

Marine Resources to Indonesia's Food Security Potential

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Abstract. *The huge economic potential of the ocean in Indonesia and the importance of maintaining the sustainability of marine resource exploitation to support sustainable economic growth and food security. As one of the potentials in the marine and fisheries sector, the estimated potential of fish resources from marine capture fisheries and aquaculture certainly has the potential to fulfill the food of the Indonesian people with high protein nutritional value. The purpose of this research is to see the potential of the marine sector for food security in Indonesia. This type of research is quantitative descriptive research with time series data from 2017 to 2022 obtained from the Indonesian Central Bureau of Statistics. This research is located in Indonesia. The results showed that the water sector, namely fisheries, has high potential to support food security in Indonesia. In addition to the nutritional content contained in fish that is easily digested by the body, the selling price of fish also varies so that it is affordable at all economic levels of Indonesian households.*

Keywords: *Aquaculture, Capture Fisheries, Potential Food Security*

INTRODUCTION

As the largest archipelago with a vast marine area of approximately 5.8 million km², Indonesia has a maritime zone consisting of archipelagic waters (2.3 million km²), territorial waters (0.8 million km²), and Exclusive Economic Zone (2.7 million km²) (Putra & Hakim, 2016). The maritime sector is very important for Indonesia. However, attention to this sector is still lacking compared to the land sector. However, if Indonesia's marine economic development potential is managed innovatively and efficiently, it can become a major source of development capital and provide maximum benefits for the country and the people of Indonesia (Suci et al., 2020).

The historical trajectory of Indonesia's ocean utilization can be traced back to the political decision of the Juanda Cabinet on September 13, 1953, which was manifested through a declaration. The decision included a policy to restore the legal, economic, political and technological supremacy of the Indonesian nation in the seas of the archipelago, after nearly 400 years of destruction by colonizers to the detriment of the

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spirit and ideals of the nation. In addition, the declaration can be considered as a step to correct the nation's orientation and restore the rights of the Indonesian nation to its land, water and natural resources so that they can be utilized to the maximum extent to increase the empowerment and welfare of the nation (Sukamto, 2017).

Improving the nation's welfare through the sustainable use of Indonesia's natural resources has been the government's goal for the past few decades. In line with this goal, the management of natural resources on the seabed, the land beneath it, and the water space above it must be carried out with the right direction and policy. Indonesia, which is largely composed of ocean, has enormous potential for marine resources. This potential involves aspects such as capture fisheries, aquaculture, mangrove forests, coral reefs, mining and energy, seagrass beds, marine tourism, and so on.

In the context of marine and fisheries, the potential of fish resources from marine capture fisheries, including small pelagic fish, large pelagic fish other than tuna and skipjack, demersal fish, reef fish, penaeid shrimp, lobster, crab, crab and squid, is estimated to reach around 12.01 million tons. This potential is spread across eleven State Fisheries Management Areas of the Republic of Indonesia (WPPNRI), as stipulated in the Decree of the Minister of Marine Affairs and Fisheries of the Republic of Indonesia Number 19 of 2022. In line with the principles of sustainability, proper, directed, and wise management, the amount of catch allowed each year is 8.6 million tons.

Based on information from the Ministry of Maritime Affairs and Fisheries, in the last ten years or so, fisheries production from the capture and aquaculture sectors has increased significantly, almost doubling from 11.7 million tons in 2010 to 22.18 million tons in 2022. This reflects the huge economic potential of the ocean in Indonesia, and emphasizes the importance of maintaining the sustainability of marine resource exploitation to support sustainable economic growth and food security.

LITERATURE REVIEW

Potential of Capture and Aquaculture Fisheries

Indonesia has a very large water area, with two-thirds of its territory consisting of oceans, offering tremendous potential wealth in the marine and fisheries sector. The estimated potential of fish resources from marine capture fisheries, including small pelagic fish, large pelagic fish other than tuna and skipjack, demersal fish, reef fish,

penaeid shrimp, lobster, crab, crab and squid, is around 12.01 million tons. This potential is spread across eleven State Fisheries Management Areas of the Republic of Indonesia (WPPNRI), as stipulated in the Decree of the Minister of Marine Affairs and Fisheries of the Republic of Indonesia Number 19 of 2022. In line with proper management, based on sustainability commitments, the amount of catch allowed each year is around 8.6 million tons (Kementerian Kelautan dan Perikanan, 2022).

The exploitation rate of each marine fish species (E) can be grouped into three categories. First, E is less than 0.5 (moderate), which indicates that fishing effort can be increased. Second, E falls within the range of values between 0.5 and 1 (fully-exploited), where fishing effort needs to be maintained with strict monitoring. Third, E exceeds a value of 1 (over-exploited), indicating that fishing effort should be reduced. In the entire State Fisheries Management Area of the Republic of Indonesia (WPPNRI), only about 11.11 percent of fish species have an exploitation rate of less than 0.5. Meanwhile, about 53.54 percent of fish species have exploitation rates between 0.5 and 1, and more than a third (35.35 percent) of WPPNRIs show exploitation rates per fish species exceeding 1.

On the other hand, marine capture fisheries production in 2020 reached around 6.49 million tons. It can be seen that in the effort to utilize capture fisheries by considering sustainable fishing (8.6 million tons per year), there is still a considerable opportunity, but it needs to be balanced with strict supervision so that sustainability can be maintained. (Badan Pusat Statistik, 2023).

RESEARCH METHOD(S)

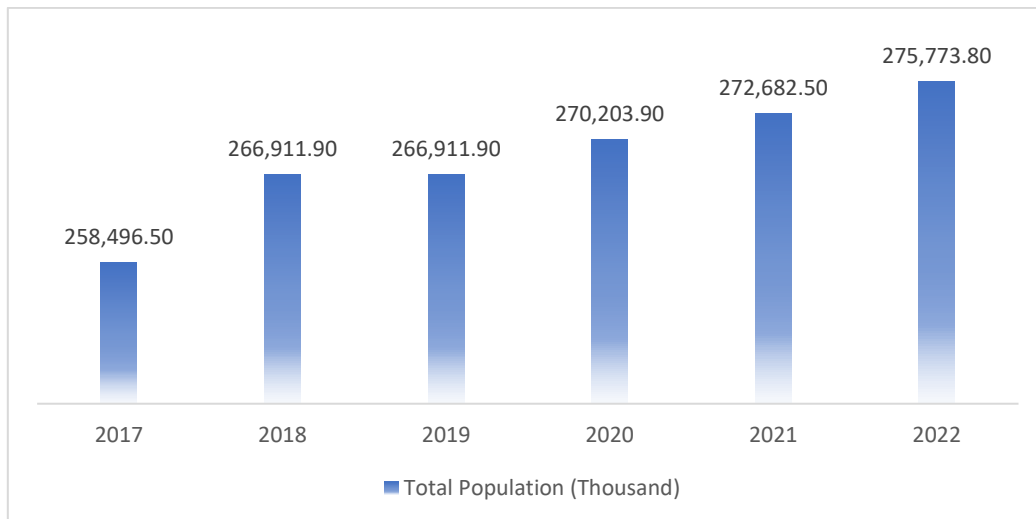
This research falls into the category of quantitative descriptive research. This type of descriptive quantitative research is used to describe, examine, and explain the phenomena studied without manipulating, and draw conclusions based on data in the form of numbers (Listiani, 2014). Quantitative descriptive research aims to describe the content of a variable without the intention of testing a particular hypothesis (Marlina, 2020). Therefore, this research focuses on describing, analyzing, and explaining a phenomenon using data in the form of numbers without the intention of testing certain hypotheses. The secondary data used in this study are in the form of time series from 2017 to 2022, obtained from the Central Bureau of Statistics. This research focuses on analyzing data related to the State of Indonesia.

FINDINGS AND DUSCUSSION

To achieve food security, the development of the fisheries sector needs to focus on four main steps, namely (1) ensuring food security, especially in providing protein from fisheries resources, (2) increasing the capacity of human resources in the fisheries sector and strengthening supporting institutions, (3) increasing production, productivity, and competitiveness of fishery products, and (4) intensifying efforts to diversify aquaculture products to increase added value.

The implementation of the blue economy in the fisheries industry is carried out in accordance with the principles of the blue economy, which involves creativity, innovation, natural resource efficiency, and waste minimization. The sustainable development approach underlying the blue economy is an extension of the green economy concept, which supports food security. The blue economy is believed to provide benefits in the form of sustainable economic growth and community welfare, while maintaining the sustainability of ocean and sky ecosystems.

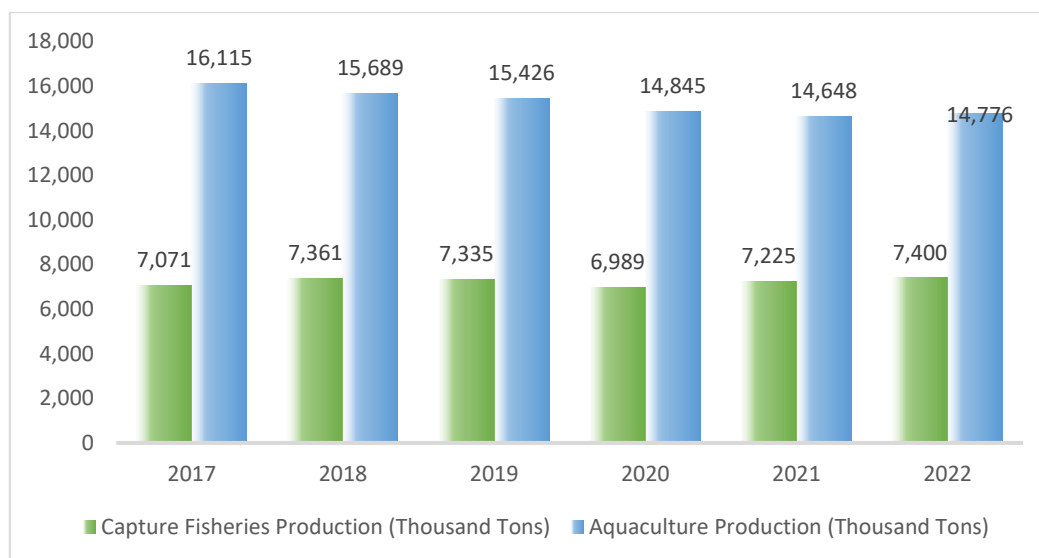
Fisheries production in Indonesia is not only dependent on capture fisheries, but also involves aquaculture production. Capture fisheries can be divided into marine capture fisheries and general fisheries in inland waters. Meanwhile, aquaculture includes various forms such as mariculture, seaweed, marine drift nets, and other aquaculture at sea, as well as ponds, ponds, cages, fresh drift nets, fresh catch nets, and rice farming in inland waters. The development of aquaculture continues in line with optimization and sustainability efforts in marine capture fisheries. There is a paradigm shift in aquaculture development policies and programs for the 2020-2024 period, which focuses on Sustainable Aquaculture Resource Management rather than increasing production alone.



Source: (Badan Pusat Statistik, 2022b)

Figure 1. Population of Indonesia from 2017 to 2022

Figure 1 information on the population of Indonesia continues to increase from year to year. This is a factor in increasing the need for food food sources that can come from animal and biological sources that can be processed and consumed. The increasing population growth must be balanced with sufficient food availability, which will affect the food security of a region (Marhaeni & Yuliarmi, 2018). The following can be seen the availability of food through the marine sector such as fisheries.



Source: (Badan Pusat Statistik, 2022b)

Figure 2. Indonesia's Capture Fisheries and Aquaculture Production 2017 to 2022

Figure 2 presents information on capture and aquaculture fisheries in Indonesia as one of the important components in achieving food security. Data shows that capture fisheries production tends to increase every year.

The role of fish in supporting food security, especially the provision of nutritious food, is very significant. In the 2020 National Fish Day webinar (Kementerian Kelautan dan Perikanan, 2020), Professor Hardinsyah from Bogor Agricultural University highlighted that the nutritional content of fish is easily absorbed by the body. Fish meat is rich in various vitamins such as A, B6, B9, B12, C, D, and E. In addition, the fatty acid content in fish also plays a role in improving the immune system by shifting bad microbes to good microbes that support the formation of immune cells.

Furthermore, fish contains nutrients that play an important role in growth and development, especially in preventing stunting in the first 1,000 days of life (HPK). Nutritional guarantees contained in fish not only support food security, but are also in line with government directives as stated in Presidential Regulation No. 72 of 2021 concerning the Acceleration of Stunting Reduction. Another fact that supports food security and at the same time encourages policies to accelerate stunting reduction is the diversity of fish prices, allowing accessibility by various economic segments.

Based on the results of the National Socio-Economic Survey processing (Badan Pusat Statistik, 2022a), in 2021, in general, the monthly per capita expenditure allocation for the fish, shrimp, squid or shellfish commodity group reached an average of IDR 51,514.00. Households with a monthly per capita income of less than IDR 150,000 spent around IDR 12,765 per capita per month on these commodity groups, while their total expenditure on all food averaged IDR 82,450 per capita per month. In other words, around 15.48 percent of their total food expenditure is allocated to the fish, shrimp, squid or shellfish commodity group.

On the other hand, households with a monthly per capita income of IDR 150,000 or more allocate between 6-8 percent of their total food expenditure to fish, shrimp, squid or shellfish commodity groups per capita per month.

Given that Indonesia has abundant marine resources and can be a significant provider of fish to support food security, while fish has high nutritional value that is easily digested and absorbed by the body, and also has a variety of prices so that it can be

reached by various economic layers of households, the government is structured and jointly trying to increase public nutrition awareness to prefer eating fish. This effort is known as the "Fish Eating Socialization Movement" popularly known as "Gemarikan." This movement has been started since 2004 at the initiative of the Ministry of Maritime Affairs and Fisheries, and continues to grow until today (Badan Pusat Statistik, 2022a).

CONCLUSION AND RECOMMENDATION

Based on the results and discussion that have been presented, it can be concluded that the aquatic sector, namely fisheries, has high potential to support food security in Indonesia. In addition to the nutritional content contained in fish that is easily digested by the body, the selling price of fish also varies so that it is affordable at all economic levels of Indonesian households.

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