

ECONOMIC VALUATION OF MORATORIUM AND TRANSHIPMENT POLICY TO TUNA FISHERIES BUSINESS, STUDY CASE IN BITUNG, NORTH SULAWESI

Nimmi Zulbainarni^{*1}, Yayuk Sukarsih^{*}, Siti Jahroh^{*}, Asaduddin Abdullah^{*}

^{*}School of Business IPB University
Jl. Raya Pajajaran, Bogor 16151, Indonesia

Abstract: The policy of moratorium on ex-welding vessels, according to Ministerial Regulation No. 56/2014, has an impact on tuna fishery conditions. Behind this policy is due to the heavy losses from the fisheries sector caused by the operation of these ex-foreign ships. This study evaluated the impact of policy by production surplus measurement techniques. The survey was conducted on capture fisheries companies, fish processing companies, and traditional processing groups. Data were analyzed by economic valuation using the extended cost-benefit analysis (ECBA) approach. The study results showed that as long as this policy is implemented, it will cause a decrease in the benefits of 9 tuna fisheries business actors by Rp1.23 trillion per year. Economic and social impacts of Rp 2.63 trillion per year, consisting of economic impacts of Rp1.35 trillion per year and social impacts of Rp1.28 trillion per year, which caused 19,972 people to lose their job.

Keywords: cost cost benefit analysis, economic impact, social impact, valuation

Abstrak: Kebijakan moratorium eks kapal lasing yang tertuang dalam peraturan Menteri No. 56/2014 memiliki dampak terhadap kondisi perikanan tuna. Latar belakang kebijakan ini karena adanya kerugian kerugian besar dari sektor perikanan yang disebabkan beroperasinya kapal-kapal eks asing tersebut. Studi ini mengevaluasi dampak kebijakan dengan teknik pengukuran surplus produksi. Survei dilakukan terhadap perusahaan perikanan tangkap, perusahaan pengolahan ikan dan kelompok pengolahan tradisional. Data dianalisis oleh penilaian ekonomi menggunakan pendekatan extended cost benefit analysis (ECBA). Hasil penelitian menunjukkan bahwa selama kebijakan ini diterapkan akan menyebabkan penurunan manfaat 9 pelaku usaha perikanan tuna sebesar Rp1,23 triliun per tahun. Dampak ekonomi dan sosial sebesar Rp2,63 triliun per tahun yang terdiri dari dampak ekonomi sebesar Rp1,35 triliun per tahun dan dampak sosial sebesar Rp1,28 triliun per tahun yang menyebabkan 19.972 orang kehilangan pekerjaan.

Kata kunci: analisis manfaat biaya, dampak ekonomi, dampak sosial, valuasi

¹ Corresponding author:
Email: nimmizu@apps.ipb.ac.id

INTRODUCTION

The fisheries sector contributed Rp 227.3 trillion to National GDP in 2017 with a growth rate of 5.95%, which is above national and sector GDP (BPS 2018). The fisheries sector consists of 6.99 million tons of capture fisheries and 17.22 million tons of aquaculture. This number has strong incremental growth annually. According to Law No. 45 of 2009, article 1 fisheries refer to all activities related to management activities and the utilization of fish resources and their environment. The types of activities in fisheries cover preproduction, production, controlling, and marketing/distribution. Among the capture fisheries, tuna appears to have a significant contribution. KKP (2018) states that tuna is the second largest foreign exchange contributor after shrimp. In 2017 tuna commodities contribute 198,132.4 tons with an export value of USD 659.99 million, or 18.38% of the total value of Indonesian fisheries export.

Trademap (2017) reports that Indonesia was the fourth largest tuna exporter globally in 2012, but this position fell to sixth in 2014, seventh in 2016, and sixth again in 2017. This period also revealed that the Indonesian tuna export statistics have a 7 % fall in export volume from 2014 to 2016. Moreover, the captured tuna volume has decreased by more than 1%. The drop in tuna exports and production is attributed to the ban and transshipment imposed by the Ministry of Maritime Affairs and Fisheries in 2014. The moratorium and transshipment policy will certainly bring a variety of technical, ecological (environmental), economic and social impacts, including fisheries business activities. For example, capture fisheries companies cannot operate at sea. Besides that, several fish canning companies are starting to reduce the number of production hours. As a result, some workers are laid off. Even some small tuna canning companies have stopped their production activities since December 2014 (Kodrat, 2015). Besides, a study from D.H. Simajuntak *et al.* (2019) shows that slight changes in coastal livelihood in the Bitung region as the transshipment policy's effect means that this policy greatly affects the economy of Bitung both in terms of regional income and employment. Currently, in Bitung, there has been a decrease in fisheries production volume by (22.7%) per year. In addition, this policy has caused social upheaval, with 11,858 vessel crew and 8.11 processing unit employees being laid off. Because of the big impact of government policy in the case of Ministerial Regulation No. 56 of 2014

concerning moratorium and Permen Number 57 of 2014 concerning transshipment, it is necessary to conduct an impact valuation. Every policy always raises costs and benefits, so a comparison that produces a value or ratio is required. Thus this study will provide a value (valuation) on the impact of a policy on economic and social both directly and indirectly on the tuna fisheries business in Bitung.

Research with commodity-specific objects was carried out on tuna commodities conducted by Saptanto *et al.* (2015) related to the moratorium's impact on ex-foreign vessels and transshipment policies on Indonesia's tuna market conditions. The results of this study indicate that this policy had an effect in the first quarter (January-March 2015). Namely, the export volume of fresh tuna decreased by 13% while the value increased by 1% and frozen tuna exports increased by 99%, with a value increase of 123%. The decrease in the volume of fresh tuna is due to many ex-foreign ships stopping sailing. More than 122 ex-foreign longline ships do not sail from the existing 533 ships (Saptanto *et al.*, 2015). This situation affects the economic conditions of coastal livelihood. In addition, the effectiveness of policies on the performance of fishing businesses has also been carried out by Hikmayani *et al.* (2015). The results of this study indicate that this policy effectively reduces illegal fishing from the reduced practice of illegal fishing in Indonesia. On the other hand, this policy is not effective for increasing the performance of large-scale capture fisheries businesses but is quite effective for increasing small-scale capture fisheries businesses. Thus, it is clear that the moratorium policy may have little effect in the short term but that much greater effect can be felt over a longer period (Khan *et al.*, 2018).

The research that uses economic valuation analysis with the ECBA (extended cost-benefit analysis) method was Wiryawan *et al.* (2013) on the reclamation project for fisheries in Jakarta. The results showed that reclamation could be continued because the positive impact was greater than the negative impact. However, the impact of the loss of fishing areas and green shell aquaculture can be overcome by finding a new place, considering the coastal waters at the study location were not environmentally feasible. Another study using economic valuation was Subekti *et al.* (2013) on coral reef ecosystems in the Kepulauan Seribu National Park. The results showed that the total economic value of the benefits on coral reef ecosystems was Rp.20,241,981,976

per year, the largest contribution of direct benefits was 81.37%, indirect benefits was 10.3%, and the selection benefits was 7.17%. The biggest benefit value came from captured fisheries. In addition, Zulbainarni (2016) also carried out a valuation of the economic and social impacts of the cantrang prohibition policy in Central Java, which resulted in direct and indirect economic and social impacts that were calculated using extended cost-benefit analysis (ECBA) obtained Total Net Benefits (ECBA) all businesses actors that affected in the study area amounted to Rp 9,123,378,294 per year, which means that these negative benefits indicate that the prohibition of cantrang fishing gear was not feasible.

METHODS

The method used in research is a descriptive method conducted by the field surveyed. A survey is an investigation conducted to obtain the facts of existing symptoms and to seek factual information, whether about the social, economic, or political institutions of a group or a region (Nazir, 2005). The survey conducted in this study also aims to obtain factual information from a group. Especially in the fisheries port (PPS) Bitung.

The impact of government policies is calculated using producer surplus measurement techniques. The producer surplus is obtained from an analysis of the business carried out by the affected producers or economic actors. Business analysis is carried out per year by calculating the value of costs incurred and receipts obtained during business conduct (Zulbainarni 2012). The business age of the financial analysis carried out in this study is ten years with policy and ten years without a policy, considering the economic age of investment.

$$\begin{aligned} \text{Producer surplus} &= \pi_a - \pi_b \\ \pi_a &= TR_a - TC_a \\ \pi_b &= TR_b - TC_b \end{aligned}$$

where: π_a (Benefits after the policy); π_b (Benefits before the policy); TR_a (Total revenue after the policy); TC_a (Total costs after the policy); TR_b (Total revenue before policy implementation); TC_b (Total cost before policy implementation).

After that the Extended Cost Benefit Analysis is conducted in the short term which includes direct and indirect economic and social impacts in the analysis (Zulbainarni et al. 2016), with the following formula:

$$NPV = \sum_{t=0}^t \frac{B_t}{(1+r)^t} - \sum_{t=0}^t \frac{C_t}{(1+r)^t} - \sum_{t=0}^t \frac{EXT}{(1+r)^t}$$

where: B_t (Benefit in Year-t); C_t (Cost of Year-t); r (Discount rate); EXT (Externalities that are calculated based on the direct and indirect economic impacts the discount rate that was used in this research was 12%, the assumption was in accordance with the current loan interest rate).

Cost-Benefit Analysis (CBA) uses theory, data, and models to test products, sacrifices, and activities to assess relevant goals and alternative solutions (Misuraca, 2014). Cost-benefit analysis in this study is an analysis that compares the implication cost (cost) of the Tuna Moratorium program with the output or benefits of economic incentives. In this study, cost reflected the investment and payment for Tuna Moratorium. The benefits referred to in this study could be neutral, positive or negative, depending on the results achieved. Thus, it will determine whether the result of the regulation is proportional to the cost. Moreover, through the analysis, it can be known how much initial investment to get advantages of the regulation.

For four months, this research was carried out in the fisheries ports (PPS) Bitung, fish processing units and business actors related to the tuna fisheries business in Bitung city, Indonesia. Primary data were obtained from observations, focus group discussions and depth interviews using questionnaires. Respondents included in this study from several stakeholders related to the moratorium regulations, such as; government institutions, associations, academics and fisheries business actors. Secondary data that were used were literature studies, relevant publications issued by authorized government institutions related to research.

RESULTS

Regulation is one of the guidelines in the utilization of fisheries resources which plays an important role in limiting individuals in the utilization of fisheries resources. There are still many problems and challenges in fisheries management, including the practice of

Illegal, Unreported, Unregulated (IUU) Fishing, degradation of fish resources and habitat stocks, the accuracy of data collection, poverty and conflict among fishermen (Bappenas, 2014). The effect of fisheries regulation toward social-economic transformations in coastal livelihood can be carried out using economic and non-economic instruments. (Fauzi 2010). The study from Wang et al. (2021) indicates that overfishing was the primary culprit, and the fishing moratorium was extremely effective in ensuring the sustainability of fish resources in the Gezhouba Dam's surrounding areas.

In order to generate responsible fisheries management and prevention of Illegal, Unregulated and Unregulated (IUU) Fishing in the Fisheries Management Region Republic of Indonesia, in November 2014, the Ministry of Maritime Affairs and Fisheries issued two policies, namely the Regulation of Minister of Maritime Affairs and Fisheries in the term of government policy on Permen Number 56 of 2014 concerning moratorium and Permen Number 57 of 2014 concerning transshipment.

PERMEN KP Number 56 of 2014 is to temporarily suspend capture fisheries business licenses in the Fisheries Management Areas of the Republic of Indonesia for fishing vessels developed abroad. This moratorium is only intended for ex-foreign vessels over 30 GT, namely vessels that production is carried out abroad. As long as the moratorium is applied, new permits for Fisheries Business Permit (SIUP), Capture Fishing Permit (SIPI), Fishing Transport Vessel Permit (SIKPI) and extension of SIPI and SIKPI will not be granted.

Regulation of Minister of Maritime Affairs and Fisheries Number 57/PERMEN-KP/ 2014 concerning the second amendment to Regulation of Minister of Marine and Fisheries Number 30/MEN/2012 concerning capture fisheries business in the Fisheries Management Region in the Republic of Indonesia, this regulation regulates the Termination of Prohibition of Fish Landing Catches through the Transshipment the Middle of the Sea. The fishing vessel transshipment activities have long been carried out as part of a business strategy to reduce operating costs or obtain optimal profits. The fishing vessel does not need to return to the port after the fish load in the hatch is complete because there will be a transport vessel that supplies fuel and supplies and collects catches from several fishing capture vessels for

later landing and further processing (Sularso 2015).

In Indonesia, captured tuna are bigeye tuna, madidihang (yellowfin tuna), albacore, cakalang (skipjack tuna) and southern bluefin tuna. Tuna has nutritional content of protein between 22.6 – 26.2 g/100 g of fish meat. Fat is between 0.2 – 2.7 g/100 g of fish meat. In addition, tuna contains calcium, phosphorus, iron and sodium, vitamin A (retinol), and vitamin B (thiamine, riboflavin and niacin) (Maghfiroh, 2000). Tuna is also rich in omega 3 higher than chicken and beef, which is beneficial in maintaining cholesterol and the heart (KKP 2018).

Several types of fishing gear that are widely used to catch tuna include huhate (pole and line), purse seine, drift gill net, tuna long line and hand line (Tamarol and Wuaten 2013). The average fleet capture capacity ranges from 30 to 100 GT (gross tonnage). As highly migratory fish stock/transboundary fish stock and limited migratory fish between the Indonesian Exclusive Economic Zone (ZEEI) and straddling fish stocks, these fish are found throughout the world except in the Arctic Ocean (Olson and Boogs 1986). The potential of tuna in Indonesia is located in various Fisheries Management Region Republic of Indonesia (WPPNRI), especially in the East. There is a tendency for tuna fish located in the waters of North Sulawesi to continue to Tomini Bay, Kendari, the Banda Sea to the Timor Sea.

Foreign-made vessels are not foreign vessels. If foreign vessels operate in Indonesian sea zones, this vessel is illegal. This foreign-made vessel is owned by Indonesian businessmen who are legal and Indonesian-flagged. Foreign vessels are vessels made by foreign countries, operate illegally in Indonesian waters, have capacities above 30 GT, and have received a Fisheries Business Permit (SIUP) and Capture Fishing Permit (SIPI) from the government.

The use of foreign-made vessels is because the shipyards in Indonesia have not been able to produce fishing vessels that meet the criteria for fishing vessels. Besides that, the price of these foreign-made vessels is lower and still has sufficient economic life of vessel so that it is economically profitable in the fisheries business for business actors. Domestically-made vessels for sovereign purposes need to be supported by an adequate shipyard. Before the domestic shipyard can produce the appropriate number and size of vessels, foreign-made vessels can be allowed until Indonesian shipyards can produce domestically-made fishing vessels.

When foreign-made vessels terminate in the Waters Management Region (WPP), there is an emptiness in the area of > 12 miles-200 miles or > 200 miles, so the question that will arise is which will utilize this fishing area. Indeed, in the short term, the moratorium policy will reduce the number of vessels that carry out fishing activities so that fisheries production decreases, while in the long term, the production will increase. Therefore, it is necessary to provide fishing vessel licenses that have passed the analysis and evaluation to operate immediately.

In order to maintain the quality of captured fish, the presence of transport vessels (transshipment) is beneficial for the interests of marketing fisheries products, both export and domestic. The absence of transport vessels can be replaced by capture fishing vessels equipped with good post-capture processing technology. The term transshipment can be replaced if this term becomes a misunderstanding as it has been conveyed that the transshipment vessel conducts transactions in the middle of the sea and carries the captured fish out of the country so that the fish catch is not landed in Indonesia. Based on interviews with the capture fisheries business actors and several institutions in the regions, this condition is not proper. If it is suspected that there is such a matter of activity, strict supervision should be carried out to monitor and oversee fishing activities in the sea by the large vessels to minimize transshipment.

Economic Impacts that occur due to moratorium and transshipment implementation, including covering capture and transport fishing vessels unable to carry out fishing activities, labors in the field of capture fisheries lost their jobs. Fish Processing Unit (UPI) in Bitung's lack of raw materials resulted in the termination of employment (PHK) to the processing company workers and reduced income for other business actors.

The large impact can be measured if we give value (price) to the impact of a policy. The impact of a policy can be direct or indirect. Direct impacts arise as a result of the policy's main objectives, whether in the form of costs or benefits. The impact map of the moratorium and transshipment is presented in Figure 1. The catches of vessels with fishing areas > 200 miles, especially fleets with size > 100 GT and transport vessels, are needed by other businesses, especially fish processing units (UPI) that require raw materials from fish products catch. Map of the moratorium and transshipment impact on the tuna fisheries business.

The fishing companies and UPI felt the direct impact caused by the moratorium and transshipment. This is because fishing companies are business actors directly related to these rules. Other direct impacts are also felt by the Fish Processing Unit (UPI). The impact is the reduced raw materials supply for the fish processing industry. The unoperated UPI will also impact regional income due to the absence of revenues from issuing a Health Certificate (HC) from fishery products that will be exported. Due to reduced fish catches, direct impacts also occur on mooring services (retribution) at the Fish Auction site. One TPI has decreased production and retribution because almost all fishing companies in Bitung have their docks. In addition, the traditional processing business, namely cakalang fufu, was also affected by this policy due to declining raw supplies. Before the moratorium, traditional processing units will utilize the raw materials not used UPI.

The indirect impacts that occur due to the regulation on cantrang prohibition are also felt by business actors, namely fish suppliers and public transportation. The non-operation of fishing vessels causes no fish raw materials to be supplied to fish processing companies. The non-operation of UPI and fishing companies has caused the termination of employment (PHK), which has caused a decline in public transport revenues as one of the means of employees mobilization.

Impact valuation is an effort to give quantitative value to the business actors affected by policies issued by the Government. The policies issued should be reviewed first in biology, economics and society, considering fisheries and marine resources are public goods. Policies issued aim to control the use of fisheries resources given the nature of fisheries resources as public goods. Control can be done through policies to prevent the massive exploitation of fisheries resources. Valuation of the policy impact can describe the value of money from affected business actors both economically and socially, directly and indirectly.

The tuna fisheries business actors reviewed in this study were 9 business actors. The main impact of the economic and social moratorium and transshipment policy, both directly and indirectly, are Vessel Owners, Vessel Crew (ABK), fishing business employees, Fish Processing Units (UPI), UPI employees, fish auction sites (TPI), Fish Supplier, traditional fish processors and land transportation owner. The direct and indirect impacts of the moratorium and transshipment policies of 9 (nine) business actors.

Production surplus is calculated from the difference in benefits and costs obtained after the conditions reduced the policy before prohibiting the cantrang fishing gear. The valuation of economic and social impacts, directly and indirectly, using the Cost-Benefit Analysis of the moratorium and transshipment is presented in Table 1. In contrast, the economic and social impact evaluations are presented in Table 2.

The analysis results show that Extended Cost-Benefit Analysis (ECBA) for all business actors before the policy was Rp. 4,164,163 million, and after the policy of Rp. 356 658 million meant a decrease in producer benefits due to a moratorium and transshipment policy of (Rp. 3,807,504 million). So as long as this policy is implemented, it will decrease the benefits of tuna fisheries businesses by Rp. 2,644,100 million per year.

Table 2 shows that the economic and social impacts of the affected businesses were Rp 1,348,634 million per year and Rp 1,277,185 million per year. The total valuation of economic and social impacts was Rp. 2,625,819million per year. This means that if the prohibition of the moratorium and transshipment continues to be carried out, it will impact all business actors sampled in the study area of Rp 8,885,203 million per year. The economic impact of the policy is more significant than the social impact. This economic impact

is related to income and revenue from business actors and the social impact associated with the social costs of losing labor related to the tuna fishing business.

Managerial Implications

National policies in the fisheries sector must be studied from a multi-aspect perspective related to the conditions of their use and the implications in the national, regional and global scope so we can find ways to adapt to these changes without harming national interests. The moratorium and transshipment policy can still be implemented if it has a greater positive impact than the negative impact to support the fisheries business.

The issue of the degradation of fish resources and habitat stocks in the framework of Sustainable development does not mean stopping economic activities. However, the carried-out economic activities produce maximum profits while preserving resources so that future generations can utilize the fisheries resources that we use today. Illegal, Unreported, Unregulated (IUU) Fishing issues can be overcome by increasing surveillance facilities at sea, which involve all monitoring stakeholders, including the community and optimizing coordination with the Marine Security Agency (Bakamla).

Table 1. Extended cost benefit analysis of direct and indirect economic and social impacts of prohibition policy in the study area to the sample business actors

| Description | Before Policy (Rp Million/year) | After Policy (Rp Million/year) |
|-----------------------------------|---------------------------------|--------------------------------|
| Benefit | 9,575,946 | 3,192,357 |
| Cost | 6,921,739 | 2,764,664 |
| Net Benefit (CBA) business actors | 2,654,207 | (25,681) |
| Present Value | 1,471,598 | (20,300) |
| Net benefit change | (3,807,504) | (1,231,981) |

Table 2. Valuation of economic and social impact from moratorium and transshipment

| Description | Economic Impact (Rp Million/year) | Social Impact (Rp Million/year) |
|---|-----------------------------------|---------------------------------|
| Loss of revenue and income of business actors | 1,348,634 | |
| Social cost of losing labor/employees | | 1,277,185 |
| Total of Impact (Rp/year) | 1,348,634 | 1,277,185 |
| Total (Rp/year) | 2,625,819 | |

The absence of these transport vessels can be replaced by fishing vessels equipped with good post-capture processing technology. The fishing technology such as freezer to provide frozen fish. Especially for tuna commodities that often do transshipment for the effectiveness and efficiency of using production factors and maintaining the quality of fish for the export market.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

There are nine tuna fisheries business actors who get the greatest impact due to the moratorium policy implementation, including ship owners, vessel crew (ABK), fishing business employees, fish processing units (UPI), UPI employees, fish auction sites (TPI), fish suppliers, traditional fish processors and land transportation owner.

As long as this moratorium and transshipment policy is applied, the economic impact (loss profit) on tuna fishery business values was Rp. 1.35 trillion per year. While the values of the social impact (loss of a job) on tuna fishery business were Rp. 1.28 trillion per year, which caused 17,972 people to lose their jobs. So the total value of the economic and social impact of the moratorium and transshipment policy on the tuna fishery business was Rp. 1.35 trillion per year. This value certainly impacts the economy in the city of Bitung.

Based on the results of this study, the moratorium and transshipment policies should consider the conditions in the field to be on the right targets, provide economic and socio-economic benefits in the long term and support the fishery business.

Recommendations

One impact of the moratorium and transshipment policy is that the catch of small fishing fish has increased significantly. However, the catch cannot enter the Fish Processing Unit in Bitung. Then should be applied some recommendations such as; It is necessary to prepare a fishing fleet from the local and strengthen human resources. This is because there is potential not utilized in certain fishing areas that previously operated many ex-foreign ships because replacement fleets did

not prepare the prohibition of ex-foreign ships to utilize these resources and the evaluation of the prohibition ex-foreign ships. It must be appropriately verified, and supervision attached to the ship's ownership and provide benefits to the coastal community.

REFERENCES

- [KKP] Kementerian Kelautan dan Perikanan. 2014. *Peraturan Menteri Kelautan dan Perikanan No. 56/Permen-KP/2014 tentang Penghentian Sementara (Moratorium) Perizinan Usaha Perikanan Tangkap di Wilayah Pengelolaan Perikanan Negara Republik Indonesia*. Jakarta: KKP.
- [KKP] Kementerian Kelautan dan Perikanan. 2018. *Laporan Tahunan KKP Tahun 2017*. Jakarta: KKP.
- [KKP] Kementerian Kelautan dan Perikanan. 2014. *Peraturan Menteri Kelautan dan Perikanan Republik Indonesia Nomor 57/PERMEN-KP/2014 tentang perubahan kedua atas Peraturan Menteri Kelautan Dan Perikanan Nomor PER.30/MEN/2012 tentang usaha perikanan tangkap di wilayah pengelolaan perikanan Negara Republik Indonesia, yang mana Permen ini mengatur tentang Pelarangan Pendaratan Ikan Hasil Tangkapan melalui Alih Muatan di Tengah Laut*. Jakarta: KKP.
- Fauzi A. 2010. *Ekonomi Perikanan: Teori Peraturan dan Pengelolaan*. Jakarta: PT Gramedia Pustaka Utama.
- Fauzi A. 2010. *Ekonomi Sumberdaya Alam dan Lingkungan Teori dan Aplikasi*. Jakarta: PT Gramedia Pustaka Utama
- Olson RJ, Boggs. 1986. Apex predation by yellowfin tuna (*Thunnus albacares*): independent estimates from gastric evacuation and stomach contents, bioenergetics and cesium concentrations. *Canadian Journal of Fisheries and Aquatic Sciences* 43(9):1760-1775. <https://doi.org/10.1139/f86-220>
- [TRADEMAP] Trade statistics for international business development. 2016. Export Product. www.trademap.org [2018 Mei 18].
- Kodrat TR. 2015. Kebijakan Peraturan Menteri Kelautan Dan Perikanan Republik Indonesia Nomor 56,57,58/Per-Men/2014 Terhadap Pelabuhan Perikanan Samudera Bitung. *Lex et Societis* 3(5).

- Maghfiroh. 2000. *Departement of Health, Education and Welfare* 1972. Roma: FAO.
- Misuraca P. 2014. The Effectiveness of a Costs and Benefits Analysis in Making Federal Government Decisions: A Literature Review. Center for National Security, The MITRE Corporation
- Tamarol J, Wuaten FJ. 2013. Daerah penangkapan ikan tuna (*Thunnus* sp.) di Sangehe Sulawesi Utara. *Jurnal Perikanan dan Kelautan Tropis* 9(3):54–59. <https://doi.org/10.35800/jpkt.9.2.2013.4172>
- [Bappenas] Kementerian PPN/Bappenas. 2014. *Kajian Strategi Pengelolaan Perikanan Berkelanjutan*. Jakarta: Bappenas.
- Hikmayani Y, Rahadian R, Nurlaili, Muhartono R. 2015. Efektivitas pemberlakuan kebijakan moratorium kapal eks asing dan transshipment terhadap kinerja usaha penangkapan ikan (pps nizam zachman dki jakarta). *Jurnal Kebijakan Sosial Ekonomi Kelautan dan Perikanan* 5(2):101–112. <https://doi.org/10.15578/jksekp.v5i2.1021>
- Khan A, Gray T, Mill A, Polunin N. 2018. Impact of a fishing moratorium on a tuna pole-and-line fishery in eastern Indonesia. *Marine Policy* 94: 143-149. <https://doi.org/10.1016/j.marpol.2018.05.014>
- Saptanto S, Yusuf R, Apriliani, Arthatiani. 2015. *Analisis Dampak Moratorium Kapal Ex-Asing Terhadap Kondisi Pasar Tuna Indonesia*. Jakarta: Balai Besar Penelitian Sosial Ekonomi Kelautan dan Perikanan.
- Simanjuntak D, Lumingas L, Sangari J. 2019. Sustainable Potential of Tuna Fishery Around the Waters of North Sulawesi Province Based on Data from the Bitung Ocean Fisheries Port (PPS). *Jurnal Perikanan dan Kelautan Tropis* 10(1):18–27. <https://doi.org/10.35800/jpkt.10.1.2019.25071>
- Subekti J, Saputra WS, Triarso I. 2013. Valuasi Pemanfaatan Sumberdaya Perikanan Ekosistem Terumbu Karang Pada Taman Nasional Kepulauan Seribu Jakarta. *Journal of Management of Aquatic Resources* 2013: 104-108. <https://doi.org/10.14710/marj.v2i3.4190>
- Wang, Congfeng & Zhao, Ping & Liu, De & Wang, Jianguo & Qin, Xiaohui & Liu, Lvbo & Yang, Zhengjian. 2021. Fish Stocks Around the Gezhouba and Their Response During Fishing Moratorium in the Yangtze River, China. *Nature Environment and Pollution Technology* 20. <https://doi.org/10.46488/NEPT.2021.v20i02.053>
- Wiryanawan B, Zulbainarni N, Sampono N. 2013. penilaian lingkungan dan valuasi ekonomi perikanan terhadap reklamasi 'water front city teluk Jakarta. Di dalam: Hermanto Siregar, Editor. *Mempercepat Penguatan Daya Saing Ekonomi Daerah Menghadapi Masyarakat Ekonomi ASEAN 2015. Seminar Nasional dan Sidang Pleno ISEI XVI*; 2013 September 18-20; Jambi, Indonesia. Jakarta: Pengurus Pusat Ikatan Sarjana Ekonomi Indonesia. Hlm 114-127.
- Zulbainarni N, Yani Ahmad, Faradissa, Kadda SA. 2016. *Kajian Valuasi Dampak Ekonomi Pelarangan Alat Tangkap Cantrang di Jawa Tengah*. Bogor: Masyarakat Perikanan Nusantara.
- Sularso A. 2015, Transshipment of Fish. <http://ajisularso.com/transshipment-ikan> [March 19, 2018].