Thesis for the Degree of Master of Fisheries Science

Evaluating the Cantrang Ban Regulation in Indonesia

by

Irvine Farhanan

The World Fisheries Graduate School

Pukyong National University

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Evaluating the Cantrang Ban Regulation in Indonesia
(인도네시아 찬트랑 어업금지 규제에 대한 평가)

Advisor: Prof. Dale Marsden

by

Irvine Farhanan

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Irvine Farhanan

Approved by:

_____

(Chairman)Sang Go Lee

_____

(Member)Yong Min Shin

_____

(Member)Allan Dale Marsden

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Irvine Farhanan

The World Fisheries Graduate School,

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Abstract

Cantrang, a modified version of a trawl used in Indonesia is seen as a problematic fishing gear. It accounts for less than 2% of all fishing gear used but has caused conflicts among fishermen and depletion ofIndonesia's fish resources. In 2015 a Ministerial Decree banned 17 fishing gears, including*cantrang*, but this ban has been postponed several times by the Minister. Given the advantages and disadvantages of banning *cantrang*, the government has been unable or unwilling to implement the law and has been easily impaired by public pressure. This study analyzes, using information from past studies, the reasoning behind the prolonged postponement of the ban, andprovides suggestion for a settlement between the government and the fishermen. I find that the ban has negative economic and social impactson fishermen and the ban was seen to be too sudden, leaving governments and fishers unprepared. I recommend that the government should better socialize the

upcoming ban and provide proper compensation for fishermen to ensure that the ban can be truly enforced in the near future.

1 INTRODUCTION

The use of trawls for fishing has been restricted in Indonesia for decades. However, some modified versions of trawls, called *cantrang*, are still used and have been causing problems in recent years. For example, only 18%-40% of the total catch in some cases is comprised of the target species, while the rest is bycatch and discards (Ministry of Health, 2018). Another study in Brondong-Lamongan found that only 51% of a trawl's total catch was the targeted species, and yet another in Tegal found only 46% of trawl catch was the targeted species (Leo, 2010). The bycatch is typically dominated by trash fish, which will be sold for fish feed or to a surimi factory at a very low price.

After trawling was banned by a Presidential decree in 1980, *cantrang* was invented. *Cantrang* is a modified trawl and has many different types and names depending on the specific area. In theory there is standardization of *cantrang*'s mesh size and top rope length regulated by Ministerial Decree in 2011 and registered in the National Standardization Agency, but a study conducted to check whether the fishermen comply with the standard found that none comply completely (Sasmita et al., 2012). Moreover, Indonesia's demersal fish production is fully exploited (MMAF, 2011)and shrimps are overexploited in almost all fisheries management areas (MMAF, 2018a).

To address this issue, Indonesia's Ministry of Maritime Affairs and Fisheries (MMAF) banned the use of 17 different trawl and seine in all

fisheries management areas in early 2015. Following the implementation of this decree, there were many demonstrations against the regulation by fishing communities across Indonesia. Their biggest concerns of the protesters were that the ban was too sudden and that there was little compensation for fishers' loss as *cantrang* are favoured among many Indonesia fishermen due its' high catching ability.

The outcome of the demonstrations was that in February 2016 the Minister of Indonesia's MMAF declared a postponement of the *cantrang* ban to December 2016 (Simorangkir, 2018). This postponement was then prolonged until June 2017, and then again to December 2018. In early 2018 at closed meeting among Ministers, Indonesia's President, and representatives of fishing communities, the ban was yet again postponed, this time until an undetermined date, and other modifications were made to the regulation as well (Andreas, 2018)

This study will examine the likely effects of the ban on different fishing groups, and on this basis will aim to understand why the ban has been repeatedly deferred.

2 BACKGROUND AND LITERATURE REVIEW

2.1 Indonesia State of Fisheries

Indonesia consists of 17,502 islands and has a coastline of 81,000 km with an ocean area of around 5.8 million km^2, including both

territorial waters and the Exclusive Economic Zone (EEZ). Such a large ocean area suggests strong prospects for Indonesia's fisheries and marine development.

Indonesian fisheries resources are considered to have the highest biodiversity in the world, with at least 37% of all fish species living in Indonesia's oceans (Adisanjaya, 2010). Notable commercial fish and other species include tunas, shrimp, cob, mackerel, snapper, squid, reef fish (e.g., grouper, rabbitfishes, lobster), ornamental fish, and seaweed (Barani, 2004)

Yet much of this potential for strong fisheries production is not being realized, as there are some areas where fish resource have been overfished. The most overfished species are squid, shrimp and coral reef fish, followed by demersal fish, small pelagic fish, and large pelagic fish(MMAF, 2018a). More specifically, squid is considered overfished in most of Indonesia's fisheries management area. This is not only due to the overfishing that exceeds the sustainable potential of fisheries resources, but also because the quality of the marine environment, especially fish habitat that is important for spawning, nurturing and foraging for most tropical marine biota, has been degraded.

Despite the poor status of many fish stocks, the economic revenue from fisheries in recent years has been strong, especially in 2017, when Indonesia's non-tax revenue from fisheries sector was the highest in a decade. It was recorded that fisheries have contributed $14.3 million, and it was the highest in a decade. Followed by the increased export

commodities rate of 8,12% (Andri Donnal Putera, 2018; MMAF, 2018b). While non tax revenue often has the same meaning with parafiscal charges or non-tax levies, meaning is the revenue that the government generated in other way than collecting tax from the people, this can be in form of requited receipts from property income, investment, fees and charges, and the cash operating surpluses from departmental enterprise (Karačić et al., 2017).

While the fisheries performance indicators show good results for the year of 2017, Indonesia aims for further improvement. The ban of *cantrang*is seen as one way to make improvements, as it is widely known to be harmful to the benthic environment and to the fish resource sustainability (see section 2.4).

2.2 History of legislation concerning trawling and *cantrang*

Cantrang is an evolved version of trawls developed in Indonesia. In the 1970s trawls were very popular in Indonesia until there were a clash between trawl and non-trawl fishers, including several incidents where ships were lit on fire by fishers from the opposing group. After these incidents President Soeharto issued a Decree (President of Indonesia, 1980)concerning the elimination of trawl usage in Indonesia, to be done in two phases. The Decree included an immediate ban on trawling in Java and Bali waters starting on October 1, 1980, while trawl vessels in Sumatra could be operated until January 1, 1981. The trawl vessels outside of the Java, Bali, and Sumatra area were still allowed to

operate but the fleet was limited to 1000 vessels in total. This is the first decree concerning trawl usage in Indonesia, and was passed in order to maintain the sustainability of resources, to increase productivity, and to avoid any social issues arising from the clash of trawl and non-trawl fishers.

In response to the 1980 Presidential Decree, instead of stopping the use of trawls, fishers developed "evolved" trawl-like gears in several different forms and with different names, but which mostly came to be known as *cantrang*. At the time *cantrang* was considered different from a trawl, but it operates in a similar way to target demersal fish. It was considered more environmentally friendly as it is operated by small vessels and operated manually, and *cantrang* quickly became a favorite fishing gear among fishers. More detail on the *cantrang* and its functioning is given below (see section 2.3).

With the massive usage of *cantrang* throughout the country, the general directorate of the fisheries ministry issued a decree in 1997 with the intention to manage the *cantrang* fisheries and to apply some rules and standards for *cantrang* vessels (MMAF, 2016). Use of *cantrang* is only allowed for small-scale fishermen with vessel size of up to a maximum of 5 gross tons and machine capacity up to 15 Paarden Kracht.

Cantrang gears that were developed in different regions of Indonesia has a different nomenclature. For example, fishermen in Lamongan use the name of *dogol* even though the fishing gear is actually a type *cantrang*. However, in several other areas such as the

Straits of Malacca and some areas on the Java Island the name *cantrang* is used for types of trawl fishing gear (Riyanto et al., 2011). In 2010, a more detailed specific classification was generated of all fishing gear in Indonesia, and the MMAF issued a decree (MMAF, 2010)about "Fishing gears in Indonesia's Fisheries Management Areas." Ten types of fishing gears are acknowledged in this classification: surrounding nets, seine nets, trawls, dredges, lift nets, falling gears, gillnets & entangling nets, traps, hooks & lines, and grappling & wounding. The decree also addresses the development and use of modified fishing gears in specific areas or for specific purposes. In this classification of fishing gear, *cantrang* is considered as a type of seine net together with five other types of fishing gears.

In 2011 the classification of *cantrang* in the previous Ministerial Decree was further refined, and the standard operation of the gear was specified, including: the net's mesh has to be more than 2 inches; maximum vessel size was increased to 30 GT, and was to be operated a maximum of four miles from shore, in Indonesia's Fishing Routes II and III, only (see section 2.4 for definition of Fishing Routes).

Cantrang is indeed popular among the fishers in Indonesia, mostly because *cantrang* is considered to give bigger profits with less effort, it has high productivity for a short sailing time, and usually fishers are able to bring two or three *cantrang* on board as backups in case the first gear is damaged or lost. For example, one study suggested that *cantrang* will only spend 74 hours while gillnet will need 105 hours

(Sutanto, 2005). However, *cantrang* is a smaller version of a trawl, so it is still harmful to the environment and fish sustainability in general.

Due to known problems with management of trawls and seine nets, such as illegal modification, rule violation, and a rapidly increasing number of*cantrang* vessel, the productivity of Indonesia's fish resources was depleted and their sustainability was threatened. However, Indonesia's Fisheries Law Framework (MMAF, 2015)says:

"Fisheries management and operation in all of Indonesia's fisheries management areas is carried out to achieve optimal and sustainable benefits, as well as ensuring the sustainability of fish resources."

Thus, under the new ministry of MMAF on January 8, 2015, the usage of *cantrang* was banned in all fisheries management areas in Indonesia. There are a total of twenty kinds of fishing gears listed in the decree. Already registered vessels are permitted to continue operation with these gears until the expiration date of their current license, but afterward must stop using the banned gears.

However, this ban did not go as smoothly as the Ministry hoped it would. Following the issuance of the ban, there were many demonstrations against the ban in several areas with the main reason that the ban was too sudden. These protest convinced the government to suspend the ban for one year, to February 2016. The postponement was

authorized in circular letter (MMAF, 2016) and came with several new measures that would take effect during the “transition” period:

- Vessels that are using *cantrang* must be remeasured.
- Cantrang may onlybe used in fisheries management area that are within 12 miles of shore.
- Standardized selectivity of the mesh size must be a minimum of two inches and top rope must be a minimum of 60 meters in length.
- The catch must be landed and recorded in the base port as written in the fishing permit.

The first circular letter suspended the ban only until December 2016 to allow for a transition period. However, this was followed by more demonstrations as the transition time allowed for in the first letter was not considered to be enough. Therefore a second circular letter was issued, further postponing the ban until June 2017. When there was still resistance to fully implementing the banning it was further postponed until December 2017(Andreas, 2018).

2.3 Cantrang

2.3.1 *Construction and Operation Method*

In general, *cantrang* is made from polystyrene and the parts include a cod end, body, wings, and mouth (Figure 1) (Putri, 2018):

- The cod end is where the catch is collected.
- The body, the largest part of the net, serves to channel the catch from the wings and mouth into the cod end.
- The wings direct the fish into the body, from where it enters the cod end.
- The mouth, which has an upper lip and lower lip. The lower lip comprises a ground rope and ballast to keep the net against the ocean bottom, while the upper lip has a head rope and buoys to keep the net open.

The operation method and technique of *cantrang* by the fishermen are as follows (National Standardization Agency, 2006; Nurdian, 2008). The net is set from one side of the boat, with the forward movement of the boat then forming a circle. The net is then towed, with the towing ship moving in a circle around the area being fished. The net is then drawn into the boat by machinery using the warp ropes.

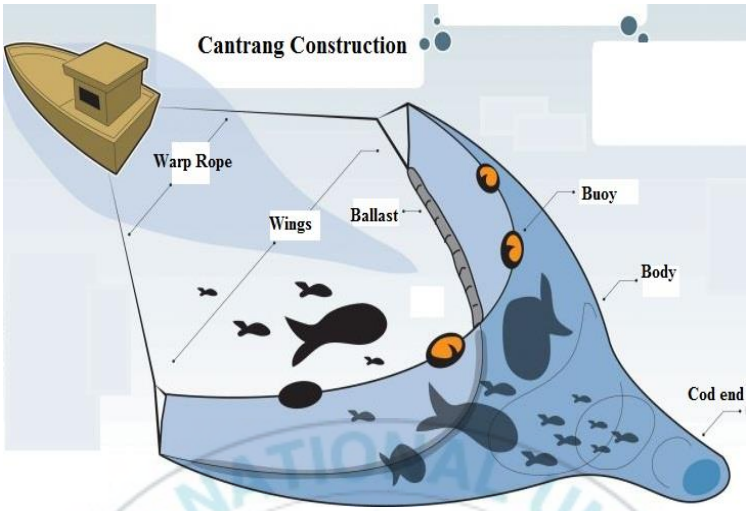

Figure 1. The main parts of *cantrang* (Caksono, 2018)

There are several factors that can affect the amount of catch obtained using *cantrang* fishing gear, including (Nurhasanah and Hakim, 2016), such as the speed at which the net is pulled, water current and wind direction, the width of the net, and others.

The *cantrang* operation is similar to that of a bottom trawl in that it sweeps the sea bottom part, often causing harm to the benthic environment. However, (Nurdian, 2008)suggested that *cantrang* operation may be able to minimize the damage it will do to the environment by focusing on fishing in areas where the seabed consists of sand or mud, and not in rocky areas, as in the former there are no objects that will get caught when the net is pulled.

2.3.2 *Evolution of cantrang and resulting issues and conflicts*

Since *cantrang* was developed in the 1980s it has been through many modifications that have made it more harmful for the environment as time has gone by. Originally, under the first decree addressing *cantrang* in 1997, vessels that used *cantrang* could be no larger than 5 gross tons, this ban was increased to 30 gross tons in 2000, and then regulations were further relaxed in 2010 to allow the use of a freezer to store fish. Furthermore, originally a *cantrang* vessel was much like a traditional ship that used sail to move, but more recently these have been motorboats with machine capacity that started at 15 Paarden Kracht (PK) but is now 33-200 PK. According to the General Directorate of MMAF (Adhawati et al., 2017), following these modifications, the types of catch targeted were broadened; in the 1980s the target were only big demersal fish, but starting from the 1990s targeted species included both small and large demersal fish, and in 2010 even squids became a target.

These also cannot be separated from external factors related to the cantrang fishery. For example the demand for *cantrang* catch was expanded, from a mere fresh fish or dried fish it was developed into more variable such as frozen fish, fillet, and fish flour. The fish flour that is coming from bycatch product was considered as only a “bonus” from the catch, but existing demand of fish flour towards *cantrang* fisheries indicates that fish flour has already been one of main commodities in *cantrang* fisheries catch. Fish flour that is made from side catch or small fish (trash fish) caught in *cantrang* net or usually known as

bycatch is not an optimal use of resources as it will only be sold at a low price and the high amount of small fish or juvenile caught as bycatch is harmful for ecosystem. Rates of bycatch in *cantrang* fisheries are alarmingly high. One study estimated the rate as almost 50% of total catch in one of Indonesia's *cantrang* fisheries (Leo, 2010), while another similar study 2015, estimated that only 18 - 40% of *cantrang* fisheries catch has real commercial value, while the other 60 - 82% are bycatch and discard(Habibi, 2015). Discard can also be much worse than small fish that will be used for fish flour, because discards potentially are not recorded into the logbooks and will be just thrown away back to the sea in dead condition and it is not a rare case that the discard contains rare species conserved by the law.

The number of *cantrang* vessels in Indonesia has risen ten times from 1980 until now, from 1,370 vessels into 13,300 in 2015. What is worse at the same time the catch per unit effort in North Java Sea has decreased significantly, from 156kgs/seton 2002 and cut more than half into only60kgs/set in 2015, moreover these catches are dominated by small fish, suggesting that the fish resource is indeed unhealthy (KIARA, 2015; Ministry of Maritime Affairs and Fisheries, 2018)

As an additional concern, the MMAF states that there have been many conflicts among the fishermen themselves. Not all fishermen use *cantrang* in Indonesia, and even before the 2015's decree many of them were already opposing *cantrang* usage in their area. Once they

figured that there were still *cantrang* being used in their area many conflicts were ignited (MMAF, 2018a):

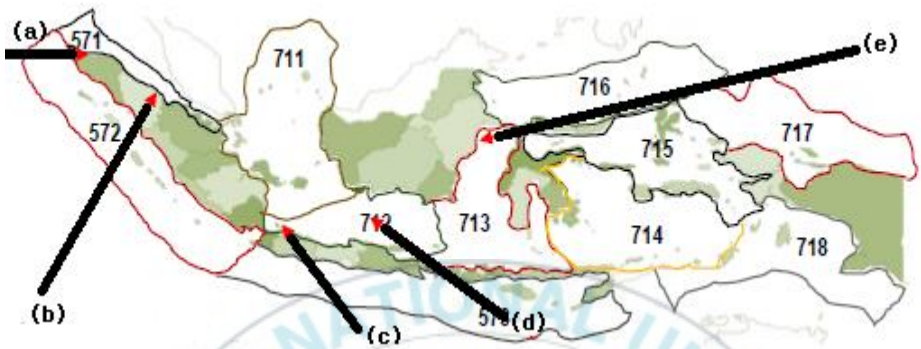

Figure 2. Location of Incidents. e) NaganRaya , b) Bagan Asahan, c) Lamongan, d) Probolinggo, e) Bendar.

In June 1995, Probolinggo, Kalibuntu fishermen was involved in a fight with Ketapang Island fishermen caused by the use of *cantrang*. On the same year in Lamongan, Hundreds of Paciran fishermen destroyed public facilities, such as the office of the Village Head, Sector Police, and Sector Military because they thought the Lamongan District Government did not immediately overcome the fishermen who had been using *cantrang* all those time. Later in 2006, on Bendar, West Kalimantan, fishermen's *cantrang* vessels were burned down because local fishermen accused the landing of the catch at the local fishing port had damaged the fish market price. As a result, shipowners suffered huge losses, reaching almost 1 billion rupiah or around $80,000. In Bagan Asahan on 2011, the local community had burnt down 6 cantrang vessels, yet in the following year of 2012 the local fishermen still

suffered from lost income due to existing *cantrang* in the area. Same thing in Nagan Raya, because of seen as contradicting with the traditional law, *cantrang* vessel had been sinked by the local fishermen.

The issues do not stop there, on the time most recent regulation the maximum size for *cantrang* vessel is <30 GT, but in reality the average of vessel size is >85 GT, meaning there was indeed markdown violation that caused big vessel could get the small vessel license so they can fish in the designated area of actual *cantrang* vessel. They even do not pay the nontax revenue and getting fuel subsidy from the government that was meant for small scale fishermen.

Above all those mentioned issues, the country loss due to *cantrang* fisheries in 2015 and 2016 are shown in Table 1.

Table 1. Indonesia's Loss due to improper management of *cantrang* as estimated by (MMAF, 2018b)

Loss	2015	2016
• Non-tax Revenue	$ 21,894.000	$ 36,713,000
• Misuse of fuel subsidies	$ 18,672,667	$ 23,407,000
• Fish Resource Depletion	$ 655,333,333	$ 818,000,000

Total	**$ 695,900,000**	**$ 878,120,000**

2.4 Indonesia's Fisheries Management Area

The management of fisheries resources in Indonesia seawaters is carried out based on the Republic of Indonesia Fisheries Management Area map (WPP RI) (Figure 3). The WPP RI map changes and updates according to the demands of the development of fisheries management and administrative status.

The latest renewed fisheries management area decree was issued in 2009 by the Ministry of Fisheries and Maritime Affairs. To achieve optimal and sustainable utilization in fisheries management and ensure the sustainability of fish resources and the environment, it is necessary to study the potential, utilization, conservation, research and development, as well as supervision of fish resources and the environment managed with a measurable system. This partition of fisheries management areas was also the beginning of the effort to revitalize fisheries from the aspect of management area(MMAF, 2009).

Figure 3. Map of Indonesia's Fisheries Management Area. 571) Malacca Strait and Andaman Sea, 572) Indian Ocean – West of Sumatra – Sunda Strait, 573) Indian Ocea – South of Java- The Savu Sea – East Timor Sea, 711) Karimata Strait Waters – Natuna Sea – SouthChina Sea, 712) Java Sea, 713) Makassar Strait – Bone Bay – Flores Sea – Bali Sea, 714) Tolo Bay and Banda Sea, 715)

Tomini Bay – Maluku Sea – Halmahera Sea – Seram Sea- Berau Bay, 716) Sulawesi Sea – North of Halmahera Sea, 717) Cendrawasi Bay –Pacific Ocean, 718) Aru Sea – Arafuru Sea – East Timor Sea.

Indonesia Fisheries Management Area was assessed based on a bio-ecological approach, diversity of fish resources, and sea toponymal rules by observing the morphology of the seabed, the distribution of waters territories based on International Maritime Organization (IMO) and International Hydrographic Organization (IHO), and with the consideration of the development of regional autonomy expansion and the development of Indonesia's maritime boundaries.

In the preparation of the WPP's map, other than the mentioned consideration regarding the utilization of Indonesia's seawater, the

government also considered the data standardization and synchronization with the other spatial data:

- Compiled based on national coordinate system standards in digital format based on Geographic Information System (GIS).

- The outermost boundaries are the Indonesian Exclusive Economic Zone, which has been studied in each border segment with the updated status, under the supervision of the Department of Hydro Oceanography team and has been consulted with the Ministry of Foreign Affairs.

- The WPP Naming and Numbering was adjusted and referred to the International Maritime Organization (IMO), International Hydrography Organization (IHO) and Food and Agriculture Organization (FAO). As Indonesia occupied the FAO Major Fishing Area number 57 and 71.

2.4.1 *Indonesia Fishing Routes as part of Fisheries Management Area*

As a follow up tothe Fisheries Law Framework(MMAF, 2004)article 7 point, (f) determining the type, amount and size of fishing gear, (g) determining the type, amount, size and placement of fishing aids, (h) determining the area, route and time or season of fishing. A minister decree was issued in 2011 to manage and determine the fishing routes and the placement of fishing gear throughout the Indonesia fisheries management areas(MMAF, 2011).

Fishing routes are territorial waters that are part of WPP for the regulation and management of fishing activities that use fishing equipment that is permitted and / or prohibited. Fishing routes in Indonesia fisheries management area is divided into three parts(MMAF, 2011):

1. Fishing Route I
   - Fishing Route IA covers coastal waters up to 2 nautical miles measured from sea level at the lowest tide.
   - Fishing Route IB covering coastal waters outside 2 nautical miles up to 4 nautical miles.
2. Fishing Route II covers waters outside the fishing line I up to 12 nautical miles measured from sea level at the lowest ebb.
3. Fishing Route III covers Indonesia Economic Exclusive Zone and water area outside fishing line II.

Fishing routes as part of WPP are determined based on the depth characteristics of the waters, it is differentiated into two:

a) Shallow Waters with depth of ≤ 200 meters. This covers WPP 571, WPP 711, WPP 712 , WPP 713, and WPP 718.

b) Deep Waters with depth of > 200 meters. This covers WPP 572, WPP 573, WPP 714, WPP 715, WPP 716, WPP 717.

2.4.2 *Cantrang Fisheries Fishing Routes and Standardization*

On the Minister Decree no 2 year 2011, other than the establishment of fishing routes throughout fisheries management areas, every fishing gear admitted by Indonesian fisheries law framework is also regulated. In article 23 paragraph 6, *cantrang* is described as active fishing gear that is operated with mesh size ≥ 2 inches and top rope of ≥ 60 meters, with vessel size of < 30 GT. Also for the operating routes for *cantrang* is only allowed in WPP 711, WPP 712, and WPP 713 on Fishing Route II and III.

However, this has been automatically nulled since the issuance of *cantrang* banning regulation in 2015 that states *cantrang* is forbidden to operate in all Indonesia fisheries management area. However, with the latest postponement of the banning in January 2018 by the extension of previously issued circular letter from the fisheries directorate general in 2016, this does not automatically makes*cantrang* fishing routes are back to the previous one, rather than back to allowing *cantrang*to operate in WPP 711, 712, 713, *cantrang*is only allowed in WPP 712 or Java Sea instead until undetermined time.

3 THESIS STATEMENT

- What are the possible impacts of a ban on *cantrang* if it were to be fully implemented in the future, given that *cantrang* has been an important part of one of Indonesia's fishermen 'culture'?

- What are the factors that hinder the enforcement of the *cantrang* ban and/or the factors that leads to the prohibition *cantrang* being repeatedly delayed?

- What is the best possible settlement that the government and the fishermen community can conclude?

4 METHODS

4.1 Research Type

This research is a qualitative research. The purpose of qualitative research is to analyze, describe, and interpret the variation and diversity in a situation, phenomenon, problem, or event (Kothari et al., 2014).

Among several commonly used designs in qualitative research, the case study approach will be taken under this research. The case study approach is a dominant and prevalent approach in quantitative research. A case could include an individual, a group, a community, an episode, an event, a subgroup, a place, and any combination of them. It is usually identified as an on-going real events.(Kothari et al., 2014; Rahardjo, 2017).

4.2 Data Source and Data Gathering

Data gathering method in qualitative research, in contrast, quantitative methods, is not predetermined or standardized. Qualitative research data gathering is flexible in terms of structure.

There are three main methods of data gathering in qualitative research: unstructured interviews; participant observation; secondary sources. The data gathering method that will be used in this research is the third method, secondary sources. Secondary sources in qualitative research is about extracting descriptive and narrative information for the sources. It comes from several grouped sources(Kothari et al., 2014):

1. Government or NGO Publications, these two bodies usually has periodically data gathering and use it for their periodically publication to be used by members or public.

2. Earlier Research, for most topic there will always be previous researches that has been done and can be used for data mining.

3. Mass Media, the report that is published in newspapers, internet, can be a source of data as well. Moreover for current on-going event that is still developing or having something new to be expected.

4.3 Data Analysis

Basically, data analysis is an activity to give meaning or interpret data by arranging, sorting, grouping, giving codes or signs, and categorizing them into sections based on certain groupings, thus the problem solving is proposed. There are no actual standard data analysis procedures or techniques in qualitative research (Rahardjo, 2017).But, these are the steps that will be used:

1. To read the entire document to obtain general information.
2. These general messages are compiled for their main idea.
3. From these compiled data will be known the general pattern of data. Furthermore, the data can be grouped according to the sequence of events, categories, and typologies.
4. Theoretical dialogue, after analyzing the compiled data and to answer what is being questioned in the thesis statement, the next step is to “dialogue” the findings and literature review, this aims to make use of the literature review and strengthen the opinion on the conclusion.
5. Data presentation is the preparation of complex information into a systematic form so that it becomes simpler to read and understand by the reader.

6. Lastly will be followed by conclusion of the finding and possible suggested action by the researcher to the analyzed topic's conclusion.

4.4 Validity

In order for findings not to be considered biased, there is a need to triangulate the findings, or what is often referred to as confirmability. Test of data validity in qualitative research includes credibility tests (internal validity), transferability (external validity), dependability (reliability), and confirmability (objectivity)(Bachri, 2010).

Those can be done with triangulation data, triangulation is checking the data of various sources in various ways and times. Triangulation is divided into three types(Bachri, 2010):

a. Source triangulation is done by checking data obtained through various sources.

b. Technical triangulation, is done by checking the data to the same source with different techniques. For example data obtained by interview, then printed by observation and documentation.

c. Time Triangulation, carried out by checking through interviews, observations in different times and situations

As this research will only be using secondary sources, thus the Source Triangulation will be done through the research progress

5 RESULTS AND DISCUSSION

The *cantrang* ban was first established in January 8th 2015, but then suspended on February 11th 2016. There was approximately a one-year period when *cantrang* was banned during which the *cantrang* fishermen did not go fishing due to the ban. During this period studies were conducted and serve as one of this study's references as well, mainly in the regions that has big populations of *cantrang* fisherman.

5.1 Possible Impact of *Cantrang* Ban in Indonesia

The possible impact that would affect the *cantrang* fishermen are classified as social and economic impacts, as it can directly affect their economic condition and it is directly linked to their social life.

5.1.1 Economic Impact

Decreased income is the basic apparent impact of *cantrang* ban on the *cantrang* fishermen community. When the *cantrang* was banned, the fishermen would have to adjust to fulfill their needs, either to switch to another environmentally friendly fishing gear or move to another field of work. In the case of switching to another fishing gear is not that easy, as the majority of the vessel funding (not only on the gear) were coming from financial institution, in form of bank or another similar institution in the region, and having to request another credit for the new fishing gear to the bank while still having the debt for *cantrang* in

the first place would be almost impossible from both perspective. (Ermawati and Zuliyati, 2015; Suhendar et al., 2015).

For another case of trying to switch out to another field of work, is also considered hard to do in such a short time, because most of the *cantrang* fishermen in fishermen village had already been using *cantrang* for decades and they do not have the means to use another fishing gear for the time that resulted on them not being able to try and excel in another field, the condition of surrounding environment that are mostly linked with *cantrang* fisheries production is the form of another further obstacle(Halylyarti, 2017; Luhur, 2018).

Cantrang fisheries business industry includes various components, these components include: input production, distribution and post-production activities, and consumption. From the supplier of fishing supply as fuel, ice cube, basket, etc for the fisherman until the post fishing related job or industry, such as transporter man who transports the catch from the port to the market area, weigher who scales and record the catch, the wholesalers or retail traders who distributes it to the buyers, fish processing industry like dried fish or surimi factory, even until the restaurants which serve seafood and relying on *cantrang* catch as their supply and also the village's households(Suryawati and Pramoda, 2015).

The disrupted business cycle can be aggravated if it happens in a big scale, as it is known in Central Java where the growth of *cantrang* vessel was quite massive, there was 5,100 vessels in 2007 and it was

increased by more than 100% into 10,758 vessels in 2015 (Ardhy Dinata Sitepu, 2015). On the other side at the adjacent time of 2012it was recorded the total of fishing gear operating in Indonesia was 1.1 million units of which 1.66% or 18,542 units were *cantrang* (Ermawati and Zuliyati, 2015). Thus, it seems like *cantrang* is heavily concentrated in Central Java. This condition in can be quite serious because even though compared to other fishing gears that are operating in Indonesia *cantrang* ratio can be considered small, but if it is concentrated in one place like in Central Java, then the effect was indeed significant. As if that 1,66% population of *cantrang* were more evenly scattered all around Indonesia, that might be easier for each of regional government to manage that small amount at a place and at a time, but what was happening in Central Java was massive, big community of *cantrang* fishermen and its' related business is in there and it caused the difficulty in managing the impact.

Quoted by the central java governor's response letter to the MMAF regarding the ban on 2015; there were 120,966 ship crews, 6,808 micro, small, and medium enterprises of fish processing with 107,918 workers. There were also 30-export scale Fish Processing Units with 23,604 workers. With total of 252,488 people that are threatened by unemployment and it has not been accounted with their whole family, it could potentially reach one million people that would be affected economically with the law (Apriando, 2015). How serious it was in Central Java can also be reflected on the demonstrations as most of it were first happening in Central Java regions and the resistance continued

to Jakarta, to the presidential palace that successfully pushed the government to postpone the ban.

Other than Java, the decreased income effect threat was also shown in another regions, like a previous study on 3 different locations in South Sulawesi, from the mainland to a deserted island, indicated that after the ban there were decreased fishing activities from the fishermen in all those areas that resulted in decreased revenue and income in a whole *cantrang* fishermen community on all the three study area(Adhawati et al., 2017). Another one is a study in Probolinggo, East Java, shows the same result of the impact on disrupted *cantrang* fishing village activity that will decrease the income of the fishermen community, lost of asset's investment (in this case the *cantrang* vessel), and bad credit to the bank they loaned to (Suryawati and Pramoda, 2015).

As for the amount of the loss that the fishermen suffered: a study from (Suhendar et al., 2015) in Riau Province in Sumatra Island suggested that the fishermen at the area were suffering 20% decrease in income, but unfortunately since they were small scale fishermen, that 20% were significant impact to their earnings. On the other place in Probolinggo, Java Island, a study from (Suryawati and Pramoda, 2015) found that at least total of$167,000 has been lost from monthly income from *cantrang* fisheries and also loss of assets amounted $5,233,334 in form of *cantrang* vessels. That only stands for the loss from the vessels, not included with the loss that the traders, weight interpreter, and porter suffered which were $106,667, $13,866, and $5,200 monthly

respectively. Not to mention the bank that was threatened by the bad credit coming from the *cantrang* financing of $870,400 yearly. The findings do show how impacting the sudden banning were in the fishermen livelihood on the *cantrang* fishermen village people in Indonesia.

5.1.2 Social Impact

Social impact is changes in social institutions on a society that can affect the social system including values, attitudes, and patterns of behavior among groups in society(Wulansari, 2013). The changes in this case can be interpreted as the *cantrang* ban effect towards the fishermen society. Also the social impact cannot be clearly separated from the economic impact, because economic impact lead to social impact, and vice versa.

With the threat of decreased income because of the forced decrease in fishing activity by *cantrang* fishermen comes the threat of unemployment for ex-*cantrang* fishermen. With the fact of most of the fishermen are the patriarch on their family and losing their initial job and income will definitely affect their family welfare (Ermawati and Zuliyati, 2015). As previously known that many of the interviewed fishermen testimonial is they do not possess any other way of generating income other than using *cantrang*, not even using the other fishing gear, combined with lack of capital, unemployment seemed to be unavoidable.

When it is viewed from psychological point of view, with the difficulty of fulfilling their needs of food, health care, and children's education, the anxiousness of not being able to provide to their family could potentially affect their psychological state, when it got worse it can cause criminality to break out as their last resort to survive. A review study (Webster and Kingston, 2014) concluded that the rate of unemployment does have strong influences with the increased property crimes, such as burglary and theft. In line, property crime is often considered a crime from poor people to avoid their already low standards of living falling further down(Bharadwaj, 2014). While in this case the fishermen mostly indeed are considered as people who lives poorly but not in poverty, and we would not want them to fall deeper into poverty by making them losing their livelihood.

5.1.3 Possible Environmental Effect

Environmental interest is what initiated the government to ban *cantrang* in Indonesia in the first place. The finding of *cantrang* impact on environment were the acknowledgement of consecutively increased *cantrang* fisheries' high bycatch rate based on studies noted by the government (Habibi, 2015; Leo, 2010) and the condition of fish stock in Java Sea that was mostly fully exploited and overexploited (MMAF, 2011) ultimately resulted in the decreased catch per unit effort from 156kgs/set in 2002 to 60kgs/set in 2015, which is significant. Aside from the catch related issue, *cantrang* fisheries did avoid a big group of coral reefs when fishing, but not for the small group of reefs that was also be

swept when towing, that actually are significant for sea environment as well (Hanung, 2018).

With the actual banning of *cantrang* that will set in near future in Indonesia according to the government, the sea environment should receive big positive impacts, even though we would not be able to restore the dead reef that took centuries to grew, but we will slowly be able to restore the fish stock sustainability in the sea. Due to the prolonged damage to the environment over many years, it will take some time to restore what had been done, but it surely will benefit the future generations(Suryawati and Pramoda, 2015).

5.2 Factors that has Delayed the Implementation of the *Cantrang* Ban.

The *cantrang* ban law decision in Indonesia is based on the depleting fisheries resource that threatens the resource sustainability, not to mention that most of the fisheries management area's resource in Indonesia are already fully exploited or over-exploited, so it can be emphasized that the goal is the sustainability and progress of the fisheries sector in the long term, not to kill fishermen's livelihoods (MMAF, 2015).

As described above (section5.1) the implementation of the ban came with a cost of economic and social effect that negatively impacted the *cantrang* fishermen community. They suffered from decreased fishing activity that affects their income, moreover for them that completely do not know or do not have any mean to use another fishing gear they would just

fall to be unemployed and ended up losing their livelihood. This affected all businesses related to *cantrang* fisheries in the fishing village and more importantly, the family welfare of each of the ex-*cantrang* fishermen.

Not being able to operate and/or yield the catch like *cantrang* could, ignited many local demonstrations that led to one big demonstration the president palace. They demanded the minister and the president has to cooperate to postpone the ban, giving them more time, and form a better regulation regarding *cantrang*. Their representative stated at least two things: (1)*cantrang* is not harmful because the net does not touch the seabed due to the fact that the vessel does not move when towing the cantrang, and (2) the gillnet recommended by the minister as a replacement for *cantrang* was not suitable in Java Sea(Kencana, 2018).

The first statement is not necessarily true as the *cantrang* standard operation from (National Standardization Agency, 2006)tells that *cantrang* vessel does move with slow movement. Furthermore, what makes cantrang harmful to the environment is not solely about whether it is touching and/or sweeping the seabed on the operation but also because its nature is that it is not a selective gear, resulting in the high rate of bycatch that is clearly not healthy for the sustainability of fish resource in the long term.

Yet, the second statement appears to be valid as it is proven with a study by (Muhsonim, 2006), the study was about analyzing the profitability of 4 fishing gears in Madura Strait (Java Sea); *cantrang*, *payang* (another form of modified trawl but less popular than *cantrang*),

trammel net, and gillnet using NPV (Net Present Value), the difference between the cost that has been spent and the benefit. The study's result shows that the NPV for *cantrang* and *payang* are 4,608,030 and 167,757 per trip respectively in Indonesian Rupiah , while trammel net and gillnet shows negative NPV of -671,832 and -2,858,52 per trip respectively in Indonesian Rupiah. Which means the gillnet and trammel net would generate a loss and are indeed not suitable to be used in Java Sea.

The fact that the ban was too sudden and that there was no socialization before the announcement were other main points raised by the fishermen the demonstrations following the *cantrang* ban. The MMAF claimed that they had undertaken socialization for the ban in advance, but it appears that socialization was done only once in 2009(MMAF, 2018a), and neither follow up nor affirmation from the MMAF side was given. Thus, when the ban was announced in 2015, it was seen as too sudden by the fishermen because six years had passed since the one-time socialization in 2009.

Additionally, as previously mentioned the *cantrang* population was considered very large in Central Java, and the central government or MMAF in 2009 actually had encouraged the regional fisheries government of Central Java to stop issuing *cantrang* permits and only wait until the on-going permit to be expired through an official letter, but in 2013 after an inspection turned out that the regional government still

keep issuing the permit of *cantrang* vessel with the excuse of the vessels were already been built (Ali Hamid, 2015).

This makes clear that the central government of that time failed to coordinate with the regional government about the prohibition. The president at that time was a different President than the one now in power. The new President and Ministry who took power in 2014 tried to continue what was already planned by the previous government in 2009 by implementing the ban in the early 2015(Iin Yumiyanti, 2017) but did not realize how complicated it was going to be due to lack of socializations in advance.

The location of a place may be a factor too in how an area can respond to a regulation, more specifically when the particular place is a relatively deserted area. On the previously mentioned study in South Sulawesi(Adhawati et al., 2017), the rate of decreased income and fishing activity was identified for the 3 locations, it showed that even though the mainland has the most reduced fishing activity of 65%, but it has the least impact on revenue and income. On the contrary the second and third location are representative islands of South Sulawesi archipelago and Gulf strait that is a bit deserted were impacted worse in term of revenue and profit but had the least reduced fishing activity. The study found the mainland despite having reduced fishing activity but they were able to take part in another field of work to generate income. While on the islands even though they could not do fishing with *cantrang* anymore, because most of them did not have or had not found

any other way to work in other field, they just kept doing fishing with less efficient gear like fishing pole and spear at the time. This shows that each region has different characteristics in terms of resources, culture, and level of welfare of fishermen, consequently the impact of ban will differ for each region. Ultimately it affects the information processing and response for each region, this can be worsened with the sudden implementation and lack of socialization by the government.

Lastly, the government did implement the ban with some consideration of giving away compensation, but still it was deemed with flaw, an actual testimony from the fishermen is there was indeed free gillnet compensation from the MMAF to the fishermen, but it is strictly for the vessels under 10 GT and it will only be able to operate within 12 mile from the shore, while those areas are usually already occupied with trap for crab that is planted in the bottom of the sea, thus it would ignite another conflict between fishermen if it is forced(Suprihadi, 2017).

Not only the flaw in compensation regulation, but also in the distribution of the compensation gear that can be considered very slow. The government actually had distributed free fishing gear as a compensation of the ban law to the fishermen to use in order for them to move forward from *cantrang.* Yet based on the recent information, even after two years of the ban first announced on 2017, in Central Java, among entitled 5,199 *cantrang* vessels whose size are under 10 GT, only 588 vessels already received their compensation gear, while the rest

were still waiting for the new gear to be distributed (Dedy Afrianto, 2017).

5.3 Possible Settlement that the Government and the Fishermen can Conclude.

At this point of time after a few years the government should have been recognizing the flaws of 2015 sudden implementation of *cantrang* ban that was causing many conflicts and already prepared something better to offer regarding this *cantrang* ban as the minister insisted that she will do it, all start from the socialization, regulation, and compensation part.

Based on conducted interviews, some of the fishermen actually do not mind about switching to another fishing gear, yet most of them do not have any capital to do that(Luhur, 2018). Even for the *cantrang* capitalization most of them should relied on credit from banks, so it will be difficult for them to just switch like what the government instructed.

For small vessel compensation under 10GT, the government would give away free fishing gear. But that is not the case for the bigger vessel, the government promised to assist the 10-30 GT vessels with the capital credit from bank. But of course, unless the government is willing to cover up for the debt, the bank side should not be that easily persuaded to just give the capital credit for the fishermen to afford a new fishing gear (and cost to renovate the vessel) while most of them already have on going credit for the previous *cantrang* gear.

It can be seen that the government themselves is indeed looked quite unprepared in resolving this *cantrang* ban. From the too-sudden and barely existed socialization about the ban that they should have socialize it enough in many regions in Indonesia, to the slow distribution of compensation fishing gear even after two years of the first announcement, and also the government should have taken better measure for the regulation that is following the ban to not be like what is mentioned in the previous section about overlapping compensation gillnet and trap in Java Sea(Suprihadi, 2017) and/or like what happened in Sulawesi where the impacts differ for each place (Adhawati et al., 2017). If the government does want to enforce the ban, and they state they will in the future(Andreas, 2018), they would have to remodel and reorganize the ban regulation so the fishermen can respond and comply better without having serious impacts on their livelihoods.

An example of socialization approach that can be carried out by the government is trying to collaborate with KIARA or The People's Coalition for Fisheries Justice in Indonesia, a non-profit NGO. Since its' establishment, KIARA has been committed to strengthening fishers' groups and people living in coastal regions and small islands, in order to obtain protection and welfare of their communities. Other than securing the justice and the welfare for the fishermen, KIARA also does campaigns and public education in the realm of ocean studies (KIARA, 2017). KIARA themselves agreed about the banning of *cantrang* in Indonesia, yet they also measured that it would take some more time in

Indonesia, the current ban in 2015 was needing many adjustment in socialization and compensation aspects (Subekti, 2018).

Looking at KIARA's initial mission of securing fishermen's welfare and to educate coastal area, it is very suitable to collaborate with them in socializing *cantrang* banning later. The socialization is not only about informing about the mechanism of upcoming banning of *cantrang* to the fishermen like the previous one-time socialization, but it should also include the education of the new replacement fishing gear's usage, as previously mentioned in 5.1 that the fishermen does not have the skill and capital to switch gear from *cantrang*. Thus we can leave the education part to KIARA with still under MMAF supervising on the actual implementation.

Also looking at the fairness perspective, this approach of cooperating with KIARA can also be used as a "suggestion box" from the fishermen community or widely known as co-management approach, knowing any inputs given by the fishermen community is important. But this does not solely mean that those would be included to the actual implementation later (Af-idati, 2008), but if it really is, it can possibly boost the support and enforcement level because the fishermen would feel like they contributed to the regulation and also they will know more detailed about the detriment and benefit of it.

But, aside from those, the compensation is still also a vital point to the successfulness of *cantrang* ban in the future, the government has to prepare and distribute it evenly based on initial GT size of the vessel

after remeasuring and auditing all registered vessels, because there were many big vessels that were marked down in the license to be recorded as smaller vessels.

With the proper socialization and compensation from the government, it is expected to realize the elimination of *cantrang* in Indonesia sea in order to restore the sea environment and fish stock sustainability for the future generation's benefit.

6 CONCLUSION

The *cantrang* ban will clearly have short-term negative effects on the *cantrang* fishermen's livelihood, from the decreased income, threat of unemployment, decreased welfare, and disrupting all of related business in *cantrang* fishermen village economic cycle. Increase in crime might also be anticipated in this situation.

The ban has been repeatedly postponed because of its effects on fishers, and because it was indeed too sudden and unprepared. The central government failure to recognize what the local government had been doing in keep issuing *cantrang* permits for4 years was a big mistake, and the failure of both previous and new regimes to coordinate things about planned regulation should also be accounted. Also the lack of socialization part and the measurement of regulation following the ban for the ex-*cantrang* fishermen.

To move forward, better and coordinated compensation should be offered to the fishermen. Better socialization and measurement for the soon-to-be-announced real enforcement of *cantrang* ban that the minister had said on 18th January of 2018 in front of thousands of fishermen. On the other hand, it would indeed benefit both of the environment sustainability and the fishermen in the end, but getting through the transition is where the biggest question mark lies to be solved.

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