Estimating socio economic impacts of re-enacting a permit policy for foreign-made fishing vessels

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Abstract. The fishing permit moratorium for foreign-made fishing vessels applied since 2014 is one of the Indonesian Government efforts to combat illegal, unreported and unregulated (IUU) fishing. The Ministry of Marine Affairs (MMAF) of the Republic of Indonesia has been planning to re-enact a permit policy for foreign-made fishing vessels to conduct fishing in Indonesian waters. This plan has raised different responses from relevant parties. This study aimed to estimate the socio economics impacts of re-enacting permits for foreign-made fishing vessels. Data were collected from in-depth interviews with representatives from the central government, local governments, and owners of foreign-made fishing vessels. The data were analysed using the Regulatory Impact Assessment (RIA) model by comparing the costs and benefits of three policy plans. The first option is re-enacting the permits by exemptions on certain fishing areas and fishing gears; the second option is re-enacting the permits with restrictions on fishing area and fishing gear; and option three is continuing the moratorium. The results show that option two should have the greatest positive impact on economic aspects, as well as the least potential negative impacts. Some steps need to be taken by the government to re-enact the permits for foreign-made fishing vessels: (1) public communication before and after policy implementation; and (2) fishing licenses should be granted carefully with strict monitoring.

1. Introduction

Moratorium policy on fishing permit for foreign-made fishing vessels has been regulated by Indonesian government since 2014 on the Decree of Minister of Marine Affairs and Fisheries (MMAF) Number 56 [1]. The policy is expected to combat IUU fishing activities which causes Indonesia loss by USD 2 million annually [2]. During the implementation, the government has analyzed and evaluated 1132 fishing vessels affected by the moratorium to identify forms of infringement and recommend sanctions and fines.

In five years, the policy has brought both positive and negative impacts on fisheries sector. Small scale fisheries have experienced positive impacts of the moratorium; i.e. in Bitung, fishermen with 10 GT fishing vessels increase their fish production by 200%; In addition, improvement fish prices and closer fishing area were experienced by fishermen in Bitung [3]. Another impact is found that IUU fishing practices decrease significantly; thus, Indonesian sovereignty was proved over its fish resources. However, negative impacts were also found especially decrease on export volume due to lacks of raw materials led to increasing unemployment.
The moratorium policy has been suspended since 2015 due to Minister Decree Number 10/2015. However, the implementation is contradicting. Many fishing vessels scattered over Indonesian water have been waiting for the re-enactment the fishing permit for foreign made fishing vessels. Those vessels might be damaged due to long-term docking.

In early 2020, a re-enactment of fishing permit for foreign-made fishing vessels was proposed. This proposal to re-enact the permit led some responses from general publics including local governments, fisheries business owners and community members. Loi and Rodrigues [4] argue that public policy is implemented to improve situation of impacted individual. Then, the questions arise from this argument: does planning on re-enactment of fishing permit would improve Indonesian fisheries? Or the situation could be on the contrary? An acceptable policy should be problem-solving instead of doing-something. This rule also applies to the policy plan regarding foreign-made fishing vessels.

Policy analysis is conducted to assess program or policy. There are several methods of policy analysis can be employed. This study aims to estimate impacts of re-enacting fishing permit for foreign-made fishing vessels. Hence, this study examines whether the re-enactment of the policy is appropriate.

2. Research Method

2.1. Location and Time of the Study
This policy analysis research was conducted from April to August 2020 in Jakarta, Bitung, Cilacap and Bali. Research area was selected due to data from Directorate General of Marine and Fisheries Resources Supervision about number and location of foreign-made fishing vessels in Indonesian waters.

2.2. Types and Data Collection Method
Primary and secondary data were gathered for this research. Primary data was collected from in-depth interviews with owners of fishing vessels affected by the moratorium, whereas secondary data was gathered from central and local governments about updated location of foreign-made fishing vessels in Indonesia. Interviews with 20 owners of foreign-made fishing vessels were assisted by structured and semi-structured questionnaires. Interviews were also conducted with five representatives from central and local governments. The interviews were focused on shrimp and tuna because both commodities are important on Indonesian fisheries sector.

2.3. Data Analysis Method
This study employs qualitative and quantitative methods. Qualitative approach is applied to identify the impact of moratorium policy on capture fishery business for tuna and shrimp commodities. This method is appropriate for this study due to arduous variables to be identified and quantified. “Qualitative research approach consists of description and interpretation of new issues or issues that are not well researched; generalizing theories, developing theories, theory qualification, and theory correction; evaluation, policy suggestion, and action research; research that focuses on future issues” [5]. This study is an explorative research since business operators and stakeholders were interviewed to capture their perspectives on re-enactment of fishing permit for foreign-made fishing vessels.

Quantitative analysis is employed to estimate impacts of re-enacting permit policy on costs and benefits of foreign-made fishing vessels. Schniederjans, Hamaker, and Schiederjans [6] argue that cost benefit analysis is a technique to measure costs and benefits involving estimation and evaluation associated with alternative actions to be implemented. This technique compares the current value of investment with similar investment costs to assist decision-making. The BCR method is a way of evaluating a project by comparing the present value of all projects / programs obtained from the project / program with the present value of all the project / program costs. This method provides ratio where project/program will be implemented if BCR > 1.
The following steps should be taken to perform Cost-Benefit Analysis:
1. Identify program or project to be analyzed
2. Identify costs of each program or project
3. Measure total costs of each program or project
4. Identify and transform the benefits into financial values
5. Measure total benefits
6. Analyze options from the most benefitted program

\[ BCR = \frac{\sum_{t=0}^{T} B_t (1+r)^t}{\sum_{t=0}^{T} C_t (1+r)^t} \quad \text{…………………………………………………………………………………} (1) \]

where \( B_t \) is the benefit obtained at \( t \) point, and \( C_t \) is the cost at \( t \) point. It is generally agreed to start measuring with the current period \( t = 0 \). If \( BCR \) is higher than one, a policy or program might be the best option to be accepted or implemented.

3. Result and Discussion

3.1. Moratorium Policy for Foreign-Made Fishing Vessel Permit

According to the Great Dictionary of the Indonesian Language of the Language Center (KBBI), a moratorium has a literal definition of *penundaan* (postponement) or *penangguhan* (suspension). Another definition of moratorium is stopping a certain activity within a predetermined period of time. Moratorium is usually related to a current policy that unexpected results occur; hence, the moratorium is applied to evaluate the policy. The local authorities have jurisdiction to set a moratorium policy.

Moratorium policy on fishing permit for foreign-made fishing vessel has been regulated on Ministry of Marine Affairs and Fisheries (MMAF) Regulation Number 56/2014. This regulation states that governments will not grant new fisheries business permit for foreign-made fishing vessels (Surat Ijin Usaha Perikanan - SIUP), Fishing Permit (Surat Ijin Penangkapan Ikan - SIPI), Fishing Viable Permit (Surat Ijin Kelayakan Penangkapan Ikan - SIKPI), and the renewal of SIUP and SIKPI. This moratorium is considered necessary since the number of foreign-made fishing vessels has reached 1240 boats out of total 5329 fishing vessels with size above 30 GT [7].

The moratorium policy for foreign-made fishing vessels with 30 GT and above was valid from November 2014 to 30 April 2015. This moratorium has been extended because of unexpected results. The policy had been extended until October 2015, as mentioned in MMAF Regulation Number 10/2015. The MMAF then established Task Group 115 to analyze and evaluate status of foreign-made fishing vessel following the moratorium implementation. More than a thousand vessels were evaluated as depicted in Table 1. Around 44% of foreign-made fishing vessels were rejected on renewing permit and obtaining new fishing licenses. Thus, they were given options to deregulate (remove the vessels from the list of Indonesia fishing vessels) or to switch the function of the vessels for other purposes. In addition, some vessels were on the blacklists that could not be utilized for any activities in Indonesian waters but waiting for convictions and other penalties. The execution is handed over the owners of the vessels, and they are required to report to MMAF.
Table 1. The Result of Task Group 115 Analysis and Evaluation on Ex-Foreign Vessels

| No | Analysis and evaluation results                                      | Number of vessels |
|----|---------------------------------------------------------------------|-------------------|
| 1  | Cannot extend fishing permit and apply new permit                   | 498               |
| 2  | License revocation                                                  | 271               |
| 3  | Open application for a new permit if it meets MMAF policies          | 253               |
| 4  | Permit suspension                                                   | 54                |
| 5  | Warning notice                                                      | 48                |
| 6  | SIPI Suspension Notice                                              | 7                 |
| 7  | Allowed to operate                                                  | 1                 |

Grand Total 1,132

Source: DJPSDKP, 2015

The vessel owners affected by the moratorium have begun to take some steps such as scraping the vessels and selling the vessel scraps, returning the vessels to their country of origin, shifting function into transport or excursion vessels, and docking their vessels in the port. From the interviews we found that several reasons vessels owners took those measures:

a. to minimize maintenance costs of unutilized vessels
b. to add capital from scrapped vessels
c. fishing permits would be difficult to obtain had the owners haven’t taken any action for foreign-made fishing vessels.

Since 2019, the number of foreign-made fishing vessels has been decreased from 1132 to only 450 fishing vessels. These ships were scattered throughout Indonesia water, as summarized in Table 2.

Table 2. The Location of Ex-Foreign Vessels in Indonesian water

| UPT PS DKP / Location                                                                 | Number of Vessels |
|---------------------------------------------------------------------------------------|-------------------|
| PS DKP Quay Tual (including Wanam, Benjina, Avona, Tual, Sorong, Warabel, Merauke and Dobo) | 217               |
| PS DKP Quay Ambon (including Ambon and Bacan)                                         | 93                |
| PS DKP Quay Benoa (including Benoa, Banyuwangi, Surabaya, and Buleleng)                | 55                |
| PS DKP Quay Bitung (including Bitung and Kendari)                                     | 46                |
| PS DKP Quay Batam (including Batam, Moro, Kijang, Tanjung Pinang, Tanjung Balai Karimun, and Tanjung Pandan) | 14              |
| PS DKP Quay Jakarta (including Muara Baru, Muara Angke, and Tulang Bawang)            | 9                 |
| PS DKP Station Biak                                                                    | 6                 |
| PS DKP Station Pontianak (including Sungai Rengas, and Ketapang)                      | 3                 |
| PS DKP Station Cilacap (including Tegal, Cilacap, and Pekalongan)                    | 4                 |
| PS DKP Station Lampulo (including Sabang and Bungus)                                  | 2                 |
| PS DKP Station Kupang (including Flores Timur/East Flores)                            | 1                 |

Source: DJPSDKP, 2019

It was found that the identified vessels no longer exist in several places after tracing the physical condition and location. It is a challenge to re-inventory foreign-made fishing vessels that may lead to new issues had the government plans to re-enact the fishing permit for foreign-made vessels.
According to the MMAF Regulation Number 10/2015, the moratorium had been effective until November 2015. Nevertheless, those foreign-made vessels have not granted any operational permit.

3.2. Post-Moratorium Condition of Tuna Capture Fisheries

Tuna is an important commodity for domestic market demand and a source of national foreign exchange. Tuna is a type of scombrid that actively swim and spread across nearshore waters to oceanic waters. Blackburn [8] states that tuna can be categorized into three large groups based on its area of distribution; (1) tunas that live in oceanic waters: bluefin tuna, albacore (Thunnus alalunga), big eyes tuna (Thunnus obesus), and madidihang (Thunnus albacares); (2) tunas that live in nearshore waters: skipjack tuna (Katsuwonus pelamis) and mackarel (Euthynnus affinis); and (3) tunas that distribution area is still unknown: Allothunus fallai. Several oceanography parameters, such as variations in water temperature, affect distribution of tuna spatially [9]. For example, Longhurst & Pauly [10] found that Madidihang tuna has a vertical spread limited by the depth of the thermocline (100 to 300 meters), while albakora and large eyes tuna usually live in the water layer under the thermocline [11].

Implementing the moratorium policy for foreign-made fishing vessels at national level has insignificant impact on total fisheries production in Indonesia. Figure 1 shows that the fisheries production only increased by 1.4% in 2016. However, further analysis shows that tuna and shrimp production experienced a significant impact of moratorium policy implementation. A number of foreign-made fishing vessels with tuna and shrimp as the main production could not operate; thus, production of tuna and shrimp decreased.

![Figure 1. Marine Capture Fisheries Production in Indonesia 2014-2017](image)

Industry of tuna capture have started since early 1970s pioneered by PT. Perikanan Samudera Besar [12]. Tuna capture industry have growth in the last decade. Tuna handline has been employed aside from tuna longline, where both gears are operated near deep water “rumpon”. In eastern Indonesia, this gear has been growing in several regions, such as North Sulawesi, Tomini Bay, Maluku Sea, and Makassar Strait. Since a venture company operates with purse seine gear in North Sulawesi, a Filipino-type-handlines fishing gear called pump boat is growing. This gear usually uses a large motorized jukung (wooden Indonesian outrigger canoe) that can operate for up to two weeks. In 2012, most of 1,459 tuna longline vessels with a fishing permit from the central government (>30 GT) anchored in three main fish landing center: Benoa-Bali, Cilacap, and Muara Baru. The majority of longline tuna vessels (>70%) fished beyond International Exclusive Economy Zone (ZEEI) water [13].
Based on MMAF about Fishing Management Plan of Tuna, Skipjack, and Tongkol, regional and/or international collaborations are needed to implement tuna fishing management [14]. Tuna and tuna-like-species are highly migratory fish stocks and straddling fish stocks in the Exclusive Economy Zone or more countries and international waters. Following Fisheries Law Number 31/2004 changed into Fisheries Law Number 45/2009, Indonesia has been an active member in:

a. Indian Ocean Tuna Commission (IOTC) based on President Regulation Number 9/2007;
b. Commission for The Conservation of Southern Bluefin Tuna (CCSBT) based on the Presidential Regulation Number 109/2007;
c. Western and Central Pacific Fisheries Commission (WCPFC) based on Presidential Regulation Number 61/2013.

In Indonesia, tuna fish capture is dominated by small boats with simple fishing gear such as handline. Tuna fishing is still potentially developed since Indonesian fishing vessels with large size cannot meet existing quota to fish in ZEEI and offshore area. This fishing quota has been only complied by small vessels with size 1-2 GT. Small number of fishing vessels above 60 GT was operated in Indonesian area due to moratorium. Tuna longline was dominant in Indonesian water in 2012 with 1,459 units, but it has been declined by 10.75% annually and became 429 units in 2020, as depicted in Figure 2. It can be observed that the increase of fishing gear number in a period does not improve production of tuna and skipjack tuna [15]. Figure 2 shows that production of tuna and skipjack are not solely determined by the number of fishing gears but impacted by other factors such as number of fishing fleets, season, and number of fishers.

Figure 2. The Number of Tuna Catching Vessels in Indonesia with a Permit from the Central Government 2012-2020

Figure 3 shows the number of tuna production in Indonesia between 2012 to 2018. The catching production reached highest peak in 2014 with 305,435 tonnes, and it significantly declined in 2015 with 250,485 tonnes. Decrease in production after 2014 could be led by moratorium policy in Indonesian water. The MMAF Decree Number [1] on the moratorium policy regulation includes governing the temporary suspension of fishing permits for foreign-made fishing vessels.
3.3. Shrimp Capture Fishery Business After the Moratorium

Shrimp contributes to national foreign exchange due to high economic value (price) and potentially high abundance (biomass). Around 70% of shrimp production comes from fishing activities in the sea. According to MMAF (2012), the volume of shrimp export reached 158,062 tonnes in 2011 (13.6% from total export volume of Indonesia fisheries) with economic value of USD 1,309.6 million (37.2% of total export values of Indonesia fisheries). Compared to 2010, export volume and value of shrimp increased by 8.8% and 23.9%, respectively. High prices and demands for shrimp in international market often led to uncontrolled fish catching activities. Fishing vessels had been increased significantly that led to overfishing (overexploited). Therefore, the management of shrimp fishing should be conducted carefully and wisely to ensure sustainability. Potential shrimp production is unequal on each WPP. In 2008, shrimp fishing is already over-utilized (overfishing) or exceed its sustainable potential except in Arafura Sea, which was at its full utilization (fully exploited). The effective fishing gears to catch shrimp are lampara dasar or dogol (technically a trawl), trammel net, and pukat sondong (push net). The other passive catching gears are jermal, belat pantai, tuguk, bubu apolo, and gombang, often installed on the estuary.

The Arafura Sea, including WPP 718, is one of the most remarkable water regions in Indonesia for fish catching activities known as ‘The golden fishing ground’. This preference can be observed in the number of fishing vessels that apply for a fishing permit in WPP 718. These fishing vessels are dominated by trawlers targeting shrimp and demersal fish. The majority of these vessels are foreign-made fishing vessels. This condition experienced significant change after the government implemented a moratorium policy for foreign-made fishing vessels through the MMAF Decree Number 56/2014. MMAF Decree Number 2/2015 forbids Hela Trawl Fishing Equipment (Trawls) followed by MMAF Decree Number 71/2016 regarding Fishing routes and fishing gears in Indonesian WPP.

Since moratorium policy was implemented in 2014, shrimp capture level in Indonesian water has been dropped drastically. Based on data from fisheries stock study in 2017 [16], shrimp resources in Arafura Sea could only be utilized up to 5.09 % from its sustainable potential in 2018. On the other side, it is widely known that shrimp life span is less than two years, and recruitment progress occurs all year-round. The low fishing activities since moratorium implementation are expected to increase the abundance of shrimp stock in the water region. The moratorium for foreign-made fishing vessels also significantly impacts shrimp resource supply because most of the vessels used shrimp trawl. However, at national level, the foreign-made fishing vessels moratorium had not significantly impacted the national production of fish capture, as summarized in Figure 4.
Figure 4. Indonesia Shrimp Production 2010-2017

3.4. The estimated impact of re-enactment of fishing permit for foreign-made fishing vessels

Re-enactment plan of fishing permits for foreign-made fishing vessels is estimated to positively and negatively affect the social and economic field, as represented in Figure 4. The active roles of governments and business actors become vital in anticipating estimated negative impacts of this re-enactment policy.

Figure 5. The Estimated Impact of Re-enactment Permit on Foreign-Made Fishing Vessels

This study simulates several scenarios to analyze the estimated impact of re-enactment permit on foreign-made fishing vessels. The collected data was analyzed using RIA (Regulatory Impact Assessment) to determine the impacts on social and economic aspects. In this analysis, the cost-benefit analysis is conducted by including the variables related to the fishing business. The variables are summarized in Table 3.
Table 3. Variables used in Cost-Benefit Analysis of Capture Fisheries Business at the Research Location

| Variable | Indicator (Cost or Benefit) |
|----------|----------------------------|
| Economy  | The production values of fish capture business |
|          | Business actors and workforce income (ship captain and crew) |
|          | Non-Tax State Revenue (Penerimaan Negara Bukan Pajak - PNBP) |
| Social   | The potential of workforce absorption (fishermen) who work in the fish capture sector |
|          | The potential of conflict between local fishers in utilizing fisheries resources |

Source: processed primary data, 2020

The next step is examining cost and benefit analysis on the identified variables to estimate the impacts of re-enactment permit for foreign-made fishing vessels based on the social and economic variables in fish capture business.

3.4.1. Economic Aspect. From the economic aspect, the estimated impacts of re-enactment permit for foreign-made fishing vessels can be observed from various indicators, such as production values, income of fish capture business actors, and non-tax state income potential from the capture production. The analysis results are presented in Table 4.

Table 4. Cost-Benefit Analysis for Fish Capture Business based on the Estimated Impact of MMAF Decree No.56/2014

| Description                  | Option 1: Continue the Moratorium | Option 2: Re-enact the permit for utilizing foreign-made vessels |
|------------------------------|------------------------------------|---------------------------------------------------------------|
| Value                        | 196 billion                        | 195 billion                                                  |
| Cost                         | 148.37                             | 201.62                                                        |
| Benefit                      | 250 billion                        | 320 billion                                                  |

Source: processed primary data, 2020

Table 4 shows the cost-benefit analysis on the impacts of re-enactment permit for foreign-made fishing vessels on fish capture business. The table shows two policy options. The analysis results show that Option 1 and Option 2 positively affect the fish capture business. It is found that Option 2 (re-enactment permit for foreign-made fishing vessels) is estimated to bring substantial positive impact than Option 1 (Continue the Moratorium) with B/C Ratio 201.62. In Option 2, the production value of tuna capture production would increase by 57%, workforce income (ship captain and crew) would increase by 53% in average, income of business actors would also increase by 36.5% per trip. Lastly, non-tax state income (PNBP) would rise by 11.92%.

Cost-benefit analysis is assessed further had re-enactment permit for foreign-made fishing vessels is selected by the government with two requirement options: requirements on fishing gears and catching zones. Option A is granting a license without a limitation on capture area and fishing gears, whereas Option B offers re-enactment permit with a restriction on the fishing ground and only allows fishing gears for tuna and shrimp. The analysis result is summarized in Table 5.
Table 5. Cost-Benefit Analysis on Capture Fisheries Business based on the Estimated Impact of Foreign-made Vessels Usage Permit Re-enforcement, 2020

| Policy Option                                      | Benefit   | Cost    | B/C  |
|----------------------------------------------------|-----------|---------|------|
| Option A (capture area and fishing gears for all fish species) | 34,139 billion | 180 billion | 189.13 |
| Option B (capture area, and fishing gears for tuna and shrimp capture) | 42,366 billion | 180 billion | 234.32 |

Source: processed primary data, 2020

The results show that both options of foreign-made vessels equipped with all fishing gears and specific fishing gears positively impact the fish capture business. However, in detail, policy Option B, foreign-made fishing vessels equipped with specific fishing tools (tuna longline and shrimp trawl), provide higher benefit for fish capture business.

3.4.2. Social Aspect. The RIA analysis using cost-benefit analysis was implemented on the option to re-enact permits for foreign-made vessels by limiting the use of specific fishing gears. The social aspect examination includes several indicators, including the potential for labor absorption and potential conflict among local fishers in utilizing fisheries resources.

Table 6. Social Dimension based on the Estimated Impact of Re-enactment Permit on utilizing Foreign-made Vessels with the Use of Certain Fishing Gears, 2020

| Aspect     | Description                                                                 | Notes |
|------------|-----------------------------------------------------------------------------|-------|
| Human resources | The labor absorption potential will increase if the usage permit for foreign-made vessels is re-enacted. | (+)   |
| Conflict   | In utilizing fishery resources, the potential of conflict between local fishermen and other fish capture businesses will decrease due to following the government regulation on the use of approved fishing gears. | (-)   |

Source: processed primary data, 2020

Table 6 shows a descriptive analysis of the social impact of fish capture business. In the workforce indicator, foreign-made vessels equipped with specific fishing gear (tuna longline and shrimp trawl) are potentially absorb more workforce than during the moratorium period. Another indicator for the social aspect, the re-enactment of permits for utilizing foreign-made vessels can create new conflicts between vessel owners and local fishers in fishery resource exploitation.

Based on the result of cost-benefit analysis and descriptive analysis explained above, the result on the estimated impact of re-enactment of permits for utilizing foreign-made vessels can be summarized in Table 6. There are three options: Option 1 (re-enacting permits for utilizing foreign-made fishing vessels by allowing any fishing gears and fishing ground), Option 2 (re-enacting permit for utilizing foreign-made fishing vessels by limiting the fishing ground and the equipment only for tuna and shrimp commodities).
Table 7. The Analysis on the Estimated Impact of Usage Permit Re-enforcement for Foreign-made Vessels

| Policy Options | Economic Criteria | Social Criteria |
|----------------|-------------------|----------------|
|                | Description       | Notes          | Description                      | Notes        |
| Option 1       | Net Benefit = IDR 33.9 trillion ** | Well handling of workforce issues (+) |
|                |                   | A high potential of competition for the fishing ground with local fishermen (-) |
|                |                   |                | Option 2 | Net benefit = IDR 42.1 trillion *** | Partially addressing the workforce issues (+) |
|                |                   | Addressing the potential competition for the fishing ground with local fishermen (-) |

Source: processed primary data, 2020

Table 7 shows that in economic aspect, Option 2 provides a potential higher net benefit than other two options. Meanwhile, all options have an estimated positive and negative impacts on the social aspect, but Option 2 has the potential lowest negative impacts than other options.

4. Conclusion and Recommendation

4.1. Conclusion

The moratorium of permit for foreign-made fishing vessels implemented in 2014 significantly impacted fish capture business in Indonesia. The impact was positive for local fishers with small boats because they could not compete with large foreign-made fishing vessels. The moratorium expanded fishing ground and improved fishing activities effectively and efficiently for small fish boats. On the other hand, a negative impact occurred for the owner of foreign-made fishing vessels due to the moratorium. They experienced a sharp decline in productivity so that they could not rely on the income generated from fish capture business. The multiplier effect is increasing numbers of unemployment in some regions because number of labor worked in the ships such as captains and crewmates were reduced.

After five years, MMAF plans to re-enact catching permits for foreign-made fishing vessels. This plan has both potential positive and negative impacts for fish capture business and governments. Therefore, this study provides policy options that can be chosen by the government to be enforced. The proposed options are Option 1 (re-enacting permits for utilizing foreign-made fishing vessels by allowing any fishing gears and fishing ground), Option 2 (re-enacting permit for utilizing foreign-made fishing vessels by limiting the fishing ground and the equipment only for tuna and shrimp commodities)

Based on RIA analysis by examining cost and benefit of each proposed option, this study found that Option 2 provides the highest estimated economic impact than other two options. However, from the social aspect, this option has potential to cause adverse effects such as conflict over the use of the smallest fishery resources.
4.2. Recommendation

The analysis of estimated social and economic impacts to re-enact permit for foreign-made fishing vessels is expected to be a basis for the stakeholders to decide the feasible policy. Had the government chooses Option 2 to re-enact permit for utilizing foreign-made fishing vessels by limiting the fishing ground and the equipment only for tuna and shrimp commodities, several strategies need to be implemented by the government and foreign-made fishing vessels. These strategies are conducting public communication before and after policy implementation to minimize potential conflicts, increasing supervision for foreign-made fishing vessels permitted to operate, and considering the company’s track record before granting a fishing permit to minimize the probability of IUU Fishing.

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