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Prospects of Fisheries Industry Development in Indonesia Through Online Publication Media

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Abstract

The potential of Maritime Affairs and Fisheries owned by Indonesia becomes a massive opportunity in producing various types of commodities provided by natural resources such as the fishing fish, aquaculture, fishery products, and ecotourism. Based on this, it is necessary to have synergy between the government, the private sector and the community in managing marine fisheries resources that exist today. Of course, with the existing potential, it will become a challenge in its management that can guarantee the sustainability of natural resources and the improvement of the people's economy. This paper examines the opportunities and challenges of the fishing industry in Indonesia using the input and output data of the Directorate General of Maritime and Fisheries Resources Supervision, which are analyzed descriptively using tables and graphs and journal reviews relating to the study.

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fisheries industry, the potential of fisheries, aquaculture, fishing fish, ecotourism industry.

Introduction

Indonesia has considerable fisheries potential that includes inland fisheries and sea fisheries. One of the advantages of the marine fisheries sector is that Indonesia is a maritime country with the most significant sea area and the highest number of islands, around 17 x 103, which are spread across the archipelago (Nurkholis et al., 2016). Based on this, Indonesia has enormous potential from the fisheries sector, namely the cultivation and capture sector, which is a mainstay in supporting the development of the fishing industry in Indonesia and is one of the strategic economic activities that deserve to be developed. Fisheries resources in Indonesia are very abundant because they have a very high level of biodiversity (biodiversity).

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Indonesia has several main types of commodities that are the mainstay of the fisheries industry in fishing fish, such as shrimp, tuna, tuna and skipjack, squid, cuttlefish, octopus and crab-crab, while in the aquaculture sector has fisheries commodities, namely: seaweed, shrimp, milkfish, snapper, carp, tilapia, carp and catfish. These commodities are the mainstay of exports in Indonesia at this time. The second position of the world is occupied by Indonesia, being the largest producer of marine fisheries globally; it's just that the production of marine fisheries has not significantly contributed to the economy. If seen from the contribution of the marine fisheries sector only gives 2 per cent of the contribution to the National GDP. By looking at this case, it becomes a sign that the management and coordination between marine and fisheries planning and development are still very weak, different if we apply appropriate management and coordination, then Indonesia is able to produce the maximum potential of marine wealth that we have even equivalent to developed countries. The tendency of the world community today to consume more fish is cultivated than can consume fish caught. By seeing this phenomenon, fishing fish can be managed sustainably by maximizing the potential of very large aquaculture (Ditjen PDS-KKP, 2017).

Innovation is the key to success in increasing competitiveness (Barney, 2002; Foss et al., 2011, Hult, Hurley and Knight, 2004; Molina-Castillo and Munuera-Aleman 2009; Shapiro, 2002; Rogers, 2003). Industrial development in Indonesia still has many limitations in designing and creating sustainable innovation (Dhanani, 2000). Based on Indonesian Marine and Fisheries Investment Data for 2017, it is known that the value of the production of catches and aquaculture is around Rp. 1.23 Trillions, while the processing industry Rp. 2.29 Trillions. The highest value comes from the fisheries processing industry due to high export market demand so that the development of the fisheries processing industry continues to increase.

Materials

Potential of Aquaculture Industry

The fisheries sector plays an important role in the Indonesian economy through increased income, diversification of livelihoods, supply of animal protein, and foreign exchange earnings. This sector contributes 3.1% of total national gross domestic product (GDP) and 21.0% of total agricultural GDP, creates around 6.4 million direct jobs for the people of Indonesia, and obtains the US $ 4.2 billion dollars from food exports sea in 2012 and provided 54.8% of domestic animal protein supply (MMAF, 2013). Fish consumption per capita in Indonesia has also increased, with annual consumption per capita increasing from 21.0 kg in 2003 to 33.9 kg in 2012 (Marine and Fisheries Statistics Book, 2012).

Fishing fish are currently the dominant source of fish in the domestic market, and the primary source of nutrition is essential for many consumers who are below the poverty line. The decrease in fish consumption because of rising prices will endanger the welfare of the people of Indonesia. The study results highlight the importance of policies targeting sustainable fisheries landings and sustainable aquaculture growth. Under the "Global Maritime Fulcrum", the Indonesian government has taken drastic steps to limit foreign fishing to increase domestic catches, including sinking foreign fishing vessels in its waters and capturing fishermen (Connelly, 2015). However, given the limited resources and concerns about the sustainability of fish stocks in Indonesia and the consequences that may arise from climate change that are projected to have severe impacts on Indonesian fishing fish, the government needs to prioritize managing fish in nature (Cheung et al. 2010).

The potential of marine culture, consisting of the possibility of fish farming (snapper, grouper, cobia); shrimp, molluscs (shellfish, pearls, sea cucumbers); and seaweed, with a potential area of cultivation in Indonesia of 2 million ha (20% of the total potential of coastal and marine waters within 5 km of the coastline) with a volume of 46.73 million tons per year, and the potential for brackish cultivation (ponds) reaches 913,000 ha. For the possibility of marine biotechnology, there are still great opportunities to be developed, such as the raw material industry for food, the natural feed ingredients industry, and fish and shrimp seeds (Lasabuda, 2013).

A development zone for aquaculture was created by the government where intensification of production could be supported through investment in private hatcheries, distribution and marketing channels for fisheries, training, information system improvement, and support for product certification and access to capital (Nurdiana, 2006). Nevertheless, aquaculture in Indonesia needs to grow substantially in the future. During the projection period, an increase in aquaculture output will require expansion to occur only in soils that do not result in the loss of important ecosystems, intensification of sustainable agricultural practices and an increase in the efficiency of user inputs for production that is ecologically feasible (Bostock et al., 2010). As producer prices increase over time, research investment will also be needed to help farmers reduce production costs and remain competitive. This investment must promote a major transformation of the aquaculture system, policies, and investments that meet the blue economy's principles that align development goals, natural resources, and environmental conservation (Adger et al., 2005). Based on Table 1, it is known that the largest export value comes from the cultivation sector, especially the shrimp commodity. The value is 35.84% with a volume of 197,433,608 kg. This shows that the shrimp aquaculture industry in Indonesia is still the prima donna and still has opportunities for continued development because it is supported by research related to disease control which is a major obstacle in the aquaculture industry.

Table 1. Value of Main Exports of Indonesian Fisheries Commodities

No	Commodity	Value (USD)	% Value	Volume (Kg)	% Volume
1	Shrimp	1,742,119,193	35.84%	197,433,608	17.53%
2	Tuna- Tongkol - Cakalang	713,919,147	14.69%	168,433,759	14.96%
3	Cumi-Stotong-Octopus	554,594,192	11.41%	152,108,581	13.51%
4	Crab	472,962,123	9.73%	27,791,618	2.47%
5	Seaweed	291,837,226	6.00%	212,961,523	18.91%
6	Other Commodities	1,085,479,049	22.33%	367,349,488	32.62%
7	Grand Total	4,860,910,930	100.00%	1,126,078,577	100.00%

Data source: Ditjen PDS-KKP, 2017

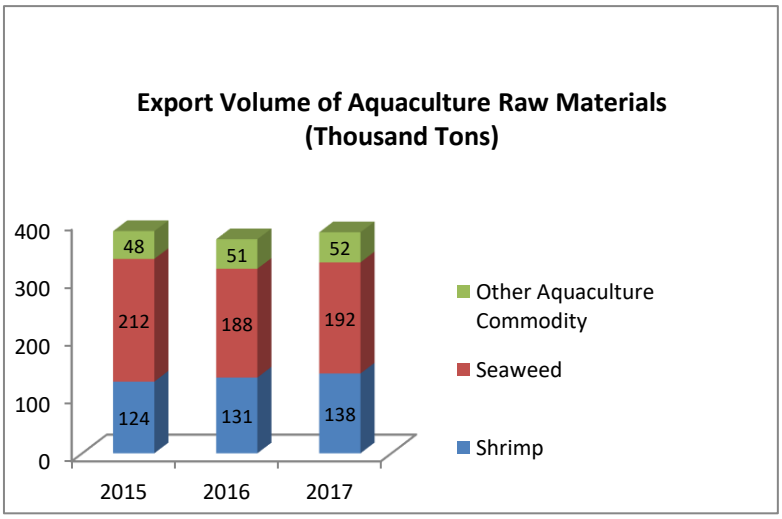

Figure 1. Value and Volume Export of Aquaculture Raw Materials for 2015-2017 (Source: Ditjen PDS-KKP, 2017)

Based on figure 1, the largest aquaculture commodity in Indonesia in terms of export volume is a seaweed commodity, but the highest export value is shrimp commodity. This indicates that the export value of seaweed is low because what is exported is a raw material or has not been processed, so that even though the export volume is high, the matter remains low compared to shrimp.

Potential of Fishing Fish Industry

Indonesia has enormous fisheries potential. The maximum sustainable value (MSY) of fishing fish resources is around 12.54 million tons per year. At the same time, the potential that can be exploited (allowable catch) of 80% of MSY is about 10,032 million tons per year. Based on catch data from 2012 to 2016 (Table 2), the value of catches continues to increase each year but is still very low compared to the potential value of fishing fish that

can be utilized. This shows that the potential for developing the fishing fish industry is still huge.

Table 2. National Fishing Fish Production Value from 2012 to 2017

Year	Production value (thousand tons)	MSY Value (million tons/ year)	*Allowable catch* (million tons/ year)
2012	5.829	12.54	10.032
2013	6.105		
2014	6.484		
2015	6.678		
2016	6.58		
2017	6.04		

Data Source : Ditjen PDS-KKP, 2017

Although the value of MSY is still far above the value of the production of catches, specific fish species are already in the control stage of fishing due to the decreasing amount in nature, for example is grouper.

South Sulawesi Province decreased export activity caused by a decrease in marine fishery yields, which impacted the decline in grouper export results, thereby reducing regional income. Along with this, coral reefs experienced a reduction in the area of coral reefs, which affected the catch of coral fish, which decreased by 63 per cent (Sutinah, Rahmatia, Seniwati & Kitta, 2017). In addition to production data, the magnitude of opportunities for the development of the fishing industry can be seen from the value of national fish needs. Based on the calculation of the national fish demand value (Figure 2), it is known that federal fish consumption needs continue to increase every year. This indicates that people are increasingly aware of the importance of fish as a healthier consumption material. This trend is believed to continue to grow so that the development of the fishing fish industry is needed to meet the needs of the national fish.

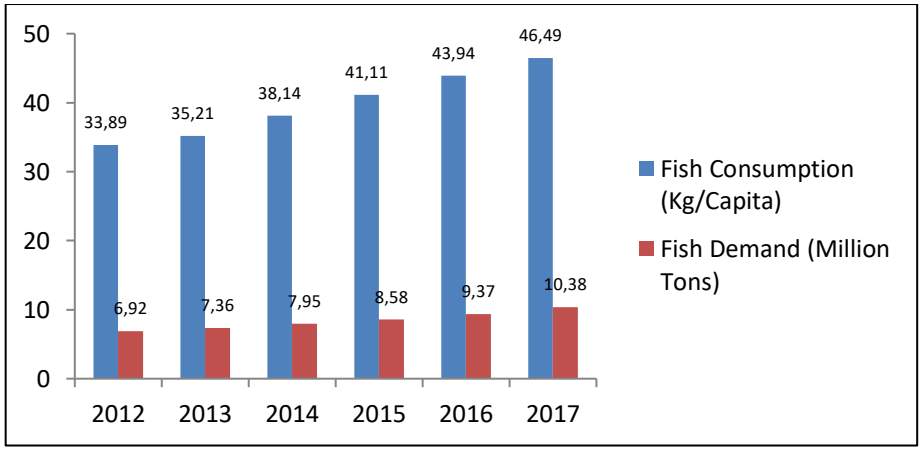

Figure 2. Data on fish consumption and national fish demand for 2012-2017 (Source: Ditjen PDS-KKP, 2017)

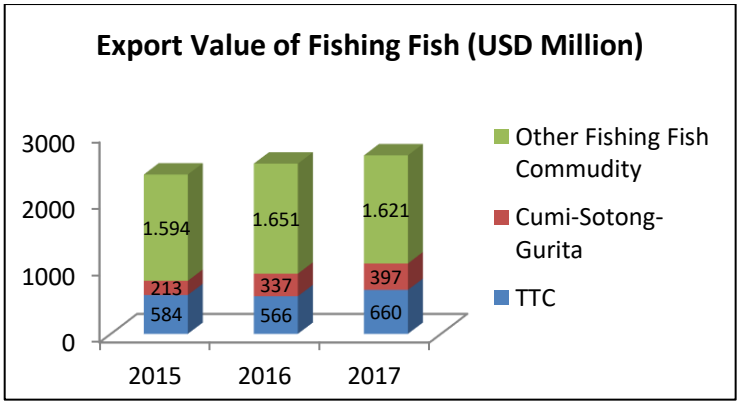

Figure 3. Value Export Of Fishing Fish In 2015-2017 (Source : Ditjen PDS-KKP, 2017)

The export value of Fishing Fish commodity Tuna-Tongkol-Cakalang (TTC) ranks second after combining other fishing fish commodities. The fishing fish of the Tuna-Tongkol-Cakalang (TTC) commodity is still below the MSY limit, so fishing fish can still be made, which must be based on sustainability.

Potential of Fishery Product Processing Industry

Indonesia is one of the world's largest maritime and island nations, producing hundreds of abundant fisheries commodities. Not surprisingly, seaweed and tuna products rank first globally; similarly, crab and shrimp products occupy the second position. According to 2015 Food and Agriculture Organization (FAO) data, China ranks first as a shrimp producer globally. Various superior fishery products are scattered throughout the archipelago. Shrimp production centres are in Sumatra and West Java. Crabs are spread in Java, Sumatra and Kalimantan. The leading producers of seaweed are in the Sulawesi and Nusa Tenggara regions. Meanwhile, tuna-producing areas focus on Papua, Maluku, and North Sulawesi.

The total Indonesian fishery products in 2016 reached more than the US $ 2.9 billion. During the five years from 2011 to 2016, the export value of Indonesian fishery products grew 3.5% per year. The five largest importing countries of Indonesian fish products in 2016 were the US, Japan, China, Vietnam and Malaysia. Among the five, exports to China and Vietnam experienced rapid development, while exports to Japan declined. 39.4% of Indonesia's total exports to the world in 2016 were directed to the US, up from 31.5% five years earlier. The Chinese market share rose from 5.3% to 9.4%, Vietnam from 4.5% to 6.7%, and Malaysia rose from 2.8% to 3.7%. Japanese market share fell from 27.0% in 2011 to 16.3% in 2016 (Ningsih. 2018).

Processed fishery products in the excellent category for export are Processed Shrimp, Squid, Fish Meat, Crab. Those with the opportunity but not yet maximally fulfilled are: Frozen Fish, Frozen Lobster, Albacore or Frozen Long Tuna Fins, Live eel, processed sea cucumbers, and Frozen Mackerel. Processed fish products are determined using three four-digit HS categories: extracts and juices of meat, fish or crustaceans (HS 1603); processed or preserved fish (HS 1604); and processed or preserved crustaceans and molluscs (HS 1605). Figure 3 shows that in these three categories, the export value of HS 1605 reached twice that of HS 1604, while the export value of HS 1603 was not significant (Ningsih. 2018).

Table 3. World Exports of Processed Fish Products by Country 2011-2016

No	Importer	Total Value (US $ Million)						Market share (%)	
		2011	2012	2013	2014	2015	2016	2011	2016
1	AS	302.2	307.3	406.1	534.2	457.6	471.7	40.6	49.0
2	Jepang	129.3	147.7	132.3	144	122.8	122.3	17.4	12.7
3	Arab Saudi	33.2	53.5	59.4	55.3	61.2	57.2	4.5	5.9
4	Britania Raya	25.9	43.6	58.3	60.6	49.8	48.8	3.5	5.1
5	Belanda	36.1	29	49.8	60.1	19.3	27.6	4.8	2.9
6	Italia	3.2	3.5	18.0	25.9	29.9	25.5	0.4	2.6
7	Thailand	18.7	34.5	34.1	14.9	16.9	24.7	2.5	2.6
8	Australia	8.5	15.3	22.2	27.5	29.7	21.4	1.1	2.2
9	Jerman	39.3	27.5	36.2	35.5	18.0	15.0	5.3	1.6
10	Vietnam	1.9	1.5	2.1	3.2	2.1	11.5	0.3	1.2
11	Kanada	9.5	9.7	10.2	7.5	7.8	9	1.3	0.9
	Other Countries / Regions in the World	137.1	169.8	160.8	167.0	129.5	127.5	18.4	13.3
World Total		**744.9**	**843**	**989.5**	**1135.7**	**944.7**	**962.3**	**100.0**	**100.0**

Source : *International Trade Centre.* 2018

The total export value of Indonesian processed fish products in 2016 reached the US $ 962 million. (See Table 3). The central destination countries for this product are the US, Japan, Saudi Arabia, the United Kingdom and the Netherlands. In 2016, total exports to these five countries accounted for 76% of Indonesia's exports to the entire world. This represents a small portion (i.e. 0.9%) of Indonesia's total exports of processed fish products and is lower than the share recorded in 2011 (Ningsih. 2018).

Potential of Ecotourism Industry

Marine and fisheries-based ecotourism in Indonesia has been developed into one industry that needs special attention from all stakeholders, considering that tourism in this sector can lead to domestic and foreign tourists. Ecotourism, being a solution to care for the natural and cultural environment, can also minimize adverse effects on the environment, besides visitors willingly pay to get a comfortable and quality vacation. In the current conditions, many tourists are not satisfied with the existing ecotourism because of its homogeneous nature. Increased human awareness of the importance of preserving nature and culture is a significant factor that also determines the growth of ecotourism, so there must be equality between social and cultural based on the tourist destination created (Situmorang, 2007). In developing an ecotourism area, it must be based on local communities empowered through the provision of education, social entrepreneurship and how to preserve the existing culture that can have an impact on improving welfare and improving education. The science of social entrepreneurship can educate local people to be people who are responsible for improving people's lives by how to behave in protecting the environment (Situmorang & Mirzanti, 2012)

Ecotourism is a place to work with stakeholders in the social world (Wood, 2008). Gonzalo (n.d.) states that ecotourism is a social endeavour that leads to community organizations. In planning and managing an ecotourism area, local people and natural resources significantly contribute. This shows that the implementation of ecotourism must benefit local communities (Asadi and Kohan, 2011). People who are empowered through tourism activities become an effective solution in tourism development, where developed tourism can support the preservation of culture and the environment so that sustainable tourism development such as ecotourism is realized. The purpose of organizing community-based tourism is to see the community build themselves based on ecotourism activities carried out in their area. Tourism development will not succeed without local leaders and communities (Sutawa, 2012). As one example of a case study in Shiraz, Iran, this place has good prospects for tourism development; with the participation of the community, the tourism industry in Shiraz can increase (Aref and Ma'rof, 2008). Many people are aware of how important tourism is in making social, cultural and environmental treatment and economic change; for this reason, tourism is very dependent on the local community. (Beeton, 2006). Tourism can be one of the factors of economic development; in this case, leaders who deal directly in the field of action must take an essential role in the organization of environment-based tourism and the community to improve their welfare (Godfrey 1996).

Indonesia, which is known for its wide variety of cultural, ethnic, and marine tourism potentials, has the potential to make this an opportunity that requires good management. Based on the current literature review, it is emphasized that the best-applied ecotourism management pattern is community-based ecotourism for ecosystem sustainability and improving the welfare of local communities.

Methods

This study uses input and output data from the Directorate General of Maritime and Fisheries Resources Supervision, which are analyzed descriptively using tables and graphs and related journal reviews.

Results and Discussion

Based on the information that has been presented, the government should adopt a development policy based on the perspective of ecological, economic and social development dimensions, or integration of the three dimensions (integrated management) in all sectors, as an example of the case of the results of the study of Tran et al. (2017), where researchers developed several approaches to the projection model of Indonesian fisheries trends. In this study, the focus is on growth trends in the marine and inland fisheries sector as well as the significant impacts on the social, economic and environmental sectors related to this trend from increased activities in the public and private sectors, which are identified as policies that are guided by the application of the Blue Economy concept.

Constraints faced in the development of the fishing industry include the use of eco-friendly fishing gear, which is still very limited, and fishers still prioritize the number of catches compared to the selectivity of pitfalls. In addition, there are not many regulations governing fishing time, so spawning fish are also caught. Stocks of fish in the natural world are declining, and this is because the policy regarding determining the right time to see to

protect the mother fish when spawning does not yet exist. Solutions that can be offered related to the development of the fishing industry in the future are; First, the Indonesian government needs investment both in the form of research and product development in overcoming the problem of diseases which are the main obstacle to the aquaculture industry, in addition, the government also needs to promote restocking and recovery activities in nature through the concept of sea ranching. Increasing human resources (HR) is also very much required by fishermen and fish farmers related to knowledge and skills in their fields in supporting the sustainability of their businesses (Tran, 2017).

Conclusions

The current approaches that need to be taken by the government related to the development of the fishing industry are Increasing science and technology and human resources, developing the production centre area, improving the quality and food safety for exports, developing sustainable and community-based ecotourism areas, increasing supervision of marine natural resources and fisheries, additional investment in the aquaculture sector, sustainable management of fishing fish, diversifying fishery products and reducing the export of fishery products in the form of raw materials by making partnership patterns to revive domestic industries. This approach is critical to do based on the problems of the existing fishing industry; it is hoped that through the application of this approach, the Indonesian fishing industry can develop.

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