

3. **Social**

   The large number of fish processing agro-industries that exist in this region has a good effect on the social aspect, one of which is the reduction in unemployment. Dwhere the unemployment rate for the people of the Muncar coastal area is quite low. This is due to the large number of agro-industry that absorbs more than 13 thousand workers, the majority of whom come from the area.

Figure 3. Fish Industry Tree



Analysis of Added Value of Lemuru Fish in Muncar District

The fish processing agro-industry in Muncar District is divided into three groups, namely the fish canning industry, the cold storage industry that produces frozen fish products (frozen fish) and the fish meal industry. Value added is the basic concept of the difference between input value and output value. The concept of commodity itself is based on increasing the maximum added value so that the greater the added value obtained, the better an industrial process as a whole. Meanwhile, according to Helda (2004), added value is the difference between product value and raw material costs and other input costs and profit is the difference between added value and direct labor income. The added value resulting from this analysis is the gross added value for the processor. The gross added value obtained still contains direct labor benefits. The main components for calculating added value include raw materials, products/output, labor inputs and contributions of other inputs. Other input contributions are costs incurred other than raw materials and labor costs to process raw materials. Other input contributions are obtained from the sum of joint costs (besides the cost of raw materials and labor) divided by the amount of raw materials used. The results of calculating the added value of lemuru fishery products can be seen in Table 3. Other input contributions are obtained from the sum of joint costs (besides the cost of raw materials and labor) divided by the amount of raw materials used. The results of calculating the added value of lemuru fishery products can be seen in Table 3. Other input contributions are obtained from the sum of joint costs (besides the cost of raw materials and labor) divided by the amount of raw materials used. The results of calculating the added value of lemuru fishery products can be seen in Table 3.

No	Variable	Unit	Fish Processing Products		
			Fish canning	Cold Storage	Fish flour
1	Output1	tons/day	22.5	12	2
2	Raw Materials1	tons/day	30	10	5
3	Labor1	OK	150	30	20
4	Conversion Factor	tons	0.75	1,2	0.4
5	Direct Labor Coefficient	HOK/tonne	5	3	4
6	Output Price1	Rp/ton	43,930,000	9,000,000	4,000,000
7	Labor Average Wages1	IDR/HOK	50,000	50,000	50,000
8	Raw Material Prices1	Rp/ton	8,000,000	8,000,000	0
9	Contribution of Other Inputs1	Rp/ton	1,500,000	400,000	300,000
10	Output Value	Rp/ton	32,947,500	10,800,000	1,600,000
	Value-added	Rp/ton	23,447,500	2,400,000	1,300,000
	Value Added Ratio	%	71,16	22,22	81.25
12	Labor Benefits	Rp/ton	250,000	150,000	200,000
	Labor Section	%	1.06	6,25	15,3
13	Profit	Rp/ton	23,197,500	2,250,000	1,100,000
	Profit Rate	%	98.93	93.75	84,61
14	margin	Rp/ton	24,947,500	2,800,000	1,600,000
	Direct Labor Income	%	1.02	5,3	12.5
	Contribution of Other Inputs	%	6.01	14,2	18,7
	Company Profits	%	92.98	80.35	68.75

Source: Interview, 2020

In the fish canning agro-industry, 30 tons of lemuru are processed each day, whereas in the cold storage agro-industry, 10 tons of lemuru are needed for a year and in the fish meal agro-industry, 5 tons of lemuru are needed each year to be processed. During the daily production period, the output of canned fish in canned fish production was 22.5 tons, while the frozen fish output in cold storage production was 12 tons, and fish meal production was 2 tons. The price of raw materials, namely lemuru fish, to produce each fish processing agro-

industry is the same, namely 8,000,000, -/ton. The price of raw materials is determined by the results of fishing by fishermen. Table 2 shows that the calculated conversion factor is the division between the output value and the input value. The conversion factor value in the fish canning agro-industry is 0.75. The conversion factor for cold storage is 1.2 and the flour conversion factor is 0.5.

The calculated workforce is all workers who play a direct role in the fish processing production process. The number of Working Person Days (HOK) in fish canning is 150 HOK per day to process 30 tons of lemuru fish, while in cold storage agro-industry it is 30 HOK per day to process 10 tons of lemuru fish, in fish meal agro-industry it is 20 HOK to process lemuru fish as much as 5 tons. The labor coefficient is the quotient between the labor force and the raw materials used. Table 4.1 show that the labor coefficient is 5 HOK/ton in the fish canning agro-industry, 3 HOK/ton in the cold storage agro-industry, and 4 HOK/ton in the flour agro-industry. This means that if each agro-industry processes 1 ton of lemuru fish, a workforce of approximately 5 people is needed to process fish canning, 3 for cold storage, and 4 to process flour. The average wage for workers in the fish processing agro-industry is the same, which is IDR 50,000.00 per HOK.

Other input contributions consist of supporting materials, electricity, depreciation of equipment and other additional costs. In the fish canning agro-industry, the contribution of other inputs is IDR 1,500,000.00 per ton, in the cold storage process it is IDR 400,000.00 per ton, and in the flour agroindustry it is IDR 300,000.00 per ton. The input value is the multiplication of the conversion factor and the average output price. The output value in the fish canning agro-industry is IDR 32,947,500.00 per ton, in the cold storage agro-industry it is IDR 10,800,000.00 per ton, and in the flour agro-industry it is 1,600,000.00 per ton. To obtain added value is by subtracting the output value with the price of raw materials and contributions of other inputs. The biggest added value was in the fish canning agro-industry, which was IDR 23,447,500.00 per ton, in the cold storage agro-industry it was IDR 2,400,000.00 per ton, and in the fish meal agro-industry it was IDR 1,300,000.00 per ton. From the calculation of added value, the ratio of added value is obtained by dividing the added value by the output value. The added value ratio is the percentage of added value to output value. The value added ratio in the fish canning agro-industry is 71.16%, while in the cold storage agro-industry is 22.22%, and in the fish meal agro-industry is 81.25%. In the fish canning agro-industry, the wage for labor is Rp. 250,000.00 per ton, with a profit levelby 98.93%and a margin of IDR 24,947,500.00 per ton. In the cold storage agro-industry, the employee compensation is Rp. 150,000.00 per ton, with a profit rate of 93.75% and a margin of Rp. 2,800,000.00 per ton. In the fish meal processing agro-industry, the wage for labor is IDR 200,000.00 per ton, with a profit rate of 84.61% and a margin of IDR 1,300,000.00 per ton.

Value added is the value added to goods or services used by production units in the production process as an intermediate cost. This added value is the same as remuneration for the participation of production factors in the production process. If the intermediate cost component used is greater, then the added value of the product will be smaller. And vice versa, if the intermediate costs are smaller, the added value of a product will be even greater (Tarigan, 2011).

The main processed product from lemuru fish is canned sardines. With the calculations that have been done, this product has a high added value compared to the raw materials which only cost between Rp. 8,000.00/kg to Rp. 9,000.00/kg. Meanwhile, sardines in a 425 gram can have a high price of IDR 19,100.00. This huge added value gives the company a big advantage. The sustainability of this industry, of course, also depends on the amount of fish caught by fishermen. The Muncar fishery industry cluster, which consists of capture fisheries and fish processing industries, is dependent and related to one another. The fish processing industry, which consists of the fish canning industry, the clod storage industry and the fish flour and oil industry, is a distribution chain for lemuru which are also interdependent.

Profits from the fishing business are quite low compared to the processing industry itself. However, fishermen also get other catches besides lemuru by catch. These other types of fish have a higher economic value than lemuru fish, such as cob, scad, marmalade, pomfret, mackerel, shrimp and others as additional fishermen's income. In addition, the fishing business also cannot last all year round as in the processing industry. If lemuru fish production from Muncar port is absent or lacking, fishermen will usually look for other jobs

because they cannot go to sea or look for fish in more remote areas. The fish canning agro-industry will import lemuru fish from China and India or can other types of fish.

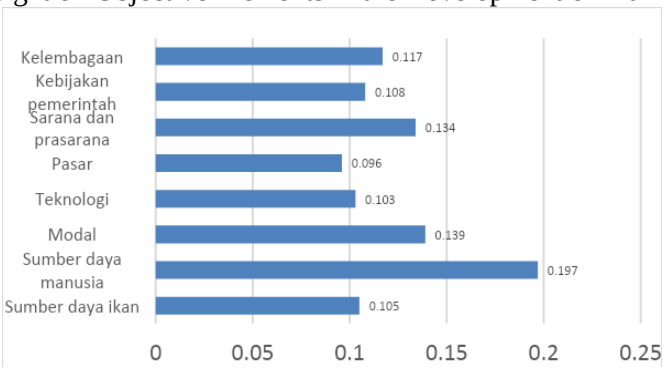
With the analysis of added value in fish processing, companies can find out the level of profit and the ratio of added value in the products they produce. Based on the principles of the Blue Economy concept (Gunter Pauli, 2010), one of which is related to the efficient use of natural resources and minimizing the waste produced, raw materials are processed optimally so that from several parts of the raw materialscan be a product and has its own added value.

Marine Fisheries Agroindustry Development Strategy

By using the AHP (Analitycal Hierarchy Process) method on the strategy sub model, the hierarchy for selecting alternative strategies for developing marine fisheries agro-industry on factors, objectives and alternatives. Important factor elements that influence the development of marine fisheries agro-industry are Fish Resources, Human Resources, Technology, Capital, Markets, Government Policies, Infrastructure and Institutions. The elements of the goal to be achieved include increasing added value, expanding employment opportunities, expanding business opportunities, increasing regional income, economic growth, and increasing fish consumption. Meanwhile, to achieve this goal, the alternative strategies offered include Supporting the Growth of New Agro-industry, Strengthening Existing Agro-industry, and Optimizing Fishing.

Soekartawi (2000) states that agro-industry is an industry whose main raw materials are agricultural products (at least 20% of the total raw materials), with an emphasis on food processing management. The agricultural products include food, plantation, forestry, animal husbandry and fishery products. By using the AHP (Analitycal Hierarchy Process) method on the strategy sub model, the hierarchy for selecting alternative strategies for developing marine fisheries agro-industry on the elements of factors, objectives and alternatives. The results of the AHP (Analitycal Hierarchy Process) calculation in Figure 4.5 show that, the Elements of Factors that influence the development of marine fisheries agro-industry are as follows.

Figure 4. Priority Weight on Objective Elements in the Development of Marine Fisheries Agro-industry.



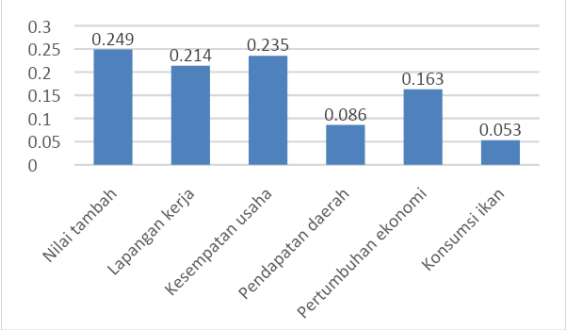
In Figure 4 the results of the AHP (Analitycal Hierarchy Process) calculation show that the factors of Human Resources (0.197), Availability of Capital (0.139) and Facilities and Infrastructure (0.134) are the top 3 factors, which means that these factors are determinative factors in agro-industry development strategies sea fisheries. The Human Resources factor is a determinative factor, in which business actors and the workforce involved are expected to be more skilled, innovative and creative in seeking added value by utilizing various increasingly sophisticated fishery product processing technologies. In addition, business actors and workers are also directly responsible for handling and processing fish in accordance with the principles of Good Handling Practices (GHP). Good Manufacturing Practices (GMP) and implementation of Hazard Analytical Critical Control Point (HACCP) procedures to maintain the safety of fishery products. Currently, the practice of using prohibited additives for food products, such as formalin for preservatives and rhodamine B for dyes, is indicated to be mostly carried out by traditional agro-industry businesses.

The Capital factor is the second main factor which is a priority in the development of marine fisheries agro-industry, because the fisheries agro-industry is in the DistrictMuncar is still dominated by small and household industries, which classically have constraints in obtaining access to capital. Even though the products produced are traditional products, several business actors admit that the salted fish export market is still wide open, however, business actors from small and household industries admit that they lack the capital to expand their business scale. These business actors need capital to have Cold Storage which can be used to store fish during the fish harvest season so that they can be taken out during the lean season. These efforts are very important to maintain the price stability of fishery products in the market.

The facilities and infrastructure factor is the third main factor which is a priority in the development of marine fisheries agro-industry, as has been explained that agro-industry in the DistrictMuncar is still dominated by small industries and households. Business actors and workers in traditional agro-industry admit that the facilities and infrastructure in the fish processing process still use many traditional tools and methods. Lack of advice and infrastructure makes fish processing inefficient.

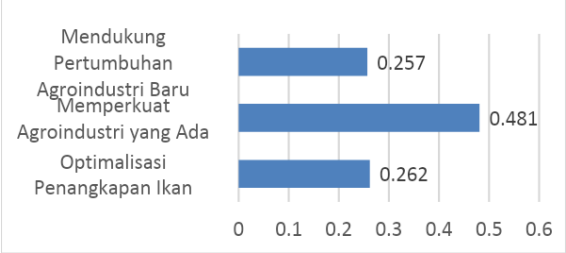
Furthermore, the results of the calculation of the AHP (Analitycal Hierarchy Process) in Figure 5 show that, the Elements of Objectives that are a priority in the development of marine fisheries agro-industry are as follows.

Figure 4.7 Priority Weight on Objective Elements in the Development of Marine Fisheries Agro-industry.



The results of the AHP (Analitycal Hierarchy Process) calculation show that based on the priority scale, the goals that should be prioritized from the main objectives of developing marine fisheries agro-industry are Increasing Value Added (0.249), Expansion of Business Opportunities (0.235) and Increasing Employment (0.214) . The goal of increasing added value is the goal with the top order, because apart from being a form of effort to generate a higher level of profit, increasing added value also has a positive impact on leftover materials from products that are usually wasted to be reprocessed into something more valuable. it also has a positive impact on the state of the environment and marine ecosystems. Furthermore, AHP calculation results (Analytical Hierarchy Process) in Figure 6 shows that, the Alternative Elements that are a priority in the development of marine fisheries agro-industry are as follows.

Figure 4.8 Priority Weight on Alternative Elements in the Development of Marine Fisheries Agro-industry.



In the alternative strategy hierarchy (Figure 6) the result is that the priority alternative strategy needed for the development of marine fisheries agro-industry is to strengthen the existing agro-industry (0.481), followed by optimizing fishing (0.262) and supporting
new agro-industry growth (0.257). An alternative strategy that is a top priority is strengthening the existing agro-industry, which shows that the current management of the existing fisheries agro-industry is not optimal. Strengthening the existing agro-industry can be done through various activities, such as coaching in improving product quality and quality, managerial coaching, improving the quality of managing human resources, and facilitating accents to obtain venture capital. Optimization of the fishing industry is a form of effort to maintain the continuity of the supply of fishery commodities as raw materials for the existing fishery agro-industry, as well as to open opportunities for the growth of new marine fishery agro-industry. In addition to maintaining continuity in terms of volume,

CONCLUSION

1. A conclusion section must be included and should indicate clearly the advantages, limitations, and possible applications of the paper. Although a conclusion may review the main points of the paper, do not replicate the abstract as the conclusion. A conclusion might elaborate on the importance of the work or suggest applications and extensions. (11) Based on the results of research using descriptive methods, it shows that the marine fisheries agro-industry has implemented the Blue Economy concept through optimal and sustainable utilization of marine products. In accordance with the 3 pillars of sustainable development which include environment, economy and social. In environmental and economic aspects, it is applied in 3 fish processing agro-industry chains. Thus preventing exploitation of natural resources and preventing waste and increasing added value to the products produced. Meanwhile, in the social aspect, increase employment so as to reduce unemployment in the community in Muncar District, Banyuwangi Regency.
2. After calculating the added value using the hayami method, an added value was obtained for Fish Canning of Rp. 23,447,500.00 per ton, for Cold Storage of Rp. 2,400,000.00 per ton, and for Fish Meal of Rp. 1,300,000.00 per tons. The added value of the fish processing agro-industry is influenced by the price of output, the contribution of other inputs, and the price of raw materials. Based on the calculation of added value using the Hayami method, the largest value added ratio was obtained, namely the fish canning agro-industry of 71.16%. While the smallest added value ratio is in Cold Storage which is equal to 22.22%. And the biggest profit level obtained is in the fish canning agroindustry which is equal to 98.93%. The added value and profits obtained by the fish processing agro-industry are strongly influenced by the production costs used.
3. Based on the results of the analytical hierarchy process needed for the marine fisheries agro-industry development strategy in Muncar Banyuwangi District, priority is given to strengthening the existing agro-industry. The determinative factor in the development of the marine fisheries agro-industry is the availability of human resources, capital and facilities and infrastructure that support the productivity of the fish processing agro-industry. The objectives of developing marine fisheries agro-industry must be directed at increasing added value, expanding business opportunities and increasing employment opportunities.

SUGGESTION

1. The availability of marine resources and the many establishments of a marine fisheries agro-industry located in Muncar Banyuwangi District have the potential to increase regional and national economic growth and improve people's welfare. In addition to the positive impacts, there are also negative impacts that need to be considered by the government, business actors and the surrounding community. For business actors, it is expected to comply with the protocol regarding impact analysis on the environment so that pollution does not occur due to untreated factory waste. For the surrounding community, it is hoped that they will participate in maintaining the cleanliness of the beach in order to preserve the marine ecosystem.
2. Based on the added value obtained from fish processing, lemuru fish has the potential to be developed into more innovative products so that companies must increase their production while still paying attention to

product quality and provide product innovation to increase added value. To increase production, companies must maximize facilities or infrastructure that can support performance in the production process. As well as utilizing human resources to create innovations and creations in making products that are more environmentally friendly.

3. Clear policies are needed to support the development of high added value agro-industry, given the large multiplier effect it generates. Related to this, continuous guidance is also needed regarding the application of cold chain to maintain the quality of fishery commodities.

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