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FEDERALISM IN MARINE FISHERIES GOVERNANCE IN INDONESIA:
AN ANALYSIS OF THE STAKEHOLDERS' PERCEPTIONS

BY
FERY SUTYAWAN

A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY
IN
MARINE AFFAIRS

UNIVERSITY OF RHODE ISLAND

2019

DOCTOR OF PHILOSOPHY DISSERTATION

OF

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2019

Abstract

This paper analyzes the policy impacts generated by three interconnected regulations that were authorized in the 2014-2015 period pertinent to Indonesian marine fisheries governance. In addition, it also develops policy alternatives and investigates the stakeholders' attitudes towards these policies.

Employing the mixed-method research approach with the case study research design, this paper explains the impacts caused by the increased fishing fee tariff on the national fisheries revenues, the composition of the Nationally Registered Fishing Vessels (NRFV), and the Fishing Operational Costs (FOC). The latter, the contribution of the increased fishing fee tariff to the FOC, was derived from an analysis conducted on 1,108 samples of medium-scale commercial fishing vessels (60-200 GT) based in the Nizam Zachman Oceanic Fishing Port, the largest industrial-scale fishing base in Indonesia.

In regard to the revocation of regency/municipality authority and their maritime jurisdiction, several policy impacts are summarized, encompassing relicensing issues for the small-scale commercial fishing boats (5-30 GT), job reassignment, and irrelevancy of related existing law. This paper also conducts an assessment of the establishment of a Fisheries Management Commission in Indonesia Fisheries Management Areas (FMC-IFMA), a newly established regional fisheries institution. The assessment focuses on the legal basis, tasks and functions, and membership apportionment.

Investigation of the stakeholders' attitudes also employs a mixed-method research approach. Collected responses from a survey on 446 respondents of Indonesian marine fisheries stakeholders are merged with the summary of 19 in-depth interviews. In addition, the findings garnered from field observation are also included. As a result, the magnitude and distribution of attitudes from nine types of stakeholders are portrayed, including supporting arguments.

In conclusion, this paper argues that the authorized policies generate various impacts and several potential problems. Several findings also emerge from the investigation of the stakeholders' attitudes regarding these policies. Finally, this paper proposes several recommendations. These encompass reinforcement of the legal basis for FMC-IFMA establishment, including more engagement of non-governmental stakeholders in the commission, and an amendment of the formula for the Revenue Sharing Fund (RSF) from the fisheries sector by implementing a proportional distribution based on exploitation levels and registered fishing fleet size in each IFMA.

Keyword: commercial marine fisheries management, fishing licensing policy, regional fisheries governance, fisheries co-management

Acknowledgements

There are too many names to be mentioned when I have to express my gratitude to all who have been giving me support to complete this study. My deepest appreciation goes to my advisor, Dr. Seth Macinko who has been guiding me patiently and making this paper much better. The research committee; Dr. Richard Burroughs, Dr. Brian Crawford, Dr. Carlos Garcia- Quijano, and Dr. Austin Humphries with their valuable inputs for improving this study. Dr. Michael Rice for his willingness to Chair my dissertation defense.

I would like to thank the Faculty and fellow students at the Marine Affairs Department for their support during my study. To my Indonesian comrades who have been sharing both the joy and sadness during our ‘adventure’ in the smallest yet beautiful state in the US, particularly during the long and winding winter nights of New England. To Dr. Gellwynn Yusuf and the CTI-Coremap Team for providing this great opportunity for us.

This paper is dedicated to the special ones, my beloved wife, Dewi Driyayuni Yitnasih Utami and our son, Haickal Caesar Saintya, who, once again, have to sacrifice a lot to make my wildest dream come true. The ego has landed.

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CHAPTER I

INTRODUCTION

Indonesian marine fisheries governance is undergoing significant transformations generated by the authorization of several national policies and regulations in recent years (2014-2015). Three of those policies/regulations, based on Indonesia's law hierarchy, are Law Number 23 of 2014, Government Regulation Number 75 of 2015, and Presidential Regulation Number 2 of 2015.

Law Number 23 of 2014 concerning Local Government expands the authority of provincial governments in managing fisheries, from 4-12 nautical miles (nm) to 0-12 nm, while at the same time this law revokes the authority of the regency and municipal governments within 0-4 nm (GOI 2014). Meanwhile, Government Regulation Number 75 of 2015 significantly increases the fishing fees imposed on Nationally Registered Fishing Vessels (NRFV) operating in the 12-200 nm zone (GOI 2015). Lastly, Presidential Regulation no 2 of 2015 mandates the further implementation of fisheries co-management by encouraging stakeholder engagement in the decision-making process.

Undoubtedly the authorization of these three regulations generates both direct and indirect problems. First, Law 23 of 2014 shifts Indonesia's policy of decentralized fisheries management in the opposite direction. Referring to Sen and Nielsen (1996), fisheries decentralization is defined as an action to move some responsibilities to the lower level of government. Hypothetically, this alteration will evoke dissatisfaction from the affected regions-- the municipalities and the regencies. In addition, this law

also has the potential to make some provisions of other related statutes irrelevant, for instance, Law Number 33 of 2004 concerning Fiscal Balance.

Second, theoretically, the increased fishing fees directly affect fishing vessels' operational costs, particularly the Nationally Registered Fishing Vessels (NRFV). Indirectly it will also have an impact on the livelihood of the crews working on those vessels. A policy simulation on the Industrial scale of Hawaiian Longline fishery demonstrates that doubling the rate of auction fee, as another form of fishing fee, will significantly (18-21%) decrease the owner and crew incomes. (Chakravorty and Nemoto, 2000)

Not surprisingly, this regulation has evoked strong resistance from fishermen and fishing company associations (Mongabay 2016; Tribun News 2016). Furthermore, this regulation contradicts, arguably, the efforts to increase production from the domestic fleet after the expulsion of (ex) foreign fishing vessels.

Third, the establishment of a Fisheries Management Commission (FMC) in each Indonesia Fisheries Management Area (IFMA) as the final outcome of the policy mandated by the Presidential Regulation will, hypothetically, alter the governance of commercial marine fisheries in Indonesia. This paper argues that the formation of FMC-IFMA can be considered as an attempt to implement federalism in Indonesian marine fisheries management. Sharing, not dividing, the authority and responsibility between the central and provincial governments is a relatively new experience for Indonesia.

Prior to further discussion, it is crucial to have some understanding regarding the term 'Federalism' discussed in this paper. Here, federalism is not defined as the commonly used and known definition; as a mode or type of a state/nation's political

system (Law 2013). As discussed in this paper, federalism refers to the sharing of jurisdictional and management responsibilities between the national and the sub-national governments in managing natural resources located in a specific or designated geographical area (Juda 1993). In the context of Indonesia, the sharing of authority and responsibility occurs between the central government (the national level) and the provincial governments (the sub-national level).

As a Unitarian state that does not implement federalism in her political system, another definition of federalism that is suitable with the Indonesian context is the one defined by Bauer *et al.* (2018) as natural resources federalism. It refers to a process of conferring or granting some responsibilities to the sub-national institution or administration, to some degree, in governing natural resources. At a glance, this definition is quite similar with the definition of decentralization proposed by Sen and Nielsen (1996); an action to move the responsibilities to the lower level of government. However, it is also necessary to notice that the marine fisheries resources that would be jointly managed by the central and the provincial governments are initially located in the national jurisdiction; 12 to 200 nautical miles (nm). This condition has several similarities with those underlying the establishment of the Regional Fishery Management Council (RFMC) system in the US (Rogalski 1980). Therefore, the term federalism is more appropriate than the term decentralization in the following discussion. Furthermore, it is the main argument of this paper that Indonesia is on the path to implement federalism in marine fisheries management.

Referring to the potential problems mentioned earlier, several research questions emerge. First, how do the new policies/regulations affect marine fisheries management

in Indonesia? Second, what are the other potential impacts from the implementation of the new policies/regulations? Third, what are the available policy alternatives to cope with the potential problems? Fourth, will the FMC-IFMA meet the objectives mandated in the middle-term national development plan (Presidential Regulation) and Ministerial Strategic Plan? Fifth, to what extent will the commission perform fisheries co-management? Lastly, what are the stakeholders' perceptions (attitudes) toward both the policy impacts and the proposed policy alternatives?

Regarding the research questions, this paper has four objectives. First, it analyzes the policy impacts generated by the implementation of the new regulations. Second, it develops policy alternatives related to these policy impacts. Third, it investigates stakeholder perceptions toward these policy impacts. Lastly, my research also proposes some policy recommendations generated from the results of policy analysis and investigation of stakeholders' perceptions.

CHAPTER II LITERATURE REVIEW

II.1. Fisheries Management and Fisheries Governance

As publicly owned resources, the management policies for fisheries resources have been developing dynamically covering a broad range of ecology, economics, socio-cultural, and political aspects. Yet, some failures still occur in spite of the significant improvements that have been made in fisheries policy and management. The reasons contributing to these failures are attributed to the failures in enforcing the management measures and institutional deficiencies (Macinko and Bromley 2002, Okey 2003, Bromley 2009, Dell'Apa *et al.* 2012).

The evolution of marine fisheries management has led to the adoption of limited entry regimes, encouragement of fisheries co-management, and some efforts focused on implementing the Ecosystem Approach to Fishery Management (EAFM) (Ginter and Rettig 1978, Pinkerton 1989, Schreiber 2001, Jentoft 2005, Zabel *et al.* 2003).

Jentoft and Chuenpagdee (2009) summarized fisheries governance as a more complex and broader concept than fisheries management mostly dealing with the technical issues. While fisheries management employs a set of tools for solving concrete tasks with clearly defined goals and measurable outcomes, fisheries governance addresses interconnected and complex biological, economic and social issues having, sometimes, contradictory goals. In addition, governance is not exclusively exercised by the government, but it is a collective effort involving broader stakeholders that carry out not only vertical but also horizontal coordination.

II.2. Fishing Fees as a Type of Limited Entry Regime in Marine Fisheries Management

A fishing fee or marine resource rent charge can be simply defined as a charge imposed on resource users for the privilege given to them in utilizing the public resource (Gylfason and Weitzman 2003, Bromley 2009). Charging the fee for fishing is an assertion and confirmation of public ownership as it would return the share of the harvested fish value to the public as the owner of the resources (Macinko and Bromley 2002). In addition, Matthiasson (2001) argued that the fishing fee represents equity and justice as it works as another form of social contract between the industry as the resource users and the government as the representative of a publicly-owned resource.

Weitzman (2002) argued that a price-based instrument like a fishing fee is more efficient than a quantity-based instrument such as an Individual Transferable Quota (ITQ), especially for multi-species marine fisheries (Gylfason and Weitzman 2003).

Two primary topics commonly discussed in the implementation of fishing fees are the payment or charging mechanism and the mechanism for distributing the collected fund or state revenues. Regarding the charging mechanism, the Resource Depletion Charge (RDC) or Landing Fee is argued as the better market-based instrument for handling fisheries management issues related to equity or fairness (Gylfason and Weitzman 2003). Under this mechanism, the amount of charge imposed on the industry is set based on the percentages of raw wet fish catch value that is to be paid after the catch is landed.

II.3. Fishing Fee as a portion of the Operational Costs of Commercial Fishery

Operational costs of commercial fishing are commonly classified into two types; *the fixed costs* (vessels and gear maintenance, mooring, and depreciation) which are commonly borne by the owner, and *the variable costs*; expenses incurred during the fishing trips (fuel, bait, ice etc.). The variable costs commonly are shared between the owner and the crews (Chakravorty and Nemoto, 2000). In addition, Fyson (1985) categorized the operating costs into 11 items; ranging from crew costs (salary/wages) and fuel consumption to the income tax. In this categorization scheme, the landing fee and license fee with unloading costs and watchman's wages are classified as the harbor costs. Regarding the operational costs, Matthíasson (2001) argued that a vessel owner will continue to run his business as long as the variable costs and the loan costs (including the interest rate of the invested capital) can be covered by revenues from the landed catch.

Most fisheries economics literature addressing the economic performance of specific fishing operations focus on the contribution of fuel consumption to fishing operations. Drawing from that literature, particularly in the developed countries, it can be concluded that crews' salary/wages and fuel consumption are the primary contributors to commercial fishing expenses. Crews' salary/wage contributes up to 40% of the annual operating/fishing costs (Fyson 1985, Daures *et al.* 2013), followed by fuel costs representing approximately 20% of the annual total fishing costs (Daures *et al.* 2013).

Increased world fuel price significantly escalates the contribution of fuel costs toward the total fishing costs. The contribution of fuel costs to the total fishing costs of

the European Union (EU) fishing fleets rose from 17% in 2002 to 29% in 2008 (Cheilari *et al.* 2013). Meanwhile, Abernethy *et al.* (2010) demonstrated that the increased fuel price escalates the portion of fuel costs toward the gross expenditures per trip of the UK trawl fishery from 20-35% in 2007 into 45-60% in 2008. In addition, compared to their income, the ratio of fuel costs ranged between 19% and 34% of the average income of the UK offshore fishing fleet (Curtis and Anderson 2012).

Taxes as a percentage of the total revenue from a fishing trip (the total price of the landed catch) or the Landing Fees are part of the Variable Costs that are shared by the owner and crews. Therefore, supporting the classical fishery bioeconomic model (Gordon 1953, Gordon 1954, Schaefer 1957), an increased landing fee will affect both the owner's and the crews' income. A policy simulation on the industrial scale Hawaiian Longline fishery demonstrated that doubling the rate of auction fee will significantly reduce the owner and crew incomes between 18% and 21% (Chakravorty and Nemoto, 2000).

In contrast, the contribution of any other type of fishing fee to the operational costs and size relative to vessels' revenues in developing countries is relatively small. The fishing taxes consisting of vessel registration fee and annual tax of Vietnam's offshore longline fishery operating in the South China Sea were only about 0.8% of the average annual vessel gross revenue (Flaaten and Anh 2008).

II.4. Distributing the National Revenues from the Natural Resource Rent

Several studies addressing the distribution of national revenues derived from natural resources rent favored a proportional distribution based on the derivation basis

(Alisjahbana 2005, Agustina *et al.* 2012). This means that the producer regions shall receive a larger amount of funds from the collected national revenues than the other regions located further from the location of the resources. The derivation basis is developed based on the assumption that producer regions suffer from the negative externalities generated by the natural resource's extraction. Unfortunately, most of these studies in Indonesia discuss revenue distribution from other types of natural resources such as mining and forestry (Alisjahbana 2005, Agustina *et al.* 2012). These studies rarely analyze the formula for intergovernmental distribution of resource rent from the fishery sector.

From the beginning of decentralization in Indonesia back in 1999, the Revenue Sharing Fund (RSF) derived from the royalty of the natural resources extraction has always been a sensitive issue, particularly from the oil and mining sector. The disparities of the RSF tend to ignite disappointment from the subnational governments (Brodjonegoro and Asanuma 2000, Alm *et al.* 2001, Alisjahbana 2005, Agustina *et al.* 2012).

Gylfason (2001) argued that the national revenues collected from natural resource extraction should be invested back into the education sector, particularly for the producer regions. In addition, Brodjonegoro and Asanuma (2000) argued that decentralization in Indonesia should have been implemented and limited at the provincial level, not on the municipal/regency level. The argument was made based on the institutional capacity and the availability of human resources.

II.5. Fisheries Co-Management

Full-government intervention in managing the fisheries as a publicly-owned resource, either through direct or indirect regulations fails to cope with the complexity of fisheries problems. Eventually, the failure is attributed to the legitimacy of the enacted regulations. Two of four factors affecting the legitimacy of the regulatory scheme are the level of the user involvement in the decision-making process and in the implementation or the enforcement of the regulations (Jentoft 1989). These factors lead to the emergence of what is commonly known as fisheries co-management involving the resource users' participation in the decision-making process.

Fisheries co-management can be understood as a sharing of power and responsibility between the government and the users (fishermen or fishing industry) in managing the (fisheries) resources (Sen and Nielsen 1996, Schreiber 2001, and Carlsson and Berkes 2005). However, the definition encompasses a much wider or broader spectrum of the collaborative decision-making process (Pinkerton 1989, Sen and Nielsen 1996).

Types of collaborative management classified as fisheries co-management range from a local agreement in a fishing village or community (Pinkerton 1989) to the sharing of authority and responsibility involving intergovernmental agencies at the national level such as the US Regional Fishery Management Council system (Sen and Nielsen 1996, Burroughs 2011). Furthermore, Carlsson and Berkes (2005) expanded the definition of fisheries co-management beyond a limited yet formalized power-sharing arrangement, envisioning a continuous logical approach to governance and to solve resource management problems through partnership.

As an effort to simplify assessment of arrangement types, Sen and Nielsen (1996) classify fisheries co-management into five types (typology); the *Instructive* (Type A), the *Consultative* (Type B), the *Cooperative* (Type C), the *Advisory* (Type D) and the *Informative* (Type E). This classification is made based upon the role taken by the government and the users. An arrangement dominated by the government role represents the instructive type of co-management, while the informative type represents the most opposite mechanism (Figure 1).

Figure 1. Spectrum of co-management arrangements)

Source: Sen and Nielsen (1996), adapted from Mc Cay 1993 and Berkes 1994

In summarizing the wide spectrum of possible collaborative management arrangements, Sen and Nielsen (1996) also differentiate the arrangement based on the role of the government and the user groups in the decision-making process, types of management tasks, and the stage of the management process. Referring to the type of management task, the decentralization (moving the responsibilities to the lower level of government) can be considered as another type of co-management. Furthermore, Carlsson and Berkes (2005) also describe co-management as a means of linking

different types of organizations. In this case, various types of organizations coming from the different levels are working together in a designated area or addressing a specific resource.

II.6. Federalism as marine fisheries co-management

Muawanah *et al.* (2017) argued that five main pillars of fishery management shall be enforced in order to promote a successful fisheries reform in Indonesia. One of these pillars is the reinforcement of regional governance in each Indonesia Fisheries Management Area (IFMA). Responding to the encouragement of stakeholders' participation in managing Indonesian marine fisheries resources in the 12-200 nm zone as mandated by Presidential Regulation and MMAF's National Strategic Plan (MMAF-RI 2015), the Directorate General of Capture Fisheries (DGCF) as an agency under the Ministry of Marine Affairs and Fisheries (MMAF) that is responsible for marine fisheries governance in Indonesia, established the Indonesia Fisheries Management Commissions (FMCs) in each IFMA. Referring to the Directorate General's Decree, each FMC consisting of stakeholders' representatives from the constituent provinces and other institutions will be assigned to implement and evaluate marine fisheries management in their respective or assigned FMA (DGCF 2017).

In the context of natural resource governance, federalism is defined as a concept of sharing jurisdictional and management responsibilities between the national and the subnational governments in managing natural resources located in a specific or a designated geographical area (Juda 1993). In addition, Bauer *et al.* (2018) defined natural resources federalism as a process of conferring or granting some responsibilities to the sub national institution or administration, to some degree, in governing the natural

resources. Drawing from these two definitions, my research argues that the establishment of FMC-IFMA signifies the implementation of marine fisheries federalism (Juda 1993, Oakey 2003), and to some extent represents fisheries co-management (Sen and Nielsen 1996).

Pinkerton (1989) summarized favorable conditions for developing co-management regimes. Some of the conditions that are relevant to this study encompass the opportunity for the negotiation process, the existence of a long-term legally formalized arrangement, the availability of external support from other stakeholders (university, non-government scientists, and credible organization), the fishermen's direct involvement, and the availability of experienced bureaucrats. Other related conditions encompass the size of managed areas, the size of the relevant population of fishermen, and the size of the relevant government bureaucracy

Hanna (1996) proposed three main outcomes for evaluating co-management arrangements; sustainability, efficiency, and equity. The last one consists of four elements; representation, process clarity, homogenous expectation, and distributive effect.

Stakeholders' representation has always been the focus in assessing a fisheries co-management regime (Pinkerton 1989, Ostrom 1990, Hanna 1996, Schreiber 2001). Regarding the membership apportionment of the Regional Fishery Management Councils (RFMC) in the US, for example, several studies (Okey 2003, Eagle *et al.* 2003, Dell'Apa *et al.* 2012) proposed to reshape the existing institutional structure of the councils, particularly by diversifying the composition of the voting members. The arguments underlying the request for more balance and broader stakeholder

representation are attributed to the concerns over domination by specific stakeholders in the decision-making process (Dell'Apa *et al.* 2012) and to the failure in bringing diverse viewpoints into council discussions and decision-making (Eagle *et al.* 2003).

II.7. Stakeholders' Attitudes

Marine fisheries stakeholders can be defined as those who have interests in and are impacted by the enactment of policies pertinent to fisheries management and the marine environment. While the term is thus quite broad, encompassing various 'actors' from society, the fishermen and their representative organizations are considered as the principal fisheries stakeholders. The other stakeholders encompass fishing communities, fishing-related industries such as fish processors and fish traders, management agencies, Non-Profit Organizations or Civil Society organizations such as environmental NGOs, and other citizens (Mackinson *et al.* 2011).

Attitude can simply be defined as the extent of disfavor or favor toward an object or an issue. It has a broad range and contains a belief component (Fishbein and Ajzen in Perry *et al.* 2017). Measuring stakeholders' attitudes is the most common type of study in investigating human dimensions of natural resource management (Manfredo, Teel, and Bright 2004 in Manfredo 2008). Studies about attitudes provides the most understandable way of explaining a group of stakeholders' thoughts on a specific issue. Another reason underlying the popularity of attitude studies is their ability to provide useful information in predicting and influencing human behavior (Manfredo 2008).

Restricted item, or closed-ended item, is the most common survey method used in quantitative research, and mostly employs rating scale known as a Likert-scale

varying between 5 and 7 points for measuring the level of agreement of the respondents (Privitera 2017). Pérez-Sánchez and Muir (2003) and Pont *et al.* (2016) are few examples of study employing close-ended questionnaires for assessing fishermen's attitudes on issues related to their livelihood. In addition, Pont *et al.* (2016) demonstrated a significant positive correlation between fishermen attitude and their perception toward a specific issue. On the contrary, Knapp (1997) demonstrated the assessment of fishermen's attitudes using open-ended, or short comments collected from the respondents. In other words, attitude can also be studied using a qualitative approach.

The Advocacy Coalition Framework (ACF) developed by Sabatier (1988) is built based on the assumption that the various stakeholders discussing substantive issues pertinent to a specific geographical area (Policy Subsystem) will create an advocacy coalition based on shared policy beliefs at the level of coordination (Weible 2005). Furthermore, this coalition will promote their beliefs into public policies (Sabatier 1988). According to the ACF theory, stakeholders having similar beliefs will be easier to coordinate and to share information than those having different beliefs. Since belief is inherited in attitude, therefore investigation of the stakeholders' attitudes is expected to predict the coalition and the level of future coordination among Indonesia's marine fisheries stakeholders engaged in FMC.

CHAPTER III METHODOLOGY

III.1. Research Design

The study consists of three stages of research activities. First, it analyzes the direct policy impacts resulting from the authorization of three new policies/regulations. Second, it investigates the stakeholders' attitudes regarding the direct policy impacts and the proposed policy alternatives. Finally, it proposes some policy recommendations for the newly enacted policies/regulations. In presenting the results, the study follows the standard (i.e., non-manuscript) format for dissertations at the University of Rhode Island.

The study applies the mixed-method research approach using the case study research design/strategy (Robson 2000, Creswell 2014). The analysis of the policy impacts and the proposed policy alternatives is conducted based upon the detailed information derived from the literatures review, field observation, surveys, and interviews.

The second stage of the research activities, the investigation of the stakeholders' attitudes, also employs a mixed-method research approach using a survey research strategy and the Convergence Parallel research design that merges the results of the quantitative and qualitative analyses (Creswell 2014). Qualitative analysis derived from the combination of the literature review, field observation, and interviews (the qualitative approach) supports the quantitative results from the questionnaires (the quantitative approach) analysis. Lastly, the results from each stage will be used to develop policy recommendations.

III.2. Location and Time of the Study

The study was carried out in Jakarta, Indonesia over six months, from June to November 2018. It was concentrated in two specific locations; the Headquarters of the Ministry of Marine Affairs and Fisheries (MMAF) in Central Jakarta, and the *Nizam Zachman* Oceanic-class Fishing Port (NZOFP) in North Jakarta (Appendix I). Data collection conducted in HQ-MMAF was concentrated in two different places; the *Mina Bahari* Building II and the One-Stop Service Center (OSSC) located at the first floor of *Mina Bahari* Building IV.

Mina Bahari Building II is the headquarters of Directorate General of Capture Fisheries (DGCF), an agency (echelon I) under MMAF responsible for marine fisheries governance in Indonesia. Meanwhile the OSSC is the venue specifically designed by MMAF to provide various services to the industry covering a broad range from aquaculture services to the certification of exported aquaculture/fisheries products.

NZOFP, famously known as *Muara Baru* Fishing Port, is the largest fishing port in Indonesia covering 110 Ha area, including 40 Ha of Port Basin. NZOFP is the fishing base of 1,484 vessels, where 76% of those are larger than 30 GT or Nationally Registered Fishing Vessels (NRFV). Total landed catch in 2016 was 92,472 ton or around 253 tons per day. This volume has declined 23% compared to the total landed catch in 2014 of 119,603 tons (PPSNZJ 2017).

Fishing vessels based in NZOFP in 2016 were dominated by *Bouke Ami* (Stick-Held Dip Net) vessels making up 37% of total vessels. These were followed by purse seine, tuna longline, oceanic drift gillnet, and squid jigging respectively (PPSNZJ 2017). Their fishing grounds cover six different Indonesia Fisheries Management Areas

(IFMAs); IFMA 572 (Indonesia Exclusive Economic Zone/IEEZ of Indian Ocean-Western part of Sumatra), IFMA 573 (IEEZ of Indian Ocean-Southern part of Java), IFMA 711 (IEEZ of South China Sea), IFMA 712 (Java Sea), IFMA 714 (Banda Sea), and IFMA 718 (Arafura Sea). Therefore, arguably, the study has already covered nearly half of the total IFMAs.

In addition to the two primary locations, the study also took place in several locations nearby Jakarta such as Bogor, particularly for attending the national conventions and seminars related to the subject matter of this research.

III.3. Data Collection

III.3.1. Types of Data

Data collected for this study are classified into two types; the *Primary Data* and the *Secondary Data*. The first refers to data collected directly by the researcher from the subjects of study. This comprises data collected from field observation, respondent questionnaires, short-interviews, in-depth interviews, and other information garnered from informal discussions. Secondary Data, in contrast, is defined as any data retrieved from the official sources, either publicly published or unpublished ones. Following the guidelines from the Institutional Review Board (IRB) approval form, the use of unpublished data for the purpose of this study has been approved by the in-charge officials.

For the purposes of this study, Secondary Data is differentiated into two types; final secondary data and raw secondary data. The first refers to secondary data that can be used directly to support the policy analysis. Meanwhile, the raw secondary data

requires further data processing and analysis prior being used to support the study. The following diagram summarizes the data classification used in this study.

Figure 2. Types of Data Collection

III.3.2. Primary Data

Field Observation

Data collected during the field observation encompasses any findings and information from the field (locations of study) that can be used to analyze the policy impacts and to investigate the stakeholders' attitudes. For example, the field observation in NZOFP that was focused on the impact of increased fishing fee and the possibility for implementing the landing fee mechanism.

As the largest and the most modernized industrial-scale fishing port in Indonesia, NZOFP has always been the benchmark for its counterparts. Therefore, it is common that any new policy or regulation will be tested here before being enforced in other fishing ports. Similarly, any negative impacts experienced by NZOFP's fishing fleet hypothetically also occur in other fishing ports' fleets.

Field observation was also employed to analyze the future of the Fisheries Management Commission in Indonesia Fisheries Management Areas (FMC-IFMA). Findings and information gathered during the conventions and other meetings related to the establishment of FMC-IFMA support the analysis of this newly established regional fisheries governance institution.

Survey

In investigating stakeholders' attitudes towards the policy impacts and the proposed policy alternatives, a small-scale survey applying a Non-Probability Sampling Approach (Robson 2000) was conducted. The survey employed a close-ended questionnaire in Bahasa Indonesian (Appendix 2) to the targeted respondents (Section III.5).

Each questionnaire consisted of 10 close-ended questions divided into three sections. Each section discusses different policy impacts and policy alternatives analyzed by this study. The number of questions in each section was unequal and varied between three and four questions. For instance, Section (I) questioning the respondent's attitude regarding the increased fishing fee consists of three questions. Meanwhile, Section (III) assessing the respondent's attitude regarding the establishment of the FMC-IFMA comprises four questions.

Each question has five possible answers as referred to in the Likert-Scale Response Anchor set by Vagias (2006). The value of each answered question ranges from the extremely negative (score = 1) to the extremely positive attitude (score = 5). In addition to the attitude questions, the questionnaire also collects respondents'

demographic information. These include the name of the represented institution (nine options), age, gender, ethnicity, and educational level. Except for the first one, the name of represented institution that defines the type of stakeholder, the other demographic questions are optional to afford the respondents confidentiality.

Short-Interview

The study only distributed one-single type of questionnaire. Therefore, the academicians with the highest educational level and the fishing vessel skippers, who generally had the lowest educational level, had to answer the same set of questions. To assist the skippers in completing the questionnaires and to increase the accuracy of the collected responses, a short-interview was included during the face to face survey of the skippers in NZOFP.

The comments collected from the skippers also function in reinforcing their previous answers. Like many other Indonesians, particularly when facing government officials, the skippers tend to give the non-straightforward answers, or to respond very cautiously. It often happens that the first answers given are not their real opinion. Therefore, similar to Knapp (1997), collecting the skippers' comments in addition to the questionnaire responses is very helpful in investigating their attitudes.

In-depth Interview

In-depth interviews were conducted with key informants selected for their expertise in the discussed issues. These key informants covered a broad range of stakeholders, from bureaucrats representing the central government (MMAF) to the

head of commercial fishing associations representing the industry. The study conducted 19 in-depth interviews (Appendix 4). Unfortunately, the study failed to interview a few of the initially targeted key informants.

In addition to the investigation of the stakeholders' attitudes, in-depth interviews were also conducted to garner any other information related to the analysis of the policy impacts. For instance, interviews with the boat caretaker and some fishing vessel owners were conducted to obtain information related to fishing operational costs.

Informal Discussion

Informal discussions took place in between the formal meetings and on other occasions where the researcher garnered other information related to the study. This included discussions during coffee breaks, smoking sessions, or the moment while waiting for Friday's prayer. Although ethical consideration related to privacy and confidentiality have been explained previously, many of the potential respondents, particularly those representing governments, were reluctant to respond to the questions. In contrast, valuable information was garnered during the relaxing informal discussions where the respondents have more liberty in conveying their opinions.

III.3.3. Secondary Data

Final Secondary Data

Final Secondary Data requires no or little refinement prior to be used in the policy analysis. This includes legal documents containing laws and other types of

government regulations, the statistic of annual marine fisheries production, the number of Nationally Registered Fishing Vessels (NRFV), and other related data.

Raw Secondary Data

Raw Secondary Data requires additional data processing in order to be employed in the policy analysis. The study uses two types of raw data; the Quarterly Fishing Report (QFR) and the Landing Report (LR). QFR is an obligatory report that must be submitted by the Fishing Permit (FP) holders to the Directorate General of Capture Fisheries (DGCF). This report is one of the requirements to extend the Fishing Permit (FP). In addition to the basic information regarding the fishing vessel and her designated fishing grounds, the report also comprises the total catch, catch composition, catch value, fishing days, and the amount of fuel expenditure. This study uses the 2017 reviewed QFR retrieved from DGCF's database.

Landing Report (LR) contains catch data from every vessel landing/unloading in NZOFP. The data are collected daily by the enumerators working in NZOFP. Information collected in LR is nearly similar to those submitted in QFR. Additional information provided by the LR includes the main engine dimension, fishing days, and number of crew. This study used the 2018 LR. Both QFR and LR were used to reconstruct the average fishing operational costs as the baseline in analyzing the impact of the increased fishing fee.

III.4. Sampling Design and Strategy

The study combines Quota Sampling Methods and the Convenience Sampling Method (Robson 2000). The quota sampling method classifies the respondents into several categories or groups. Subsequently, a specific sampling quota is set for each group of respondents (Robson 2000). The amount of quota in nine categories of stakeholders is determined based on the combination of several factors; population size, their representativeness in the FMC-IFMA, and researcher personal judgment and experience.

Convenience sampling methods were applied to sample the fishing vessel owners or the fishing companies' representatives, and the fishing vessel crew/skippers. This sampling method randomly selects the nearest and the most convenient respondents (Robson 2000). In addition to two sampling designs and as an effort to increase the respondent participation, this study applied three sampling mechanisms; *Conventional Survey*, *Online Survey (e-questionnaires)*, and *Guided face-to-face survey*

Conventional Survey

This survey distributed the paper questionnaires to the targeted respondents who are expected to complete it voluntarily. The conventional survey took place in three different locations; in the HQ of DGCF, in the One-Stop Service Centre (OSSC) of MMAF, and in the national meetings or conventions attended by representatives from the fishing port, provincial fisheries agency, and reGENCY/municipality fisheries agency. The last sampling mechanism is similar to the one conducted by Gray and Campbell (2008).

The targeted respondents of the conventional survey in the HQ of DGCF were the experienced staffs or officials having job descriptions pertinent with the investigated policy issues. Meanwhile, in the OSSC, the questionnaires were distributed to the nearest and the most convenient fishing vessels owners or company's representatives extending their Fishing Permit (FP). The conventional survey was the major contributor for this study with 261 answered questionnaires, or 59% of the total collected questionnaires.

Online Survey

The Online Survey distributed the link of previously prepared paperless questionnaire by email and to WhatsApp Groups (WAGs). E-mailed questionnaires were sent to the previously contacted respondents who were willing to participate in the survey. Meanwhile, the link of the online questionnaire was distributed to several WAGs specially created for discussing fisheries management's issues or consisting of Indonesia marine fisheries stakeholders as the groups' members. Two examples of WAGs receiving the link of the online survey were the WAG of Indonesia EAFM and WAG of alumni of Faculty of Fisheries and Marine Science – Bogor Agricultural University.

In addition, the link of the online survey was also published in the researcher's social media account, Facebook. The online questionnaire distributed to WAGs was created using the Survey Gizmo application. In total, there were 70 completed e-questionnaires or 16% of the total respondents.

Guided face-to-face survey

This type of survey initially was applied to assist the fishing vessel skippers in completing the conventional or paper questionnaires. The skippers' educational level gave rise to a concern for accuracy that provided the underlying reason for employing this procedure. The face-to-face survey was assisted by ten enumerators previously briefed and trained by the researcher. The briefing encompassed the purpose of study, the strategy to deliver the questions in a short and simple yet understandable way, and the way to measure respondents' attitudes based on their short comments, intonation, and gestures.

The enumerators are contracted employees hired by NZOFP. Their primary job is to collect the catch data from every fishing vessel landing in NZOFP. Therefore, the Guided Face-to-Face Survey was conducted during the landing inspection with the skippers who were willing to voluntarily participate. In addition to the previously prepared questionnaires, the enumerators also garnered information concerning fishing vessel dimension (size of the vessels in GT, type of fishing gear), the location of fishing grounds, and other related data required for further analysis.

A guided face-to-face survey was also employed in sampling the fishing vessel owners. This strategy was applied to optimize the limited study time. The survey of the owners was conducted in the form of short-interviews while reviewing their submitted Quarterly Fishing Report (QFR). Similar to the one applied to the skippers; additional questions related to the fishing operation were also conveyed to the owners. This sampling mechanism collected 115 answered questionnaires, or 26% of the total collected respondents.

III.5. The Respondents

The study focused on the industrial-scale marine fisheries in Indonesia that are geographically located from the baseline of the territorial waters to the outer limit of the Exclusive Economic Zone (EEZ), a 12 – 200 nautical mile (nm) zone. The area covers the designated fishing grounds for commercial fishing vessels that are larger than 30 Gross Tonnage (GT) and are holding the Fishing License (FL) and Fishing Permit (FP) issued by the MMAF-RI. The latest data show that there are 4,229 Fishing Licenses (FL) and 3,722 Fishing Permits (FP) issued by MMAF-RI by May 6, 2017 (MMAF 2017).

Following the definition of marine fisheries stakeholders (Mackinson *et al.* 2011), this study limits and classifies the Indonesian marine fisheries stakeholders into nine categories/groups. These are: 1) central government officials; 2) heads of central government-managed fishing ports; 3) provincial fisheries agencies' officials; 4) regency/municipality's fisheries agencies officials; 5) fishing vessel owners and fishing companies' representatives; 6) fishing vessel crews or skippers; 7) fishermen associations; 8) environmental NGOs; and 9) academicians.

The Central Government officials are defined as the civil servants or government employees working in the HQ of DGCF and having job descriptions related to marine fisheries management. Total respondents from this type of stakeholders were 84 persons, or 19% of the total respondents.

Essentially, the heads of MMAF-managed fishing port are also central government officials, yet they are posted outside the HQ. Along with the fishing ports'

staffs (including the harbor master), they are the DGCF's employees dealing with daily activities in the field. In other words, the HQ officials represent or are considered as the regulation drafters, while their counterparts posted in the fishing ports are the regulation executors or enforcers. In several occasions, regulations or policy prepared by HQ personnel are difficult to enforce in the field. This clear differentiation between HQ and field staff is the reason for separating them into two categories.

In principle, both the officials from the provincial and the regency/municipality fisheries agencies can be classified as the local governments' representatives. Their authority only differs based on the jurisdiction of their respective regions. Although basically these four types of stakeholder are the representatives of the government's side and contribute 52% of the total respondents, this study still differentiates them. The underlying reason is the hypothetical assumption that each of them will advocate their own interests, particularly when dealing with authority and responsibility issues.

Most fishing vessel owners in Indonesia assign their employees or hire an independent middle-man to take care of their fishing licensing process. These representatives or the middle-man are considered as the vessel owners' right-hand man or the spokesman when dealing with the government. Thus, for this study, they are considered the same type of stakeholders. By nature, the right-hand man or the spokesman has the same opinion as the owner they represent.

Most of the skippers consider themselves as ordinary workers hired by the vessel owners. Therefore, they tend to follow any instructions from the owners and have little or no liberty in voicing their opinions. Nevertheless, this paper still classifies them as a different group from their employers due to the possibility of dissenting opinion.

The next group is the commercial fishing associations, the institution organizing and commonly representing the vessel owners in any discussion forum held by the government or other institutions like the NGOs. These three types of stakeholders can be classified as the representatives of the industry. Referring to Weible (2005), these groups are most likely to form an advocacy group where they closely interact with each other in opposing the government's side, particularly on adverse regulations. Hypothetically, this study argues that these two groups, the government and the industry, will have opposite attitudes toward the increased fishing fee.

Two other types of stakeholders hypothetically considered as neutral groups are the environmental Non-Government Organizations (NGOs) and the academicians/researchers. Stakeholders representing the NGOs consist of any NGO working on or advocating issues related to marine fisheries management in Indonesia. This includes both the national and the international NGOs.

This study classifies the researchers working in the MMAF Research Center into the same group with the academicians who are mostly comprised of faculty members from various universities having marine fisheries programs of study in Indonesia. Having slightly different perspectives on marine fisheries management than their counterparts working in the headquarters and fishing ports is the underlying reason to separate them, although essentially these researchers are also central government employees. The following table summarizes the number of respondents representing each type of stakeholders and the percentage (%) of the total pool of respondents they represent.

Table 1. Total Respondents

No.	Types of Stakeholders	Σ Respondents	%
1	DGCF-MMAF (Central Govt.)	86	19.28
2	Fishing Port	87	19.51
3	Provincial Government	42	9.42
4	Municipality/Regency Government	17	3.81
5	Skipper/Crews	79	17.71
6	Industry (Owners) or Company Representatives	75	16.82
7	Commercial Fishing Association	12	2.69
8	NGO	20	4.48
9	Academician/Researcher	28	6.28
	Total	446	100.00

III.6. Data Processing and Data Analysis

Data processing was conducted on two types of data requiring further actions before being used to support the policy analysis. These are the Quarterly Fishing Report (QFR) and the Landing Report (LR) for estimating the impact of the increased fishing fee on the fishing operational costs, and the collected responses from the distributed questionnaires for investigating the stakeholders' attitudes.

The first data processing consists of four stages; *Data Classification*, *Data Verification*, *Data Reconstruction*, and *Data Analysis*. The investigation of the stakeholders' attitudes also consists of four stages; *Data Compilation*, *Descriptive Statistics Analysis*, *Result Compilation*, and *Statistical Test*. The following diagram summarizes the stages in data processing.

Figure 3. Stages in Data Processing

III.6.1. Estimating the Impact of Increased Fishing Fee on the Fishing Operational Costs

III.6.1.1. Data Classification

This stage sorted out the retrieved raw secondary data, both the QFR and the LR, based on the type of fishing gear. The resulting data were grouped into six primary fishing gears based in the NZOFP. Those are the Big Pelagic Purse Seine, Small Pelagic Purse Seine, Tuna Long Line, Oceanic Drift Gillnet, *Bouke Ami* (Stick-Held Dip nets), and Squid Jigging. The type of targeted species and the mesh-size of the net differentiate Big Pelagic Purse Seine from the other type, the small pelagic purse seine. Subsequently, the data was sorted based on the size of the vessel in Gross Tonnage (GT) to facilitate the next stages.

III.6.1.2. Data Verification

Essentially, this was the data elimination stage. Incomplete reports having little, or no information required for the next stage of data processing were deleted. The required information encompasses the total catch value, the length of fishing days, the number of fishing trips, number of crew, and the size of the main engine. In addition, this stage also eliminated inaccurate reports. An example of an inaccurate report is the incompatibility between the type of fishing gear and their landed catch, for instance, a squid jigging vessel that landed tuna. Regardless of verification stage conducted on the submitted reports, some errors related to the inaccuracy of the reports still occur.

This stage also verified the report reliability. The simplest way to do it was by comparing the total reported landed catch with the length of fishing trip and the size of the vessels. Data verification was the most time-consuming stage of data processing as the verification was conducted manually and painstakingly on thousands of data entries. This stage significantly refined the retrieved data. The following table summarizes the final number of verified fishing vessel reports.

Table 2. Verified Fishing Vessels' report

No.	Types of Fishing Gear	2017 QFR				2018 LR			
		S	M	Total	%	S	M	Total	%
1	Big Pelagic Purse Seine	0	82	82	19.81	0	78	78	20.86
2	Small Pelagic Purse Seine	16	63	79	19.08	4	26	30	8.02
3	Tuna Longline	29	22	51	12.32	19	29	48	12.83
4	Oceanic Drift Gillnet	18	40	58	14.01	5	12	17	4.55
5	Bouke Ami	42	24	66	15.94	66	74	140	37.43
6	Squid Jigging	4	74	78	18.84	2	59	61	16.31
	Total			414	100.00			374	100.00

**S = Small-scale Fishing Vessel (<60GT)*

***M = Medium-scale Fishing Vessel (60-200 GT)*

III.6.1.3. Data Reconstruction

The first step in data reconstruction was to set the components of fishing operational costs. Referring to literature review (Fyson 1985, Chakravorty and Nemoto, 2000) and due to the limited data availability, this study classified the fishing operational costs into six categories; *fuel consumption, provision, crew basic wage, crew incentives, charged fishing fee, and miscellaneous costs*. Subsequently, expenditure in each category was calculated based on the formula retrieved from the literature review. Several assumptions obtained from field observation and interviews were incorporated into the formulas.

Fuel Costs

This component comprised the fuel consumption for the main engine and the auxiliary engine. In addition, lubricant consumption was also incorporated. Estimation

of the main and the auxiliary engine fuel consumption was calculated based on the following formula:

$$C = 0.75 \times P(\text{max}) \times (S/d) \times t \times 0.001 \text{ (Prado and Dremiere 1990)}$$

Where;

- C = Engine's fuel consumption during a given period of time (Liter)
- C_f = Average Coefficient (during traversing = 0.7-0.8, during fishing operation = 0.5-0.8)
- P(max) = Maximum Power of Engine (Horsepower or HP)
- S = Special consumption of fuel (grams/HP/hour; 170-200 for diesel)
- D = Density of fuel (0.84 for diesel)
- t = Time of engine operation (hours)

Referring to the formula, it is obvious that the information availability regarding the main engine size (P_{max}) and fishing days (t) is crucial. Meanwhile the coefficient values (C_f and S) used in the formula were determined based on the information garnered from the interviews with the skippers, chief of the engine room, owners, and boat caretakers. In addition, the lubricant consumption was set as 1% of total fuel consumption. Subsequently these results were multiplied by the average price of fuel (diesel) and lubricants in the relevant year to calculate their nominal value.

Provisions

Provision expenditures covered food and other necessities for the crews during the fishing operation (Fyson 1985). The average daily expenditure for this component was set based on the interviews with the boat caretaker supplying these items to the fishing vessels. For instance, in 2017, the average nominal value of daily provisions for the crew was Rp. 25,000/day/person. Therefore, total provision costs per trip (PC) was calculated using the following formula:

$$PC = FD \times \Sigma \text{ crew} \times ADPC$$

Where;
 PC = Provision Cost
 FD = Σ Fishing Days
 Crew = Σ of crew in the concerned trip
 ADPC = Average Daily Provision Cost

Wage

Basic wage for the crews varied depending on the type of fishing gear and their rank (working experience) on the vessels. Tuna Longline crews have the highest average basic daily wage at Rp. 65,000/day followed by Oceanic Drift Gillnet crew. In contrast, a purse seiner commonly applies a profit-sharing system between the owner, skipper and crew. Therefore, unlike other fishing gears, the purse seiner's crew receive no basic wage. The purse seine crews' income is determined by the net value of the landed catch. The estimation of the Wage Cost (WC) per trip was calculated based on the following formula:

$$WC = \text{Fishing Days } FD \times \Sigma \text{ crew} \times ACDW.$$

Where;
 WC = Wage Cost
 FD = Σ Fishing Days
 Crew = Σ of crew in the concerned trip
 ACDW = Average Crew Daily Wage

Incentives

Aside from the daily wages, the crews also received an incentive as additional income. The incentive was determined based on the total catch and their achievement during the fishing operation. For instance, each Squid Jigging crew receives additional Rp. 6,000/kg for squid caught. For purse seine crews, their additional income came from individual angling conducted while the vessel was drifting nearby a Fish Aggregating

Device (FAD). This individual catch will be bought by the owners as soon as the vessel returns to port. Most of this catch was not officially recorded and was separated from the total landing of a vessel, therefore it is excluded in the analysis of this study. The estimation on Crew Incentive Cost per trip (CIC) was calculated based on in the following formula:

$$\text{CIC} = \text{TLC} \times \text{IR}.$$

Where;

CIC = Crews' Incentive Cost per trip

TLD = Total Landed Catch (kg)

IR = Incentive Rate (Rp/kg)

Charged Fishing Fee (CFF)

For the purpose of this study, Charged Fishing Fee (CFF) is defined as a portion of annual fishing fee included into the fishing operational costs. This component was calculated based on the assumption that the real nominal value of a fishing fee charged to a vessel depends on the number of her fishing days in a year (Σ fishing days/365 days). In other word, the CFF is a function of the vessel's dimension, fishing days, and fishing fee rate.

For example, if a purse seiner spends 150 days for one fishing trip, then the CFF is the result of multiplication of the vessel's dimension (GT), the number fishing days in a year (150/365), and the Simplified Annual Fishing Fee Rate (Rp. 1,802,200/GT for Big Pelagic Purse Seine). Therefore, the estimation on the Fishing Fee Costs was calculated based on the following formula:

$$\text{CFF} = \text{GT} \times (\Sigma \text{FD}/365) \times \text{SAFFR}$$

Where;

CFF = Charged Fishing Fee (Rp.)

GT = Fishing Vessel's dimension (Gross Tonnage or GT)

FD = Σ Fishing Days (D)

SAFFR = Simplified Annual Fishing Fee Rate (Rp/GT)

Miscellaneous Costs

Miscellaneous Cost was the final component added into the estimation of the fishing operational costs. It covered any other unpredictable costs and was set as 5% of the accumulation of the previous five components. Therefore, the estimated Total Fishing Operational Costs (TFOC) was calculated based on the following formula.

$$\text{TFOC} = (\text{FC} + \text{PC} + \text{WC} + \text{CIC} + \text{CFF}) \times 105\%$$

Where:

TFOC = Total Fishing Operational Costs

FC = Fuel Costs

PC = Provision Costs

WC = Wage Costs

CIC = Crews' Incentive Cost

CFF = Charged Fishing Fee

III.6.1.4. Data Analysis

The data analysis of the impact of the increased fishing fee over the fishing operational costs comprised another three stages. First, it calculated the portion, or the percentage of Charged Fishing Fee (CFF) from the Total Fishing Operational Costs (TFOC) for each vessel. The calculation was made based on the simple formula; The CFF Portion (%) = (CFF/TFOC) x 100%

Second, it conducted the Descriptive Statistics Analysis of the CFF Portion (%) for each type of fishing gear. Referring to the description of the Descriptive Statistics Analysis (Walpole 1982, Privitera 2017), this stage calculated single values-summary

statistics. This encompasses the Mean, Median, Mode, Maximum and Minimum Value, Variance, Frequency, and the Standard Deviation.

Hypothetically, an increased fishing fee tariff will escalate the portion of CFF in TFOC. Therefore, the last stage of data analysis calculated the magnitude of the increased CFF portion by comparing the contribution (percentage) of TFOC before and after the authorization of Government Regulation No.75 of 2015. Automatically, this stage also determined the most affected fishing gear due to the authorization of this policy.

III.6.2. Investigating the stakeholders' attitudes

III.6.2.1. Data Compilation

In this stage, the completed questionnaires, both the conventional (paper) and the electronic or the online questionnaires were compiled manually. This stage also sorted the questionnaires into nine groups of stakeholders. Subsequently, each response was quantified, with values ranging from the extremely negative (score = 1) to the extremely positive attitude (score = 5).

This stage also summarized the qualitative data; the short comments from the skippers and the summaries from the in-depth interviews. As previously mentioned, in investigating the stakeholders' attitudes, this study employed the Convergence Parallel research design (Creswell 2014). Consequently, this qualitative data will be merged with the quantitative results to form the outcome of the stakeholders' attitudes investigation.

III.6.2.2. Descriptive Statistics Analysis

Since the collected data was ordinal data, the Descriptive Statistics Analysis focused on the median and mode as the measures of central tendency (Jamieson 2004). Initially, the expected result was 90 values of median and mode (10 questions x 9 stakeholders). However, this study collected 83 values since several of the respondents were not willing to participate in answering Section II (Revocation of Municipality/Regency' authority) and Section III (Establishment of FMC-IFMA).

Most of these incomplete questionnaires were collected from respondents representing the industry interests (Fishing Vessel Owner and skipper). The primary reason for unwillingness to participate was the lack of interest in commenting on what they consider as the government's internal problem. In addition, many of them were not completely familiar with the questioned issues.

This stage also created the relative frequency histogram or the percentage histogram (Walpole 1982) mapping the distribution of the recorded answers (in percentages), a method similar to that applied by Perez-Sanchez (2003). The purpose of this action was to facilitate comprehension of the answered question, especially in measuring the magnitude and the direction of the stakeholders' attitudes.

III.6.2.3. Results Compilation

In this stage, the results from the Descriptive Statistics Analysis were compiled and summarized to facilitate the next stage, the statistical test. The compilation included median and mode values for each question from nine different stakeholder groups, the

frequency distribution histograms (in percentages) of answered questions, and the summarized interviews.

III.6.2.4. Statistical Test

The Non-Parametric Statistical test employed to analyze questionnaire responses was the Kruskal-Wallis test. The Null hypothesis was that the nine groups of respondents are identical populations having equal medians. Therefore, the Kruskal-Wallis test aims to examine the null hypothesis, whether at least one group of stakeholders has different population median.

If the Kruskal-Wallis test rejects the null hypothesis, the pairwise test will be carried out. Essentially the test was conducted on each group of stakeholders, by comparing head to head the median of their responses on each investigated aspect. The purpose of this test is to determine which medians differ (LeBlanc 2004). However, this study focuses on the two groups of stakeholders most affected by the authorized policy. The Pairwise test aims to see whether these two affected stakeholder groups have a significant difference in the median of their responses. The analysis was conducted using the Statistical Package for the Social Sciences (SPSS) version 24.

CHAPTER IV INDONESIA MARINE FISHERIES MANAGEMENT

IV.1. Brief Overview on Indonesia Marine Fisheries

As the 2nd largest world marine capture fisheries producer (FAO 2016), the fisheries sector has significant biological and socio-economic impacts on Indonesia's national economic growth. The total national landing of capture fisheries in 2014 was over 6 million tons. The number increased by 7% from the previous year and by 27% from the 2003-2014 period (FAO 2016). Combined with the aquaculture sector, the fisheries sector contributed 2.3% to the national Gross Domestic Product (GDP) in 2014. In terms of socio-economics, the fisheries sector contributes by providing jobs or livelihoods to over 2.7 million fishermen. Most of them work in small-scale fisheries (Pusdatin-MMAF 2016).

Table 3. World's Major Capture Fisheries Producers

MARINE CAPTURE PRODUCTION: MAJOR PRODUCERS						
COUNTRY OR TERRITORY	AVERAGE 2003–2012	2013	2014	VARIATION		
				AVERAGE (2003–2012) – 2014	2013– 2014	2013–2014
		(Tonnes)		(Percentage)		(Tonnes)
China	12 759 922	13 967 764	14 811 390	16.1	6.0	843 626
Indonesia	4 745 727	5 624 594	6 016 525	26.8	7.0	391 931
United States of America	4 734 500	5 115 493	4 954 467	4.6	–3.1	–161 026
Russian Federation	3 376 162	4 086 332	4 000 702	18.5	–2.1	–85 630
Japan	4 146 622	3 621 899	3 630 364	–12.5	0.2	8 465
Peru	7 063 261	5 827 046	3 548 689	–49.8	–39.1	–2 278 357
	918 049 ⁱ	956 416 ⁱ	1 226 560 ⁱ	33.6	28.2	270 144
India	3 085 311	3 418 821	3 418 821 ²	10.8	0.0	0
Viet Nam	1 994 927	2 607 000	2 711 100	35.9	4.0	104 100
Myanmar	1 643 642	2 483 870	2 702 240	64.4	8.8	218 370
Norway	2 417 348	2 079 004	2 301 288	–4.8	10.7	222 284

Source: FAO, 2016

Indonesia's marine (capture) fisheries production grew over the years (2011-2015). Yet, data indicates a declining growth in 2015, from 5.27% annual growth in 2014 to 2.77% in 2015. The available on-line data on Indonesia's marine fisheries statistics only classifies the catch landings into six categories; tunas (*Thunnus* sp), skipjack (*Katsuwonus* sp), eastern little tunas (*Euthynnus* sp), other fish (the small pelagic fish and demersal fish), shrimp, and other marine species. The group of species categorized as other fish contributes more than 67% of Indonesia's marine fisheries annual production (table 4 and figure 5).

Table 4. Indonesia Marine Fisheries Production (2001-2015)

No.	Category	2011	2012	2013	2014	2015	Average	%
1	Tunas	241,364.00	275,779.00	305,435.00	313,873.00	255,452.00	278,380.60	4.84
2	Skipjack Tuna	372,211.00	429,024.00	481,014.00	496,682.00	415,060.00	438,798.20	7.64
3	Eastern Little Tunas	415,331.00	432,138.00	451,048.00	515,571.00	524,387.00	467,695.00	8.14
4	Other fish	3,684,533.00	3,684,633.00	3,848,064.00	3,988,564.00	4,121,272.00	3,865,413.20	67.27
5	Shrimp	260,618.00	263,032.00	251,343.00	273,133.00	278,625.00	265,350.20	4.62
6	Others	371,672.00	351,027.00	370,109.00	449,831.00	609,873.00	430,502.40	7.49
Total		5,345,729.00	5,435,633.00	5,707,013.00	6,037,654.00	6,204,669.00	5,746,139.60	100.00
% of Growth			1.68	4.99	5.79	2.77		

Source: MMAF-RI, 2017 http://sidatik.kkp.go.id/dynamic_report

Figure 4. Indonesia Marine Fisheries Production (2011-2015)
Source: MMAF-RI, 2017 http://sidatik.kkp.go.id/dynamic_report

Figure 5. The Composition of Indonesia Marine Fisheries Production (2011-2015)

Source: MMAF-RI, 2017 http://sidatik.kkp.go.id/dynamic_report

IV.2. Decentralized Marine Fisheries Management

The authority for commercial fisheries management in Indonesia (to define policy and management of exploration, conservation, and utilization of marine fisheries resources) is divided between the central (MMAF-RI) and the local governments (provinces and regencies/municipalities). The MMAF's authority is limited to waters beyond 12 nautical miles (12-200 nm) *i.e.*, the Indonesia Exclusive Economic Zone (EEZ). The authority over the fisheries within 12 nm was initially divided between the provincial (4–12 nm) and the regency/municipal governments (0–4 nm), but the regency/municipal's authority was revoked by an amendment of Law Number 23 of 2014 expanding the province's authority, from 0 nm (the baseline) to 12 nm (Satria and Matsuda 2004; GOI 2004; GOI 2014).

Sen and Nielsen (1996) differentiated fisheries co-management, based upon the division of management tasks, into 2 types; decentralization and delegation. Decentralization can simply be defined as shifting responsibilities to the lower level of government. In the case of Indonesia's decentralized marine fisheries management, prior to 2014, enforcement of fishing licensing for the smaller industrial-scale commercial fisheries was delegated to the provincial (10-30 GT) and the regency/municipal (5-10 GT) administrations. Delegation of fisheries management, on the other hand, can be defined as the transfer of responsibilities from the government to the user groups.

Decentralizing marine fisheries management was one of the impacts of implementing the decentralization system in Indonesia, which marks the beginning of the Reform-era, after the resignation of Indonesia's military regime led by General Suharto that ruled Indonesia for 32 years (1966-1998). The decentralization system revised most of the distribution of authority among the administration levels in Indonesia (Satria and Matsuda 2004, Siddik 2007).

IV.3. Indonesia Fisheries Management Area (IFMA)

Indonesia's Fisheries management is divided into 11 areas called Indonesia Fisheries Management Areas (IFMAs). IFMAs are designated management areas for capture fisheries, aquaculture, conservation, research and other fisheries development that encompass the inland waters, the archipelagic waters, the territorial seas, the contiguous zone, and the Exclusive Economic Zone (EEZ) of Republic of Indonesia

(MMAF 2014a). The inclusion of Indonesia's EEZ into IFMAs is an assertion of the country's sovereign rights, as a coastal/archipelagic state, over its EEZ.

Although essentially designated for general and broader fisheries management, IFMAs are mostly known and used in managing commercial fishing in Indonesia. The commercial fishing grounds, for instance, are designated based upon IFMAs.

The division of IFMAs is based on geographical and natural characteristics of each area and following the international code set by the FAO (MMAF 2014a). In general, IFMAs can be categorized into two groups of World Fisheries Management Areas; the 57 areas of the Eastern Indian Ocean and the 71 areas of the Western-Central Pacific.

The characteristics of each IFMA affect the type of catch landed and the fishing gear operating in the concerned area. IFMA 718, for instance, encompasses the Arafura Sea, the Aru Sea, and the Timor Sea, and is part of the Sahul Continental Shelf, which shapes the eastern part of the Indonesia archipelago. Geographically, it is located between 6°00' – 10°50' South Latitude (SL) and 127°27' – 141°10' East Longitude (EL). Northward it is bordered by the southern coast of Papua, westward and southwestward are bordered by the Banda and Timor Seas, and southward and southeastward by the Gulf of Carpentaria and the Torres Strait (Australia). It covers 650,000 km², mostly a shallow sea floor consisting of a vast sand and mud bank with depths ranging from 50 to 80 meters (Tomascik *et al.* 1997; MMAF 2014a; MMAF 2014b).

The combination of shallow depth and a heavy load of nutrient-rich sediments flowing from the coastal mangrove forests and rivers along the south coast of Papua results in the Arafura Sea of IFMA 718 being one of Indonesia's most productive fishing

grounds for small pelagic fish (Indian Mackerel, Mackerel, and Scads), demersal fish (Barramundi/Giant Sea Perch, Croakers, Red Snapper, Jack Trevallies and Giant Catfish), and *Penaeid* shrimps (Tiger Prawn, Banana Prawn/White Shrimp and Red Shrimp). Prior to the prohibition imposed on January 2, 2015, IFMA 718 had been the preferred fishing ground for mid-water trawlers and shrimp trawlers. Nowadays, small pelagic purse seiners, squid jigging, and oceanic drift gillnets dominate IFMA 718. Annually, IFMA 718 contributes up to 10% of the national fisheries production.

Meanwhile, the neighboring IFMA 714 which encompasses the Gulf of Tolo and the Banda Sea, is categorized as deep-sea waters with an average depth of 5,400 m. The Banda Sea is one of the deepest seas in the Indonesia archipelago, and is a well-known fishing ground for big pelagic species such as tuna and skipjack.

From the brief description above, it can be concluded that the IFMA has some similarities with the US Fishery Conservation Zone (FCZ, now EEZ). Yet, there is no semi-independent institution such as the US Regional Fishery Management Council (RFMC), which was established for semi-autonomous management of the fisheries in each designated management area. The commercial fishery in each IFMA, as mentioned earlier, is managed separately by the central (MMAF-RI) and the provincial governments based on the vessels' size and the geographical jurisdiction.

Figure 6. Indonesia Fisheries Management Area (IFMA)
Source: MMAF 2014a

Being an archipelagic state, most of Indonesia's provinces have jurisdiction over two or three IFMAs (table 5). For instance, the Central Java province has jurisdiction over IFMA 712 and IFMA 573. Another example is the South East Sulawesi province becoming the constituent province for three IFMAs; 713, 714 and 715. As there are no landlocked provinces in Indonesia, every province becomes the member of, at least, one IFMA. These facts contribute to the membership composition of Fisheries Management Commission in each IFMA.

Table 5. The Jurisdiction of Indonesia Fisheries Management Area (IFMA)

IFMA	Jurisdiction Area	Σ Contituents	Constituent Provinces
571	Malacca Straits, Andaman Sea	3	NAD, North Sumatera, Riau
572	Western Indian Ocean of Western Sumatera, Sunda Straits	6	NAD, North Sumatera, West Sumatera, Bengkulu, Lampung, Banten
573	Part of Indian Ocean in Southern Java, Southern Nusa Tenggara, Sawu Sea, and Western Timor Sea	8	Banten, West Java, Central Java, Jogjakarta, East Java, Bali, West Nusa Tenggara, East Nusa Tenggara
711	Karimata Straits, Natuna Sea, IEEZ in South China Sea	6	Riau, Riau Archipelago, Jambi, Bangka-Belitung, South Sumatera, West Kalimantan
712	Java Sea	8	Lampung, Jakarta, Banten, West Java, Central Java, East Java, Central Kalimantan, South Kalimantan
713	Makassar Straits, Gulf of Bone, Flores Sea, and Bali Sea	10	North Kalimantan, East Kalimantan, South Kalimantan, South East Sulawesi, West Sulawesi, South Sulawesi, Central Sulawesi, Bali, West Nusa Tenggara, East Nusa Tenggara
714	Gulf of Tolo, Banda Sea	4	SouthEast Sulawesi, Central Sulawesi, Maluku, East Nusa Tenggara
715	Gulf of Tomini, Maluku Sea, Halmahera Sea, Seram Sea, Gulf of Berau	7	SouthEast Sulawesi, Central Sulawesi, North Sulawesi, Gorontalo, North Maluku, Maluku, West Papua
716	Sulawesi Sea, Northern Halmahera Sea	4	North Sulawesi, Central Sulawesi, Gorontalo, North Maluku
717	Gulf of Cendrawasih, and IEEZ in Pacific Ocean	3	North Maluku, West Papua, Papua
718	Aru Sea, Arafura Sea, Eastern Timor Sea	3	Maluku, West Papua, Papua
TOTAL		62	

Source: MMAF 2014a

IV.4. Indonesia Marine Fisheries Management

License limitation and fishing fees are the two primary management tools enforced in Indonesia's industrial-scale marine fisheries. Other management measures include Total Allowable Catch (TAC), fishing gear restrictions, and fishing area closures. The number of Fishing Licenses (FL) and Fishing Permits (FP) allocated to commercial fishing is calculated based upon the TACs of primary fisheries in each IFMA. TAC is derived from the estimated Maximum Sustainable Yield (MSY), which is stipulated by the MMAF-RI through a ministerial decree. In consideration of the precautionary principle, each TAC has been set at 80% of the MSY (Mous *et al.* 2005; GOI 2006; MMAF 2006; MMAF 2011).

Due to its high diversity of marine fish species - more than 120 recorded commercial fish species (DGCF 2014) - the MSY for each IFMA is grouped into seven

fisheries; *the big pelagic fishery* (Tuna, Swordfish, Marlin, Skipjack), *the small pelagic fishery* (Indian Mackerel, Mackerel, Trevallies, and Scads), *the demersal/ground fish fishery* (Barramundi/Giant Sea Perch, Croakers, Red Snapper, Jack Trevallies and Giant Catfish), *the Shrimp fishery* (Tiger Prawn, Banana Prawn/White Shrimp and Red Shrimp), *the Reef fish fishery* (Groupers), *the Lobster fishery*, and *the Squid fishery*.

The estimated total MSY in 2011 was 6.5 million metric tons (MMAF 2011). The latest total MSY enacted by the Minister of Marine Affairs and Fisheries' decree No.50/KEPMEN-KP/2017 was 12.5 million metric tons (MMAF 2017). The 2017 MSY increased by 2.6 million MT or 26.3% compared to the 2016 MSY with 9.9 million MT (MMAF 2016). The new MSY also adds two groups to the fishery: *the crab fishery* and *the swimming crab fishery*.

Table 6. The dynamic of Indonesia's MSY

Description	YEAR	WPP 571	WPP 572	WPP 573	WPP 711	WPP 712	WPP 713
Annual Production	2013	496,239.00	632,575.00	464,015.00	623,937.00	918,531.00	687,992.00
MSY	2011	276,000.00	565,200.00	491,700.00	1,059,000.00	836,600.00	929,700.00
MSY	2016	484,414.00	1,228,601.00	929,330.00	1,143,341.00	981,680.00	1,026,599.00
MSY	2017	425,444.00	1,240,975.00	1,267,540.00	767,126.00	1,341,632.00	1,177,857.00
Description	YEAR	WPP 714	WPP 715	WPP 716	WPP 717	WPP 718	Total
Annual Production	2013	518,672.00	504,723.00	301,039.00	143,445.00	415,845.00	5,707,013.00
MSY	2011	278,000.00	595,600.00	333,600.00	299,100.00	855,500.00	6,520,000.00
MSY	2016	431,069.00	631,703.00	478,765.00	603,688.00	1,992,730.00	9,931,920.00
MSY	2017	788,939.00	1,242,526.00	597,139.00	1,054,695.00	2,637,565.00	12,541,438.00

The allocated TAC for each fishery in each IFMA is the benchmark, or point of reference, for limiting the number of vessels allowed to fish in the concerned area. At maximum, each vessel is allowed to fish in the fishing grounds of two adjacent IFMAs. The location of the fishing ground is stated in the Fishing Permit (FP). A purse seiner based in the North Coast of Java, for example, is mostly permitted to have fishing

grounds in the adjacent IFMAs of the Java Sea (FMA 712) and the Natuna Sea or the Indonesia EEZ South China Sea (FMA 711), or the Java Sea (FMA 712) and the Makassar Straits (IFMA 713). This vessel may also be permitted to fish in further fishing grounds such as in the Arafura Sea (IFMA 718), or in the Indian Ocean (IFMA 572). However, the fishing gear must not be operated when traversing to the designated fishing grounds.

The Fishing License (FL/*Surat Izin Usaha Penangkapan* or SIUP) and the Fishing Permit (FP/*Surat Izin Penangkapan Ikan* or SIPI) for the industrial scale fishing vessels, larger than 30 Gross Tonnage (GT) and fishing beyond 12 nm, are issued by the MMAF (Satria and Matsuda 2004, GOI 2004; GOI 2014). In 2014, there were 3,483 nationally registered fishing vessels (table 7 and figure 7).

The Fishing License (FL) proclaims fishing allocation (number/type/size of vessels) of a fishing entity, either a firm or an individual, in designated IFMAs. The Fishing Permit (FP) conferred on a fishing vessel/boat describes the vessel's technical characteristics (vessel and fishing gear dimensions) and its designated fishing grounds. In summary, an individual or a fishing company can only have one Fishing License (FL), while the number of Fishing Permits (FP) granted to them depends on the number of fishing vessels that they are operating.

The compliance with technical requirements (fishing gear restriction, minimum mesh size of the operated net, and fishing gear dimension), the TAC's availability in the desired fishing ground (IFMA), and payment of the fishing fees are the primary considerations in granting the license and the permit. In addition, the industry is also obliged to submit quarterly production/fishing reports to MMAF. The TAC availability

and amount of fishing fee imposed on the industry are the limiting factors for accessing the resources.

Table 7. The Number of Nationally Registered Fishing Vessel (NRFV) in each IFMA

YEAR	WPP 571	WPP 572	WPP 573	WPP 711	WPP 712	WPP 713	WPP 714	WPP 715	WPP 716	WPP 717	WPP 718	Total
2003	83.00	461.00	495.00	510.00	372.00	395.00	328.00	43.00	123.00	219.00	504.00	3,533.00
2004	61.00	435.00	451.00	265.00	196.00	239.00	258.00	60.00	169.00	375.00	963.00	3,472.00
2005	103.00	461.00	470.00	306.00	133.00	184.00	242.00	82.00	152.00	294.00	994.00	3,421.00
2006	118.00	532.00	533.00	684.00	486.00	550.00	308.00	116.00	251.00	373.00	780.00	4,731.00
2007	86.00	744.00	573.00	441.00	232.00	338.00	272.00	144.00	330.00	332.00	659.00	4,151.00
2008	94.00	676.00	568.00	247.00	151.00	176.00	219.00	155.00	344.00	358.00	478.00	3,466.00
2009	133.00	610.00	596.00	559.00	298.00	335.00	255.00	162.00	314.00	301.00	571.00	4,134.00
2010	194.00	1,065.00	952.00	834.00	371.00	452.00	296.00	193.00	431.00	435.00	872.00	6,095.00
2011	209.00	1,332.00	1,239.00	1,205.00	477.00	621.00	427.00	308.00	386.00	391.00	1,086.00	7,681.00
2012	180.00	1,270.00	1,131.00	1,163.00	428.00	611.00	330.00	321.00	322.00	356.00	1,022.00	7,134.00
2013	152.00	1,077.00	1,030.00	1,180.00	366.00	575.00	179.00	356.00	227.00	261.00	1,056.00	6,459.00
2014	75.00	569.00	530.00	801.00	230.00	295.00	54.00	205.00	128.00	96.00	500.00	3,483.00
Average	124.00	769.33	714.00	682.92	311.67	397.58	264.00	178.75	264.75	315.92	790.42	4,813.33

Figure 7. Number of Nationally Registered Fishing Vessels (2011-2014)

IV.5. Indonesia's Fishing Fees

Indonesia's fishing fees are classified into two types: The Access Fee (AF/*Pungutan Pengusahaan Perikanan* or PP) and the Harvest/Fishing Fee (HF/*Pungutan Hasil Perikanan* or PHP). The Access Fee is charged to a fishing entity, either individuals or firms, and is one of the requirements for obtaining the Fishing License (FL). The Access Fee is calculated based on input factors used to participate in fisheries. These comprise the number and the size of the vessels (in Gross Tonnage), and the type of fishing gear. A mobile or active fishing gear such as a Trawler and a Purse Seiner pay a higher tariff than the passive and less destructive gears like tuna longline, bottom-longline, or squid jigging.

Unless there is a change or addition in the input factors, such as an addition of new fishing vessels or a fishing gear modification of the previously registered fishing vessels, the Access Fee is a one-time payment imposed on a commercial fishing entity that must be paid in advance. A fishing company adding a vessel to its fleet, for example, must pay an additional Access Fee. This obligation also occurs when the concerned fishing entity modifies, at least, one of its registered vessels.

The Harvest/Fishing Fee (HF/PHP) is charged annually before the Fishing Permit (FP) is conferred on a fishing vessel for a one-year period. Based on this mechanism, a fishing company or individual operating 10 purse seiners, for example, has to pay a one-time payment for the Access Fee (AF) to obtain the Fishing License (FL), and an annual payment of the Harvest/Fishing Fee (HF/PHP) for each operated purse seine to obtain the Fishing Permit (FP).

In summary, the Harvest/Fishing Fee (HF/PHP) represents a charge for the resource rent, a charge imposed on the industry in exchange for the privilege given to them to utilize or exploit a public natural resource. Meanwhile, the Access Fee (AF) works merely as an administrative or registration fee for entering or participating in a certain fishery. It is similar to the Entrance Fee applied by the US National Marine Fisheries Service (NMFS).

The fishing fee (HF/PHP) charged to the industry is determined by the combination of input and output factors. In Indonesia, these factors consist of 4 components; the Coefficient Factor (Y), the size of the vessel in Gross Tonnage (GT) unit, the Fishing Vessel's Productivity (FVP) or the Catchability based on fishing gear types, and the Basic Fish Price (ex-vessel price/dockside price/landing price). Only the last component, the Basic Fish Price (BFP) represents the output factor.

Both the Access Fee (AF) and the Harvest/Fishing Fee (HF/PHP) are charged to the industry as resource users prior to the Fishing License (FL) and the Fishing Permit (FL) being granted. It means that the privilege to fish is given after the industry fulfills its obligation to pay the resource rent to the State, through the MMAF-RI as the trustee of publicly-owned resources (GOI 2015).

The Harvest/Fishing Fee (HF/PHP) is calculated based on the following formula: *Fishing Fee (PHP) = Y (%) x GT x FVP x BFP* (GOI 2015). Essentially, the Coefficient Factor (Y) represents the percentage (the rate) of resource rent that must be paid by the industry. Table 8 illustrates a fishing fee calculation.

Basically, the Fishing Fee is the sum of the multiplication of the components mentioned above. The vessel's size in Gross Tonnage (GT) is multiplied by the Vessel's

Productivity (Ton/GT/year) and the Basic Fish Price (BFP). Vessel Productivity is stipulated by a ministerial decree estimating the annual catch of the concerned vessel. It comprises the amount and composition of targeted species. Each type of fishing gear has different productivity level. After the prohibition of trawlers starting from January 9, 2015, purse seines have the highest productivity with 1.5 ton/GT/year. This means that a 100 GT purse seine is predicted to catch 150 ton of fish annually.

Meanwhile, the Basic Fish Price (BFP) is the lowest average of the ex-vessel price or dockside price. BFP is stipulated annually by the Ministry of Commerce. Lastly, this multiplication (Vessel Productivity x BFP) is multiplied by the Coefficient Factor (CF) of the concerned vessel. The CF depends on the size of the vessel. CF for large-scale vessels (>200 GT) is 25% while for small-scale vessels (<60GT) it is 5%. Meantime, the CF for medium-scale vessels (60-200 GT), which dominate the Nationally Registered Fishing Vessels (NRFV), is 10%. Therefore, it can be assumed that the Coefficient Factor (CF), as the percentage of charged resource rent, is the pivotal component in calculating the Fishing Fee. Further explanation regarding this statement will be discussed in Chapter V.2.

Table 8. The simulation of Fishing Fee Calculation

GT	Tuna Longline		Species	%	Amount (Kg)	BFC	Total Harvesting Fee (2014) *1.5%	Total Harvesting Fee (2015) *5%	% of Increase
	Ton/GT/year								
35	0.6	21	Big Eye Tuna	25	5250	17,400.00	1,370,250.00	4,567,500.00	
35	0.6	21	Yellowfin Tuna	32.5	6825	18,400.00	1,883,700.00	6,279,000.00	
35	0.6	21	Albacore	15	3150	9,000.00	425,250.00	1,417,500.00	
35	0.6	21	Marlin, or Swordfish	12.5	2625	14,500.00	570,937.50	1,903,125.00	
35	0.6	21	Other Tuna	15	3150	15,000.00	708,750.00	2,362,500.00	
				100			4,958,887.50	16,529,625.00	
						US\$	413.24	1,377.47	233.3333

CHAPTER V

POLICY ANALYSIS ON THE INCREASED FISHING FEE

Hypothetically, increased fishing fees, or any other forms of taxes/levies imposed on the fishing industry, generate both direct and indirect impacts on commercial fishing activities. Gylfasson (1992) argued that the fishing fee has a similar role as a pollution tax in discouraging commercial fishing efforts. Therefore, it is aimed at promoting conservation of fish stocks. On the other hand, as the amount charged by a tax/fee/levy correlates positively with the input factors used in resource extraction (such as vessel size and gear dimension), the fishing fee tends to increase the efficiency of a fishing operation. The additional burden caused by the fishing fee promotes the use of smaller vessels using more sophisticated yet compact technology.

In addition, Chakravorty and Nemoto (2000) demonstrated that doubling the rate of auction fees (another form of fishing fee) in the Industrial Longline fishery of Hawaii reduced commercial fishing profitability. They argued that this kind of policy affected boat owner's incomes the most. As profitability declines, so does fishing effort. Therefore, similar to Gylfasson's argument (1992), the fishing fee can potentially preserve fish stocks while contributing to additional revenues for the State. Essentially, these two studies support the classic fishery bioeconomic model theory (Gordon 1954, Schaefer 1957)

Drawing from those previous studies, this paper divides the analysis of policy impacts generated by increasing fishing fee rates into three sections. First, it analyzes policy impacts on the national revenues collected from the fishery sector. Second, it evaluates policy impacts on the number and composition of the Nationally Registered

Fishing Vessels (NRFV). Lastly, it estimates the impacts of increasing fishing fees on the fishing operational costs.

Subsequently, the analysis is followed by an investigation of stakeholders' attitudes towards increasing fishing fee tariffs. The investigation focuses on the level of agreement (agreeability), the level of acceptability, and the level of support or resistance.

V.1. Impact on the National Revenues from the Fishery Sector

The fishing fee is classified as a natural resource fee, as are the leasing and royalty fees collected from the Mining and the Forestry sector. In Indonesia's tax system, natural resource fees are categorized as Non-Tax State Income (NTSI) from natural resource (*Penerimaan Negara Bukan Pajak (PNBP) dari Sumberdaya Alam*). The classification is based on the characteristics of the natural resource fee itself. These types of levies are imposed on the industry, both corporate and individual entities, as a compensation for the privilege given to them to extract or utilize public natural resources controlled by the state.

According to Article 33 (3) of the Constitution Law 1945 (UUD 1945), the highest administrative law in Indonesia, all the natural resources located within the national jurisdiction of the Republic of Indonesia are owned and controlled by the State and shall be utilized for the greatest prosperity of the people. Therefore, any entity aiming to utilize the resources shall need to obtain approval from the State (the central government) and must pay a resource fee as a compensation fee for the privilege given to them. This is the primary reason for categorizing the resource fee as a Non-Tax State

Income, and to differentiate it from common taxes such as the annual income tax imposed on each citizen.

Since 2002, the national revenue collected from the fishing fees has fluctuated (table 9 and figure 8). The gradual increase was caused by two factors: the addition of the Nationally Registered Fishing Vessels (NRFV) to the registration of newly built fishing vessels; and the adjustment of components used to calculate the fishing fee amount.

Table 9. National Revenues from the Fisheries Sector (2002-2018)

Year	National Fleet (IDR)	Foreign Fleet (IDR)	Total Revenues (IDR)
2002	150,021,491,558.51	44,163,372,355.36	194,184,863,913.87
2003	60,766,040,148.37	153,371,860,433.63	214,137,900,582.00
2004	58,573,212,101.70	223,794,750,329.93	282,367,962,431.63
2005	74,365,362,857.55	197,037,546,170.93	271,402,909,028.48
2006	81,787,280,296.00	116,361,267,799.79	198,148,548,095.79
2007	102,698,968,325.00	12,384,976,879.60	115,083,945,204.60
2008	77,404,162,800.00	-	77,404,162,800.00
2009	91,743,434,620.00	-	91,743,434,620.00
2010	91,816,661,810.00	-	91,816,661,810.00
2011	183,423,043,800.00	-	183,423,043,800.00
2012	215,489,127,500.00	-	215,489,127,500.00
2013	227,561,090,600.00	-	227,561,090,600.00
2014	214,445,203,505.00	-	214,445,203,505.00
2015	77,476,601,001.00	-	77,476,601,001.00
2016	357,880,000,000.00	-	357,880,000,000.00
2017	491,080,000,000.00	-	491,080,000,000.00
2018*	281,240,000,000.00	-	281,240,000,000.00

**until August 31, 2018*

As briefly explained in Chapter IV.5, the amount of the fishing fee charged to a vessel is the result of a multiplication of four components: the vessel size in Gross Tonnage (GT), the Vessel Productivity (Ton/GT/year), the Basic Fish Price (in IDR)

and the Coefficient Factor (in percentage). Prior to 2015, these factors, except for the Coefficient Factor, were reviewed and adjusted periodically, particularly the Basic Fish Price (BFP) which was always renewed annually by the Ministry of Trade. This annually revised BFP contributes to the slight increase of fishing fee rates. Consequently, this adjustment also slightly raises the national revenues from the fishery sector.

**the 2018 data per August 31,*

Figure 8. The Dynamic of the National Revenues from the Fisheries Sector (2002-2018)

The national revenues plunged in 2007, 2008, and 2015 (figure 8). These significant declines were caused by policies authorized in the concerned years. Between 2007 and 2008, Indonesia ended the Bilateral Arrangement with three distant-water fishing nations; the Peoples Republic of China (PRC), the Kingdom of Thailand, and the Republic of the Philippines. Previously (2002-2007), Indonesia permitted fishing vessels from those countries to fish in Indonesia's Economic Exclusive Zone (EEZ), mostly in the eastern part of the country: the FMA 718 (the Arafura Sea). These

arrangements were made under the implementation of Article 56 of the United Nations Convention on the Law of the Sea (UNCLOS) promoting the accessibility to the untapped resources of coastal States, by allowing other States to utilize it under foreign fishing licensing policies.

During that period, approximately 700 licensed foreign fishing vessels operated in the IEEZ and contributed significantly to the national revenues from the fisheries sector. In the 2002-2006 period, the percentage of the foreign fishing vessel revenue over the total fisheries revenues varied between 23% and 79% (figure 9). Not surprisingly, the revocation of foreign fishing licenses affected the national revenues from the fisheries sector significantly, with a 42% decline in 2007 and a 33% decline in 2008.

Figure 9. The Composition of the National Revenues from the Fisheries Sector (2002-2018)

The 2007 and 2008 drops were relatively smaller than the one that occurred in 2015. By the end of 2015, the national revenues had declined by 64%, from IDR 214.44 billion (December 31, 2014) to IDR 77.47 billion (December 31, 2015). However, it is important to underline that the decline was not caused by the increased fishing fee

authorized by the 2015 Government Regulation No.75. Although the regulation was signed on October 7, 2015, it was only effectively enforced 60 days later, in 2016. Therefore, any vessels extending their permit at the end of 2015 were still charged using the old tariff.

The 2015 drop was primarily caused by other policies regulating commercial marine fisheries licensing in Indonesia: the expulsion of (ex) foreign fishing vessels, and the trawler prohibition in all waters of Indonesia Fisheries Management Areas (IFMA). On November 3, 2014, a Ministerial Decree No.56/Permen-KP/2014 temporarily halted the fishing licensing process for any vessels built overseas. These kinds of vessels are categorized as ex-foreign vessels, including domestic vessels previously re-flagged from other nationalities. This policy was followed by Ministerial Decree No.2/Permen-KP/2015 prohibiting the operation of any type of trawler in all Indonesian waters, including the IEEZ, starting from January 9, 2015. To this date, these two crucial regulations have not been repealed.

The enforcement of these regulations denied all ex-foreign vessels and trawlers extensions of their Fishing Permits (FP). Consequently, these policies greatly reduced national revenues. Prior to 2015, ex-foreign vessels and trawlers were the primary contributors to national revenues due to the high fishing fees imposed on them. Trawlers operating in the IEEZ of the Arafura Sea were charged with the highest fishing fees.

On the contrary, as predicted, implementation of the new fishing fee tariffs as authorized by Government Regulation No.75 of 2015 led to a sharp increase in national revenues the following year. By the end of 2016, national revenues collected from the fisheries sector had increased by 362%, to IDR 357.88 billion.

This positive trend continued the following year. By the end of 2017, revenues reached IDR 491 billion or US\$ 3.4 million, the highest record so far. It can be concluded, not surprisingly, that increasing the fishing fees had a positive impact on national revenues. Furthermore, this policy successfully liberated Indonesia from its dependency on foreign fishing vessels and destructive fishing gears as the main source of national revenues from the fishery sector.

V.2. Impact on Nationally Registered Fishing Vessels (NRFV)

National revenues from the fisheries sector stem from fishing fees paid by Nationally Registered Fishing Vessels (NRFV). These vessels are conferred Fishing Permits (FP) by the central government, the Directorate General of Capture Fisheries-Ministry of Marine Affairs and Fisheries (DGCF-MMAF). Referring to the fishery bioeconomic model (Gordon 1954, Schaefer 1957), it is hypothesized that the number of NRFV will decrease as the fishing fee tariff escalates.

Chapter IV.5 briefly describes the four factors determining the amount of the fishing fee charged on a vessel. Out of these four factors, the vessel size and the type of fishing gear represent the input factors in a fishing operation, while the Basic Fish Price (BFP), which sets the average floor price of the landed catch, represents the output factor. The Coefficient Factor determines the percentage of the estimated annual catch that must be paid to the government in the form of the fishing fee.

Essentially, the 2015 Government Regulation No.75 only altered the Coefficient Factor's values, from 1.5% to 5% for small-scale vessels (<60GT), and from 2.5% to 10% for middle-scale vessels (60-200 GT). Meanwhile, for large-scale vessels (>200 GT), the coefficient factor was steeply increased from 2.5% to 25%. Not surprisingly,

these alterations significantly affected the annual fishing fee tariff per gross tonnage of the NRFV, with an increase ranging from 233% to 2,785 % and averaging 613% (Appendix 5).

Given the new Coefficient Factor's structure, it was easy to predict that small-scale vessels would be less impacted by the fishing fee increase than large-scale ones. For middle-scale vessels, which dominated the NRFV, the fishing fee increase ranged from 300% to 1,054%.

Among the six types of dominant fishing gears, the small-scale (<60 GT) oceanic drift gillnet vessels experienced the lowest increase (233%), while the largest increases impacted squid jigging vessels, with a 2,785% increase for the large-scale vessels (>200 GT) and a 1,054% increase for the middle-scale vessels, followed by Tuna Longline and Stick Held Dip Net with respective increases by 488.03% and 370.51% (Table 10).

Table 10. Fishing Fee Tariff Escalation (%)

No.	Fishing Gear	Small Scale (<60 GT) (%)	Medium Scale (60-200 GT) (%)	Large Scale (>200 GT) (%)
1	Stick Held Dip Net (<i>Bouke Ami</i>)	292.09	370.51	1,076.27
2	Oceanic Drift Gillnet	233.32	299.99	899.97
3	Squid Jigging	861.54	1,053.85	2,784.62
4	Small Pelagic Purse Seiner	238.45	306.14	915.34
5	Big Pelagic Purse Seine - IEEZ (Single Vessel)	258.56	299.92	899.80
6	Tuna Longline	390.03	488.03	1,370.08

Figure 10. Fishing Fee Tariff Escalation (%)

It was hypothesized that, by generating additional costs for fishing operations, skyrocketing fishing fees would have diminished the demand for Fishing Permit (FP) extensions and decreased the number of NRFV (Gylfasson, 1992). Once again, this hypothesis was also based on the classical fishery bioeconomic model (Gordon 1954, Schaefer 1957).

The number of NRFV did plunge in 2015, by 26.97%, from 4,490 units to 3,279 units, but for the same reasons national revenues did (the expulsion of (ex) foreign fishing vessels, and the trawler prohibition in IFMA,) not because of the fishing fee increase authorized by Government Regulation No.75 of 2015, which was only enforced in 2016.

Interestingly, the number of NRFV bounced back slightly during 2016, returning to 3,980 units (+21%). Similar to the changes in national revenues, the positive trend persisted the following year: by the end of 2017, NRFV counted 4,913 units (+23.44%).

Interestingly, this number is also higher by 9.42% than the number of NRFV at the end of 2014. This means that despite skyrocketing tariffs, 423 vessels were added to the fleet (figure 11). Reasons contributing to this ‘anti-theory’ phenomenon will be discussed in the next section.

Figure 11. The Dynamic of Nationally Registered Fishing Vessels (NRFV)

The composition of the NRFV is also interesting. Notwithstanding being submitted to the highest fishing fee raise, squid jigging vessel numbers in the NRFV segment kept rising and almost doubled during 2016-2017. Other types of fishing gear also increased in numbers, except for the tuna longline, which has continuously declined since 2010 (figure 12).

Figure 12. The Dynamic of 6 dominant NRFV Composition

According to data gathered from the various stakeholders, this phenomenon was caused by several factors: the re-registration of previously downsized fishing vessels, the expulsion of (ex) foreign fishing vessels, and a higher selling price of the landed catch.

For years many of the boat owners took advantage of the shortcomings of the management division between the MMAF and the local governments. In order to avoid the MMAF licensing process, with higher fishing fees imposed on the NRFV, vessel owners downsized their boats, registering them as vessels smaller than 30 GT, which only needed to apply for a Fishing Permit (FP) from the provincial fisheries agency, with much lower fishing fees. At the beginning of 2016, DGCF-MMAF started enforcing the re-measurement of every industrial-scale vessel, particularly those

registered with the provincial fisheries agencies, forcing previously downsized vessels to re-register with the MMAF, turning them from “provincial’ vessels” into NRFV.

Adding to this, the expulsion of (ex) foreign fishing vessels opened ‘new fishing grounds’ to domestic vessels, particularly in the IEEZ Arafura Sea, the most productive fishing ground in IFMAs. This situation created an incentive for the industry to expand their armada. Hundreds of the NRFV, including newly built vessels and transformed fishing gears, were relocated to the IEEZ Arafura Sea.

Lastly, higher market prices for the landed catch also contributed to the NRFV increase. The selling price is much higher than the Basic Fish Price (BFP) enacted by the Ministry of Trade, particularly for exported fish. Squid (*Loligo sp*) BFP, for example, is set at IDR 16,000/kg while the market price can reach IDR 80,000/kg. The lowest average price for skipjack (*Katsuwonus sp*) in Nizam Zachman Oceanic Fishing Port (NZOFP) is IDR 18,000/kg, twice the BFP at IDR.8,800/kg. This situation is acknowledged by fishing vessel owners.

At that time, we were saved by two things; decreasing oil (fuel
*ed) price and increasing fish price.
(Anonymous, Director of a fishing company with 73 registered
fishing vessels)

Regarding the NRFV composition dynamics (figure 12), this paper argues that it was caused by two reasons: the declining catch of longline tuna, and the characteristics of the other fishing gears, particularly squid jigging.

Longline tuna catch worldwide had been declining since 2004 (Clarke *et al.* 2014). In Indonesia’s context, the situation was worsening because of fishing gear conflicts between tuna longlines and purse seiners. During interviews, neither representatives from the Indonesia Purse Seine Association (*Himpunan Nelayan Purse*

Seine Nusantara/HNPN) nor the Indonesia Tuna Longline Association (*Asosiasi Tuna Indonesia/ASTUIN*) denied this situation. However, both agreed that the conflict was not as bad it was believed to be. They claimed that frictions at sea could be minimized using ‘Indonesia’s way’, to put a compromise before a confrontation. Some owners from these two types of gear are relatives or have, to some degree, business agreements. Some even have both types of gears simultaneously.

There was a time when the conflict escalated, the longliners’ crews burnt the Fish Aggregating Device (FAD) set by the (Big Pelagic) Purse Seine. It costed the purse seine owner a lot. For your information, one FAD may cost at least IDR 80 million (± US 6,000).

(Anonymous, a fishing company owner operating Big Pelagic Purse Seine)

Despite claims from fishing association representatives, skippers and owners have different opinions. Some of them openly blamed their declining catch on the existence of Big Pelagic Purse Seine (BPPS) fishing on the same fishing ground in IFMA 572 (Western Indian Ocean of western Sumatra) and IFMA 573 (Part of Indian Ocean in Southern Java). Their disappointment can be perceived from the following excerpts gathered during the short interviews.

It is much more difficult to catch the fish (tuna) now, we (the long liners *ed) are outcompeted by the purse seiners.

(Anonymous, 36 years old, Javanese, Longline skipper)

Our business (Long Line’s tuna fishing *ed) is dying; harsh competition with the (big pelagic *ed) purse seiner, long and complicated bureaucracy for a very limited period of Fishing Permit (FP/SIPI), increased fishing fee rate, and not to mention, other expenses generated by the various ‘unofficial fees’ (bribe, graft *ed)

(Anonymous, 56 years old, Javanese, Longline skipper)

We can’t compete with the (Big Pelagic *ed) Purse Seine (operating *ed) in (FMA *ed) 572 and 573.

(Anonymous, 39 years old, Indonesian-Chinese, Tuna Longline owner)

Actually, the Indonesia Tuna Longliners have access to larger and wider fishing grounds as they are also permitted to fish in the High Seas (the International Waters). However, the potential catch is limited by the fishing quota allocation given by the Indian Ocean Tuna Commission (IOTC), a Regional Fisheries Management Organization (RFMO) in the Indian Ocean. So is the number of permitted tuna longline that was limited and was monitored both by DGCF-MMAF and the RFMO. In addition, distant fishing grounds require extra costs for additional fuel. Despite these factors, longline skippers are still convinced that the declining catch, both in quantity and size, is caused by the heavy exploitation of juvenile tuna by the Big Pelagic Purse Seine.

Theoretically, the targeted species for the Big Pelagic Purse Seine (BPPS) is skipjack (*Katsuwonus pelamis*). However, during the fishing season, juvenile tunas swimming along with skipjack schools are also caught. In fact, this situation has motivated the increase in BPPS number, as the landing price of juvenile tuna contributes considerably to its profitability, making it more a lucrative business than the tuna longline.

The steady decline of longline tuna, as well as structural boat similarities, lower investment barriers and high exporting squid prices, prompted many of the NRFV longline vessels to transform into squid jigging vessels and move their fishing grounds to the IEEZ Arafura Sea. Being a less active fishing gear, squid jigging consumes less fuel than tuna longline (Sainsbury 1986). Also, the simpler technique involved in squid fishing requires less skilled labor and lower wages than tuna crews (Ben-Yami 1976). Furthermore, as previously mentioned, the disappearance of the (ex) foreign fishing vessels, mostly mid-water trawlers, left an abundant stock of squid and small pelagic

species in the Arafura IEEZ. Nowadays this fishing ground is occupied by small pelagic purse seiners relocated from the fully exploited IFMA 712 (the Java Sea), and the – previously tuna longline – squid jigging vessels. Another excerpt from the short interviews portrays this situation.

The increased fishing fee may be suitable for the purse seine fishery as they catch much more than us, but it is very hard for us (the tuna longline fishery *ed). Perhaps, my boss is the only remaining owner who still running the fresh tuna business, the others have transformed their vessels into squid vessels (Squid Jigging and Cast Net *ed). I'm afraid that soon we will have to do the same thing.

(Anonymous, 56, Javanese, Elementary School, Longline skipper)

The analysis above shows that increasing fishing fees does not instantly reduce the number of operating fishing vessels, especially when the profit gained from a fishing operation outweighs the additional costs generated by a higher fishing fee. In this case, the findings support Matthiasson's (2001) argument that the vessel owner will continue his fishing business as long as the variable costs and the interests of the invested capital can be covered by the yielded profit. In addition, it can be concluded that several internal and external factors generated by other related policies also affect both the total number and the composition of the registered fishing vessels.

V.3. Impact on Fishing Operation Costs

To estimate the impact of the increased fishing fee tariff on the fishing operational costs, this paper reconstructs the variable costs of a fishing operation for six dominant fishing gears. Following the operating cost categories (Fyson 1985) and due to the limitations of the available data, this paper only incorporates six components into

the analysis. Those encompass *the fuel consumption, provision, crew basic wage, crew incentives, charged fishing fee, and miscellaneous costs*. Subsequently each component is calculated using the formulas described in Section III.6.1.3.

Not all data related to fishing operation expenditures are available to be calculated. For instance, this analysis excludes the cost for bait in tuna longline. In addition, the analysis exclusively focused on the middle-scale fishing vessels (60-200 GT) dominating the Nationally Registered Fishing Vessels (NRFV).

The number of samples from each type of fishing gear varies greatly. Big Pelagic Purse Seine (BPPS) has the highest number with 394 (in 2014), 82 (in 2017), and 72 (in 2018) vessels. This was caused primarily by two factors; the average length of fishing trips, and the requirement from the Regional Fisheries Management Organization (RFMO). These two factors are the underlying reason for the incompleteness of the available data, data accuracy, and data reliability.

On average, a BPPS spends 3-4 months per fishing trip, a similar period with *Bouke Ami*. This fishing trip period is relatively shorter than the other types of fishing gear based in Nizam Zachman Oceanic Fishing Port (NZOFP) - Jakarta.

Basically, the Oceanic Gillnet (OGN) and the Squid Jigging (SJ) operating in the FMA 718 (IEEZ Arafura Sea) also spend a similar amount of time per fishing operation, or even less with 2-3 months per trip. However, those vessels will only return to their fishing base in NZOFP Jakarta after spending 8-9 months on the fishing grounds.

During their fishing operations in the Arafura Sea, these vessels are back and forth to the nearest fishing ports either in *Dobo* or in *Tual* (Maluku province), or even in *Merauke* (Papua province). There the vessels unload their catch and refill with fuel

and provisions before returning to the fishing grounds. Later, the landed catch is transported using a fish carrier vessel operated by the same fishing company or by the same owner. Consequently, the OGN and SJ only carry home the catch from their last fishing operation, the last 2-3 months, before returning to NZOFP-Jakarta and ending their fishing trip. Unfortunately, most of the landed catch records including the fishing logbook reported in their previous fishing ports are incomplete and unreliable.

Meanwhile, the tuna longliners operating in the FMA 572 and 573 (the IEEZ of the Indian Ocean) have the longest fishing trips, particularly those permitted to fish on the high seas (international waters). On average, the longliners spend 5-9 months per trip before returning to the fishing base. During that period, those vessels may have anchored in the other ports outside Indonesia for refueling and refilling their provisions, or even for landing their catch. In addition, the tuna longliners also carry home the catch from other vessels owned by the same fishing company or owner. Similar to the OGN and SJ, this situation not only affects the number of available vessels to be sampled but also the data accuracy and data reliability.

There is yet another reason attributed to the requirement from the RFMO. As the participating member of the Indian Ocean Tuna Commission (IOTC), Indonesia is obliged to submit an annual report of tuna and tuna-like species caught in the IOTC convention area. The data is required to determine the amount of catch quota for each participating member. Accordingly, some enumerators in NZOFP are deployed to specifically record the landed catch from tuna longline and BPPS operating in FMA 572 and 573. This situation contributes to the number of qualified samples from BPPS; much higher than the other types of fishing gears based in NZOFP.

Using the verified data and the formulas described in Chapter III.6.1.3., the operating costs of six types of fishing gears in three different years (2014, 2017, and 2018) were calculated. The 2014 data is used to estimate the percentage of the charged fishing fee in a fishing operational cost (FOC) before the authorization of the new fishing fee tariff. Later the results are compared with the 2017 and the 2018 data representing the period after the enforcement of the new tariff.

Basically, the portion of the fishing fee component in the fishing operational costs (FOC) is relatively small (Table 11). The value (in percentages) is insignificant compared to the largest component; the expenditures for fuel (including the lubricant) consumption. In 2014, the highest fishing fee contribution in the FOC occurred in BPPS. Nevertheless, the value ranged only between 1.6% and 4.7%. On average, the charged fishing fee was only 2.7% of BPPS total variable costs. For comparison, the fuel consumption expenditure for BPPS at the same year ranged from 46.1% to 66%. On average, the fuel expenditure contributed 54.9% to the total FOC of BPPS in 2014.

Squid jigging, as the least active fishing gear, had the smallest percentage of fishing fee component in their FOC in 2014. The value ranged between 0.4% and 0.85%. On average, the variable cost for the fishing fee was only 0.7% of the total FOC of squid jigging.

After the authorization of Government Regulation No.75 of 2015 in 2016 dramatically increased the annual fishing fee tariff, the magnitude of the fishing fee component in the FOC escalated. Similar to the situation in 2014, the highest fishing fee contribution (in percentage) in the FOC also occurred in BPPS. This time the value escalated and ranged between 4.7% and 11.4%. On average in 2017, the fishing fee

component was 8.1% of the FOC of BPPS; escalating 199.1% from the value in 2014 (Table 11).

Squid jigging had the smallest percentage of the fishing fee component in the FOC of 2014 but underwent the most significant escalation in 2017. It ranked as the fishing gear with the second highest percentage of fishing fee contribution in the FOC. The value ranged between 4.15% and 9.15% (Table 11 and Figure 13). On average, the fishing fee component in the FOC for Squid Jigging was 5.9%; skyrocketing 767.5 % from the value in 2014 (Table 11 and Figure 14). Meanwhile, the smallest contribution of the fishing fee expenditure in the FOC of 2017 was experienced by *Bouke Ami* (Stick-Held Dip Net), a fishing gear targeting smaller squid operating mostly in FMA 711 (Natuna Sea) and 712 (Java Sea).

Table 11. Fishing Fee Contribution in Fishing Operational Cost (%)

Fishing Gear	Year			Year to Year Comparison	
	2014	2017'	2018	Δ (%) 2017 to 2014	Δ (%) 2018 to 2014
Bouke Ami	2.18	3.05	7.20	40.09	231.22
Oceanic Gillnet	1.51	3.81	4.19	151.92	176.99
Squid Jigging	0.68	5.91	5.73	767.49	741.33
Big Pelagic Purse Seine	2.72	8.13	9.16	199.08	237.14
Small Pelagic Purse Seine	1.00	3.53	3.58	252.97	258.23
Tuna Longline	0.92	4.93	3.85	437.37	320.18

The increased fishing fee contribution to the FOC for squid jigging was mainly caused by the significant increase of the annual fishing fee tariff for this gear. As discussed in Section V.2., squid jigging experienced the largest tariff escalation for the middle-scale and the large-scale of NRFV with 1,053.85% and 2,784.6% respectively (Table 10).

Figure 13. Fishing Fee Contribution in Fishing Operational Cost

While Table 11 summarizes the percentage of the fishing fee component in the FOC of six primary fishing gears, it also demonstrates the magnitude of their escalation (in percentage terms). As already mentioned, Squid Jigging experienced the largest increase in comparison with the value in 2014. It was followed by the tuna longline with 437.3% and 320.2% for 2017 and 2018 respectively (Figure 14).

Figure 14. The Escalation of Fishing Fee Contribution in Fishing Operational Cost

Based on the magnitude of the observed increase, one can conclude that squid jigging is the fishing gear that was most affected as a result of the authorization of the new annual fishing fee tariff. However, it is crucial to consider the size of FOC spent by each type of fishing gear.

Using the same analyzed data, Table 12 summarizes the descriptive statistics of the FOC from three fishing gears; Big Pelagic Purse Seine, Tuna Longline, and Squid Jigging. Generally, the total variable costs of a fishing operation (FOC) in 2018 escalates nearly 1.5 – 2 times from the values in 2014. Mostly this was caused by fuel prices that increased by 16.7%. Both in 2014 and in 2018, tuna longliners had the largest FOC among the NRFV based in the NZOFP, two times greater than Squid Jigging's FOC. Therefore, 3.85% of increase in Tuna Longline FOC has a larger impact than 5.73% of increase in Squid Jigging FOC. A similar situation occurs when comparing the impact based on the magnitude of the percentage escalation. In addition, as previously mentioned, the analysis, due to the data unavailability, has already excluded the expenditure for the bait in the tuna longline FOC. Inclusion of bait expenditure will increase the tuna longline FOC

Summarizing from the analysis above, it can be concluded that the increased annual fishing fee tariff affects the variable cost of fishing operation (FOC). The relative increase of the fishing fee in the FOC escalates as high as 767.5% which is experienced by squid jigging. However, this paper argues that tuna longline becomes the most affected fishing gear. In the long run, it may also affect the number of tuna long line vessels in NRFV. In addition, regardless of the significant escalation, the fishing fee contribution in the FOC is still smaller than the fuel consumption expenditure.

Therefore, it has much less impact on the fishing operational costs than the increasing fuel price.

Table 12. Descriptive Statistics of the Fishing Operational Costs (FOC)

2018	BPS	LL	SJ
Mean	936,186,268.96	2,148,150,865.88	946,741,247.28
Standard Error	31,609,317.85	245,086,995.55	45,353,201.41
Standard Deviation	279,165,936.37	1,319,833,863.11	348,364,550.16
Minimum	549,784,340.96	645,957,424.06	376,531,610.96
Maximum	1,633,393,455.82	5,383,783,210.27	2,907,248,479.11
Count	78.00	29.00	59.00
Confidence Level(95.0%)	62,942,193.10	502,037,952.04	90,784,296.22
2014	BPS	LL	SJ
Mean	707,768,226.60	1,041,720,003.90	558,436,607.68
Standard Error	7,607,473.56	47,439,906.07	28,046,925.07
Standard Deviation	151,004,038.60	217,396,960.54	79,328,683.65
Minimum	519,556,083.52	612,565,159.93	419,204,437.65
Maximum	1,724,228,418.38	1,419,069,269.20	657,068,741.82
Sum	278,860,681,279.58	21,876,120,081.86	4,467,492,861.47
Count	394.00	21.00	8.00
Confidence Level(95.0%)	14,956,434.63	98,957,910.01	66,320,439.21

***Note:**

BPS = Big Pelagic Purse Seine
 LL = Tuna Longline
 SJ = Squid Jigging
 Mean = Average Fishing Operational Cost (FOC)
 Minimum = the smallest amount of FOC
 Maximum = the largest amount of FOC
 Count = number of samples

V.4. The Stakeholders Attitudes on the Increased Fishing Fee Tariff

The investigation of the stakeholders' attitudes toward the increased fishing fee tariff focuses on three aspects; the agreement level, the acceptability level, and the support or the resistance level. The first question measures to what extent that the stakeholders can agree with the tariff escalation. Meanwhile, the second question measures to what extent that the stakeholders can accept the tariff escalation. The last

one investigates the level of support, or resistance toward the new tariff. The stakeholders are categorized into nine groups as described in Chapter III.5.

The results of the Kruskal-Wallis test for three questions related to the increased fishing fee tariff reject the Null Hypothesis (Table 13 and Appendix 7). This means that all the samples are not from an identical population. The test also demonstrates that at least one group of stakeholders has a different median score for their answers. The results of the median also indicate the dynamic of the central tendency of the collected answers (Table 14).

Table 13. The Kruskal-Wallis test for the collected samples related to the increased fishing fee tariff

	Q1 Agreement Level	Q2 Acceptability Level	Q3 Support Level
Chi-Square	177.714	161.069	183.090
Df	8	8	8
Asymp. Sig.	<i>0.000</i>	<i>0.000</i>	<i>0.000</i>

Table 14. The Median of the collected samples related to the increased fishing fee tariff

Stakeholders	Q1 Agreement Level		Q2 Acceptability Level		Q3 Support Level	
	Σ Resp.	Median	Σ Resp.	Median	Σ Resp.	Median
Central Govt.	85	5.0	85	5.0	85	5.0
Fishing Port	87	5.0	86	5.0	87	5.0
Provincial Govt.	42	4.0	42	4.0	42	4.0
Regency Govt.	17	4.0	17	4.0	17	4.0
Crews/Skipppers	76	1.0	76	2.0	76	2.0
Industry (Owners)	74	2.0	74	2.0	74	2.0
Commercial Fishing Association	12	3.0	12	4.0	12	2.5
NGO	20	4.0	20	3.0	20	3.0
Academia/Researchers	28	4.0	27	4.0	28	4.0
Total	441	4.0	439	4.0	441	4.0

Notes:

Likert Score	Q1 Agreement Level	Q2 Acceptability Level	Q3 Support Level
1	Disagree	Unacceptable	Strongly Oppose
2	Somewhat Disagree	Slightly Unacceptable	Somewhat Oppose
3	Neither Agree nor Disagree	Neutral	Neutral
4	Somewhat Agree	Slightly Acceptable	Somewhat Favor
5	Agree	Acceptable	Strongly Favor

V.4.1. Level of Agreement

The boxplot (Figure 15) portrays the distribution of answers from 9 groups of stakeholders for question number 1; the agreement level. Not surprisingly, the stakeholders representing the industry, the crews/skipper (Group 5) and the owners (Group 6) have a negative attitude toward the increased fishing fee tariff. Their collected answers range between 1 and 3 on the 5-point scale of the Likert test. The crews/skippers have a stronger negative attitude than the owners. The median (bold line in each bar) of their collected answer (1) is lower than the median from the owners' answers (2). In addition, small circles in this boxplot denote the outliers, while the numbers represent the respondents' numbers.

*Notes:

Y-axis = Likert Scale (1 to 5)

X-axis = Types of Respondents

Number = Outliers (marked by respondent number)

Bold line in bar = Median

Figure 15. Boxplot of the Agreement Level for the Increased Fishing Fee Tariff

The negative attitude is understandable as the increased fishing fee tariff, as discussed in Chapter V.3., escalates the fishing operational costs (FOC). Like the rest of the world, most of the Indonesian commercial fisheries also apply the profit-sharing system between the owner and the skipper. For the purse seine fishery, the profit-sharing system also includes the crews with various levels of sharing. The owners may have other income from the other vessels to compensate for their declining profit, but for the skipper (and the crews), the vessel is their only source of income. In addition, the samples from group 6 (the industry) also incorporate the responses collected from company representatives and the independent middle-men (Chapter III.5). Although they can be regarded as the owners' right-hand man, these professionals might have dissenting opinions as they receive less direct impact from the increased tariff. Therefore, it is unsurprising when the skippers have stronger negative attitude than the owners regarding the agreement level on the increased tariff.

I strongly disagree with the increased fishing fee; we go fishing further and longer but the catch is declining and smaller. Nowadays everything is expensive that raise the operational costs, it takes ages to get the Fishing Permit (FP/SIPI) but the landing price (the dock price *ed) remains the same. Since the fishing fee is incorporated into the operational costs, it is diminishing our income.
(Anonymous, 50 years old, Javanese, Elementary School, Purse Seine)

In contrast, the stakeholders from the government representatives (MMAF, Fishing Port, Provincial, and Regency/Municipality) have a positive attitude. The median values range between 4 and 5 in the 5-point scale of the Likert test (Table 14). The reasons supporting their answer are attributed to the national revenues from the fisheries sector and an awareness of guarding the publicly-owned property.

One of the prominent arguments for strongly agreeing with the increased tariff is the time period for the tariff stagnancy. Although the tariff has been increased gradually to a slight extent, it has small impact on national revenues. Furthermore, the previous government regulation concerning the fishing fee tariff was enacted 12 years ago in 2006. It is also argued that it is necessary to consider the national annual inflation rate for adjusting the fishing fee tariff as the compensation for the privilege conferred on the industry. In addition, the government representatives, particularly from the central government (MMAF and the Fishing Port), believe that the industry is still able to pay the escalated fishing fee tariff.

The median of the samples from the fishing association (Group 7) shows a neutral attitude. Their collected answers range from 1 to 5. This paper argues that there are two reasons underlying this result. First, some of the respondents from this group are professionals, not the vessel owner, hired to run the association. Therefore, they experience less direct impact from the increased fishing fee tariff. Second, the association representatives have a better understanding regarding the need for preserving the resources through the entrance fee escalation. The combination of these reasons with the negative attitude expressed by representatives of other types of associations results in varied answers covering the whole length of the Likert-scale.

Group	Stakeholders	Group	Stakeholders	Group	Stakeholders
1.	Central Govt	4.	Regency Govt	7.	Association
2.	Fishing Port	5.	Crews/Skipppers	8.	NGO
3.	Provincial Govt	6.	Industry (Owners)	9.	Academia Research

Notes

Scale	Color	Color	Interpretation
1	Blue	Blue	Disagree
2	Green	Green	Somewhat Disagree
3	Grey	Grey	Neither Agree nor Disagree
4	Purple	Purple	Somewhat Agree
5	Yellow	Yellow	Agree

Figure 16. Sample Distribution of Agreement Level on the Increased Fishing Fee Tariff

The other types of stakeholders, the NGOs and Academia also demonstrate a positive attitude regarding agreement with the increased tariff. The median of the collected answers both from NGOs and academia range between 3 and 4 (Table 14). This means that both of them are divided between the neutral and the slightly positive attitude on their level of agreement regarding the increased tariff. Mostly they believe that the escalated tariff has a positive impact in preserving the resource, however they also comprehend the difficulties that may be faced by the industry due to the increasing

fishing operational costs. This can be seen from the distribution of their answers (Figure 16).

Figure 16 also demonstrates that the number of strong positive attitudes (score 5) collected from the government representatives decline as they are located further from the central government. For instance, the percentage of score 5 collected from the fishing port officials (63.22%) is slightly lower than the samples collected from their counterparts working in headquarters of the MMAF (69.41%). Subsequently, the collected answers having score 5 from the regency/municipality's officials are slightly lower than their counterparts working for the provincial fisheries agencies. This paper argues that this result is caused by their familiarity with the national fisheries revenues. Furthermore, these revenues are collected from the fishing fees payment of the NRFV that were exclusively managed by the MMAF. As predicted, the strongest disagreement comes from the skippers.

Essentially the national revenues from the fisheries sector have no direct impact on the income of the officials working in MMAF's headquarter. As Non-Tax State Income from the natural resources' utilization, the national fisheries revenues will be distributed in form of the Inter-Governmental Transfer Fund. According to Law number 33 of 2004 concerning Fiscal Balance, the distribution composition is **20%** for the central government (MMAF) and **80%** for the local governments (the regency and the municipality, excluding the provincial government). Subsequently, all the funds received by the MMAF must be allocated for fisheries resource conservation and development. However, national fisheries revenue has always been used as one of the indicators for assessing the MMAF annual performance. *Dewan Perwakilan Rakyat* (DPR) as

Indonesia's legislative branch has always raised this issue during the annual budgeting meeting with the Minister. Therefore, the MMAF officials have more concern than other governmental representatives regarding the increased fishing fee tariff.

V.4.2. Level of Acceptability

Hypothetically, the stakeholders' attitudes regarding their acceptance level of the increased fishing fee tariff correlates positively with their level of agreement and support. Those who strongly disagree with the new escalated tariff, hypothetically will very reluctant to accept and support it. The results from the collected samples support this hypothesis.

The median of the collected answers for the agreement level and the acceptability level are almost identical. The only differences occur in 3 groups of stakeholders; the crews/skippers, the commercial fishing associations, and the NGOs (Table 14). Skippers' strong negative attitude (score 1) in the agreement level is softening in their level of acceptability (score 2). This means that regardless of their strong disagreement with the escalated tariff, eventually they can accept it somewhat. Most likely this result is caused by very limited availability of options for them. The following excerpt from one of the short interviews portrays their opinion.

Honestly, I disagree with the increased fishing fee and cannot accept it, but we have no choice. We still have to pay it in order to get the Fishing Permit, right?

(Anonymous, 38 years old, Javanese, Elementary School, Longline skipper)

What can we do? What can we say? Do we have a choice?

(Anonymous, Javanese-Chinese, a fishing company owner operating Squid Jigging and Purse Seine)

A similar situation exists in the group of vessel owners. Their attitude on the acceptability level softens. In addition to the limited available options, the less significant impact generated by the new fishing fee tariff on the fishing operational costs (FOC) also affects their softened negative attitude. As discussed in Chapter V.3., despite its significant escalation, the contribution of the fishing fee expenditure to the FOC is much smaller than fuel expenditures.

Fishing fee is nothing compared to the total operational costs.
(Anonymous, a fishing company owner operating tuna longline).

We don't have problem with the increased tariff, our business is still profitable.
(Anonymous, a fishing company owner operating purse seine)

The group of stakeholders representing the commercial fishing associations also shifts their attitude towards a more positive score; from the neutral attitude (score 3) to the slightly positive attitude (score 4). On the contrary, the NGOs demonstrate the opposite direction; shifting to the neutral attitude (score 3) from a slightly positive one (score 4). Most likely it was caused by the minimum or no direct impact experienced by the NGOs regarding the escalated fishing fee tariff. In addition, some of the respondents from NGOs argued that the new tariff was too high and may negatively affect crews' livelihood.

**Notes:*

Y-axis = Likert Scale (1 to 5)

X-axis = Types of Respondents

Number = Outliers (marked by respondent number)

Bold line in bar = Median

Figure 17. Boxplot of the Acceptability Level for the Increased Fishing Fee Tariff

The range of the attitudes on the acceptability level from nine types of stakeholders (Figure 17) is almost identical to the previous boxplot illustrating their agreement level (Figure 15). However, the range of attitudes from the fishing ports officials is notable. The range of their acceptability level is slightly wider than their level of agreement, with a slight movement toward to the neutral attitude. This paper argues that it was caused by their workplace location. As the central government officials (DGCF-MMAF) working in the field and interacting intensively with the skippers and the owners of NRFV berthing in their ports, these officials have more concern for and empathy with the industry than their counterparts working in the

headquarters of MMAF. The distribution of the answers (Figure 18) reinforces this argument. On the other hand, similar to the agreement level, the skippers are the most reluctant stakeholders in accepting the new tariff authorization.

Figure 18. Sample Distribution of Acceptability Level on the Increased Fishing Fee Tariff

V.4.3. Level of Support

The third question investigates the stakeholders' level of support for or resistance to the new fishing fee tariff. As predicted, the results are identical with their level of acceptability. The median of the attitudes for the level of support from each stakeholder is exactly the same with their median of attitude for the acceptability level

except for the commercial fishing associations (Table 14). In this case, the associations have the neutral attitude (score 3), the same with the median for their agreement level.

These identical values indicate a very strong positive correlation between the acceptability level and the level of support. Those who can accept the new tariff authorization, ultimately will support it, and the other way around. For instance, the skippers and the owners who strongly disagree and having low acceptability on the new tariff will definitely resist it.

**Notes:*

Y-axis = Likert Scale (1 to 5)

X-axis = Types of Respondents

Number = Outliers (marked by respondent number)

Bold line in bar = Median

Figure 19. Boxplot of the Support Level for the Increased Fishing Fee Tariff

A similar situation also occurs in the range of the stakeholders' attitudes as portrayed by the boxplot in figure 19 with high support for increased fishing fee tariff

indicated by score 5. Here the range of the answers from the skippers and the owners becomes narrower than the range of their answers on the agreement level and the acceptability level. This indicates the accumulation of their opinion in a specific scale of the attitude measurement. Although the skippers and the owners have slightly dissenting attitudes on the agreement level and acceptability level (Figure 15 and 17), ultimately, they reach a consensus regarding their level of support, or resistance level, on the escalated fishing fee tariff.

This paper argues that the identical level of resistance measured by the median values was also caused by the profit-sharing system mostly applied in Indonesia's commercial fisheries. The system means they bear together the escalated fishing fee as one of the components in fishing operational costs.

Our catch is unpredictable, but the operational costs are already fixed (permanent). Since the fishing fee is part of the operational costs, automatically it will affect our income, and certainly it diminishes our income.

(Anonymous, 34 years old, Javanese, High School, Longline skipper)

The increased fishing fee hits us hard. The captain's income is the most affected one.

(Anonymous, a fishing company owner operating 10 Squid Jiggings)

In contrast, the governmental stakeholders have an exactly identical range of attitude for the agreement level and the support level. Only a slight difference occurs with the fishing ports officials and their acceptability level as previously discussed in Chapter V.4.2. For the level of support, both representatives from the central government, the MMAF and the fishing ports officials, have exactly the same range of answers for the highest positive score (Figure 20). However, most likely due to their workplace location (placing them closer to the industry), the fishing ports officials also

have slightly larger samples opposing the new tariff authorization. Meanwhile, both provincial and regency/municipality representatives have wider neutral attitudes for their collected answers than their counterparts working for the central government. Presumably this was caused by less impact on them due to the authorization of the new tariff, particularly for the provincial government receiving no funds from the distributed national revenues from the fisheries sector

Group	Stakeholders	Group	Stakeholders	Group	Stakeholders
1.	Central Govt	4.	Regency Govt	7.	Association
2.	Fishing Port	5.	Crews/Skippers	8.	NGO
3.	Provincial Govt	6.	Industry (Owners)	9.	Academia Research

Notes

Scale	Color	Color	Interpretation
1		Blue	Strongly Oppose
2		Green	Somewhat Oppose
3		Grey	Neutral
4		Purple	Somewhat Favor
5		Yellow	Strongly Favor

Figure 20. Sample Distribution of Support Level on the Increased Fishing Fee Tariff

The distribution of the answers collected from the industry representatives should also be noted. From the skippers to the commercial fishing associations, the frequency of the resistance attitudes (blue and green colors) is slightly declining (Figure 20). In addition to the label as the most affected stakeholders, they (the skippers, owners, and the commercial fishing associations) have different ways to convey their opinions. Consequently, this nature affects their level of support, or resistance.

Another factor contributing to this result is the data collection mechanism. Skippers interviewed in the field mostly by the field enumerators have more liberty in delivering their opinion than the owners and the association representatives interviewed during the submission of their quarterly fishing report. However, generally, these three representatives of the industry have resistance attitudes on the escalated fishing fee tariff. The composition of the negative attitudes (score 1 and 2) varies between 50% (the associations) and 62.16% (the skippers). Meanwhile, the NGOs slightly shift their attitude to the neutral position (score 3). Once again, this paper argues that it was caused by the minimum direct impact experienced by the NGOs.

The Pairwise test was conducted on two most affected stakeholders, the crews/skippers (Group 5) and the vessel owners (Group 6). The test aims to compare whether these two groups of stakeholders have a median that is significantly different (Chapter III.6.2.4). The result indicates that there is no significant difference in the median between the skippers and the owners for three investigated aspects of the increased fishing fee tariff (Appendix 9). Regardless of variance on their distribution range of answer (the boxplots) and composition of responses (histograms), eventually the skippers and the owners have the same attitude on the increased fishing fee tariff.

CHAPTER VI

POLICY ANALYSIS OF THE AUTHORITY REVOCATION

Except for the special affairs that are still exclusively governed by the central government, Law No.23 of 2014 concerning the Local Governments comprehensively re-organizes the authority and the jurisdiction of the three administration levels in Indonesia: the central, the provincial, and the municipality/regency governments. The law itself consists of 411 articles described in 212 pages, excluding the explanation section and the tables summarizing the distribution of authority and jurisdiction for each aspect discussed.

The special matters classified as being an absolute (central) government prerogative encompass foreign affairs, national defense, national security, the judicial system, the national monetary and fiscal affairs, and religious affairs. Meanwhile government affairs distributed between the central and the local governments (provincial and municipality/regency) are classified as concurrent government affairs. Furthermore, these affairs are categorized into three types: the basic service mandatory government affairs, the non-basic services mandatory government affairs, and the optional government affairs.

Education, Health, and Public Works are examples of the mandatory government affairs providing basic services. Meanwhile, marine affairs and the fisheries sector fall into the category of optional government affairs. Other sectors grouped into this category are tourism, agriculture, forestry, energy and mineral resource, trading, industry, and transmigration.

Article 27 of the law specifically designates the authority and the jurisdiction of the provincial governments pertinent to marine affairs. Hereby, the provinces are conferred the authority to manage natural resources located within their marine jurisdiction. The term ‘manage’ includes the authority to explore, exploit, conserve, and manage marine natural resources in their jurisdiction with the exception of exploration and exploitation of offshore oil and liquid gas, which are exclusively managed by the central government (Ministry of Energy and Mineral Resources). Other authorities conferred to the provincial governments include administrative arrangement and marine spatial planning. In addition, provinces are also obliged to participate in preserving the national maritime security and sovereignty.

Subsequently, article 27 (3) designates the maritime jurisdiction of provincial governments, measured from the baseline (0 nautical miles) to 12 nautical miles. Thus, their jurisdictions essentially cover the territorial waters of the Republic of Indonesia. For overlapping maritime jurisdictions, the law applies a method similar to the one described by article 15 of the United Nations Convention on the Law of the Sea (UNCLOS), according to which the maritime jurisdiction area is divided equidistantly between concerned provinces.

The law does not specifically revoke municipality/regency authority and maritime jurisdiction. However, the designation of the provincial maritime jurisdiction, as stated in article 27 (3), automatically annuls the jurisdiction stipulated by Law No.32 of 2004, except for what concerns small-scale coastal fisheries, which, as stated by Article 27 (5), are excluded from the provincial authority to manage marine natural resources. The small-scale sector is composed of boats under 5 Gross Tonnage (GT)

that are exempted from the obligation to hold the Fishing Permit (FP/SIPI) for their fishing operation.

The authority and jurisdiction of the marine affairs and fisheries sector, distributed over three levels of administrations, consists of 7 sub-sectors. These are the marine, coastal, and small islands affairs, marine fisheries management, aquaculture, marine and fisheries monitoring and surveillance, processing and marketing of the fish products, fish quarantine, seafood quality control and safety, and human resources development.

It is important to note that the term ‘fisheries’ in Bahasa Indonesia (Indonesia Language) literally covers both fisheries and aquaculture, while the terms ‘capture fisheries’ or marine fisheries would be used to refer to what ‘fisheries’ usually means in academic or international circles. For the purpose of this study, this paper limits the analysis of the policy impact generated by the revocation of the municipality/regency authority on the marine fisheries sub-sector, and more specifically on boats (5-30 GT) operating within the 12 nautical miles.

This chapter consists of three sections. First, it describes problems that emerged during the implementation of the previous regulation of decentralized management involving municipality/regency administrations. The second section focuses on the direct impacts generated by the authorization of Law No.23 of 2014 regarding fisheries management and fishing licensing procedures for fishing boats (5-30 GT) operating within 12 nautical miles. The last section analyzes the results of the investigation of the stakeholders’ attitudes toward the revocation of municipality/regency authority.

VI.1. Emerging Problems in Fisheries Decentralization

In addition to classical problems of Indonesia's marine fisheries management, poor quality of data collection (Yuniarta *et al.* 2017; Muawanah *et al.* 2018) and weak law enforcement (Heazle and Butcher 2007; Resosudarmo *et al.* 2009), which fostered Illegal, Unreported, and Undocumented (IUU) fishing activities, this paper argues that at least four other specific problems plagued the decentralized system: rent-seeking behavior, horizontal conflict, slow response due to long and complicated bureaucratic procedures, and economic inefficiency.

First, this paper supports the argument on local governments' rent-seeking behavior (Satria and Matsuda 2004). The 'freedom' conferred to them after decades of centralized administration (New Order Regime, 1966-1998 period), prompted the local governments (municipalities and regencies) to behave in a slightly 'uncontrolled' way. Most of them focused on achieving local economic growth.

One of the common practices was to freely give concessions for the exploitation of natural resources located within their jurisdiction, including fishing permits. In other words, the system endorsed the race to increase local income while, unfortunately, mostly ignoring the carrying capacity and the catch limitations set by the higher-level administration. At the beginning of local autonomy implementation, it was common to see regents or mayors disobeying the governors of their provinces. In other words, as stated by Muawanah *et al.* (2018), the national and provincial governments lacked control over the utilization of fisheries resources under municipality/regency jurisdictions.

Prior to Law No.23 of 2014, municipalities and regencies had the authority to confer the Fishing Permit (FP or SIPI) to boats sized between 5 and 10 GT (Table 15). While larger boats/vessels (10-30 GT and >30 GT) are forbidden to fish in coastal waters (0-4 nm), there is no fishing zone limitation for the smaller boats. For instance, a 9 GT purse seiner is allowed to fish beyond the municipality/regency jurisdiction (>4 nautical miles) where it obtained the Fishing Permit. Consequently, as discussed in the Chapter V.2., many of the boat owners took advantage of this situation by downsizing their vessels. With a 'smaller' boat size, they did not need to apply for their Fishing Permit (FP) to the higher administrations (the province or the central government) wielding the right authority for their boats, and which commonly charged higher tariffs for fishing permits. Yet, the concerned boat is still permitted to fish on wider fishing grounds, beyond the 4 nautical miles.

The inaccuracy of collected data regarding the size and the productivity (catchability) of registered fishing boats led to overfishing and to underestimating exploitation levels. The calculation of the Catch per Unit Effort (CPUE) required to estimate Maximum Sustainable Yield (MSY) is an example of how the practice of downsizing negatively affected data collection. In the last 3 years (2014-2017), the MMAF had to revise the national MSY.

In addition, many of these boats also held a Fishing Permit (FP) from neighboring municipalities/regencies as migrant fishers (*nelayan andon*). This double permit system ignited a horizontal conflict among fishermen. For instance, fishing boat 'A' originally from Regency 'R' also holds the Fishing Permit (FP) from the Municipality 'M' as a migrant fisher. This means that in addition to their local fishing

ground located in the Regency ‘*R*’ jurisdiction, the fishing boat ‘*A*’ also has the privilege to fish temporarily in the jurisdiction of the Municipality ‘*M*’. This temporary permit may last for months and may be conferred by other municipalities/regencies located in different provinces, far from the original residence of the migrant fishers. Not surprisingly, this ignited feelings of displeasure of local fishermen residing in the Municipality ‘*M*’. This situation frequently led to physically violent disputes among them, particularly at sea. The situation got even worse when fishing gear conflict was involved. The simple illustration above briefly describes the Muawanah *et al.* (2018) argument on horizontal conflict caused by migrant fishers.

Lack of control from the higher administration and the need to reduce horizontal conflicts were the underlying reasons to re-arrange the distribution of governmental authority in fisheries management, resulting in the revocation of municipality/regency authority and jurisdiction by Law No.23 of 2014.

This paper also argues that the previous system generated two additional problems: slow responses due to long and complicated bureaucratic procedures, and economic inefficiency.

Despite the decentralized system dividing the authority based on vessel size and maritime jurisdiction, this paper argues that Indonesia was conducting a top-down approach in managing marine fisheries. Through the MMAF-RI, the central government dominates regulation of management measures in each Fisheries Management Area (FMA). Those include the enactment of the Maximum Sustainable Yield (MSY) and the Total Allowable Catch (TAC), the prohibition of specific fishing gears (mid-water

trawler and Danish seine), the fishing zones designation, and the calculation of fishing fee tariffs for the Nationally Registered Fishing Vessels (NRFV).

The MMAF-RI determines the TAC allocation for groups of fish stocks that will be distributed to the provincial administrations in an intergovernmental annual forum (*Forum Komunikasi Pengelolaan dan Pemanfaatan Sumberdaya Ikan/FKPPS*, or the Communication Forum for Fisheries Resources Management and Utilization). Subsequently, the provincial governments use the given TAC to set the number of allocated fishing vessels/boats in their jurisdiction (<12 nm). A similar mechanism occurs at the regency/municipal level to receive the TAC from their provincial administration.

The top-down approach asserts the central government's full authority as the resource owner. It involves only a few representatives of stakeholders in the decision-making process. Feedback mostly occurs through various forms of reports, or through representatives of the commercial fishing associations in a dissemination forum. Consequently, some of the regulations and policies produced by this approach are unsuitable to the dynamic conditions of the concerned regions. This often ignites displeasure, or even rejection from stakeholders, particularly from the industry.

The complicated bureaucracy of decentralized fisheries management also decelerated decision-making processes and led to overlooking local conditions. The generalization of the Basic Fish Price (BFC) or the ex-vessel price as factors entering the fishing fee calculation is one of the examples of overlooked local characteristics.

Decentralized marine fisheries management also induces economic inefficiency caused by emerging additional costs, both for the government and the industry. All the

procedures necessary to extend the Fishing Permit (FP) for Nationally Registered Fishing Vessels (NRFV), for example, are mostly performed by the DGCF of the MMAF-RI. They encompass the annual vessel inspection, administrative verification, and the Fishing Fee calculation. The industry must front the additional costs to travel to or to operate their representative offices in Jakarta, while the MMAF also has to fund officials to carry out management functions. As an illustration, the distance between Bitung-North Sulawesi as the fishing base for tuna longline fishing in Indonesia EEZ Pacific Ocean (IFMA 717), and the MMAF's headquarter in Jakarta is approximately equal to the distance between Denver and Washington D.C.

Recently, some procedures have been delegated to the MMAF's fishing ports and to the provincial agencies, and an online service has been employed to minimize costs, yet the final decision is still exclusively determined by central offices of MMAF-RI. This mechanism is time-consuming as well as creating economic inefficiency.

VI.2. Direct Policy Impact

The primary direct policy impact of Law No. 23 of 2014 was the transfer of authority regarding commercial fishing licensing services to provincial governments. Having their maritime jurisdiction revoked took away the municipalities' and regencies' authority to issue Fishing Permits for boats with sizes ranging between 5 and 10 Gross Tonnage (GT). This implied that boats previously holding Fishing Permits (FP) issued by the municipality/regency had to apply or to extend their permit with the provincial governments after Law No. 23 of 2014 was authorized. According to Law No.45 of 2009 concerning Fisheries, any commercial boat fishing in Indonesian waters must hold

a Fishing Permit, except for boats smaller than 5 Gross Tons. According to the Indonesia Fisheries Statistics, fishing boats sized between 5 and 10 GT represent 65.21% (2015) and 64.34% (2016) of the total registered inboard engine fleet obliged to hold Fishing Permits (FP). Consequently, on average, the total number of fishing boats managed by the provinces was doubled since it increased by more than 117% (Table 15).

Table 15. Authority and Jurisdiction Distribution based on the Law No.14 of 2014

Authority and Jurisdiction	Law No.23 of 2014					
	Before			After		
	Central	Provincial	Municipality/ Regency	Central	Provincial	Municipality /Regency
Maritime Jurisdiction for fisheries management	12-200 nm	4-12 nm	0-4 nm	12-200 nm	0-12 nm	-
Size of managed Fishing Vessels/Boats	> 30 GT	10-30 GT	5-10 GT	> 30 GT	5-30 GT	-
Number of registered fishing vessel/boats	4,286*	23,990*	46,358*	3,671**	52,259**	-
Fishing Licensing Services	> 30 GT	10-30 GT	5-10 GT	> 30 GT	5-30 GT	-

* 2013

**2016

The fishing fleet expansion (Table 15) after relicensing had different impacts on provinces. For some of them, particularly in the eastern part of Indonesia, where municipalities/regencies managed a small number of boats, the impact was low. For instance, the province of Papua and West Papua only received 58 and 255 additional fishing boats, respectively, a small number in comparison with the fishing fleet of boats sized between 10 and 30 GT (Appendix 8) that they previously managed.

In other provinces, the high number of additional boats potentially posed a problem as it heavily outnumbered the existing fleet. West Java Provinces, for example, the most populated province in Indonesia, received 4,913 additional boats with sizes ranging between 5-10 GT. This number is 77 times higher than the fleet of boats with sizes ranging between 10 and 30 GT that they previously managed. Another less

extreme example is the East Kalimantan Province with additional 1,751 boats, or more than triple their previously managed fishing fleet.

This situation led to the pessimistic scenario conveyed by opponents of the revocation, which had warned that provinces would be overwhelmed by additional jurisdiction added to additional tasks, particularly concerning the fishing licensing services. Interestingly, provincial government officials also expressed this concern.

Definitely the provinces cannot cover the additional authority over 0-4 mile. Unless there are representatives posted in their regencies, or branches of offices, the provinces will not be able to perform well the (fishing *ed) licensing services to the industry.

(Anonymous A., 44 years old, Buginese, Deputy Director for Fisheries Management Evaluation, DGCF-MMAF)

Our province has vast areas, we can't control the entire area. We need the municipality and regency. They know their local conditions better

(Anonymous, 45 years old, Banjarnese, East Kalimantan Province)

The second direct impact of Law No. 23 of 2014, economic inefficiency, was caused by emerging additional costs for fishing licensing services, both for the industry and the provinces. A “*regency fishing boat*” based in *Tegal*, a primary fishing base for small-scale industrial fishing boats (5-30 GT) of the North Coast of Java, now must apply for or extend its Fishing Permit (FP) in Semarang, the capital city of Central Java Provinces. For *Tegal* fishermen, this may not cause a significant problem as Semarang is only 160 km (99 miles) away from their base, but the same situation for a *Cilacap* fishermen, another fishing base in Central Java Province located in the South Coast of Java facing the Indian Ocean and distant 274 km (170 miles) from Semarang (more than 5 hours of driving), would bear higher costs. This short description illustrates the

diversity of impacts experienced by two different groups of fishermen living in the same province.

So now they (5-10 GT boat owners *ed) have to go to Semarang to extend their (fishing *ed) Permit? Hmm, it's costly
(Anonymous, 39 years old, Javanese, Purse Seine owner based in Juwana, Central Java)

Additional costs and time-consuming procedures may have a less significant impact on fishermen residing in Java than on their compatriots living in other islands. The primary island in the Indonesian archipelago, Java is the smallest of five big islands and has better infrastructure to support business. It has a much better transportation system and internet connections than the others, crucial to speed up the licensing process.

Unfortunately, provinces located outside Java, particularly in less developed eastern Indonesia, do not benefit from similar conditions. For instance, the archipelagic province of Maluku has widespread locations of regencies/municipalities under her administration. It takes a one-hour flight from *Dobo*, one of the fishing bases located nearby the Arafura Sea, to Ambon, the capital of Maluku. To overcome this issue, the Maluku provincial government plans to establish several representative offices in their archipelago. Undoubtedly this will escalate management costs a direct impact that will be similar to the emerging additional cost of fishing licensing services for the Nationally Registered Fishing Vessels (NRFV).

Remember, we're an archipelagic state with numerous islands occupying a vast area. The online system has not worked smoothly. The (regency/municipality authority *ed) revocation tends to generate higher costs for (licensing *ed) administration.

(Anonymous, Chairman, of Indonesia Purse Seine Association/*Himpunan Nelayan Purse Seine Nusantara* (HNPN))

The third direct impact is caused by the task adjustment for municipality/regency officials. Theoretically, by losing their authority and jurisdiction, the municipality/regency governments are regarded as the stakeholders most negatively affected. The impact weighs on their daily working activities, particularly those of officials of the fishing licensing services and other pertinent affairs. They no longer have the authority to issue or extend fishing permits, or to manage small-scale fishing ports. Regarding fisheries management, the law limits the municipality/regency authority by focusing on empowering local-small fishers and management of the local fish landing sites.

To overcome this situation, most municipality/regency fisheries agencies restructured their institution and re-assigned their staff to other sections or divisions, such as aquaculture or empowerment of traditional fish processing. The ‘jobless’ staffs were rarely transferred to provincial governments because transferring government employees is a complicated administrative process, not to mention that concerned employees were not always willing to join the new institution located far away from their home. On the other side, provincial governments seemed reluctant to accept staff transfers, and tended to hire new staff to fill the openings in their representative offices. The Maluku Province is a good example.

Everything is handed over to the province (provincial government *ed) including the fish landing sites. We have no activities, no work, and no revenues related to fisheries management. That’s why we altered our program, expanding empowerment.
(Anonymous, 40 years old, Palembang Municipality officials, South Sumatra Province)

All my friends were transferred to different sections. We no longer deal with (fishing *ed) licensing and (fishing *ed) port management. The provincial government will open a new office here with their own people (staff *ed).
(Anonymous, 35 years old, Central Maluku Regency officials, Maluku Province)

The last direct impact concerns the irrelevance of a few existing marine fisheries management regulations, particularly concerning the fishing fee implementation. According to Law Number 33 of 2004 concerning Fiscal Balance, national revenues collected from the fisheries sector had to be redistributed as an Inter-governmental Transfer Fund, namely the Revenue Sharing Fund (RSF) from the fishery sector. The RSF was to be shared between the central and local governments, with 20% for the central government (MMAF) and 80% for local governments, to be equally distributed to all regencies and municipalities in Indonesia. Provincial governments were excluded from this redistribution (GOI 2004, Siddik 2007).

This paper argues that the distribution formula stipulated by Article 14 d of Law Number 33 of 2004 is no longer relevant in the new regulatory framework. National fisheries revenues stem from fishing fees paid by Nationally Registered Fishing Vessels (NRFV), which are operating in the national maritime jurisdiction, beyond 12 nautical miles, and are registered with the central government (MMAF). These vessels mainly exploit resources located beyond the local governments' jurisdiction.

Also, referring to Law No.23 of 2014 concerning Local Governments, municipalities/regencies no longer have authority and jurisdiction over small-scale industrial fishing fleet (5-10 GT) management. These boats are now under the management of provincial governments, which, most likely, have insufficient funds to

manage extra boats. It is, therefore, necessary to amend the law, particularly regarding the distribution formula, by including provincial governments in the redistribution of fisheries based national revenues.

Lastly, the existing formula also does not promote equity. Based on the aforementioned “equal” RSF distribution formula, landlocked municipalities/regencies having no jurisdiction over fisheries resources, such as *Depok*, *Cimahi*, and *Bekasi*, receive the same amount of funds as others located in coastal areas adjacent to productive fishing grounds, such as *Ambon*, *Bitung*, *Tual*, and *Pekalongan*. Yet, equity does not mean equality, it refers to the fair distribution of overall benefits and costs of natural resources’ utilization among sub-groups of the total population (Field 2008). Shaffer *et al.* (2004) define equality as a situation in which everyone has shoes, while equity refers to a situation where everyone’s shoes fit. This paper argues that the equal distribution of RSF to all municipalities and regencies all over Indonesia is not equitable. Moreover, the growing number of municipalities/regencies (457 in 2018 and 511 in 2014) negatively affects the amounts of annual RSF redistribution.

Alternatively, regencies and municipalities could be still included in the sharing mechanism with a smaller portion than the fund distributed to provinces. However, this paper argues that it will complicate the sharing mechanism and will diminish the amount of fund shared. First, it is important to notice that the more recipients of the sharing fund will lessen the fund that will be distributed. Second, referring to the existing condition, some of these municipalities/regencies did not allocate the distributed fund for the initial purposes; fisheries resources conservation and fisheries development. This was attributed to the small amount of fund distributed. Lastly, as previously explained, an

equal sharing does not represent equity where the landlocked regions receive the same amount of fund with the coastal regency/municipality.

Because natural resources are unequally scattered within a country, assigning a proper distribution formula for national revenue collected from natural resources fees is harder than stipulating a sharing formula for property-based taxes or personal income tax. Even more so when it comes to the marine fisheries sector as the resource is located beyond the authority of local governments (12-200 nm). This was the primary reason underlying the equal sharing implementation. Another reason came from national perception. As an archipelagic country, Indonesia perceives her seas as one entity unifying the nation. Therefore, all economic benefits derived from her seas belong to the nation as a whole and shall be enjoyed equally by the entire citizenry.

Several studies analyzing distribution of national revenues deriving from natural resources rent favor a proportional distribution based on the derivation basis. This means that producer regions shall receive a larger amount of funds than other regions located further from the location of the resources. The derivation basis assumes that producer regions suffer from the negative externalities generated by natural resource extraction. Most of these studies in Indonesia focus on revenue distribution from other types of natural resources such as mining and forestry (Alisjahbana 2005, Agustina *et al.* 2012), and they rarely analyze the formula for intergovernmental distribution of resource rent from the fisheries sector.

To determine which regions are impacted by offshore fisheries exploitation (beyond 12 nautical miles), it is necessary to perceive the marine fisheries resources as one interconnected ecosystem. Although offshore fishing exists beyond the jurisdiction

of the local governments, it has economic, biological and social impacts on coastal regions. The exploitation of targeted species offshore, to some extent, affects coastal species and habitats. Ultimately it has biological impacts on artisanal and small-scale coastal fisheries. In addition, offshore fishing also contributes to the local economy growth of coastal regions by providing fishing bases (fishing ports, fish processing units, and fishermen communities) for the large-scale industrial fishing vessels. In summary, coastal regions adjacent to the exploited fishing grounds must be considered as the ones impacted.

This paper argues that the derivation basis implemented in the fisheries sector should refer to the exploitation level, or fishing intensity in each Fisheries Management Area (FMA). The simplest way is by referring to the number of permitted vessels in each FMA, particularly the number of Nationally Registered Fishing Vessels (NRFV). Consequently, the national revenue should be shared proportionally among each FMA, based on the exploitation level represented by the number of NRFV in those FMAs (Appendix 10). Subsequently, the fund distributed to each FMA will be distributed to the constituent provinces located adjacent to them. At this advanced stage, the proportional distribution is made based on the number of registered fishing boats (5-30 GT) managed by each province.

For instance, the fund attributed to FMA 712 (Java Sea) will be distributed proportionally to 8 constituent provinces; Lampung, Jakarta, Banten, West Java, Central Java, East Java, Central Kalimantan, and South Kalimantan. The proportional distribution depends on the number of fishing boats between 5 and 30 GT managed by the concerned provinces. Similar to the FMA 712, the fund attributed to FMA 718 (Aru

Sea, Arafura Sea, and Eastern Timor Sea) will also be distributed proportionally based on the number of managed vessels by Maluku, West Papua, and Papua provinces, the three constituent provinces of FMA 718. Therefore, although the Arafura Sea is predominantly exploited by vessels from Jakarta and other fishing bases in Java, the adjacent provinces would be the ones receiving the biggest part of the national fisheries revenues stemming from the fishing fees under a proportional allocation. This can be considered as a compensation fee for the externalities suffered by the adjacent regions of highly exploited fishing grounds.

With additional funds from the central government, it is expected that provinces will abandon the rent-seeking race to increase their local income that was happening when the three-level decentralization system was being implemented (Section VI.1). In addition, it is also expected that proportional distribution can function as an incentive for provincial governments to improve their fisheries statistics, particularly regarding registered fishing boat data. In summary, the proportional distribution has the potential to contribute to improving the Indonesian marine fisheries management. However, more thorough and deeper study is required to assess the possible implementation of this proposed formula, particularly in comparing monetary value with the existing one. This paper limits itself to delivering the general idea.

On the other side, proponents of the authority revocation argue that eliminating municipality/regency authority would smooth the multi-level governmental coordination, while at the same time potentially minimizing the horizontal conflict among their regencies. The lack of human resources of municipality/regency governments is one reason put forward. Brodjonegoro and Asanuma (2000), also argued

that decentralization in Indonesia should be implemented and limited to the provincial level, not the municipal/regency level, for reasons of institutional and human resources capacity.

The existing (previous *ed) system is complicated. The revocation simplifies the system.

(Anonymous, 44 years old, Sundanese, Deputy Director for Fisheries Management in IEEZ, DGCF-MMAF)

Municipality/Regency infrastructures are not ready yet, and the provinces manage the (fisheries *ed) resource better. Regencies mostly focus on increasing their local income, neglecting the quality of service.

(Anonymous., 41 years old, Javanese, Researcher at MMAF Research Center)

It's better to hand over the authority to the higher administration. Provinces have the potential to minimize the horizontal conflict among the regencies, particularly in regard to the overlapped fishing grounds in 0-4 miles.

(Anonymous, 30 years old, Sundanese, Staff at Nizam Zachman Oceanic Fishing Port, Jakarta)

The absence of municipal/regency interventions provides more liberty to provincial governments in managing the fisheries. Moreover, not only does their jurisdiction expand, but also their authority due to the inclusion of 5-10 GT boats. Therefore, theoretically, provincial governments have sufficient power to minimize potential horizontal conflicts among their regencies.

The revocation of municipality/regency jurisdiction automatically eliminates the overlapped maritime jurisdiction in 0-4 nautical miles. Now all waters within 12 nm are controlled by provincial governments. Thus, theoretically it becomes easier for them to manage fishing allocations, including for migrant fishers from adjacent municipalities/regencies Furthermore, since all fishing licensing procedures for small-scale industrial fishing boats (5-30 GT) are performed by them, provincial governments

have full authority to set the number of fishing permits in their maritime jurisdiction. This includes the number of fishing boats for each type of fishing gear. Therefore, it also has the potential to minimize fishing gear conflicts. Concentrated public services also tend to minimize ‘additional’ costs for the industry.

The revocation (of municipality/regency authority *ed) eliminates the uncertainty in fisheries management. It has the potential to reinforce more coordinated (fisheries *ed) management.

(Anonymous, 43 years old, an international NGO, Marine Stewardship Council-Indonesia)

I favor the integrated (fishing licensing *ed) services at the provincial level.

(Anonymous, 55 years old, Balinese, Benoa (Bali)-based Tuna Longline Fishing Company)

VI.3. Stakeholders Attitude on revoking municipality/regency authority

Similar to the analysis of increasing fishing fees, the investigation of stakeholders’ attitudes about the revocation of municipal/regency authority also focuses on three aspects: the agreement level, the acceptability level, and the support level (Appendix 2 and 3). However, this investigation excludes the samples collected from skippers and crews. Most of them are unwilling to answer questions that, in their opinion, are beyond their knowledge and capacity. In fact, most of them have no idea about the subject matter behind such questions.

This condition is attributed to the education level of skippers/crews, half of which have only completed elementary school, while only 13% of them completed high school. Moreover, they argue that revoking municipality/regency authority in governing commercial fisheries in 0-4 nautical miles is a government internal problem that has nothing to do with them.

Also, as Nationally Registered Fishing Vessels (NRFV), these skippers mostly deal with the central government agency, particularly regarding their Fishing Permit (FP) and other pertinent administrative matters, such as submitting fishing logbooks and port clearance. In addition, they mostly assume the government to be a single entity and not a multi-level administration, so the authority revocation of one level hardly has any significant impact on their daily activities. Consequently, the attitude investigation on the authority revocation was only conducted on 8 types of stakeholders.

The Kruskal-Wallis test for three questions investigating the authority revocation rejects the null hypothesis. This means that at least one group of stakeholders has a different mean value for their answers, and the collected samples are not from an identical population (Table 16). Meanwhile, since collected samples are classified as ordinal data, the central tendency of the stakeholders' responses is measured by their median (Table 17).

Table 16. The Kruskal-Wallis test for the collected samples related to the revocation of the municipality/regency authority

	Q4 Agreement Level	Q5 Acceptability Level	Q6 Support Level
Chi-Square	16.279	20.715	15.156
df	7	7	7
Asymp. Sig.	0.023	0.004	0.034

Table 17. The Median of the collected samples related to the revocation of the municipality/regency authority

Stakeholders	Q4 Agreement Level		Q5 Acceptability Level		Q6 Support Level	
	Σ Resp.	Median	Σ Resp.	Median	Σ Resp.	Median
Central Govt.	86	3.0	86	3.0	86	3.0
Fishing Port	87	4.0	86	4.0	86	3.0
Provincial Govt.	42	3.0	42	3.0	41	3.0
Regency Govt.	17	2.0	17	2.0	17	2.0
Crews						
Industry	37	3.0	37	4.0	37	3.0
Association	12	3.0	12	3.0	12	3.0
NGO	20	3.5	20	4.0	20	3.0
Academia Research	28	2.5	28	3.0	28	3.0
Total	329	3.0	328	3.0	327	3.0

Notes:

Likert Score	Q4 Agreement Level	Q5 Acceptability Level	Q6 Support Level
1	Disagree	Unacceptable	Strongly Oppose
2	Somewhat Disagree	Slightly Unacceptable	Somewhat Oppose
3	Neither Agree nor Disagree	Neutral	Neutral
4	Somewhat Agree	Slightly Acceptable	Somewhat Favor
5	Agree	Acceptable	Strongly Favor

VI.4.1. Level of Agreement

For the level of agreement, five of eight groups of stakeholders have neutral attitudes. Their median values are 3 on the 5-scale Likert type measurement. Those are the central government (MMAF), the provincial government, the Commercial Fishing Associations, the NGOs, and academia (Table 17). Predictably, stakeholders representing municipal/regency governments, hypothetically the most negatively affected stakeholder by Law No.23 of 2014, are the only group with a negative attitude (score 2).

Interestingly, although hypothetically the most benefitted stakeholder, provincial representatives also show a neutral attitude. Apparently, additional jurisdiction and larger authority does not instantly lead to a strong positive attitude,

probably because stakeholders are aware that additional tasks will not come with additional supporting budget.

**Notes:*

Y-axis = Likert Scale (1 to 5)

X-axis = Types of Respondents

Number = Outliers (marked by respondent number)

Bold line in bar = Median

Figure 21. Boxplot of the Agreement Level for the Authority Revocation

In addition to the central tendency of the attitudes of each type of stakeholders, it is also necessary to notice the range of their responses as portrayed by the boxplot (Figure 21). Except for the municipality/regency, each type of stakeholder has a dispersed range of answers. The range of the responses collected from central government representatives has similar width to the one collected from NGOs, with values ranging between 2 and 5, slightly wider than those of fishing port representatives.

In contrast, the answers collected from municipality/regency representatives cover a shorter range, between 1 and 2. These values are categorized as the representation of negative attitudes, or the disagreement about eliminating their authority. Another group of stakeholders showing a negative attitude is Academia.

Meanwhile, the responses collected from provincial representatives have the widest range covering the whole spectrum of the Likert-scale. This means that provincial stakeholders have a divided and widely distributed attitudes in regard to their agreement level on revoking municipal/regency authority.

Academia's negative attitude is notable. They strongly disagree with revoking the authority, arguing that, due to the jurisdictional area's characteristics, provincial governments will be overwhelmed. They believe provinces will not be able to cover it optimally, particularly in regard to the governance of 5-10 GT fishing boats.

In contrast, the range of vessel owners' responses indicates a positive attitude. They believe accumulating authority at the provincial level is an effort to reduce bureaucratic complexity. Although their vessels are registered nationally with the central government institution (DGCF-MMAF), these vessels occasionally have to moor in fishing ports previously managed by the municipality/regency. *Dobo* is an example of fishing port managed by the regency. This port becomes a temporary fishing base for squid jigging vessels from the Nizam Zachman Oceanic Fishing Port (NZOFP) during their fishing operations in the Arafura Sea. Authority accumulation at the provincial level will liberate the industry from dealing with the multi-level administrations regarding their business activities.

Actually, we don't have a problem with it (the authority revocation *ed), but it seems that it will make things simpler and more efficient

(Anonymous, Balinese, Indonesia Tuna Longline Association
(*Asosiasi Tuna Longline Indonesia/ATLI*))

It (the authority revocation *ed) accelerates the (fishing *ed) licensing process. The provinces have better human resources than regencies

(Anonymous, 29 years old, Javanese, a Fishing Company Manager)

In spite of slight differences in their central tendency, the responses collected from the central government representatives (MMAF) have a similar range of distribution as those of NGOs. Those agreeing to the revocation of municipality/regency authority believe that it will smooth governmental coordination, accelerating both top-down dissemination and bottom-up feedback. On the other hand, similar to academia's argument, those who disagree are also unsure about the provincial governments' capacity to cover additional jurisdiction and authority conferred on them.

In addition to the central tendency (the median) and the distribution of answers portrayed by the boxplot, the composition of the responses is notable. The percentage of positive attitudes from central government representatives is identical with those from provincial representatives. Meanwhile, although also representing the central government, fishing port officials have higher positive attitude (score 4 and 5) percentages than their counterparts working in MMAF headquarters. This was prompted by the direct impact experienced by those working in the field.

The revocation (of regency/municipality authority *ed) is good. Now the regents and the mayors cannot disobey their governor anymore. It eliminates the existence of 'small kings' in the regencies.

(Anonymous, 43 years old, Javanese, Head of Fishing Port Deputy for Port Development, Nizam Zachman Oceanic Fishing Port, Jakarta)

Group	Stakeholders	Group	Stakeholders	Group	Stakeholders
1.	Central Govt	4.	Regency Govt	7.	Association
2.	Fishing Port	5.	Crews/Skippers	8.	NGO
3.	Provincial Govt	6.	Industry (Owners)	9.	Academia Research

Notes

Scale	Color	Color	Interpretation
1	Blue	Blue	Disagree
2	Green	Green	Somewhat Disagree
3	Grey	Grey	Neither Agree nor Disagree
4	Purple	Purple	Somewhat Agree
5	Yellow	Yellow	Agree

Figure 22. Sample Distribution of Agreement Level on the Authority Revocation

Meanwhile the sum of negative attitudes from municipality/regency stakeholders, marked by score of 1 (disagree) and 2 (somewhat disagree), reached 76.5%, the highest among all stakeholders. The distribution of answers from provincial representatives is interesting as well. Those having a positive attitude (agree and somewhat agree) and those opposing it (disagree and somewhat disagree) are nearly

equal with 40% and 43% respectively. As previously mentioned, provincial representatives have a divided attitude on the revocation supposed to benefit them. Figure 22 shows the balanced frequency of their responses underpinning the previous statement derived from the boxplot (Figure 21).

VI.4.2. Level of Acceptability

The central tendency of stakeholders' acceptability level is no different than the central tendency of their agreement level. The median values are almost exactly the same except for the industry and NGOs (Table 17). Along with fishing port stakeholders, both the industry and NGOs indicate positive attitudes (score 4). Other types of the stakeholders remain neutral (score 3). Meanwhile, the municipality/regency remains the only type of stakeholder with a negative attitude regarding their level of acceptability.

The neutral acceptability level most likely was caused by the minimum or no impact that will be experienced by the concerned stakeholders. For instance, revocation of municipal/regency authority does not add or eliminate existing jurisdiction or authority to central governments.

Meanwhile, the positive attitude manifested by the (strong) acceptability is owed to the belief that eliminating municipality/regency authority simplifies bureaucratic procedures. As central government employees posted in the field, most fishing port officials must coordinate with two levels of administration in their daily activities. Therefore, the authority revocation of one administrative level leads to a reduction of their tasks.

The authority revocation simplifies the bureaucracy, and it accelerates the dissemination of regulations and policies.

(Anonymous, 56 years old, Javanese, Head of harbor master in Nizam Zachman Oceanic Fishing Port, Jakarta)

A similar situation occurs with the industry stakeholders, who trust that simplified bureaucracy has a positive impact on commercial fishing businesses, resulting in slightly positive attitudes in regard to their acceptability level.

It (the revocation of regency/municipality authority *ed) makes the (fishing *ed) licensing process simpler, more efficient.
(Anonymous, Balinese, a Benoa Port (Bali)-based fishing company owner)

The ranges of responses from each type of stakeholders in regard to their acceptability level (Figure 23) are also almost identical with their agreement level (Figure 21). It is important to notice that the range of the answers from provincial stakeholders previously covering the whole spectrum of the Likert-scale on their agreement level is reduced. Here their values range between 3 and 5, indicating positive attitudes.

In contrast, the range of responses from the municipality/regency stakeholders widens. Their answers are not exclusively concentrated in the negative attitude spectrum (score 1 and 2 on the 5-point scale of the Likert-type measurement) but widen slightly to the neutral spectrum (score 3). This means that, regardless of their (strong) disagreement, the attitude of municipality/regency stakeholders softens in regard to their acceptability level. Arguably this is the result of the binding power of the authorizing regulation. As the second highest regulation in Indonesia's law hierarchy, it would require a long effort to amend Law No.23 of 2014, and the amendment also would have to be approved by the DPR, Indonesia's legislative branch. Therefore, these stakeholders might have limited options other than acceptance. However, the mean

value of their attitudes remains in the negative zone (score 2) and can be considered their true opinion regarding their acceptability level.

**Notes:*

Y-axis = Likert Scale (1 to 5)

X-axis = Types of Respondents

Number = Outliers (marked by respondent number)

Bold line in bar = Median

Figure 23. Boxplot of the Acceptability Level for the Authority Revocation

Similar to their median value, the range of responses from vessel owners stays in the positive range. It has exactly the same range of answers as NGOs. Meanwhile, the distribution width of academia's answers, previously in (strong) disagreement on authority revocation, slightly reduces. None of their responses fall into the weakest acceptability. Their softening attitude is presumably caused by the absence of impact they will experience.

Central government representatives, MMAF and fishing ports, have slightly different ranges of distribution. The fishing port representatives have a narrower distribution of responses, leaning more towards a positive attitude, than their headquarters counterparts.

Group	Stakeholders	Group	Stakeholders	Group	Stakeholders
1.	Central Govt	4.	Regency Govt	7.	Association
2.	Fishing Port	5.	Crews/Skippers	8.	NGO
3.	Provincial Govt	6.	Industry (Owners)	9.	Academia Research

Notes

Scale	Color	Color	Interpretation
1	Blue	Blue	Unacceptable
2	Green	Green	Slightly Unacceptable
3	Grey	Grey	Neutral
4	Purple	Purple	Slightly Acceptable
5	Yellow	Yellow	Acceptable

Figure 24. Sample Distribution of the Acceptability Level on the Authority Revocation

The sum of negative attitudes from municipality/regency representatives for their acceptability level is lower than their agreement level, declining from 76 % to 70% (Figure 24). The graphic portraying the composition of the answers illustrates the softening negative attitudes of municipality/regency stakeholders.

Figure 24 also illustrates the divided attitudes of provincial representatives towards acceptability. As with their agreement level, opposing attitudes have similar values. This time, the positive attitudes (score 4 and 5) slightly outweigh the negative ones by 45% compared to 43%. There is an approximate 5% increase of positive attitudes, due to the slight reduction of the distribution range. The result also indicates that provincial representatives have a balanced attitude regarding their level of acceptability, the same as MMAF representatives, whose positive attitudes only outweigh the negative ones by a very small margin: 42% against 38%. These divided attitudes are due to opposing predictions about the future impact of this revocation, which oscillate between increased coordination of multi-level administrations and provincial governments (in) capability to address it.

Regardless their revoked authority, we still should involve the municipality/regency. Otherwise, they will 'clean their hands up', ignoring every program we make.
(Anonymous, 41 years old, Assistant Deputy Director for fishing licensing services, MMAF)

VI.4.3. Level of Support

The central tendency of stakeholders' level of support indicates almost identical values. The median values from each type of stakeholder is uniformly neutral (score 3), except for municipality/regency stakeholders (Table 17). Not surprisingly, as the most

negatively affected stakeholders, municipality/regency representatives consistently retain their negative attitudes.

The range of responses from each type of stakeholder becomes smaller compared to the range of response from previously investigated attitudes (level of agreement and level of acceptability), slightly accumulating in a specific area of the Likert-scale spectrum (Figure 25). The attitudes of central government representatives are still divided between the revocation supporters and those opposing it with their respective arguments. Meanwhile, the fishing port officials remain in a positive attitude. The workplace location apparently also affects their favorability in regard to specific matters. Presumably this was resulted from perceived task reductions.

Provincial representatives' divided attitude is also reflected in their level of support. This time, the range of their answers is identical to that of their counterparts from the MMAF headquarters and academia. The values cover both the negative attitude (score 2) and the positive one (score 4).

**Notes:*

Y-axis = Likert Scale (1 to 5)

X-axis = Types of Respondents

Number = Outliers (marked by respondent number)

Bold line in bar = Median

Figure 25. Boxplot of the Support Level for the Authority Revocation

In addition to the distribution of these answers, the supporting reasons are noteworthy. Those with a positive attitude can be considered satisfied with the additional jurisdiction and authorities (for the provincial representatives), or with the small reduction of tasks (for the central government representatives including the fishing port officials), while the negative attitude mostly stems from the awareness of the challenges that provincial governments might face in order to handle their new jurisdiction, and the added complexity. This includes a limited available budget for workload increases. For instance, the East Kalimantan province previously managed approximately 544 fishing vessels ranging between 10 GT and 30 GT, and now has to manage 2,295 fishing boats, including 5-10 GT boats. Similarly, with fishing port management, provincial governments now have to allocate a budget to insure small-scale fishing ports and landing sites operability which was previously managed and funded by municipal/regency governments.

The sum of negative attitudes from municipality/regency stakeholders towards support is lower than their agreement and acceptability level, at only 65% (Figure 25). At the beginning, the municipality/regency representatives strongly disagree about the revocation of their authority and jurisdiction. Their negative attitude softens at the acceptability level and softens even more when it comes to their support, or resistance level. This indicates that regardless of their strong initial rejection, the municipality/regency representatives gradually soften their ‘resistance’.

Of course, I strongly disagree and cannot accept it. If everything is handed over to the province, what are our jobs then? But if it has already been decided, what can I do?
(Anonymous, 38 years old, Javanese, Pekalongan Regency, Central Java)

Provincial representatives continue to show divided attitudes in regard to their level of support, with identical 41% and 41% for negative and positive attitudes respectively, reflecting once again the undecided attitude of the group, regardless of the narrowing range of responses.

Group	Stakeholders	Group	Stakeholders	Group	Stakeholders
1.	Central Govt	4.	Regency Govt	7.	Association
2.	Fishing Port	5.	Crews/Skipppers	8.	NGO
3.	Provincial Govt	6.	Industry (Owners)	9.	Academia Research

Notes

Scale	Color	Color	Interpretation
1	Blue	Blue	Strongly Oppose
2	Green	Green	Somewhat Oppose
3	Grey	Grey	Neutral
4	Purple	Purple	Somewhat Favor
5	Yellow	Yellow	Strongly Favor

Figure 26. Sample Distribution of the Support Level on the Authority Revocation

Meanwhile, the sum of positive attitudes (score 4 and 5) from central government representatives, including fishing port officials, slightly outweighs their neutral attitudes. Despite an initial neutral position, central government stakeholders eventually manifest a slight support for the revocation of the municipal/regency authority. Also, those believing in the simplification of bureaucratic procedures outnumber the pessimist group.

NGO and academia responses provide interesting findings. These two groups of stakeholders, regarded as highly educated, have opposite responses in regard to the three investigated aspects. The sum of the positive attitudes from NGOs always decisively outnumbers the negative attitudes, indicating higher agreeability, acceptability, and support of the revocation of municipal/regency authority. Academia, on the other hand, leans toward the opposite direction. Regardless of the neutral tendency indicated by the median measurement, academia's negative attitudes are always higher than the positive ones, yet with margins of differences smaller than those of NGOs, indicating a slight disagreeability, less acceptability, and a slight resistance towards the revoked authority. Presumably, they believe that small-scale coastal fisheries (5-10 GT) should be managed by the local or the nearest administration.

In summary, municipality/regency representatives retain as the only stakeholder conveying a negative attitude towards the revocation of their authority and maritime jurisdiction. Interestingly, although regarded as the most benefitted stakeholder, provincial representatives indicate diverse and balance responses, resulting in a neutral attitude.

The Pairwise test was conducted on median values of governmental respondents; central government (Group 1) vs provincial government (Group 3), and provincial government (Group 3) vs municipality/regency governments (Group 4). As mentioned in Chapter III.6.2.4., this test aims to compare whether these groups of stakeholders have a median that is different significantly.

The result indicates that there is no significant difference of median between the central government and provincial governments, neither is between provincial and regency/municipality for three investigated aspects on the authority revocation (Appendix 9). This means that the attitudes of governmental representatives toward the authority revocation are not significantly different.

CHAPTER VII

POLICY ANALYSIS ON THE ESTABLISHMENT OF THE FISHERIES MANAGEMENT COMMISSION IN INDONESIA FISHERIES MANAGEMENT AREA (FMC-IFMA)

VII.1. Background

On January 2015, the president of the Republic of Indonesia issued Presidential Regulation No.2 of 2015 concerning the Middle-Term National Development Plan. The plan specifies the national guidelines for Indonesia's development policy for the 2015-2019 period. One of the policies pertinent to the fisheries sector is the mandate to develop the institutional framework and cooperation scheme for managing 11 Indonesia Fisheries Management Areas (IFMAs). Furthermore, the plan also mandates that the future regulation and institutional framework of marine fisheries management shall directly involve all stakeholders in each IFMA for sharing the responsibility in conserving and managing fisheries resources located across the administrative jurisdiction.

Responding to the Presidential Regulation mentioned above, the Ministry of Marine Affairs and Fisheries Republic of Indonesia (MMAF-RI) issued the Ministerial Strategic Plan for the 2015-2019 period as enacted by Ministerial Decree No.25/PERMEN-KP/2015. This decree assigns the policies and actions that shall be taken by the MMAF-RI to execute the national development plan stipulated by the president. One of the highlighted actions mandated in the Strategic Plan is the establishment and operationalization of the regional management institution in all IFMAs.

Following those regulations, the Directorate General of Capture Fisheries (DGCF) as the agency (echelon 1) under the MMAF-RI that is responsible for marine fisheries governance in Indonesia has been convening several national level meetings since 2015. The purpose of these meetings is to finalize the establishment of the regional marine fisheries institutions. The discussions involved representation from nearly all the Indonesia marine fisheries stakeholders such as the representatives from the provincial governments, industry representatives (Commercial Fishing Associations), the Indonesian Navy, academicians, independent research centers, universities, and environmental NGOs. Eventually, on June 22, 2017, the Fisheries Management Commission in Indonesia Fisheries Management Area (FMC-IFMA) was established based upon the Director General's (DG)'s decree No.47/KEP-DJPT/2017. The decree assigns the tasks and functions, and the membership apportionment of the FMC-IFMA.

As previously mentioned in Chapter I, this paper argues that the formation of FMC-IFMA can be considered as an attempt to implement federalism in Indonesian marine fisheries management. Referring to Juda (1993) and Bauer *et al.* (2018), the designated geographical areas are initially located in the national jurisdiction; 12 to 200 nautical miles (nm). Meanwhile, the two level of administration are represented by the central government (the national level) and the provincial governments (the sub-national level).

In addition to the general research question discussed in each chapter-- the impacts on the existing marine fisheries management in Indonesia-- two questions also emerge from the establishment of this commission. First, does the FMC-IFMA meet the objectives mandated in the middle-term national development plan (Presidential

Regulation) and the Ministerial Strategic Plan? Second, to what extent will the commission perform fisheries co-management?

This chapter assesses the establishment of the FMC-IFMA focusing on the legal basis, the tasks and functions, and the apportionment of the commission's membership. Subsequently, this chapter also examines the characteristics of fisheries co-management that most likely will be performed by FMC-IFMA based upon the typology proposed by Sen and Nielsen (1996). To support the policy analysis, this chapter also portrays the results from the investigation of the stakeholders' attitudes concerning the establishment of the FMC-IFMA. Finally, based on the results of the policy analysis, this chapter proposes some recommendations for the FMC-IFMA.

VII.2. Brief Description of FMC-IFMA

The official name, as stated in the DG Decree No.47/KEP-DJPT/2017, is *the Fisheries Managers in the Indonesia Fisheries Management Area (IFMA)*. The decree specifically establishes a Fisheries Management Commission (FMC) in each IFMA. The commission (FMC-IFMA) consists of representatives from the central government (MMAF-RI), representatives from each adjacent or constituent provinces, the coordinator of the secretariat in each IFMA, the scientific panel coordinator, and the consultative panel coordinator. The existence of this commission is regarded as the new model for Indonesia and becomes the main feature from the newly established regional fisheries management institution.

The decree established eleven commissions based upon the amount of FMA. Similar to the US Regional Fishery Management Council (RFMC) system, each

commission bears the name of their concerned management area. FMC-IFMA 718, for example, will be responsible for IFMA 718 encompassing the Aru Sea, the Arafura Sea, and the Eastern Timor Sea.

Initially, the commission will be established gradually starting from the FMC-IFMA 718. Afterward, all commissions are expected to be fully operationalized in 2020 (Fig.27). However, the Minister of Marine Affairs and Fisheries Republic of Indonesia demanded an acceleration on their establishment to meet the national development plan enacted by the president; direct involvement of all stakeholders in each IFMA for sharing responsibility in conserving and managing fisheries resources located across the administrative jurisdictions

Figure 27. The Roadmap for the establishment of FMC
Source: National Meeting for the Initiation of FMC 2016

Table 18 summarizes the jurisdictional areas and the constituent provinces in each IFMA, complemented by their annual production and estimated Maximum Sustainable Yield (MSY) in 2016 and 2017. The IFMA 712 encompassing the Java Sea that has been the primary fishing ground in Indonesia for years becomes the largest producer. Furthermore, along with IFMA 571 (Malacca Straits and the Andaman Sea), the 712 is also the most exploited IFMA. Meanwhile, IFMA 713 covering Makassar Strait, Gulf of Bone, Flores Sea, and the Bali Sea is the FMC having the largest number of the constituent provinces (10 provinces). Conversely, the IFMA 571, 717 and 718 have the smallest members with only three constituent provinces each.

Table 18. The Summary of the FMC-IFMA

No.	IFMA	Jurisdiction Area	Constituent Provinces		Production in 2013 (tons)	MSY 2016 (tons)	MSY 2017 (tons)
			Σ	Provinces			
1	571	Malacca Straits, Andaman Sea	3	NAD, North Sumatera, Riau	496,239.00	484,414.00	425,444.00
2	572	Western Indian Ocean of Western Sumatera, Sunda Straits	6	NAD, North Sumatera, West Sumatera, Bengkulu, Lampung, Banten	632,575.00	1,228,601.00	1,240,975.00
3	573	Part of Indian Ocean in Southern Java, Southern Nusa Tenggara, Sawu Sea, and Western Timor Sea	8	Banten, West Java, Central Java, Jogjakarta, East Java, Bali, West Nusa Tenggara, East Nusa Tenggara	464,015.00	929,330.00	1,267,540.00
4	711	Karimata Straits, Natuna Sea, IEEZ in South China Sea	6	Riau, Riau Archipelago, Jambi, Bangka-Belitung, South Sumatera, West Kalimantan	623,937.00	1,143,341.00	767,126.00
5	712	Java Sea	8	Lampung, Jakarta, Banten, West Java, Central Java, East Java, Central Kalimantan, South Kalimantan	918,531.00	981,680.00	1,341,632.00
6	713	Makassar Straits, Gulf of Bone, Flores Sea, and Bali Sea	10	North Kalimantan, East Kalimantan, South Kalimantan, South East Sulawesi, West Sulawesi, South Sulawesi, Central Sulawesi, Bali, West Nusa Tenggara, East Nusa Tenggara	687,992.00	1,026,599.00	1,177,857.00
7	714	Gulf of Tolo, Banda Sea	4	SouthEast Sulawesi, Central Sulawesi, Maluku, East Nusa Tenggara	518,672.00	431,069.00	788,939.00
8	715	Gulf of Tomini, Maluku Sea, Halmahera Sea, Seram Sea, Gulf of Berau	7	SouthEast Sulawesi, Central Sulawesi, North Sulawesi, Gorontalo, North Maluku, Maluku, West Papua	504,723.00	631,703.00	1,242,526.00
9	716	Sulawesi Sea, Northern Halmahera Sea	4	North Sulawesi, Central Sulawesi, Gorontalo, North Maluku	301,039.00	478,765.00	597,139.00
10	717	Gulf of Cendrawasih, and IEEZ in Pacific Ocean	3	North Maluku, West Papua, Papua	143,445.00	603,688.00	1,054,695.00
11	718	Aru Sea, Arafura Sea, Eastern Timor Sea	3	Maluku, West Papua, Papua	415,845.00	1,992,730.00	2,637,565.00
TOTAL			62		5,707,013.00	9,931,920.00	12,541,438.00

Source: MMAF (2013), MMAF (2016), MMAF (2017)

VII.3. Legal Basis

Although essentially the establishment of the FMC-IFMA was mandated by the higher laws. Eventually, it is the DG's decree No.47/KEP-DJPT/2017 that legally assign the tasks, the functions, and the apportionment of commission's membership. The decree assigns the composition of fisheries managers in each IFMA supplemented by a long list of names and/or positions for the scientific panel, the consultative panel, three working groups, and the supporting team. The decree only assigns the tasks and the functions of the commission in general, without specifying it in detail (Chapter VII.4).

According to Law No. 12 of 2011, the hierarchy of the Indonesia's laws consists of 7 tiers/levels. The 1945 Constitutional Law, as the fundamental law, is the highest level (1st tier) of the laws. It is followed by the MPR (People Consultative Assembly)'s Decree, the National Laws (*Undang-undang*), the (Central) Government Regulations, and the Presidential Regulation respectively. Along with the Provincial Government Regulations, the Ministerial Decree is in the lower level than the laws or statutes mentioned previously; the 6th tier. Meanwhile the Regency/Municipality Regulation is the lowest level, the 7th tier (Fig.28).

Although it regulates the general affairs such as education or public health, the authority of the Local Government Regulations (the provincial and the regency/municipality regulations) is limited by the administrative jurisdiction of the concerned regions issuing the laws/regulations. Conversely, the authority of the Ministerial decrees encompasses the national jurisdiction but is limited to specific technical matter regulated by the concerned ministries. To address more specific and

technical issues, most of the ministry also assigns some regulations based upon the Director General (DG) Decree, the highest bureaucratic position under the minister.

Figure 28. Indonesia Law Hierarchy

Referring to this brief explanation of the Indonesia law hierarchy, this paper argues that the establishment of FMC-IFMA has a weak legally binding power. Consequently, this condition will affect the future performance of the concerned institution.

Most of the personnel commissioned in the FMC-IFMA are provincial government employees. On average, 57% of each FMC-IFMA is officials from the provincial fisheries agencies (Chapter VII.5). The number is almost double the central government (MMAF-RI) representatives (table 21). Similar to the composition of the commission membership, the provincial agency officials also dominate the composition of the three working groups in each FMC-IFMA.

In the decentralized governmental system, the provincial government employees are hired and paid using the annual fiscal budget of the concerned provinces. Moreover, the officials are also commissioned based upon the provincial regulation or the Governor's decree. Therefore, it is likely that these officials tend to put their loyalty to the regulations, or the assignment issued by their own offices. In contrast, the DG decree as the more specific and technical regulation has much less legally binding power over the officials working outside the concerned institution; the Directorate General of Capture Fisheries (DGCF). Therefore, it is hard to expect that the representatives from the constituent provinces will work optimally in the commission and its supporting bodies such as the working groups.

Although it has been disputed by the official responsible for the establishment of the commissions, this paper argues that the FMC-IFMA is the Indonesian version of the US Regional Fishery Management Council (RFMC) system. Therefore, it is necessary to take the lesson learned from the existence of the RFMC in regard to the legal basis underlying its establishment.

The formation of the RFMC was mandated by the Magnusson-Stevens Fishery Conservation and Management Act (generally known as the Magnusson-Stevens Act (MSA)), the highest public law after the constitutional law in the US law hierarchy. Certainly, it has very powerful legal base in binding the council's elements. The constituent states have no reason to refuse to participate in the council process. In fact, most likely these states are delighted for the privilege conferred to them to participate in managing the natural resources that intrinsically are located in the federal government's jurisdiction (3-200 nautical miles). Subsequently, a similar situation

occurs in the other elements of the council; the industry and the other interests' representatives. They are conferred, by strong legally binding power, the opportunity to participate in conserving and managing the publicly-owned resources.

The DG decree also has a bright side. As a regulation stipulating the more specific and technical matters, it has more flexibility than the higher laws. The Director General has more liberty in amending or altering his/her own decree. As long as the decree does not violate the higher statutes or regulations, and is officially reported to the minister, an amendment of the DG's decree may proceed.

In order to adjust to a situation in which the provincial governments representatives dominate the commission (will also be discussed in Chapter VII.5), it is necessary to strengthen the legally binding power of the regulation mandating the formation of the FMC-IFMA. Not only is it for the effectiveness of commission's function but also for its sustainability. A weak legal binding power has a potency to make the provincial representatives to disregard the tasks assigned to them. As a result, this potential situation affects negatively the futures performance of the newly established institution.

In regard to strengthening the legal base, this paper partially supports Muawanah *et al's* (2017) recommendation for a gradual reinforcement; from the issuance of the ministerial decree to the inclusion of the FMC-IFMA into the proposed national fisheries law amendment. However, this paper argues that reinforcement of the legal base should be executed as soon as possible without waiting until the commission runs smoothly. Without a stronger legally binding power, these newly established commissions will most likely not be able to be operationalized. Indonesia fisheries

stakeholders should have taken faster actions in gaining the momentum. 2019, as the political year in Indonesia (the presidential and the legislative elections), provides a great opportunity for them to propose a national fisheries law amendment.

In the short term, it is necessary to upgrade the underlying legal base to a slightly higher level of the Indonesia law hierarchy. A ministerial decree as a statute having national jurisdiction concerning technical matters is sufficient to act as the legal base for the formation of FMC-IFMA. Furthermore, a ministerial decree must also assign more specific rules stipulating all aspects related to the commission, similar to what had been stipulated by the MSA for the US RFMC system. These specific rules should encompass detailed tasks and functions of the commissions (including the supporting bodies; scientific panel, consultative panel, and working groups), source of funding for operational costs, benchmarks for setting up fisheries management plans, and the decision-making procedures. An exemption may occur for the list of the assigned members of the scientific panels, the consultative panel, and the three working groups. Preferably, it is better to keep the list under the DG's decree that will leave more space for future adjustment.

In summary, national fisheries law needs only to stipulate the principles and framework. Meanwhile, the operational details will be regulated by the ministerial decree and director general's decree. The last one should only focus on the list of commission's members.

VII.4. Tasks and Functions

The DG's decree only states the tasks and the functions of the commission generally and briefly as follows:

To coordinate the implementation and evaluation of fisheries management, and to prepare the recommendations for fisheries management in Indonesia Fisheries Management Area (IFMA) based on their jurisdiction.

From the excerpt above, it can be assumed that the decree emphasizes the task and function of the commission to be the implementation and evaluation of fisheries management. Presumably, this is related to the newly authorized Fisheries Management Plan (FMP) for each IFMA in recent years. Therefore, the development of FMPs is not prioritized. The next assigned task is to prepare recommendations for fisheries management. However, there is no further explanation regarding the definition and the types of recommendations that must be prepared and be submitted to the minister.

In addition to the FMC-IFMA or the commission, there are three other bodies that have their tasks and function assigned by the DG's decree. Those are the Chair of the Fisheries Managers of IFMA, the Secretariat, and the Supporting Team. Like the commission, the DG's decree does not specify the tasks and the functions of other supporting bodies in each FMC-IFMA such as the scientific panel, the consultative panel, and the working groups.

The Secretariat of the Fisheries Managers of IFMA is comprised of four directors (Echelon II) and one deputy director from the DGCF. Their role is to coordinate and to review the recommendations prepared by each FMC-IFMA. The Director General of Capture Fisheries as the chair of the Fisheries Managers in IFMA

is tasked to formulate these reviewed recommendations. Eventually, it is the minister of Marine Affairs and Fisheries who has the authority to authorize the recommendations for the Fisheries Management Plan (FMP) in each IFMA.

Finally, the tasks and functions of the supporting team are to assist the implementation and evaluation of the fisheries management conducted by the FMC-IFMA. There are eleven members of the supporting team, one for each FMC-IFMA.

Limited description of the task and function of the commission generates vagueness and a wide-open space for interpretation. Regardless of its obscurity, this paper classifies the tasks of the commission into two main parts. First, the commission shall implement and evaluate the fisheries management in their jurisdiction. Second, the commission shall prepare the policy recommendation draft for the FMP in their area.

An ambiguity emerges in regard to the first task of the commission due to the opposing nature of implementation versus evaluation of fisheries management. It is hard to imagine one institution can carry out, while at the same time evaluate the management measures.

This ambiguity also generates several questions pertinent to the mandated task. First, to what extent is the commission given authority to perform management? Subsequently, what types of management measures can be carried out by the FMC-IFMAs in their areas of jurisdiction? Is the commission given authority to enforce the existing limited entry regime for the Nationally Registered Fishing Vessels (NRFV), such as providing services for the Fishing Permit (FP) extension? Or does the commission merely act as the evaluator or the analyst reporting on the implementation

of fisheries management based upon data provided by the working groups? Based on field observations conducted during this study, the latter option tends to be true.

The second task, to prepare a draft policy recommendation, is also marked by vagueness. The decree does not specify in detail the definition and type of recommendation required. Does the draft exist in the form of the amended Fisheries Management Plan (FMP)? Or it is just merely a recommendation concerning more specific information such as the estimated Maximum Sustainable Yield (MSY) for a certain species or group of species in the commission's area of jurisdiction? If the answer is the latter, then there will be an overlapping function between the FMC-IFMA and the already existing national commission for the Stock Assessment (*the Komnaskajiskan*), a recommending body for the minister responsible for the assessment of the stocks as stipulated in Article 7 (4) of Law 45/2009 concerning the Fisheries

One thing is sure, the second task mandated for the commission is only the first stage of the decision-making process. As previously described, the draft policy recommendations prepared by the commission shall be reviewed by the Secretariat in the central government comprised of four directors from the DGCF-MMAF. Subsequently, the reviewed draft shall be formulated by the Director General of Capture Fisheries as the Chair of the Fisheries Managers before being submitted to the minister for approval. In summary, the decision-making process still features a long bureaucratic mechanism and almost exclusively involves government representatives.

Drawing on the previous brief description, it can be assumed that the existence of the FMC-IFMA initially is an attempt to perform a bottom-up approach where the decision-making process is started from the lower level of administrations or regions.

Sen and Nielsen (1996) classified this approach as *the advisory* or *the informative* in their typology of co-management arrangements. However, it is also necessary to consider the level of user participation in the decision-making process of the commission. This process is almost fully dominated by the government representatives. In light of this reality, it is hard to accept the classification (of co-management) mentioned previously.

According to Jentoft (1989), the level of user involvement in the decision-making process is one of four factors affecting the legitimacy of the regulatory scheme. In addition, full participation of affected individuals was one of eight principles for successful cooperative common-pool resources (CPR) management (Ostrom 1990). Lacking these two principles was the primary shortcoming of FMC-IFMA to classify it as a scheme of fisheries co-management.

Although arguably it is too early to evaluate the performance of the commission, this paper argues that the function of the FMC-IFMA has been restricted to mere policy recommendation drafter. The commissions have very limited authority, or even have no authority at all, in the decision-making process. In this case, with an exemption to the maritime jurisdiction, the FMC-IFMA has a slightly similar function with the Atlantic States Marine Fisheries Commission (ASMFC). Here, the ASMFC drafts recommendations regarding the conservation of marine living resources (including anadromous fish) of the Atlantic seaboard located in state' jurisdiction (0-3 miles) to the governors and legislators of signatory states (ASMFC 2016).

Furthermore, other stakeholders' engagement, particularly the non-government representatives, has been marginalized (as only one person is included in the

commission) (Chapter VII.5). Therefore, although it can be regarded as a bottom-up approach in the co-management arrangement, this paper classifies the FMC-IFMA in between the Type A (*Instructive*) and the Type B (*Consultative*) fisheries co-management in the typology presented by Sen and Nielsen (1996).

Due to the highly limited representation of resource users, it is easily predicted that a minimum exchange of information will occur at the commission. Regardless the availability of data and information provided by the working groups in each FMC-IFMA, the first-hand information from users is still regarded as the best available data in developing the policy recommendations. The fishing gear conflict between the Big Pelagic Purse Seine and the Tuna Longline, and the extensive use of Fish Aggregating Devices (FADs) in IFMA 572 is an example of the first-hand information garnered from the industry.

Alternatively, this problem can be resolved by convening a regional public hearing. However, referring to field observations, commercial fishing associations have already been regarded as the voice of the industry. Therefore, most likely the regional public hearings will not be convened anymore. Consequently, a minimum exchange of information will still exist.

However, although it is very limited, the commissions still provide a small space for consulting over or disseminating to users the decision that will be taken by the government. In addition, the FMC-IFMA also has a potency to function as the communicating forum for the provinces in resolving the potential horizontal conflicts that may be caused by migrant fishers (Chapter VI.2). This is also the underlying reason

for categorizing the FMC-IFMA as the combination of Type A and Type B of the fisheries co-management typology.

VII.5. Membership Apportionment

In performing their tasks and functions, each FMC-IFMA is supported by one secretariat team and two panels; *the scientific* and *the consultative* panel (Fig.29). The Secretariat team is led by an executive coordinator coordinating three working groups (WG); WG for data and information, WG for fisheries management and conservation, and WG for control and compliance. Each WG comprises of the representatives from the central government (MMAF-RI, mostly from DGCF) and the concerned provincial governments (officials from the provincial fisheries agencies).

Figure 29. The Institutional Structure of the FMC-IFMA
Source: DGCF, 2017

Initially, the executive coordinator position in each FMC-IFMA will be held by a professional having extensive experience in marine fisheries management. These

professionals will be hired by the MMAF-RI for a specific period. However, eventually, the decree assigns the head of the fishing port managed by MMAF-RI located in each FMA as the executive coordinator.

Up to 2016, DGCF of the MMAF-RI managed 23 industrial-scale fishing ports. These ports are classified into the Oceanic Class (Type A) and the Archipelagic Class (Type B) fishing ports, the two highest categories in Indonesia's fishing port classification. Therefore, intrinsically the executive coordinator in each FMC-IFMA is a central government representative.

As the coordinator of three WGs, the executive coordinator is also a member of the commission. This is one of the reasons for commissioning the head of fishing ports, mostly echelon II or echelon III in the hierarchy of Indonesia's bureaucracy, as the executive coordinator. S/he is expected to be able to smooth the coordination among the working group members representing two different level of administrations and other institutions.

Other reasons are attributed to budget availability and administrative problems. So far, the DGCF only allocates relatively small budgets for the FMC-IFMA operationalization. Basically, this budget has been distributed to the concerned fishing ports and provincial fisheries agencies. However, in several cases, the misuse of budget still occurs where either the fishing ports or the provincial agencies use this budget for other purposes.

Small budget allocations are also attributed to the scale of priority in Indonesian fisheries development. In recent years, most of the DGCF's annual budget is allocated to infrastructure projects, such as fishing port constructions, the development of the

Management Information System (MIS), and of procurement fishing boats. This fund is insufficient for the newly established commissions to run their functions, even to convene meeting with designated commission members.

In regard to recruitment of professional candidates, the Indonesian bureaucratic system is restricted to hire and to pay a non-government employee for a long-time period. Eventually, these problems relate to insufficient budget and administrative restrictions prevent professionals from filling executive coordinator positions. On the other hand, there is a strong demand from the minister to accelerate FMC-IFMA establishment.

The membership of each Working Group (WG) varies between 9 and 18 persons, depending on the type of WG and the number of constituent provinces. In total, members of WGs in each FMC-IFMA range between 32 and 52 persons. Most WG members representing the central government (MMAF-RI) are deputy directors from the DGCF, which have job descriptions relevant to the task and function of the concerned WGs. The deputy director for fishing vessels and the deputy director for fishing gear, for example, are commissioned in the WG for data and information. Meanwhile, the deputy director for commercial fishing licensing and fisherman affairs is commissioned in the WG for Control and Compliance in each FMC-IFMA. Lastly, the number of WG members representing provincial government is correlated to the number of constituent provinces in each FMC-IFMA.

Table 19 summarizes the apportionment of FMC-IFMA membership. The Scientific Panel comprises scientists and researchers from four types of institutions: the MMAF-RI's research center, universities, the EAFM learning center, and independent

fishery experts. There is no specific formula specifying the number of representatives from each research institution

Referring to the DG decree and interviews conducted during data collection, these researchers were assigned in each FMC-IFMA based on their expertise. For instance, the small pelagic species researchers from MMAF Research Center are posted in FMA 712 (the Java Sea), while those having expertise on big pelagic species are assigned in FMA 572 (the Indian Ocean of western Sumatra) and FMA 573 (the Indian Ocean of southern Java). In addition, the scientific panel is also fulfilled by academia from universities located adjacent to the concerned FMC-IFMA. For instance, two of scientific panel member of FMC-IFMA 718 (the Arafura Sea, and the eastern Timor Sea) are faculty members of Papua University.

Table 19. The Apportionment of the FMC-IFMA membership

No.	Indonesia Fisheries Management Comission	No.	Scientific Panel	No.	Consultative Panel
1	Secretary (Deputy Director General) of Directorate General Capture Fisheries (DGCF)	1	MMAF Research Center	1	Commercial Fishing Association
2	Executive Coordinator (Head of Fishing Port located in the concerned IFMA)	2	University	2	MMAF Representative (Non- DGCF)
3	Scientific Panel Coordinator	3	Learning Center of EAFM	3	Head of Local Communities/Tribe
4	Consultative Panel Coordinator	4	Fisheries Expert	4	Fish Processing Association
5	Head of Fisheries Agency from the constituent provinces			5	Non-Government Organization (NGO)

The DG Decree No.47/KEP-DJPT/2017 directly appoints the Scientific Panel members for each FMC-IFMA. The number varies between 3 and 15 persons. Some of Indonesia's leading fishery researchers are commissioned to be on more than one scientific panel. A senior researcher from the MMAF-RI's research center, for example,

is commissioned on two scientific panels of the adjacent IFMAs simultaneously, the 572 and the 573. The decree also assigns a coordinator for each scientific panel that automatically becomes a member of the commission. Interestingly, few researchers interviewed have information on their appointment. In fact, it seems that they are confused about their task on the commission.

The Consultative Panel comprising five types of representatives: the commercial fishing association, the MMAF-RI representative (Non-DGCF), the head of local communities/tribes, the fish processing association, and NGOs (Table 19). The decree does not clearly set the number of representatives for each stakeholder type and the required criteria to fulfill these positions. Yet the decree appoints a representative from the commercial fishing association as the Consultative Panel coordinator. For the purpose of the study, this paper assumes that each stakeholder type in the Consultative Panel is represented by one person.

At the end of the field observation for this study, the Consultative Panel of each FMC-IFMA still had not been filled. In fact, two important commercial fishing associations, the Indonesia Purse Seine Association (HNPN) and the Indonesia Tuna Association (ASTUIN), had little knowledge concerning the establishment of the FMC-IFMA or the existence of the Consultative Panel and the possibility for them to coordinate it.

Regardless of the existence of the Working Groups and the Panels, basically the core of the FMC-IFMA is the commission (Fig. 29). The members of this commission can be classified into 3 types; the permanent member, the representatives of supporting bodies, and the representatives of the constituent provinces. The permanent member is

the Secretary of the Directorate General of Capture Fisheries (the Deputy Director General) that becomes a member of all FMC-IFMA. S/he is an echelon II official that is considered as the 2nd person in command in the DGCF.

Figure 30. The Apportionment of the FMC-IFMA membership

The representatives of supporting bodies consist of the Executive Coordinator, the Scientific Panel coordinator, and the Consultative Panel coordinator (the representative from the commercial fishing association). Meanwhile, the constituent provinces are represented by the head of marine affairs and the fisheries provincial agency (Fig. 29). Since the head of the provincial agency is categorized as the first echelon in the Indonesia bureaucracy hierarchy (higher than the Deputy Director General; the echelon II), one of them is appointed as the coordinator in each FMC-IFMA. Due to the characteristics of the archipelagic State where one province becomes the constituent in two or more FMC-IFMA, a province may only coordinate one FMC-IFMA.

Referring to the apportionment described above, the number of commission members in each IFMA varies between 7 and 15 persons (Table 20). Once again, the number is correlated to the number of constituent provinces. A special composition occurs in IFMA 712 covering the Java Sea where additional members representing the central government are commissioned. Those are four Deputy Director Generals representing other DGs (Agencies) under the MMAF-RI. Presumably, it is related to the complexity of fisheries problems in the Java Sea, which has the largest marine fisheries production and population of fishermen.

Table 20. The number of FMC-IFMA personnel

No.	Types	571	572	573	711	712	713	714	715	716	717	718	Total
1	The Commission	7	10	12	11	15	13	9	11	10	7	7	112
2	Scientific Panel	3	7	15	3	3	10	8	4	8	5	3	69
3	Consultative Panel	4	4	4	4	4	4	4	4	4	4	4	44
4	Working Group	32	41	48	45	47	52	38	40	41	32	32	448
5	Supporting Team	1	1	1	1	1	1	1	1	1	1	1	11
Total		47	63	80	64	70	80	60	60	64	49	47	684

The DG decree also assigns eleven DGCF staff as the supporting team. Each person is commissioned specifically in one FMC-IFMA. Their role, as previously described, is to assist with implementation and evaluation of fisheries management conducted by the FMC-IFMA.

Due to his/her high workload, it is highly unlikely that the Deputy DG could fully perform his tasks and function as the permanent member in each FMC-IFMA. Therefore, this paper predicts that the supporting team members will be designees for the Deputy DG charged with performing his daily tasks and function in the commission.

Interestingly, 9 out of 11 members of the supporting team were previously sent to the US to pursue a higher education degree. However, by summer 2018, some of them had been posted or promoted in different positions in DGCF, not related with the FMC-IFMA.

Figure 31. Personnel Composition in each FMC-IFMA

On the subject of membership apportionment, this paper also investigates the stakeholder composition in the commission. Following Okey (2003), this paper first classifies the stakeholders representing different interests into four categories; the central government, the provincial government, the industry (commercial fishing), and other interests. Subsequently, the number from each category is calculated and converted into a percentage. As predicted, stakeholders representing the provincial government's interests dominated the commission, ranging from 43% (FMA 571) to 69% (FMA 713). On average, the commission consists of 57% of members representing the provincial governments (Table 21).

Table 21. The Composition of FMC-IFMA members based on the Stakeholders Interests

No.	Types	571		572		573		711		712		713	
		Σ	%	Σ	%	Σ	%	Σ	%	Σ	%	Σ	%
1	Central Government	3	42.86	3	30.00	3	25.00	3	27.27	7	43.75	3	23.08
2	Provincial Government	3	42.86	6	60.00	8	66.67	7	63.64	8	50.00	9	69.23
3	CF	1	14.29	1	10.00	1	8.33	1	9.09	1	6.25	1	7.69
4	Others	0	-	0	-	0	-	0	-	0	-	0	-
	TOTAL	7	100.00	10	100.00	12	100.00	11	100.00	16	100.00	13	100.00
No.	Types	714		715		716		717		718		Average	
		Σ	%	Σ	%	Σ	%	Σ	%	Σ	%	Σ	%
1	Central Government	3	33.33	3	27.27	3	30.00	3	42.86	3	42.86	3.36	32.74
2	Provincial Government	5	55.56	7	63.64	6	60.00	3	42.86	3	42.86	5.91	57.52
3	CF	1	11.11	1	9.09	1	10.00	1	14.29	1	14.29	1.00	9.73
4	Others	0	-	0	-	0	-	0	-	0	-	-	-
	TOTAL	9	100.00	11	100.00	10	100.00	7	100.00	7	100.00	10.27	100.00

Although it has been differentiated between the central and the provincial government, essentially the commission is still highly dominated by government representatives. There is only one person representing the non-government interests on the commission; the commercial fishing association representative as the Consultative Panel coordinator. Therefore, it is highly unlikely for the commission to meet one of the requirements for performing fisheries co-management; equity.

According to Hanna (1996), equity is one of the outcomes for evaluating fisheries-co-management performance. The extent that resources users and other stakeholders are represented is one of the elements for measuring equity outcomes. Unfortunately, although it can be considered as the simplest measurement, the FMC-IFMA tentatively fails to meet this objective. Broader stakeholder participation has not been accommodated yet, particularly those representing the industry and other interests

In addition, it is also necessary to be alerted to the potential impacts caused by the domination of a specific stakeholders' interests in a co-management forum. First, the failure to bring diverse points of view into the discussion and the decision-making process (Eagle *et al.* 2003). Second, the resulting policies may only benefit the dominant stakeholders (Dell'Apa *et al.* 2012).

During the field observations, several interesting findings and perspectives were garnered from the short-interviews with industry representatives. Interestingly, several government representatives interviewed during the study were less aware of these collected findings. For instance, even some field officials in Nizam Zachman Oceanic Fishing Port (NZOFP) and in the headquarters of MMAF were surprised when informed about the dimensions and the price of Fish Aggregating Devices (FAD) used by Big Pelagic Purse Seine based in the Jakarta fishing port.

Another example is attributed to the distinct point of view of the industry concerning transshipment at sea. While most of the government officials consider the transshipment prohibition as an effort to deter IUU fishing and to improve data collection, the industry views this mechanism not only to overcome the increased fishing operational costs but also for preserving the quality of fresh caught tuna.

Diverse perspectives are absolutely required to resolve the escalating problems in Indonesian marine fisheries management. The potential social unrest ignited by the increased fishing fee tariff and fishing gear conflict is one of the potential latent problems. Other problems that may also evoke social unrest are the prohibition of certain types of fishing gear, fishing access limitation, and horizontal territorial conflicts ignited by migrant fishers. In addition, the downsized fishing vessels and poor data

collection still continuously disrupt the evaluation of the marine fisheries utilization. Eventually, it is also necessary to include the conservationists' point of view regarding future management measures that shall be taken for ensuring sustainability.

Unfortunately, due to very small representation from the other interests on the commission, this paper argues that the existing condition of the FMC-IFMA will not be able to contribute more in resolving the problems mentioned earlier. Without significant alteration of the membership apportionment, it is likely that only minor or even unimportant changes can result from the commission in the near future

However, it also necessary to notice that the addition of FMC-IFMA members representing the industry must not decrease or eliminate the existing members, particularly those representing constituent provinces. Strengthening the previous finding (Chapter VII.3), an amendment and reinforcement of the existing legal base (the DG decree) are absolutely required to make this new concept, the marine fisheries federalism, works.

VII.6. The Stakeholders Attitude on the establishment of FMC-IFMA

The investigation of stakeholders' attitudes regarding the establishment of the Fisheries Management Commission in Indonesia Fisheries Management Area (FMC-IFMA) was conducted on four aspects; *the familiarity level*, *the support level*, *the representativeness level*, and *the comparison level* (Appendix 2 and 3). The first one measures the extent of stakeholders' knowledge of or familiarity with this newly established regional institution. The second question investigates the support level, or the resistance level from stakeholders concerning the formation of FMC-IFMA. The

third question investigates the stakeholders' attitudes towards the existing FMC-IFMA membership apportionment. The last one investigates stakeholders' attitudes comparing the potential FMC-IFMA performance with the existing system.

Similar to the analysis of the revocation of the municipality/regency authority (Chapter VI.3), the analysis in this chapter also excludes the skipper/crew representatives. Unwillingness to answer due to their unfamiliarity with the context of the questions asked and the respondents' educational background are the underlying reasons for the exclusion. This unwillingness is also attributed to the nature of issues that, in their opinion, are beyond their knowledge and capacity. As described in Chapter VI.3, this situation is related to the skippers'/crews' educational level. Moreover, they view this issue as the government's internal problem that has no impact on their daily activities. Consequently, similar to the Chapter VI.3., the investigation of the stakeholders' attitude on the establishment of FMC-IFMA was only conducted on 8 types of the stakeholders.

Like the previous two investigations, the Kruskal-Wallis test for four questions investigating the FMC-IFMA establishment rejects the null hypothesis (Table 22). This means that the collected samples are not from an identical population, and at least one group of stakeholders has a different mean for their answers (Table 22). Meanwhile, as ordinal data, the Central Tendency of the stakeholders' responses is measured by their median (Table 23).

Table 22. The Kruskal-Wallis test for the collected samples on the FMC-IFMA establishment

	Q7 Familiarity Level	Q8 Support Level	Q9 Representativeness Level	Q10 Comparison Level
Chi-Square	41.366	46.556	29.057	40.947
df	7	7	7	7
Asymp. Sig.	0.000	0.000	0.000	0.000

a. Kruskal Wallis Test

b. Grouping Variable: Stakeholders

Table 23. The Median of the collected samples on the FMC-IFMA establishment

Stakeholders	Q7 Familiarity Level	Q8 Support Level	Q9 Representativeness Level	Q10 Comparison Level
Central Govt.	4.0	4.0	4.0	4.0
Fishing Port	3.0	5.0	4.0	4.0
Provincial Govt.	3.0	5.0	4.0	4.0
Regency Govt.	2.0	4.0	4.0	4.0
Crews				
Industry	2.0	3.0	3.0	3.0
Association	3.5	4.0	4.0	4.0
NGO	3.0	5.0	4.0	4.0
Academia Research	4.0	4.0	4.0	4.0
Total	3.0	4.0	4.0	4.0

Notes:

Likert Score	Q7 Familiarity Level	Q8 Support Level	Q9 Representativeness Level	Q10 Comparison Level
1	Not at all Familiar	Strongly Oppose	Extremely Unlikely	Much Worse
2	Slightly Familiar	Somewhat Oppose	Unlikely	Somewhat Worse
3	Somewhat Familiar	Neutral	Neutral	About the Same
4	Moderately Familiar	Somewhat Favor	Likely	Somewhat Better
5	Extremely Familiar	Strongly Favor	Extremely Likely	Much Better

VII.6.1. Level of Familiarity

For level of familiarity, five groups of stakeholders exhibited moderate positive attitudes (Table 23). Their median values are larger than 3 (somewhat familiar) on the 5-point Likert type measurement. The exception occurs with the municipality/regency and the industry (fishing vessel owners and fishing company representatives). Their

median values indicate slight familiarity (or less) with the establishment of the FMC-IFMA.

The results also indicate that information regarding the formation of the FMC-IFMA has not been disseminated optimally, particularly to the industry (vessel owners). This can be seen from the gap in the median value between the commercial fishing associations and the fishing vessel owners they represent. Therefore, it can be assumed that the associations invited to dissemination sessions did not spread the information regarding the FMC-IFMA to their members.

Other types of stakeholders having a negative value (less than 3) on the familiarity level are the municipality/regency representatives. Most likely this was caused by their non-engagement in the FMC-IFMA. As previously explained (Chapter VII.5), this regional fisheries institution only involves representatives from the provincial level.

In addition to the Central Tendency measurement of stakeholders' attitudes, the boxplot portrays the distribution range of their collected responses (Figure 32). Similar to the Central Tendency, 5 groups of stakeholders have the same distribution range. The exception also occurs in the answers collected from the municipality/regency and the industry representatives. Their collected responses range between 1 and 2 on the Likert-scale, considered as negative attitudes in terms of their familiarity with establishment of the FMC-IFMA.

Meanwhile, the dispersed responses from 5 types of stakeholders ranged between 2 and 4 (Fig.32). This means that although their median values represent a

positive attitude (score higher than 3), there are parts of these groups still having little knowledge of the establishment of the FMC-IFMA.

*Notes:
Y-axis = Likert Scale (1 to 5)
X-axis = Types of Respondents
Number = Outliers (marked by respondent number)
Bold line in bar = Median

Figure 32. Boxplot of the Familiarity Level for the FMC-IFMA establishment

To support analysis of the central tendency (the median) and the range of the collected answers, it is also necessary to observe the composition of the collected responses from each type of stakeholder (Fig.33). This graph portrays the declining trend of positive attitudes (score 4 and 5) collected from the government representatives. Positive attitudes decline as distance from Jakarta increases. This situation supports the previous statement concerning the flawed dissemination of information on the FMC-IFMA.

Figure 33. Sample Distribution of the Familiarity Level for the establishment of the FMC-IFMA

Figure 33 also shows the magnitude of negative responses from the two types of stakeholders having the least knowledge of establishment of the FMC-IFMA. Here 82% of the answers from municipality/regency representatives have negative attitudes (scores 1 and 2). These values indicate no familiarity and slight familiarity with the

FMC-IFMA. The industry representatives occupy second place with 79% [having negative attitude].

Interestingly, half of the collected answers (50%) from the commercial fishing associations represent positive attitudes (score 4 and 5). The value is more than two-times of positive responses collected from the vessel owners that they are representing. This indicates their moderate to extreme familiarity with the existence of FMC-IFMA. Similar to the findings derived from the Central Tendency (Table 23) and the boxplot (Fig.32), apparently dissemination of information stops at the association level. This also indicates institutional failure of commercial fishing associations to communicate with their members. Therefore, in the future, it will be necessary to directly invite vessel owners to dissemination fora to inform them of new regulations or policies pertinent to their business.

VII.6.2. Level of Support

Interestingly, regardless of their level of familiarity, the Central Tendency for the level of support indicates positive attitudes (Table 23). Except for the industry representatives, the median of answers from all stakeholders indicates a moderate to a strong support (score 4 and 5) for the FMC-FMA formation. Strong support (score 5) comes from the fishing ports, provincial governments, and NGO representatives. Meanwhile, the central government along with the municipality/regency, commercial fishing association, and academia representatives display moderate support (score 4). The industry (vessel owners and fishing company representatives) is the only stakeholder having a neutral attitude (score 3).

Unlike level of familiarity, stakeholders' level of support is more narrowly concentrated on the Likert-scale spectrum (Fig.34). The central government, the fishing ports, provincial governments, and the commercial fishing associations have identical distribution ranges for their answers. However, both the fishing ports and the provincial government representatives have higher 'mean' (score 5); represented by the bolder line. These results are identical with their Central Tendency (Median).

**Notes:*

Y-axis = Likert Scale (1 to 5)

X-axis = Types of Respondents

Number = Outliers (marked by respondent number)

Bold line in bar = Median

Figure 34. Boxplot of the Support Level for the establishment of the FMC-IFMA

The strong support from these 2 types of stakeholders is attributed to their direct involvement in the FMC-IFMA. As described in the discussion of membership

apportionment (Chapter VII.5), the provincial government representatives and the head of the fishing port are the core members of the relevant commission. Most importantly, the head of the fishing port acts as the executive coordinator in each FMC-IFMA.

The most concentrated distribution of answers occurs with the NGOs representatives. This indicates the accumulation of strong support from NGOs regarding the formation of the commission. Once again, this strengthens the previous result derived from their median value. In contrast, the most dispersed answers occur with the municipality/regency representatives. Their answers range from a neutral attitude (score 3) to a strong positive attitude, or strong support (score 5). Most likely this result was correlated with their lower familiarity and their non-involvement in the commission.

The institution (FMC-IFMA *ed) endorses the more integrated
(Indonesia *ed) marine fisheries governance.
(Anonymous, 43 years old, International NGO)

Although rather complicated, the FMC-IFMA provides us the
opportunity to re-design the FKPPS (the communicating forum
*ed), and to ‘control’ the provinces.
(Anonymous, 44 years old, Sundanese, Deputy Director for
Fisheries Management in IEEZ, DGCF-MMAF)

Group	Stakeholders	Group	Stakeholders	Group	Stakeholders
1.	Central Govt	4.	Regency Govt	7.	Association
2.	Fishing Port	5.	Crews/Skipppers	8.	NGO
3.	Provincial Govt	6.	Industry (Owners)	9.	Academia Research

Notes

Scale	Color	Color	Interpretation
1	Blue	Blue	Strongly Oppose
2	Green	Green	Somewhat Oppose
3	Grey	Grey	Neutral
4	Purple	Purple	Somewhat Favor
5	Yellow	Yellow	Strongly Favor

Figure 35. Sample Distribution of the Support Level for the FMC-IFMA establishment

The composition of the responses (Fig.35) strengthens two previous findings derived from the median value and the distribution range analysis. Here NGOs have the highest level of positive attitudes with 95%, consisting of 75% strong support (score 5) and 20% moderate support (score 4). Surprisingly, the commercial fishing associations have the second highest level of positive responses. However, moderate support (score 4) dominates (58%) over strong support (33%).

Meanwhile, as predicted, another high level of strong support is reflected in the responses from the fishing ports and the provincial government representatives. Their strong support percentages (Score 5) are 56% and 55% respectively. These values outnumber the strong support responses from their counterparts working in the HQ of MMAF. Once again, it is argued that this result is caused by their direct involvement in the commission. In contrast, neutral responses dominate (62%) the answers from industry representatives, indicating a significant difference from the associations representing them.

VII.6.3. Level of Representativeness

This section investigates the stakeholders' attitudes regarding the representativeness of the FMC-IFMA membership apportionment. The question is asking whether the membership apportionment has represented Indonesian marine fisheries stakeholders. The Central Tendency (the median) values are almost identical (Table 23). Once again, except for the industry (vessel owners) representatives, all stakeholders have identical median value (score 4). This means that most of them thought that the existing membership apportionment does indeed represent the marine fisheries stakeholders in Indonesia.

**Notes:*

Y-axis = Likert Scale (1 to 5)

X-axis = Types of Respondents

Number = Outliers (marked by respondent number)

Bold line in bar = Median

Figure 36. Boxplot of the Likelihood Level for the FMC-IFMA membership apportionment

Although the boxplot shows a slightly wider distribution range, the ‘mean’ of the answers reflects identical values (Fig.36). Except for the industry representatives, the mean values from the stakeholders’ responses are 4 (the bold line located at the center of each bar). Similar to the Central Tendency analysis, this means that most of the stakeholders assume that the existing membership apportionment does represent them.

The municipality/regency, industry, and academia have more concentrated responses compared to the other types of stakeholders. However, their mean values (the bold line) are different. Both the municipality/regency and academia have moderately

positive attitudes on FMC-IFMA membership apportionment, leaving the industry as the only stakeholder having a neutral attitude,

Group	Stakeholders	Group	Stakeholders	Group	Stakeholders
1.	Central Govt	4.	Regency Govt	7.	Association
2.	Fishing Port	5.	Crews/Skippers	8.	NGO
3.	Provincial Govt	6.	Industry (Owners)	9.	Academia Research

Notes

Scale	Color	Color	Interpretation
1	Blue	Blue	Extremely Unlikely
2	Green	Green	Unlikely
3	Grey	Grey	Neutral
4	Purple	Purple	Likely
5	Yellow	Yellow	Extremely Likely

Figure 37. Sample Distribution of the Likelihood Level for the FMC-IFMA membership apportionment

Similar to the results from the investigation of the level of support, the composition of the responses (Fig.37) strengthens two previous findings derived from the median value and the distribution range. This time the NGOs share their position as the stakeholder having the highest positive attitudes (accumulation of score 4 and 5) with the provincial governments. Their levels of positive attitudes are identical; 75%. However, the highest composition for the strongest positive attitudes (score 5) are collected from the fishing port representatives. Nearly half of them (47 %) assume that the existing FMC-IFMA membership apportionment is extremely likely to represent the Indonesian marine fisheries stakeholders. Not surprisingly, this value is followed by the provincial government representatives. Most likely, both of them are satisfied enough with the existing commission membership apportionment.

The smallest positive attitude is expressed by the industry representatives. A neutral attitude dominates (57%) their responses. Two hypotheses emerge regarding this result. First, the industry does not really care about the formation of the new regional institution. As with the skippers and the crews, the vessel owners consider this issue as an internal governmental affair. Thus, they selected the neutral choice on the Likert-scale as a reflection of their ignorance, or their disinterest. Second, the industry actually is not satisfied with the existing apportionment as they are only represented by one person in each commission. However, as typical Indonesians, they keep their disagreement silent. Referring to their gestures 'recorded' during the short interviews, and with the addition from the author's personal experience, apparently the first possibility tends to be true.

VII.6.4. Level of Comparison

This section investigates the stakeholders' views comparing the future performance of the FMC-IFMA with the previous system. The term 'the previous system' refers to the status quo situation in which marine fisheries governance runs as usual without the existence of the regional fisheries institution. Here, the most positive attitude is represented by the belief that the existence of FMC-IFMA will create much better marine fisheries governance. In contrast, an assessment of a much worse condition constitutes the most negative attitude.

The median values of the responses from each stakeholder type are identical with the previous investigation assessing the representativeness level of the FMC-IFMA membership apportionment (Table 23). Except for the industry representatives having a neutral attitude (score 3), the other types of stakeholders have identical median values (score 4). This means that they believe FMC-IFMA will generate slightly better conditions than the previous system. This also indicates an optimistic outlook for the future performance of FMC-IFMA. In contrast, the consistency of the industry representatives' attitudes strengthens the previous argument concerning their disinterest on the 'government's internal affair' (Chapter VII.6.3).

Compared to the previous investigations, the distribution ranges of the responses are narrower. The respondents' answers are more concentrated in a specific portion of the Likert-scale spectrum. In fact, the answers from the provincial governments and academia representatives are accumulating in one point; the score of 4 (Fig.38). Meanwhile, the responses from the central government, the fishing ports, and the NGOs range between scores 4 and 5. All of them have an identical 'mean' value (score 4).

Identical mean values also occur for the municipality/regency and the commercial fishing associations. However, the distribution of their answers ranges between 3 and 4, (the same as with the industry). A distinction occurs in the mean value as the industry maintains a neutral attitude (score 3).

The repeating median value and distribution range from the industry representatives provide stronger evidence to strengthen the previous argument; essentially the industry (the vessel owners) have little or no attention focused on the FMC-IFMA. In this case, the industry believes that the commission will have no impact for Indonesian marine fisheries governance. For them, the situation will remain the same. Most likely this result is attributable to the low level of effort by the DGCF-MMAF to disseminate information concerning the formation of the FMC-IFMA.

**Notes:*

Y-axis = *Likert Scale (1 to 5)*

X-axis = *Types of Respondents*

Number = *Outliers (marked by respondent number)*

Bold line in bar = *Median*

Figure 38. Boxplot of the Comparison Level for the FMC-IFMA existence

In summary, all stakeholders except the industry indicate an optimistic attitude concerning the potential performance of the FMC-IFMA. Five of them exhibit a sum of positive attitude scores exceeding 80% of their responses (Fig.39). These are the central government, the fishing ports, the provincial governments, the NGOs and academia. Not surprisingly, these are the types of stakeholders represented in the commission membership.

FMC-IFMA will improve data collection, provide better monitoring system. Moreover, it will also function as the 'watching' forum where the provinces will keep an eye on each other in regard to the fishing allocation.

(Anonymous, 41 years old, Sundanese, Assistant Deputy Director for fishing licensing services, MMAF)

The commission (FMC-IFMA *ed) will make the provinces to race in improving their data.

(Anonymous, 43 years old, Javanese, Head of Fishing Port Deputy for Port Development, Nizam Zachman Oceanic Fishing Port, Jakarta)

In contrast, among the governmental stakeholders, the municipality/regency has the lowest positive attitude. Most likely this was caused by their exclusion from the FMC-IFMA. However, the sum of their positive attitudes still greatly exceeds the negative scores. The range is almost similar to composition of the answers from the commercial fishing associations.

Group	Stakeholders	Group	Stakeholders	Group	Stakeholders
1.	Central Govt	4.	Regency Govt	7.	Association
2.	Fishing Port	5.	Crews/Skippers	8.	NGO
3.	Provincial Govt	6.	Industry (Owners)	9.	Academia Research

Notes

Scale	Color	Color	Interpretation
1	Blue	Blue	Much Worse
2	Green	Green	Somewhat Worse
3	Grey	Grey	About the Same
4	Purple	Purple	Somewhat Better
5	Yellow	Yellow	Much Better

Figure 39. Sample Distribution of the Comparison Level for the FMC-IFMA existence

Figure 39 also portrays the dominance of neutral responses from the industry representatives; 59% of the total answers. This means that more than half of the industry representatives believe that the situation will remain the same regardless of the existence of the FMC-IFMA. Furthermore, this result, once again, strengthens the argument that the industry is paying little or no attention to the establishment of the FMC-IFMA. As

previously mentioned, this paper argues that this situation was caused by poor dissemination of information to the industry that should have been performed by the DGCF-MMAF.

CHAPTER VIII

CONCLUSIONS AND RECOMMENDATIONS

VIII.1. Conclusions

VIII.1.1. Increased Fishing Fee Tariff

The analysis of the policy impacts and the investigations of the stakeholders' attitudes produced several interesting findings. First, as easily predicted, the escalated fishing fee tariff generates a positive impact on the national revenues from the fisheries sector. Not only does it increase the national revenue, it also successfully liberates Indonesia from her dependency on (ex)-foreign fishing vessels and the more destructive fishing gears that previously had been the primary contributors to the State income.

Interestingly, the number of registered fishing vessels also increases. This result is in contrast to the classic hypothesis positing a negative correlation between an increased fishing fee tariff and the number of registered fishing vessels; the fishery bioeconomic model (Gordon 1954, Schaefer 1957). However, it is crucial to underscore that this result is mostly caused by other circumstances and other policies enforced over the same period of time: the increasing price of the landed catch and the enforcement of re-registration of previously downsized vessels.

Another interesting finding related to the new fishing fee tariff authorization occurs in the composition of the Nationally Registered Fishing Vessels (NRFV). Although experiencing the highest percentage increase in the fishing fee (741.33 - 767.49%), the number of registered Squid Jigging vessels increases; doubling in two respective years (2016 and 2017). Once again, this result was also affected by other

factors: the declining catch of the tuna longline fleet and the operational characteristics of the relevant fishing gear.

In regard to the contribution of the fishing fee component of fishing operational costs (FOC), this paper concludes that it represents a relatively small portion compared to the primary variable cost-- fuel expenditures. The expenditure for the fishing fee ranges between 3.1% and 9.2%. The percentage of total FOC represented by the fishing fee component is highest for Big Pelagic Purse Seine (BPPS) targeting skipjack (*Katsuwonus* sp) and operating in IFMA 571 and 572, ranging from 8.1% to 9.2%.

Although experiencing a smaller increase in the fishing fee compared to the increase for squid jigging, tuna longline should be considered as the most negatively affected fishing gear. As the type of fishing gear having the largest FOC, a four-fold increase (437.4%) generates more impact than the one experienced by squid jigging. This situation is worsened due to the doubling of the average FOC occurring between 2014 and 2018.

Predicted results also emerge from the investigation of the stakeholders' attitudes. Among nine types stakeholders questioned, the respondents representing the vessel owners and the skippers consistently convey their negative attitudes (Score 1 and 2 in the Likert-Scale) for three investigated aspects; the level of agreement, the level of acceptability, and the level of support. The analysis also indicates the positive correlation among the investigated attitudes. Those having strong positive attitude on the level of agreement strongly accept and support the policy.

Three reasons underlying the positive attitudes towards the increased fishing fee tariff are the positive impact on the national fisheries revenues, the time period for the

old tariff stagnancy, and the awareness of preserving publicly-owned resources. In addition, the proponents of the increased tariff also believe that the escalated fishing fee still can be covered by the industry and is relatively small compared to the other variable costs of a fishing operation.

The analysis also discovered weakening positive attitudes among government representatives, correlated to an increasing distance from the center of administration; Jakarta. Most likely it was caused by the reduced fiscal impact for the concerned regions. In addition, the work location also slightly affects the attitude of the government stakeholders. Regardless of their status as central government employees, the fishing port officials interacting daily with the industry have more concern and empathy concerning the increased fishing fee than their counterparts working in the headquarters of the Ministry of Marine Affairs and Fisheries (MMAF).

VIII.1.2. Municipality/Regency Authority Revocation

This paper summarizes six emerging problems which were considered as the reasons for revoking the municipality/regency authority and maritime jurisdiction. These encompass poor quality of data collection, weak law enforcement, rent-seeking behavior, the horizontal conflict caused by migrant fishers, the long and complicated bureaucracy, and economic inefficiency. Unfortunately, the last one, economic inefficiency, still exists as the direct impact resulting from the authorization of the Law No.23 of 2014. As fishing licensing services for the 5-10 GT boats are transferred to the provincial governments, it generates additional costs both for the industry and the

government, particularly in the less developed regions of the eastern part of Indonesia where online services have not worked optimally

The transfer of authority also evokes another potential problem. The provinces will be overwhelmed trying to manage their expanded maritime jurisdiction not to mention the added fishing fleet. Generally, the potential number of managed fishing boats (5-30 GT) is doubling. However, a much larger impact will be experienced by the more populated provinces. For instance, the number of additional fishing boats in the West Java province increases by 77 times over the previous fleet.

The third impact consists of job reassignments for the municipality/regency officials previously dealing with fisheries management. To cope with this situation, most of the municipality/regency fisheries agencies have been restructuring their institution and re-posting their staff. While some provincial agencies have not yet adjusted, many municipalities and regencies have discontinued their services to fishermen. Consequently, this situation caused temporary confusion among the neglected fishers in some regions.

The last direct impact is the irrelevancy of the distribution formula for national fisheries revenues stipulated by Article 14 d of the Law No.33 of 2004. Referring to the fishing ground locations of the charged fishing vessels and the revocation of the municipality/regency maritime jurisdiction, the sharing revenues should have been allocated only to two levels of administration; the central and the provincial governments. Another aspect to this impact is the insufficient funding of the provincial governments in managing the additional boats transferred from their municipalities and

regencies. Further explanation regarding this issue, including a proposed proportional distribution, will be discussed in the recommendation section (Chapter VIII.2).

Similar to the increased fishing fee tariff, the predicted results also occurred in the investigation of the stakeholders' attitudes towards the revocation of the municipality/regency authority. As the most negatively affected stakeholder, the municipality/regency representatives were the only group of respondents who consistently conveyed their negative attitudes on the three aspects investigated. In contrast, although regarded as the most benefited stakeholder, the provincial representatives have a dispersed and divided attitude resulting in a neutral score (3) on the Likert-Scale.

This paper argues that the negative attitudes conveyed by nearly half of the provincial representatives were caused by their awareness concerning the job reassignments, mostly without the extra budget support. In other words, half of the provincial respondents expressed a pessimistic outlook: the provinces being overwhelmed by their expanded authority and maritime jurisdiction.

In addition to the positive correlation between the three aspects examined, where the median values were almost identical, the investigation also discovered the slightly declining negative attitudes of the municipality/regency representatives. Regardless of their strong disagreement and their strong unacceptability, eventually the municipality/regency representatives' attitudes were slightly softening in their level of support, or resistance. Most likely this was caused by the binding power of the authorizing regulation; the third highest rank in the Indonesia law hierarchy

VIII.1.3. Establishment of the Fisheries Management Commission in Indonesian Fisheries Management Area

Theoretically the FMC-IFMA has met three favorable conditions (Pinkerton 1989) for performing fisheries co-management. Despite its weak binding power, a long-term legally formalized arrangement exists in the form of the DG decree assigning the task, the function, and the membership apportionment of the commission. The appointment of academia and NGO representatives in the commission panels indicates partial external support. Subsequently, the domination of the government representatives both from the central and provincial administrations affirms the existence of experienced bureaucrats as the third favorable condition.

However, it is also necessary to summarize several shortcomings of the FMC-IFMA as currently implemented. First, direct fishermen engagement is highly limited. Only one representative is incorporated into the core commission; the commercial fishing association acting as the consultative panel coordinator. Unfortunately, as of the end of data collection for this study, the consultative panel in each FMC-IFMA had not yet been formed.

According to Jentoft (1989), the level of user involvement in the decision-making process is one of the factors affecting the legitimacy of a regulatory scheme. In addition, it is also one of the principles for successful common-property resources (CPR) management (Ostrom 1990). Moreover, the investigation of stakeholder attitudes indicated an institutional failure where commercial fishing associations as official representatives of vessel owners failed to disseminate the information to their members.

Second, as previously mentioned, the legal base authorizing formation of the commission is not strong enough to bind the commission members, particularly the provincial officials dominating the core of the commission in each FMC-IFMA.

Third, the vague description of the task and function of the commission led to wide-open interpretation. As a result, this paper presumes that the FMC-IFMA merely acts as the evaluator or the analyst of the fisheries management performance in their jurisdiction.

In addition, the task assigned to the commission is only the first stage of the decision-making process. Therefore, tentatively the commission's existence fails to reduce the long and complicated bureaucratic process as one of the classical problems in Indonesian marine fisheries governance. Consequently, it is hard to expect that in the foreseeable future the commission will work effectively in resolving escalated fisheries issues.

Referring to the commission's job descriptions and the engagement level of the involved stakeholders, particularly the industry representative, this paper classifies the FMC-IFMA on a spectrum located in between the Type A (Instructive) and Type B (Consultative) of Sen and Nielsen's (1996) fisheries co-management typology. Thus, the government representatives tend to dominate the co-management activities. Therefore, although initially intended to feature a bottom-up approach, the commission fails to meet the objective mandated by the Presidential Regulation concerning the Middle-Term National Development Plan for the 2015-2019 period. The failure is attributed to a lack of broad stakeholder participation, particularly by the industry.

The study also found problems that impeded the operationalization of the commission. In addition to the weak authorizing law, budget constraints also hamper the commission's performance. These insufficient operating budgets are attributed to the priority placed on fisheries development focused on infrastructure projects such as fishing port construction, the Management Information System (MIS) development, and fishing boat procurement. Furthermore, the poor dissemination of information also inhibits the operationalization of the commission's panels.

Despite diverse familiarity levels, the establishment of the FMC-IFMA essentially results in positive stakeholder attitudes. Except for the industry representatives, all types of stakeholders indicated their positive attitudes at the support level, the representative level, and the comparison level. On average, the stakeholders exhibit moderate support (Score 4) for the FMC-IFMA formation. Subsequently, they also indicate that the existing membership apportionment scheme represents them. Finally, the responses indicate optimistic assessments of the potential future performance of the FMC-IFMA. In this case, they believe that the FMC-IFMA has the potential to improve the quality of data collection due to the involvement of the provincial governments in the commission.

The industry representatives were the only stakeholder group conveying a neutral attitude (score 3). Two hypotheses were developed from the repeating median values and the distribution range of the responses from the industry representatives. First, the industry is not really concerned with the FMC-IFMA formation. Second, they are disappointed with the very limited representation in the apportionment of the commission membership. Referring to their expressions garnered during the field data

collection, this paper argues that the first hypothesis as the primary reason. Most likely this resulted from the flawed dissemination of information performed by the DGCF as the responsible agency for the FMC-IFMA operationalization.

VIII.2. Recommendations

Following the conclusions described above, this paper offers several recommendations. These recommendations were developed by combining the results of the policy analyses conducted. First, drawing from the positive trend of the national fisheries revenues resulting from the increased fishing fee tariff and the expanded authority and maritime jurisdiction of the provincial governments, this paper recommends amending of the distribution formula for the Revenue Sharing Fund (RSF). Particularly the formula assigning the sharing mechanism to the local governments; article 14 d of Law No.33 of 2004.

The amended formula should apply the derivation basis leading to a proportional distribution of the RSF. The exploitation level estimated from the number of permitted Nationally Registered Fishing Vessels (NRFV) in each Fisheries Management Area (FMA) can be set as the benchmark for this proportional distribution. Subsequently, the sharing fund allocated to each FMA should also be distributed proportionally to the constituent provinces based on their registered managed fishing boats (10-30). This proposed formula is expected to encourage the provinces to improve the commercial fishing licensing data in their maritime jurisdiction.

This study also argues that the municipality/regency shall be excluded from the proposed funding formula. The argument is made based on recognition of the source of

the potential sharing fund, and the absence of municipality/regency authority and maritime jurisdiction as a result of the recent reforms. More thorough and focused study is required to assess the possibility of implementing the proposed formula, specifically comparing the potential fiscal benefits with the existing formula.

Second, in regard to the weak binding power of the existing regulation authorizing the FMC-IFMA formation, this paper recommends reinforcement of the legal base. This action should be executed immediately. It is unnecessary to wait until the existing commissions are fully operational. In the short term, the establishment and the membership apportionment of the FMC-IFMA should be mandated by the ministerial decree. Subsequently, it should also be incorporated into a potential amendment of the national law concerning fisheries. The political year of 2019 provides an appropriate moment for amending the law. Referring to the formation of the US Regional Fishery Management Council (RFMC) system, a sturdy legal base is absolutely required to make the regional institutions perform properly.

The last recommendation concerns the FMC-IFMA membership apportionment. This paper recommends more diversified commission members, particularly by adding more representatives from the industry. The highly restricted engagement from the industry representative not only leads to a failure in bringing diverse points of view into the discussion and the decision-making process (Eagle *et al.* 2003) but is also most likely to benefit the dominant stakeholder (Dell'Apa *et al.* 2012). In this case, the dominant point of view in FMC-IFMA discussions will be easily predictable. Contrary to Eagle *et al.* (2003) and Dell'Apa *et al.* (2012), the discussion may only endorse

government interests. The results garnered during the field observations, including attendance at several national meetings, support these two arguments.

This paper proposes at least two commercial fishing associations should be seated on each commission based on the type of dominant fishing gear operating in the concerned area. Not only would this empower the resource users, but this recommendation also has the potential to balance the point of view at the FMC-IFMA. For instance, both the Indonesia Tuna Association (ASTUIN and ATLI) and the Indonesia Purse Seine Association (HNPN) should be represented on the commission in FMC-IFMA 571 and 572, where their members share the fishing grounds. The more balanced and diverse points of view that can be brought into the discussion for resolving potential conflicts, and to debate the future management measures, the better the entire system will function. Indonesia should start to involve non-governmental stakeholders in governing one of her natural resources, and the FMC-IFMA provides this opportunity.

Appendices

Appendix 1. Location of the Study

Appendix 2. The Questionnaires (Bahasa Indonesia version)

IRB NUMBER: HU1718-172
IRB APPROVAL DATE: May 1, 2018
IRB EXPIRATION DATE: May 1, 2019

Survey Persepsi Pemangku Kepentingan (*Stakeholders*)

Penjelasan Singkat

Tujuan dari survey ini adalah untuk mengidentifikasi persepsi para pemangku kepentingan (*stakeholders*) terhadap pelaksanaan Federalisasi Pengelolaan Perikanan Tangkap sebagai salah satu bentuk pengelolaan bersama (*co-management*) sumberdaya ikan di Indonesia.

Survey ini terdiri dari pertanyaan-pertanyaan yang berkaitan dengan Sikap (*Attitude*) yang akan diambil atau dipilih oleh para pemangku kepentingan (*stakeholders*) terhadap dampak kebijakan yang dihasilkan dari pemberlakuan 3 regulasi baru yang ditetapkan pada periode 2014-2015.

Dampak kebijakan tersebut adalah:

- 1) Kenaikan Pungutan Perikanan (PPP dan PHP) yang sangat signifikan,
- 2) Penghapusan/pencabutan kewenangan pemerintah kabupaten/kota dalam pengelolaan perikanan di wilayah perairan 0-4 mil laut, dan
- 3) Pembentukan Komisi Pengelolaan Perikanan (KPP) di masing-masing Wilayah Pengelolaan Perikanan Negara Republik Indonesia (WPP-NRI).

Instruksi

Mohon untuk menjawab setiap pertanyaan di lembar kuisisioner dengan memilih (menconteng) ***salah satu*** kotak pilihan jawaban yang tersedia di bawah masing-masing pertanyaan yang diajukan. Diperkirakan survey ini akan berlangsung selama ***15-30*** menit. Kami sangat mengapresiasi kesediaan dan kerjasama bapak/ibu sekalian atas partisipasinya di kuisisioner ini.

Pertimbangan Etika

Kuisisioner ini hanya diberikan kepada responden dewasa yang berusia lebih dari 18 tahun. Kuisisioner ini **Tidak** membedakan responden berdasarkan jenis kelamin (*gender*), kesukuan/ras/etnik, agama, status kehamilan, bahasa, tingkat pendidikan, dan/atau status finansial. Sangat kecil kemungkinan bahwa setiap responden akan mengalami gangguan fisik, psikologis, sosial, hukum, dan atau ekonomi sebagai dampak dan akibat dari partisipasi di kuisisioner ini.

Selama survey berlangsung, responden disarankan untuk memahami hak yang diberikan kepadanya. Sangat disarankan agar setiap responden untuk mengajukan pertanyaan lebih lanjut dan lebih mendalam terkait pelaksanaan penelitian ini.

Penelitian saya sangat menghargai keamanan dan kenyamanan (*privacy*) para responden. Jawaban para responden di kuisisioner ini bersifat rahasia (*confidential*). Transkrip dari kuisisioner ini akan dijaga sepenuhnya oleh saya selaku peneliti, dan hanya saya selaku peneliti yang mempunyai akses terhadap transkrip data kuisisioner ini.

Data yang dikumpulkan akan disimpan di dalam basis data (*data base*) di sebuah folder khusus dengan kata sandi (*password*) rahasia yang hanya diketahui oleh saya selaku peneliti. Folder tersebut akan disimpan di dalam *hard drive* and *external hard disk* yang berada di Ruang 115 Coastal Institute, the University of Rhode Island (URI) di negara bagian Rhode Island, Amerika Serikat.

Informasi Responden

Institusi :

Nama :

(Silahkan dipilih berdasarkan tabel klasifikasi di bawah ini)

No.	Jenis Pemangku Kepentingan (Types of Stakeholder)	Conteng (√) kolom di bawah ini
1.	PNS di Kantor Pusat Kementerian Kelautan dan Perikanan Republik Indonesia (KKP-RI), Jakarta	
2.	PNS KKP-RI yang ditugaskan di luar kantor pusat (Contoh: Kepala dan atau pegawai pelabuhan perikanan UPT Pusat)	
3.	PNS dari Pemerintah Propinsi	
4.	PNS dari Pemerintah Kabupaten/Kota	
5.	Nakhoda dan atau ABK Kapal Ikan	
6.	Pemilik Kapal Perikanan dan atau perwakilan perusahaan penangkapan ikan	
7.	Asosiasi Perikanan/Himpunan Nelayan/Kelompok Usaha Bersama (KUB) Perikanan Tangkap	
8.	LSM	
9.	Akademisi	

I. *Pertanyaan-pertanyaan terkait dampak kebijakan nomor 1 (Kenaikan Pungutan Perikanan (PPP/PHP) yang sangat signifikan) = 3 pertanyaan.*

1.	<p>Peraturan Pemerintah (PP) Nomor 75 tahun 2015 tentang Jenis dan Tarif atas Jenis Penerimaan Negara Bukan Pajak (PNBP) yang berlaku pada Kementerian Kelautan dan Perikanan menyebabkan kenaikan Pungutan Perikanan (PPP dan PHP) yang sangat signifikan.</p> <p>Apakah anda setuju atas kenaikan tarif Pungutan Perikanan ini?</p> <ul style="list-style-type: none"> (Likert-Type Scale Response Anchors (Vagias, Wade M. 2006) = Level of Agreement) 				
	☐ Tidak Setuju	☐ Sedikit Tidak Setuju	☐ Antara Setuju dan Tidak Setuju	☐ Agak Setuju	☐ Setuju
	<p>Mengapa?</p>				
2.	<p>Sejauh mana anda dapat menerima (akseptabilitas) kenaikan tarif pungutan perikanan (PPP dan PHP) tersebut?</p> <ul style="list-style-type: none"> (Likert-Type Scale Response Anchors (Vagias, Wade M. 2006) = Level of Acceptability) 				
	☐ Tidak dapat menerima	☐ Agak tidak dapat menerima	☐ Netral	☐ Agak Menerima	☐ Dapat menerima
	<p>Mengapa?</p>				
3.	<p>Bagaimana sikap anda terhadap kenaikan pungutan perikanan (PPP dan PHP)?</p> <ul style="list-style-type: none"> (Likert-Type Scale Response Anchors (Vagias, Wade M. 2006) = Level of Support/Opposition) 				
	☐ Sangat Menentang Kenaikan Pungutan Perikanan	☐ Agak Menentang Kenaikan Pungutan Perikanan	☐ Netral	☐ Agak mendukung Kenaikan Pungutan Perikanan	☐ Sangat mendukung Kenaikan Pungutan Perikanan
	<p>Mengapa?</p>				

II. *Pertanyaan-pertanyaan terkait dampak kebijakan nomor 2
(Penghapusan/pencabutan kewenangan pemerintah kabupaten/kota dalam pengelolaan perikanan di wilayah perairan 0-4 mil laut) = 3 pertanyaan.*

1.	<p>Undang-undang (UU) Nomor 23 tahun 2014 tentang Pemerintahan Daerah telah memperluas kewenangan Pemerintah Propinsi dalam mengelola perikanan tangkap (dari 4-12 nm menjadi 0-12 nm). Pada saat yang bersamaan, Undang-undang ini juga mencabut/menghapus kewenangan pemerintah kabupaten/kota di perairan 0-4 nm.</p> <p>Apakah anda setuju terhadap pencabutan/penghapusan kewenangan pemerintah kabupaten/kota dalam pengelolaan perikanan di wilayah perairan 0-4 nm seperti yang telah ditetapkan oleh UU tersebut?</p> <ul style="list-style-type: none"> (Likert-Type Scale Response Anchors (Vagias, Wade M. 2006) = Level of Agreement) <table border="1" data-bbox="407 737 1421 863"> <tr> <td>☐ Tidak Setuju</td> <td>☐ Sedikit Tidak Setuju</td> <td>☐ Antara Setuju dan Tidak Setuju</td> <td>☐ Agak Setuju</td> <td>☐ Setuju</td> </tr> </table> <p>Mengapa?</p>					☐ Tidak Setuju	☐ Sedikit Tidak Setuju	☐ Antara Setuju dan Tidak Setuju	☐ Agak Setuju	☐ Setuju
☐ Tidak Setuju	☐ Sedikit Tidak Setuju	☐ Antara Setuju dan Tidak Setuju	☐ Agak Setuju	☐ Setuju						
2.	<p>Sejauh mana anda dapat menerima (akseptabilitas) pencabutan/penghapusan kewenangan pemerintah kabupaten/kota dalam pengelolaan perikanan di wilayah perairan 0-4 nm?</p> <ul style="list-style-type: none"> (Likert-Type Scale Response Anchors (Vagias, Wade M. 2006) = Level of Acceptability) <table border="1" data-bbox="407 1136 1421 1262"> <tr> <td>☐ Tidak dapat menerima</td> <td>☐ Agak tidak dapat menerima</td> <td>☐ Netral</td> <td>☐ Agak Menerima</td> <td>☐ Dapat diterima</td> </tr> </table> <p>Mengapa?</p>					☐ Tidak dapat menerima	☐ Agak tidak dapat menerima	☐ Netral	☐ Agak Menerima	☐ Dapat diterima
☐ Tidak dapat menerima	☐ Agak tidak dapat menerima	☐ Netral	☐ Agak Menerima	☐ Dapat diterima						
3.	<p>Bagaimana sikap anda terhadap pencabutan/penghapusan kewenangan pemerintah kabupaten/kota dalam pengelolaan perikanan di wilayah perairan 0-4 nm?</p> <ul style="list-style-type: none"> (Likert-Type Scale Response Anchors (Vagias, Wade M. 2006) = Level of Support/Opposition) <table border="1" data-bbox="407 1556 1421 1619"> <tr> <td>☐ Sangat Menentang</td> <td>☐ Agak Menentang</td> <td>☐ Netral</td> <td>☐ Agak mendukung</td> <td>☐ Sangat mendukung</td> </tr> </table> <p>Mengapa?</p>					☐ Sangat Menentang	☐ Agak Menentang	☐ Netral	☐ Agak mendukung	☐ Sangat mendukung
☐ Sangat Menentang	☐ Agak Menentang	☐ Netral	☐ Agak mendukung	☐ Sangat mendukung						

III. *Pertanyaan-pertanyaan terkait dampak kebijakan nomor 3 (Pembentukan Komisi Pengelolaan Perikanan (KPP) di masing-masing Wilayah Pengelolaan Perikanan Negara Republik Indonesia (WPP-NRI)) = 4 pertanyaan.*

1.	<p>Indonesia berdasarkan Kep Dirjen PT No.47/KEP-DJPT/2017 (Juni 2017) telah mendirikan Komisi Pengelolaan Perikanan (KPP) di setiap Wilayah Pengelolaan Perikanan Negara Republik Indonesia (WPP-NRI). KPP akan melaksanakan dan mengevaluasi Pengelolaan Perikanan di masing-masing WPP-NRI. Salah satu tugas yang dimandatkan ke KPP adalah penyiapan bahan Rencana Pengelolaan Perikanan (RPP). KPP terdiri dari perwakilan pemangku kepentingan (<i>stakeholders</i>) seperti tercantum pada tabel 1. Pembentukan KPP dianggap sebagai salah satu upaya untuk meningkatkan partisipasi para pemangku kepentingan (<i>stakeholders</i>) dalam mengelola sumberdaya perikanan laut di wilayah perairan 12-200 nm. Se jauh mana anda mengetahui tentang Komisi Pengelolaan Perikanan (KPP)?</p> <ul style="list-style-type: none"> (Likert-Type Scale Response Anchors (Vagias, Wade M. 2006) = Level of Familiarity) 				
	Tidak tahu sama sekali	Sedikit Mengetahui	Agak Mengetahui	Cukup Mengetahui	Sangat Mengetahui

Table 1. Komposisi Keanggotaan Komisi Pengelolaan Perikanan (KPP) di WPP-NRI

Komisi Pengelola Perikanan WPPNRI	Panel Ilmiah	Panel Konsultatif
Sesditjen Perikanan Tangkap	Pusat Riset KKP	Asosiasi Penangkapan Ikan
Koordinator Executive	University	UPT KKP Non DJPT
Koordinator Panel Ilmiah	Learning Center of EAFM	Ketua Lembaga Masyarakat Adat
Koordinator Panel Konsultatif	Pakar Perikanan Tangkap	Asosiasi Pengolahan Hasil Perikanan
Kepala Dinas Perikanan dan Kelautan Propinsi yang berlokasi di WPP yang bersangkutan		Non Government Organization (NGO)

2.	<p>Bagaimana sikap anda terhadap pembentukan Komisi Pengelolaan Perikanan (KPP) di WPP-NRI?</p> <ul style="list-style-type: none"> (Likert-Type Scale Response Anchors (Vagias, Wade M. 2006) = Level of Support/Opposition) 				
	Sangat Menentang	Agak Menentang	Netral	Agak mendukung	Sangat mendukung
	Mengapa?				

3.	Apakah komposisi Komisi Pengelolaan Perikanan (KPP) di WPP-NRI (lihat tabel 1) sudah mewakili kepentingan beragam pemangku kepentingan (<i>stakeholders</i>) perikanan tangkap Indonesia? <ul style="list-style-type: none"> (Likert-Type Scale Response Anchors (Vagias, Wade M. 2006) = Level of Likelihood) 				
	☐ Sangat Tidak Mewakili	☐ Tidak Mewakili	☐ Netral	☐ Agak mewakili	☐ Sangat Mewakili
	Mengapa?				

4.	Bagaimana keyakinan/kepercayaan saudara/i terkait pembentukan Komisi Pengelolaan Perikanan (KPP) di WPP-NRI jika dibandingkan dengan sistem yang ada saat ini? <ul style="list-style-type: none"> (Likert-Type Scale Response Anchors (Vagias, Wade M. 2006) = Comparison of two products) 				
	☐ Lebih Buruk	☐ Agak Buruk	☐ Sama Saja	☐ Sedikit Lebih Baik	☐ Jauh lebih Baik
	Mengapa?				

- **Data Demografi Responden:**

1.	Usia:				
2.	Jenis Kelamin:				
	☐ Pria	☐ Wanita			
3.	Suku:				
4.	Pendidikan Akhir:				
	☐ SD	☐ SMP	☐ SMA	☐ D3/D4	☐ S1
	☐ S2	☐ S3			

- **Biografi Peneliti**

<http://web.uri.edu/maf/highlight/fery-sutyawan/>

The screenshot shows the official website of the Department of Marine Affairs at The University of Rhode Island. The header includes the university logo, a search bar, and navigation links for Email, eCampus, Sakai, and RhodyNet. The main banner features a scenic image of a beach and the text 'DEPARTMENT OF MARINE AFFAIRS' and 'College of the Environment and Life Science'. Below the banner is a navigation menu with links like CELS HOME, ACADEMIC PROGRAMS, RESEARCH, OUTREACH, DEPARTMENTS, NEWS, GIVE TO CELS, CELS @ WORK, and RESOURCES. The central content area is titled 'SUTYAWAN, FERY' and provides a detailed biography of Fery Sutyawan, including his program of study (PhD), year accepted (2015), background (Bachelor's from Bogor Agricultural University, Master's from Bandung Institute of Technology, and Master's from National Graduate Institute for Policy Studies), research interest (Fishing Licensing Policy, Fishing Port Management), and advisor (Dr. Seth Macinko). To the left of the biography is a sidebar menu with links to Home, Graduate Programs, Undergraduate Programs, News, Faculty / Staff, Graduate Students, Alumni, History, Student and Applicant Resources, Courses, and Seminar Series. To the right is a search bar and a list of links for Undergraduate Programs (Marine Affairs B.A., Marine Affairs B.S.), Curriculum Sheet (Marine Affairs B.A., Marine Affairs B.S.), and an Advisor section for Dr. Seth Macinko, detailing his department, institute, building, and room.

Appendix 3. The Questionnaires (English version)

IRB NUMBER: HU1718-172
IRB APPROVAL DATE: May 1, 2018
IRB EXPIRATION DATE: May 1, 2019

Stakeholders' Perception Survey

Brief Description

The purpose of this survey is to investigate the stakeholders' perception toward the implementation of Federalism in Indonesia Marine Fisheries Governance as one forms of fisheries co-management. The survey consists of questions related to stakeholders' attitudes toward the policy impacts generated by the enactment of 3 new policies in the 2014-2015 period.

The policy impacts are:

- 1) The significant increase of fishing fee,
- 2) The elimination of Regency/Municipality's authority over fisheries management in 0-4 nm, and
- 3) The establishment of Fisheries Management Commission (FMC) in each Indonesia Fisheries Management Area (IFMA).

Instruction

Please answer the questions from the survey sheet by ticking off **one of the boxes** below each question. The survey will take approximately 15-30 minutes to be completed. Thank you very much in advance for your attention and kind cooperation.

Ethical Consideration

My research will not survey individuals under the age of 18. Participants will **not** be excluded based on gender, race/ethnicity, religion, pregnancy status, language, education, or financial status. It is highly unlikely that respondents will experience physical, psychological, social, legal, or economic harm as a result of participating in this research project.

During the survey, the respondents will be advised to ask questions for further information about the process and nature of the survey.

My research shall respect the potential participant's right to privacy. Their recorded responses to the questionnaires are confidential. The interview question transcripts will remain at all times with the interviewer. Only the researchers will have access to the data. The collected data will be entered into a database that will be kept in a folder on a password protected hard drive or external hard disk that will be stored in Room 115 of the Coastal Institute, the University of Rhode Island-USA.

Respondent information

Name :

Institution :

(Please chose one of the stakeholders' types)

No.	Types of Stakeholder	Choose (Thick the Box below)
1.	National Officers in HQ of MMAF-RI	
2.	National Officers outside the HQ (Heads of Fishing Ports or Fishing Ports' officer)	
3.	Provincial Fisheries Agencies Officer	
4.	Regency/Municipal Fisheries Agencies Officer	
5.	Fishing Vessel' Skipper or Crew	
6.	Fishing Vessels' Owner or Fishing Companies' Representative	
7.	Fishermen Association	
8.	Environmental NGO	
9.	Academicians	

I. Questions related to the Policy Impact No.1 (The significant increase of fishing fee)
= **3 questions.**

1.	<p>Government Regulation No.75 of 2015 concerning the Non-Tax State Income (NTSI) from the Fishery Sector has increased significantly the fishing fees charged to the Nationally Registered Fishing Vessels (>30 GT) that operating in IFMA (12-200 nm).</p> <p>Do you agree about the increase of fishing fees generated by the Government Regulation No.75 of 2015?</p> <ul style="list-style-type: none"> (Likert-Type Scale Response Anchors (Vagias, Wade M. 2006) = Level of Agreement) 				
	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree
2.	<p>To what extent is your acceptability in regard to the increase of fishing fees generated by the Government Regulation No.75 of 2015?</p> <ul style="list-style-type: none"> (Likert-Type Scale Response Anchors (Vagias, Wade M. 2006) = Level of Acceptability) 				
	Unacceptable	Slightly Unacceptable	Neutral	Slightly Acceptable	Acceptable
3.	<p>What is your response in regard to the increased fishing fees?</p> <ul style="list-style-type: none"> (Likert-Type Scale Response Anchors (Vagias, Wade M. 2006) = Level of Support/Opposition) 				
	Strongly Oppose	Somewhat Oppose	Neutral	Somewhat Favor	Strongly Favor

II. Questions related to the Policy Impact No.2 (The elimination of regency/municipality's authority over fisheries management in 0-4 nm) = 3 questions.

1.	<p>Law Number 23 of 2014 concerning the Local Governance expands the authority of provincial governments in managing the commercial fisheries, from 4-12 nautical miles (nm) to 0-12 nm, while, at the same time, it eliminates the authority of the regency and municipal government in 0-4 nm (GOI 2014). Do you agree about the elimination of Regency/Municipality's authority over commercial fisheries management in 0-4 nm as mandated by the Law?</p> <ul style="list-style-type: none"> (Likert-Type Scale Response Anchors (Vagias, Wade M. 2006) = Level of Agreement) 				
	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree
2.	<p>To what extent is your acceptability in regard to the elimination of Regency/Municipality's authority over fisheries management in 0-4 nm?</p> <ul style="list-style-type: none"> (Likert-Type Scale Response Anchors (Vagias, Wade M. 2006) = Level of Acceptability) 				
	Unacceptable	Slightly Unacceptable	Neutral	Slightly Acceptable	Acceptable
3.	<p>What is your response in regard to the elimination of Regency/Municipality's authority over fisheries management in 0-4 nm?</p> <ul style="list-style-type: none"> (Likert-Type Scale Response Anchors (Vagias, Wade M. 2006) = Level of Support/Opposition) 				
	Strongly Oppose	Somewhat Oppose	Neutral	Somewhat Favor	Strongly Favor

III. Questions related to the Policy Impact No.3 (The establishment of the Fisheries Management Commission (FMC) in each Indonesia Fisheries Management Area (IFMA)) = 5 questions.

1.	<p>Indonesia has just established (June 2017) the Fisheries Management Commission (FMC) in each Indonesia Fisheries Management Area (IFMA). These FMCs will be responsible for implementing and evaluating marine fisheries management in each IFMA. One of the tasks mandated to the commission is to prepare the material for developing the Fisheries Management Plans (FMP). The commission consists of stakeholders' representatives (Table 1). The establishment of the commission is considered as one of the efforts to encourage stakeholders' participation in managing the Indonesia marine fisheries resources located in 12-200 nm.</p> <p>To what extent do you know about IFMC?</p> <ul style="list-style-type: none"> (Likert-Type Scale Response Anchors (Vagias, Wade M. 2006) = Level of Familiarity) 				
	Not at all familiar	Slightly familiar	Somewhat familiar	Moderately Familiar	Extremely Familiar

Table 1. The Apportionment of the Fisheries Management Commission (FMC) in each IFMA

No.	Fisheries Management Commission	No.	Scientific Panel	No.	Consultative Panel
1	Secretary (Deputy Director General) of Directorate General Capture Fisheries (DGCF)	1	MMAF Research Center	1	Commercial Fishing Association
2	Executive Coordinator (Head of Fishing Port located in the concerned IFMA)	2	University	2	MMAF Representative (Non- DGCF)
3	Scientific Panel Coordinator	3	Learning Center of EAFM	3	Head of Local Communities/Tribe
4	Consultative Panel Coordinator	4	Fisheries Expert	4	Fish Processing Association
5	Head of Fisheries Agency from the constituent provinces			5	Non-Government Organization (NGO)

2.	<p>What is your response in regard to the establishment of Fisheries Management Commission (FMC) in each Indonesia Fisheries Management Area (IFMA)?</p> <ul style="list-style-type: none"> (Likert-Type Scale Response Anchors (Vagias, Wade M. 2006) = Level of Support/Opposition) 				
	Strongly Oppose	Somewhat Oppose	Neutral	Somewhat Favor	Strongly Favor

3.	<p>Does the existing composition of FMC-IFMA membership (Table 1) represent the interests of various stakeholders of Indonesia marine fisheries?</p> <ul style="list-style-type: none"> (Likert-Type Scale Response Anchors (Vagias, Wade M. 2006) = Level of Likelihood) 				
	☐ Extremely unlikely	☐ unlikely	☐ Neutral	☐ Likely	☐ Extremely Likely
4.	<p>What is your belief in regard to the establishment of IFMC in each IFMA compared with the existing system of marine fisheries governance?</p> <ul style="list-style-type: none"> (Likert-Type Scale Response Anchors (Vagias, Wade M. 2006) = Comparison of two products) 				
	☐ Much Worse	☐ Somewhat Worse	☐ About the same	☐ Somewhat Better	☐ Much Better

• **Respondent's Information:**

1.	Age:				
2.	Sex:				
	☐ Male		☐ Female		
3.	Ethnicity:				
4.	Education:				
	☐ Elementary School	☐ Junior High School	☐ High School	☐ Diploma	☐ Bachelor/ Undergrad
	☐ Master's Degree	☐ Doctorate's Degree			

Researcher biography (<http://web.uri.edu/maf/highlight/fery-sutyawan/>)

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SUTYAWAN, FERY

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Appendix 4. List of Key Informants for In-Depth Interview

No.	Name	Position	Institution	Types of Stakeholders	Status
1	Anonymous	Deputy Director (III)	DGCF	Central Government	Unrecorded
2	Anonymous	Deputy Director (III)	DGCF	Central Government	Unrecorded
3	Anonymous	Deputy of Head of FP (III)	NZOFP	Fishing Port	Recorded
4	Anonymous	Deputy of Head of FP (III)	NZOFP	Fishing Port	Unrecorded
5	Anonymous	Assistant Deputy Director (IV)	DGCF	Central Government	Recorded
6	Anonymous	Assistant Deputy Director (IV)	DGCF	Central Government	Unrecorded
7	Anonymous	Researcher	MMAF RC	Academicians/Researcher	Recorded
8	Anonymous	Assistant Deputy Director (IV)	South Sumatra	Provincial Government	Recorded
9	Anonymous	Deputy of Head FA (III)	Palembang	Municipality/Regency Government	Recorded
10	Anonymous	Assistant Deputy Director (IV)	Pekalongan	Municipality/Regency Government	Recorded
11	Anonymous	Researcher	MMAF RC	Academicians/Researcher	Recorded
12	Anonymous	Chairman	Indonesia Purse Seine Association	Commercial Fishing Association	Unrecorded
13	Anonymous	Head of Legal Division	Indonesia Tuna Association	Commercial Fishing Association	Recorded
14	Anonymous	Operational Manager	PT. Dwi Putra	Fishing Vessels' Owner	Unrecorded
15	Anonymous	Middle-man	Independent	Fishing Vessels' Owner	Unrecorded
16	Anonymous	Middle-man	Independent	Fishing Vessels' Owner	Unrecorded
17	Anonymous	Program Manager	Marine Stewardship Council (MSC) Asia	NGO	Unrecorded
18	Anonymous	Boat Caretaker	Independent	Fishing Vessels' Owner	Unrecorded
19	Anonymous	Staff	East Kalimantan	Provincial Government	Unrecorded

Appendix 5. Fishing Fee Rate/Tariff Escalation

No.	Fishing Gear	Before PP No.75 of 2015		After PP No.75 of 2015		
		Small Scale (<60 GT)		Small Scale (<60 GT)		
		Tariff/GT (IDR)	Tariff/GT (US\$)	Tariff/GT (IDR)	Tariff/GT (US\$)	Increase (%)
1	Stick Held Dip Net (Bouke Ami)	179,040.00	12.79	702,000.00	50.14	292.09
2	Portable Trap	116,940.00	8.35	389,640.00	27.83	233.20
3	Pole and Line	203,340.00	14.52	953,100.00	68.08	368.72
4	Bottom Drifted Gillnet	78,300.00	5.59	260,950.00	18.64	233.27
5	Oceanic / Large Drift Gillnet	138,660.00	9.90	462,188.00	33.01	233.32
6	Long Bag Set Net	124,980.00	8.93	416,500.00	29.75	233.25
7	Squid Jigging	62,400.00	4.46	600,000.00	42.86	861.54
8	Bottom Long Line	245,280.00	17.52	817,440.00	58.39	233.27
9	Small Pelagic Purse Seiner	130,500.00	9.32	441,675.00	31.55	238.45
10	Big Pelagic Purse Seine - IEEZ (Single Vessel)	276,780.00	19.77	992,420.00	70.89	258.56
11	Big Pelagic Purse Seine - IEEZ (Armada)	485,100.00	34.65	1,627,800.00	116.27	235.56
12	Small Pelagic Purse Seine - Armada (Catcher)	130,500.00	9.32	434,880.00	31.06	233.24
13	Small Pelagic Purse Seine - Armada (Light Boat)	130,500.00	9.32	434,880.00	31.06	233.24
14	Tuna Longline	112,800.00	8.06	552,750.00	39.48	390.03
15	Cast Net	217,980.00	15.57	726,500.00	51.89	233.29
16	Demersal Hand Line	102,060.00	7.29	680,340.00	48.60	566.61
17	Tuna Hand Line	247,500.00	17.68	840,875.00	60.06	239.75

No.	Fishing Gear	Before PP No.75 of 2015		After PP No.75 of 2015				
		Large Scale (>60 GT)		Medium Scale (60-200 GT)		Large Scale (>200 GT)		
		Tariff/GT (IDR)	Tariff/GT (US\$)	Tariff/GT (IDR)	Tariff/GT (US\$)	Increase (%)	Tariff/GT (IDR)	Tariff/GT (US\$)
1	Stick Held Dip Net (Bouke Ami)	298,400.00	21.31	1,404,000.00	100.29	370.51	3,510,000.00	250.71
2	Portable Trap	194,900.00	13.92	779,280.00	55.66	299.84	1,948,200.00	139.16
3	Pole and Line	338,900.00	24.21	1,906,200.00	136.16	462.47	4,765,500.00	340.39
4	Bottom Drifted Gillnet	130,500.00	9.32	521,900.00	37.28	299.92	1,304,750.00	93.20
5	Oceanic / Large Drift Gillnet	231,100.00	16.51	924,375.00	66.03	299.99	2,310,938.00	165.07
6	Long Bag Set Net	208,300.00	14.88	833,000.00	59.50	299.90	2,082,500.00	148.75
7	Squid Jigging	104,000.00	7.43	1,200,000.00	85.71	1,053.85	3,000,000.00	214.29
8	Bottom Long Line	408,800.00	29.20	1,634,880.00	116.78	299.92	4,087,200.00	291.94
9	Small Pelagic Purse Seiner	217,500.00	15.54	883,350.00	63.10	306.14	2,208,375.00	157.74
10	Big Pelagic Purse Seine - IEEZ (Single Vessel)	461,300.00	32.95	1,844,840.00	131.77	299.92	4,612,100.00	329.44
11	Big Pelagic Purse Seine - IEEZ (Armada)	808,500.00	57.75	3,255,600.00	232.54	302.67	8,139,100.00	581.36
12	Small Pelagic Purse Seine - Armada (Catcher)	217,500.00	15.54	869,760.00	62.13	299.89	2,174,400.00	155.31
13	Small Pelagic Purse Seine - Armada (Light Boat)	217,500.00	15.54	869,760.00	62.13	299.89	2,174,400.00	155.31
14	Tuna Longline	188,000.00	13.43	1,105,500.00	78.96	488.03	2,763,750.00	197.41
15	Cast Net	363,300.00	25.95	1,453,000.00	103.79	299.94	3,632,500.00	259.46
16	Demersal Hand Line	170,100.00	12.15	1,360,680.00	97.19	699.93	3,401,700.00	242.98
17	Tuna Hand Line	412,500.00	29.46	1,681,750.00	120.13	307.70	4,204,375.00	300.31

Appendix 6. Descriptive Statistic Analyzing the Percentage (%) of Fishing Fee on the Total Fishing Operational Costs

2014						
Descriptive Statistics	Bouke Ami	Oceanic Gillnet	Squid Jigging	Big Pelagic Purse Seine	Small Pelagic Purse Seine	Tuna Longline
Mean	2.1750584	1.513895445	0.680822866	2.71838957	0.998820825	0.917191231
Standard Error	0.083932	0.140397569	0.055208674	0.027162388	0.024374921	0.043277268
Median	2.2528958	1.665253895	0.737927645	2.681739706	0.975751553	0.872040741
Mode	#N/A	#N/A	#N/A	#N/A	#N/A	0.767260662
Standard Deviation	0.335728	0.343902405	0.156153711	0.539158014	0.218015922	0.198321355
Sample Variance	0.1127133	0.118268864	0.024383982	0.290691364	0.047530942	0.03933136
Kurtosis	-0.985374	1.755212078	-0.78286503	0.122724688	0.428005368	-0.26577229
Skewness	-0.521326	-1.484954008	-0.65628969	0.455188719	0.688508853	0.539309874
Range	1.0344141	0.927134906	0.443101696	3.152882136	1.02113108	0.712000313
Minimum	1.6245102	0.893895763	0.415253981	1.550588541	0.620319331	0.615257212
Maximum	2.6589243	1.821030669	0.858355678	4.703470677	1.641450411	1.327257525
Sum	34.800935	9.083372667	5.446582929	1071.045491	79.90566597	19.26101586
Count	16	6	8	394	80	21
Confidence Level(95.0%)	0.1788968	0.36090344	0.13054777	0.053401761	0.048517067	0.090274798
2017						
Descriptive Statistics	Bouke Ami	Oceanic Gillnet	Squid Jigging	Big Pelagic Purse Seine	Small Pelagic Purse Seine	Tuna Longline
Mean	3.0470312	3.813794704	5.906038182	8.130049396	3.525497951	4.928735566
Standard Error	0.2756018	0.125221009	0.12089484	0.162083539	0.105915392	0.18986961
Median	2.7056421	3.481911834	5.743713444	8.190271444	3.421915831	4.762791705
Mode	#N/A	3.138322597	#N/A	#N/A	#N/A	#N/A
Standard Deviation	1.3501674	0.791967201	1.039976733	1.467728868	0.840677365	0.89056741
Sample Variance	1.822952	0.627212048	1.081551606	2.154228029	0.706738432	0.793110311
Kurtosis	1.3345514	0.416863659	1.015660744	-0.153194607	1.258976271	-1.371780028
Skewness	1.2815502	1.112843951	0.888313212	-0.292212727	0.695049445	0.21760171
Range	5.1565854	3.195958343	5.005824481	6.641190257	4.482912166	2.888889216
Minimum	1.3347304	2.948303075	4.145664842	4.718732188	1.859937152	3.755809992
Maximum	6.4913158	6.144261418	9.151489323	11.35992245	6.342849318	6.644699209
Sum	73.128748	152.5517882	437.0468255	666.6640505	222.1063709	108.4321824
Count	24	40	74	82	63	22
Confidence Level(95.0%)	0.5701257	0.253283399	0.240943068	0.3224954	0.211721853	0.394855469
2018						
Descriptive Statistics	Bouke Ami	Oceanic Gillnet	Squid Jigging	Big Pelagic Purse Seine	Small Pelagic Purse Seine	Tuna Longline
Mean	7.2042773	4.193348642	5.727994802	9.16475857	3.578119995	3.85385747
Standard Error	0.1000924	0.259694248	0.159576044	0.151838932	0.132174027	0.166291007
Median	7.2462109	4.151734332	5.866452886	8.983852366	3.581870603	3.637310989
Mode	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Standard Deviation	0.8610273	0.899607263	1.225726848	1.341005138	0.673957942	0.895504478
Sample Variance	0.7413681	0.809293227	1.502406306	1.79829478	0.454219307	0.801928271
Kurtosis	-0.567216	0.131252479	0.572910971	-0.982260337	0.118102304	0.497934971
Skewness	0.076942	-0.318420269	0.379590279	-0.019854612	0.341430676	0.961847378
Range	3.7704654	3.277227098	6.394277754	5.187591865	2.79362718	3.608652691
Minimum	5.513082	2.435504439	3.135588505	6.497743157	2.451413574	2.435423235
Maximum	9.2835474	5.712731536	9.529866259	11.68533502	5.245040754	6.044075926
Sum	533.11652	50.32018371	337.9516933	714.8511684	93.03111986	111.7618666
Count	74	12	59	78	26	29
Confidence Level(95.0%)	0.1994839	0.571583185	0.319426156	0.302349941	0.272217504	0.340631686

Appendix 7. The Kruskal-Wallis Test Summary

Test Statistics ^{a,b}										
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Chi-Square	177.714	161.069	183.090	16.279	20.715	15.156	41.366	46.556	29.057	40.947
df	8	8	8	7	7	7	7	7	7	7
Asymp. Sig.	0.000	0.000	0.000	0.023	0.004	0.034	0.000	0.000	0.000	0.000
a. Kruskal Wallis Test										
b. Grouping Variable: Stakeholders										
Case Summaries										
Median										
Stakeholders	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Central Gov	5.0	5.0	5.0	3.0	3.0	3.0	4.0	4.0	4.0	4.0
Fishing Port	5.0	5.0	5.0	4.0	4.0	3.0	3.0	5.0	4.0	4.0
Provincial Gov	4.0	4.0	4.0	3.0	3.0	3.0	3.0	5.0	4.0	4.0
Regency Gov	4.0	4.0	4.0	2.0	2.0	2.0	2.0	4.0	4.0	4.0
Crews	1.0	2.0	2.0							
Industry	2.0	2.0	2.0	3.0	4.0	3.0	2.0	3.0	3.0	3.0
Association	3.0	4.0	2.5	3.0	3.0	3.0	3.5	4.0	4.0	4.0
NGO	4.0	3.0	3.0	3.5	4.0	3.0	3.0	5.0	4.0	4.0
Academia Research	4.0	4.0	4.0	2.5	3.0	3.0	4.0	4.0	4.0	4.0
Total	4.0	4.0	4.0	3.0	3.0	3.0	3.0	4.0	4.0	4.0

Appendix 8. Statistics of Registered Fishing Fleet by Province (2016)

Province	Fishing Boat Reange Size (in GT)									Sum > 5GT	Total
	< 5	5-10	10-20	20-30	30-50	50-100	100-200	200-300	300-500		
Total	115 814	35 988	9 790	6 481	805	2 008	847	11	-	55 930	171 744
Sumatera	48 268	11 483	1 886	1 688	133	352	92	6	-	15 640	63 908
Aceh	5 862	2 049	423	397	-	-	3	-	-	2 872	8 734
Sumatera Utara	14 972	3 618	541	858	33	212	65	6	-	5 333	20 305
Sumatera Barat	771	521	293	147	1	1	-	-	-	963	1 734
Riau	4 660	625	399	75	2	17	4	-	-	1 122	5 782
Kepulauan Riau	10 000	1 232	72	157	88	108	20	-	-	1 677	11 677
Jambi	2 275	224	9	-	-	-	-	-	-	233	2 508
Sumatera Selatan	1 320	1 101	7	1	8	8	-	-	-	1 125	2 445
Kepulauan Bangka Belitung	5 663	545	12	-	-	1	-	-	-	558	6 221
Bengkulu	580	100	35	25	1	5	-	-	-	166	746
Lampung	2 165	1 468	95	28	-	-	-	-	-	1 591	3 756
J a w a	7 110	8 694	3 743	2 059	419	1 276	527	3	-	16 721	23 831
Banten	992	2 149	1 061	827	3	20	2	-	-	4 062	5 054
DKI Jakarta	-	42	29	11	197	625	360	3	-	1 267	1 267
Jawa Barat	1 562	4 913	51	12	94	146	1	-	-	5 217	6 779
Jawa Tengah	456	368	1 528	424	84	435	157	-	-	2 996	3 452
DI Yogyakarta	-	6	38	6	3	-	-	-	-	53	53
Jawa Timur	4 100	1 216	1 036	779	38	50	7	-	-	3 126	7 226
Bali - Nusatenggara	7 690	3 880	997	813	61	200	220	1	-	6 172	13 862
Bali	83	236	65	620	61	200	220	1	-	1 403	1 486
Nusa Tenggara Barat	3 140	1 031	319	21	-	-	-	-	-	1 371	4 511
Nusa Tenggara Timur	4 467	2 613	613	172	-	-	-	-	-	3 398	7 865
Kalimantan	27 121	4 244	1 138	90	12	55	2	-	-	5 541	32 662
Kalimantan Barat	3 419	1 252	233	60	8	55	2	-	-	1 610	5 029
Kalimantan Tengah	1 769	234	101	6	-	-	-	-	-	341	2 110
Kalimantan Selatan	6 080	504	245	15	3	-	-	-	-	767	6 847
Kalimantan Timur	14 569	1 751	538	6	1	-	-	-	-	2 296	16 865
Kalimantan Utara	1 284	503	21	3	-	-	-	-	-	527	1 811
Sulawesi	20 774	5 624	842	1 062	131	85	4	1	-	7 749	28 523
Sulawesi Utara	6	-	-	-	73	70	4	1	-	148	154
Gorontalo	74	100	28	38	23	-	-	-	-	189	263
Sulawesi Tengah	1 070	294	69	28	-	-	-	-	-	391	1 461
Sulawesi Selatan	10 143	3 892	439	282	-	1	-	-	-	4 614	14 757
Sulawesi Barat	3 917	536	47	26	-	-	-	-	-	609	4 526
Sulawesi Tenggara	5 564	802	259	688	35	14	-	-	-	1 798	7 362
Maluku - Papua	4 851	2 063	1 184	769	49	40	2	-	-	4 107	8 958
Maluku	4 077	1 239	517	312	6	2	2	-	-	2 078	6 155
Maluku Utara	561	511	370	328	23	1	-	-	-	1 233	1 794
Papua	-	58	51	34	17	11	-	-	-	171	171
Papua Barat	213	255	246	95	3	26	-	-	-	625	838

Appendix 9 Pairwise Test (Question No.1)

Each node shows the sample average rank of Group.

Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
5.0-6.0	-44.964	20.098	-2.237	.025	.910
5.0-7.0	-83.954	38.228	-2.196	.028	1.000
5.0-9.0	-117.400	27.206	-4.315	.000	.001
5.0-3.0	133.055	23.662	5.623	.000	.000
5.0-8.0	-142.254	30.928	-4.600	.000	.000
5.0-4.0	150.152	33.018	4.548	.000	.000
5.0-2.0	189.093	19.322	9.786	.000	.000
5.0-1.0	211.835	19.428	10.903	.000	.000
6.0-7.0	-38.990	38.298	-1.018	.309	1.000
6.0-9.0	-72.436	27.305	-2.653	.008	.287
6.0-3.0	88.091	23.775	3.705	.000	.008
6.0-8.0	-97.290	31.015	-3.137	.002	.061
6.0-4.0	105.188	33.099	3.178	.001	.053
6.0-2.0	144.129	19.461	7.406	.000	.000
6.0-1.0	166.871	19.566	8.528	.000	.000
7.0-9.0	-33.446	42.462	-.788	.431	1.000
7.0-3.0	49.101	40.283	1.219	.223	1.000
7.0-8.0	-58.300	44.937	-1.297	.195	1.000
7.0-4.0	66.199	46.400	1.427	.154	1.000
7.0-2.0	105.139	37.897	2.774	.006	.199
7.0-1.0	127.881	37.951	3.370	.001	.027
9.0-3.0	15.655	30.025	.521	.602	1.000
9.0-8.0	24.854	36.030	.690	.490	1.000
9.0-4.0	32.752	37.839	.866	.387	1.000
9.0-2.0	71.693	26.739	2.681	.007	.264
9.0-1.0	94.434	26.815	3.522	.000	.015
3.0-8.0	-9.199	33.434	-.275	.783	1.000
3.0-4.0	-17.097	35.376	-.483	.629	1.000
3.0-2.0	56.038	23.123	2.423	.015	.553
3.0-1.0	78.780	23.211	3.394	.001	.025
8.0-4.0	7.899	40.597	.195	.846	1.000
8.0-2.0	46.839	30.518	1.535	.125	1.000
8.0-1.0	69.581	30.585	2.275	.023	.825
4.0-2.0	38.941	32.634	1.193	.233	1.000
4.0-1.0	61.682	32.696	1.887	.059	1.000
2.0-1.0	22.742	18.769	1.212	.226	1.000

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same. Asymptotic significances (2-sided tests) are displayed. The significance level is .05.

Appendix 9 Pairwise Test (Question No.2)

Each node shows the sample average rank of Group.

Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
5.0-6.0	-39.934	20.026	-1.994	.046	1.000
5.0-7.0	-96.178	38.091	-2.525	.012	.417
5.0-3.0	121.499	23.577	5.153	.000	.000
5.0-8.0	-130.503	30.817	-4.235	.000	.001
5.0-4.0	139.648	32.900	4.245	.000	.001
5.0-9.0	-144.344	27.473	-5.254	.000	.000
5.0-2.0	175.567	19.306	9.094	.000	.000
5.0-1.0	201.778	19.359	10.423	.000	.000
6.0-7.0	-56.243	38.161	-1.474	.141	1.000
6.0-3.0	81.565	23.690	3.443	.001	.021
6.0-8.0	-90.568	30.904	-2.931	.003	.122
6.0-4.0	99.714	32.981	3.023	.002	.090
6.0-9.0	-104.410	27.571	-3.787	.000	.005
6.0-2.0	135.633	19.444	6.976	.000	.000
6.0-1.0	161.843	19.496	8.301	.000	.000
7.0-3.0	25.321	40.139	.631	.528	1.000
7.0-8.0	-34.325	44.777	-.767	.443	1.000
7.0-4.0	43.471	46.234	.940	.347	1.000
7.0-9.0	-48.167	42.544	-1.132	.258	1.000
7.0-2.0	79.390	37.788	2.101	.036	1.000
7.0-1.0	105.600	37.815	2.793	.005	.188
3.0-8.0	-9.004	33.315	-.270	.787	1.000
3.0-4.0	-18.149	35.250	-.515	.607	1.000
3.0-9.0	-22.845	30.248	-.755	.450	1.000
3.0-2.0	54.068	23.084	2.342	.019	.690
3.0-1.0	80.279	23.129	3.471	.001	.019
8.0-4.0	9.146	40.452	.226	.821	1.000
8.0-9.0	-13.842	36.177	-.383	.702	1.000
8.0-2.0	45.065	30.442	1.480	.139	1.000
8.0-1.0	71.275	30.476	2.339	.019	.697
4.0-9.0	-4.696	37.967	-.124	.902	1.000
4.0-2.0	35.919	32.548	1.104	.270	1.000
4.0-1.0	62.129	32.580	1.907	.057	1.000
9.0-2.0	31.223	27.051	1.154	.248	1.000
9.0-1.0	57.433	27.089	2.120	.034	1.000
2.0-1.0	26.210	18.755	1.398	.162	1.000

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same. Asymptotic significances (2-sided tests) are displayed. The significance level is .05.

Appendix 9 Pairwise Test (Question No.3)

Each node shows the sample average rank of Group.

Sample1.SSample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
5.0.6.0	-29.290	20.250	-1.446	.148	1.000
5.0.7.0	-69.346	38.517	-1.800	.072	1.000
5.0.8.0	-120.413	31.162	-3.864	.000	.004
5.0.3.0	126.108	23.841	5.290	.000	.000
5.0.9.0	-139.835	27.412	-5.101	.000	.000
5.0.4.0	148.440	33.267	4.462	.000	.000
5.0.2.0	194.367	19.469	9.984	.000	.000
5.0.1.0	202.575	19.575	10.349	.000	.000
6.0.7.0	-40.056	38.588	-1.038	.299	1.000
6.0.8.0	-91.123	31.249	-2.916	.004	.128
6.0.3.0	96.818	23.955	4.042	.000	.002
6.0.9.0	-110.544	27.511	-4.018	.000	.002
6.0.4.0	119.149	33.349	3.573	.000	.013
6.0.2.0	165.076	19.608	8.419	.000	.000
6.0.1.0	173.285	19.714	8.790	.000	.000
7.0.8.0	-51.067	45.277	-1.128	.259	1.000
7.0.3.0	56.762	40.587	1.399	.162	1.000
7.0.9.0	-70.488	42.783	-1.648	.099	1.000
7.0.4.0	79.093	46.751	1.692	.091	1.000
7.0.2.0	125.020	38.183	3.274	.001	.038
7.0.1.0	133.228	38.238	3.484	.000	.018
8.0.3.0	5.695	33.687	.169	.866	1.000
8.0.9.0	-19.421	36.302	-.535	.593	1.000
8.0.4.0	28.026	40.904	.685	.493	1.000
8.0.2.0	73.953	30.748	2.405	.016	.582
8.0.1.0	82.162	30.816	2.666	.008	.276
3.0.9.0	-13.726	30.252	-.454	.650	1.000
3.0.4.0	-22.331	35.644	-.627	.531	1.000
3.0.2.0	68.258	23.298	2.930	.003	.122
3.0.1.0	76.467	23.387	3.270	.001	.039
9.0.4.0	8.605	38.125	.226	.821	1.000
9.0.2.0	54.532	26.941	2.024	.043	1.000
9.0.1.0	62.740	27.018	2.322	.020	.728
4.0.2.0	45.927	32.881	1.397	.162	1.000
4.0.1.0	54.135	32.944	1.643	.100	1.000
2.0.1.0	8.208	18.910	.434	.664	1.000

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same. Asymptotic significances (2-sided tests) are displayed. The significance level is .05.

Appendix 9 Pairwise Test (Question No.4)

Pairwise Comparisons of Group

Each node shows the sample average rank of Group.

Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
4.0-9.0	-35.248	28.435	-1.240	.215	1.000
4.0-7.0	-48.343	34.868	-1.386	.166	1.000
4.0-3.0	49.522	26.584	1.863	.062	1.000
4.0-1.0	62.083	24.547	2.529	.011	.412
4.0-8.0	-76.876	30.508	-2.520	.012	.423
4.0-6.0	-79.474	27.097	-2.933	.003	.121
4.0-2.0	80.366	24.523	3.277	.001	.038
9.0-7.0	13.095	31.909	.410	.682	1.000
9.0-3.0	14.274	22.563	.633	.527	1.000
9.0-1.0	26.836	20.122	1.334	.182	1.000
9.0-8.0	41.629	27.075	1.538	.124	1.000
9.0-6.0	44.226	23.165	1.909	.056	1.000
9.0-2.0	45.118	20.094	2.245	.025	.891
7.0-3.0	1.179	30.271	.039	.969	1.000
7.0-1.0	13.740	28.498	.482	.630	1.000
7.0-8.0	-28.533	33.769	-.845	.398	1.000
7.0-6.0	31.131	30.722	1.013	.311	1.000
7.0-2.0	32.023	28.478	1.124	.261	1.000
3.0-1.0	12.562	17.409	.722	.471	1.000
3.0-8.0	-27.355	25.125	-1.089	.276	1.000
3.0-6.0	-29.952	20.851	-1.436	.151	1.000
3.0-2.0	30.844	17.376	1.775	.076	1.000
1.0-8.0	-14.793	22.958	-.644	.519	1.000
1.0-6.0	-17.390	18.182	-.956	.339	1.000
1.0-2.0	-18.283	14.062	-1.300	.194	1.000
8.0-6.0	2.597	25.667	.101	.919	1.000
8.0-2.0	3.490	22.933	.152	.879	1.000
6.0-2.0	.892	18.151	.049	.961	1.000

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same. Asymptotic significances (2-sided tests) are displayed. The significance level is .05.

Appendix 9 Pairwise Test (Question No.5)

Each node shows the sample average rank of Group.

Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig.
4.0-9.0	-31.532	28.402	-1.110	.267	1.000
4.0-7.0	-46.978	34.828	-1.349	.177	1.000
4.0-3.0	49.746	26.553	1.873	.061	1.000
4.0-1.0	59.231	24.518	2.416	.016	.565
4.0-2.0	82.899	24.518	3.381	.001	.026
4.0-6.0	-88.042	27.065	-3.253	.001	.041
4.0-8.0	-88.153	30.472	-2.893	.004	.137
9.0-7.0	15.446	31.871	.485	.628	1.000
9.0-3.0	18.214	22.536	.808	.419	1.000
9.0-1.0	27.699	20.099	1.378	.168	1.000
9.0-2.0	51.368	20.099	2.556	.011	.381
9.0-6.0	56.511	23.138	2.442	.015	.525
9.0-8.0	56.621	27.044	2.094	.036	1.000
7.0-3.0	2.768	30.236	.092	.927	1.000
7.0-1.0	12.253	28.465	.430	.667	1.000
7.0-2.0	35.922	28.465	1.262	.207	1.000
7.0-6.0	41.064	30.687	1.338	.181	1.000
7.0-8.0	-41.175	33.730	-1.221	.222	1.000
3.0-1.0	9.485	17.389	.545	.585	1.000
3.0-2.0	33.154	17.389	1.907	.057	1.000
3.0-6.0	-38.296	20.827	-1.839	.066	1.000
3.0-8.0	-38.407	25.096	-1.530	.126	1.000
1.0-2.0	-23.669	14.087	-1.680	.093	1.000
1.0-6.0	-28.811	18.161	-1.586	.113	1.000
1.0-8.0	-28.922	22.931	-1.261	.207	1.000
2.0-6.0	-5.143	18.161	-.283	.777	1.000
2.0-8.0	-5.253	22.931	-.229	.819	1.000
6.0-8.0	-.111	25.637	-.004	.997	1.000

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same. Asymptotic significances (2-sided tests) are displayed. The significance level is .05.

Appendix 9 Pairwise Test (Question No.6)

Pairwise Comparisons of Group

Each node shows the sample average rank of Group.

Sample1.Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
4.0-9.0	-25.836	28.234	-.915	.360	1.000
4.0-7.0	-30.306	34.622	-.875	.381	1.000
4.0-3.0	42.826	26.489	1.617	.106	1.000
4.0-8.0	-56.290	30.292	-1.858	.063	1.000
4.0-1.0	56.422	24.373	2.315	.021	.742
4.0-2.0	70.457	24.373	2.891	.004	.138
4.0-6.0	-77.413	26.905	-2.877	.004	.144
9.0-7.0	4.470	31.683	.141	.888	1.000
9.0-3.0	16.990	22.512	.755	.450	1.000
9.0-8.0	30.454	26.884	1.133	.257	1.000
9.0-1.0	30.586	19.980	1.531	.126	1.000
9.0-2.0	44.620	19.980	2.233	.026	.919
9.0-6.0	51.577	23.001	2.242	.025	.898
7.0-3.0	12.519	30.138	.415	.678	1.000
7.0-8.0	-25.983	33.530	-.775	.438	1.000
7.0-1.0	26.115	28.297	.923	.356	1.000
7.0-2.0	40.150	28.297	1.419	.156	1.000
7.0-6.0	47.107	30.505	1.544	.123	1.000
3.0-8.0	-13.464	25.045	-.538	.591	1.000
3.0-1.0	13.596	17.427	.780	.435	1.000
3.0-2.0	27.631	17.427	1.586	.113	1.000
3.0-6.0	-34.588	20.822	-1.661	.097	1.000
8.0-1.0	.132	22.796	.006	.995	1.000
8.0-2.0	14.167	22.796	.621	.534	1.000
8.0-6.0	21.124	25.485	.829	.407	1.000
1.0-2.0	-14.035	14.003	-1.002	.316	1.000
1.0-6.0	-20.992	18.054	-1.163	.245	1.000
2.0-6.0	-6.957	18.054	-.385	.700	1.000

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same. Asymptotic significances (2-sided tests) are displayed. The significance level is .05.

Appendix 9 Pairwise Test (Question No.7)

Pairwise Comparisons of Group

Each node shows the sample average rank of Group.

Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
6.0-4.0	4.397	26.819	.164	.870	1.000
6.0-3.0	64.154	20.942	3.063	.002	.079
6.0-8.0	-75.819	25.443	-2.980	.003	.104
6.0-2.0	79.567	18.260	4.357	.000	.000
6.0-7.0	-94.194	32.479	-2.900	.004	.134
6.0-1.0	95.785	18.321	5.228	.000	.000
6.0-9.0	-100.348	23.041	-4.355	.000	.000
4.0-3.0	59.757	26.044	2.294	.022	.784
4.0-8.0	-71.422	29.784	-2.398	.016	.593
4.0-2.0	75.170	23.941	3.140	.002	.061
4.0-7.0	-89.797	35.981	-2.496	.013	.453
4.0-1.0	91.388	23.987	3.810	.000	.005
4.0-9.0	-95.951	27.760	-3.456	.001	.020
3.0-8.0	-11.665	24.625	-.474	.636	1.000
3.0-2.0	15.413	17.103	.901	.367	1.000
3.0-7.0	-30.040	31.843	-.943	.345	1.000
3.0-1.0	31.631	17.167	1.843	.065	1.000
3.0-9.0	-36.194	22.135	-1.635	.102	1.000
8.0-2.0	3.748	22.389	.167	.867	1.000
8.0-7.0	18.375	34.967	.525	.599	1.000
8.0-1.0	19.966	22.438	.890	.374	1.000
8.0-9.0	-24.529	26.433	-.928	.353	1.000
2.0-7.0	-14.627	30.147	-.485	.628	1.000
2.0-1.0	16.218	13.769	1.178	.239	1.000
2.0-9.0	-20.781	19.617	-1.059	.289	1.000
7.0-1.0	1.591	30.184	.053	.958	1.000
7.0-9.0	-6.154	33.261	-.185	.853	1.000
1.0-9.0	-4.562	19.673	-.232	.817	1.000

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same. Asymptotic significances (2-sided tests) are displayed. The significance level is .05.

Appendix 9 Pairwise Test (Question No. 8)

Pairwise Comparisons of Group

Each node shows the sample average rank of Group.

Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
6.0-4.0	49.223	25.827	1.906	.057	1.000
6.0-9.0	-79.957	22.079	-3.621	.000	.011
6.0-7.0	-83.593	29.282	-2.855	.004	.155
6.0-1.0	88.496	17.330	5.106	.000	.000
6.0-2.0	97.227	17.300	5.620	.000	.000
6.0-3.0	99.823	20.105	4.965	.000	.000
6.0-8.0	-135.860	24.463	-5.554	.000	.000
4.0-9.0	-30.733	27.102	-1.134	.257	1.000
4.0-7.0	-34.370	33.234	-1.034	.301	1.000
4.0-1.0	39.272	23.396	1.679	.093	1.000
4.0-2.0	48.004	23.374	2.054	.040	1.000
4.0-3.0	50.599	25.520	1.983	.047	1.000
4.0-8.0	-86.637	29.078	-2.980	.003	.104
9.0-7.0	3.637	30.413	.120	.905	1.000
9.0-1.0	8.539	19.179	.445	.656	1.000
9.0-2.0	17.271	19.152	.902	.367	1.000
9.0-3.0	19.866	21.719	.915	.360	1.000
9.0-8.0	55.904	25.806	2.166	.030	1.000
7.0-1.0	4.902	27.163	.180	.857	1.000
7.0-2.0	13.634	27.143	.502	.615	1.000
7.0-3.0	16.229	29.012	.559	.576	1.000
7.0-8.0	-52.267	32.186	-1.624	.104	1.000
1.0-2.0	-8.731	13.403	-.651	.515	1.000
1.0-3.0	-11.327	16.870	-.671	.502	1.000
1.0-8.0	-47.365	21.882	-2.165	.030	1.000
2.0-3.0	-2.596	16.839	-.154	.877	1.000
2.0-8.0	-38.633	21.858	-1.767	.077	1.000
3.0-8.0	-36.038	24.139	-1.493	.135	1.000

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same. Asymptotic significances (2-sided tests) are displayed. The significance level is .05.

Appendix 9 Pairwise Test (Question No.9)

Pairwise Comparisons of Group

Each node shows the sample average rank of Group.

Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
6.0-4.0	39.672	26.422	1.501	.133	1.000
6.0-9.0	-42.554	22.587	-1.884	.060	1.000
6.0-1.0	62.260	17.761	3.506	.000	.016
6.0-7.0	-71.721	29.957	-2.394	.017	.600
6.0-3.0	79.617	20.569	3.871	.000	.004
6.0-8.0	-81.329	25.027	-3.250	.001	.042
6.0-2.0	86.928	17.699	4.912	.000	.000
4.0-9.0	-2.882	27.726	-.104	.917	1.000
4.0-1.0	22.588	23.958	.943	.346	1.000
4.0-7.0	-32.049	33.999	-.943	.346	1.000
4.0-3.0	39.945	26.108	1.530	.126	1.000
4.0-8.0	-41.657	29.747	-1.400	.161	1.000
4.0-2.0	47.256	23.912	1.976	.048	1.000
9.0-1.0	19.706	19.649	1.003	.316	1.000
9.0-7.0	29.167	31.113	.937	.349	1.000
9.0-3.0	37.062	22.219	1.668	.095	1.000
9.0-8.0	38.775	26.401	1.469	.142	1.000
9.0-2.0	44.374	19.593	2.265	.024	.847
1.0-7.0	-9.461	27.808	-.340	.734	1.000
1.0-3.0	-17.357	17.290	-1.004	.315	1.000
1.0-8.0	-19.069	22.411	-.851	.395	1.000
1.0-2.0	-24.668	13.753	-1.794	.073	1.000
7.0-3.0	7.896	29.680	.266	.790	1.000
7.0-8.0	-9.608	32.927	-.292	.770	1.000
7.0-2.0	15.207	27.769	.548	.584	1.000
3.0-8.0	-1.713	24.696	-.069	.945	1.000
3.0-2.0	7.311	17.227	.424	.671	1.000
8.0-2.0	5.599	22.362	.250	.802	1.000

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same. Asymptotic significances (2-sided tests) are displayed. The significance level is .05.

Appendix 9 Pairwise Test (Question No.10)

Each node shows the sample average rank of Group.

Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
6.0-4.0	43.871	25.470	1.722	.085	1.000
6.0-7.0	-44.418	28.878	-1.538	.124	1.000
6.0-9.0	-74.674	21.774	-3.429	.001	.022
6.0-3.0	80.834	19.828	4.077	.000	.002
6.0-1.0	88.611	17.091	5.185	.000	.000
6.0-2.0	95.988	17.061	5.626	.000	.000
6.0-8.0	-105.034	24.126	-4.354	.000	.000
4.0-7.0	-.547	32.775	-.017	.987	1.000
4.0-9.0	-30.803	26.728	-1.152	.249	1.000
4.0-3.0	36.963	25.168	1.469	.142	1.000
4.0-1.0	44.739	23.073	1.939	.052	1.000
4.0-2.0	52.117	23.051	2.261	.024	.856
4.0-8.0	-61.163	28.676	-2.133	.033	1.000
7.0-9.0	-30.256	29.993	-1.009	.313	1.000
7.0-3.0	36.417	28.612	1.273	.203	1.000
7.0-1.0	44.193	26.788	1.650	.099	1.000
7.0-2.0	51.570	26.769	1.927	.054	1.000
7.0-8.0	-60.617	31.742	-1.910	.056	1.000
9.0-3.0	6.161	21.419	.288	.774	1.000
9.0-1.0	13.937	18.914	.737	.461	1.000
9.0-2.0	21.314	18.887	1.129	.259	1.000
9.0-8.0	30.361	25.450	1.193	.233	1.000
3.0-1.0	7.776	16.637	.467	.640	1.000
3.0-2.0	15.154	16.606	.913	.361	1.000
3.0-8.0	-24.200	23.806	-1.017	.309	1.000
1.0-2.0	-7.378	13.218	-.558	.577	1.000
1.0-8.0	-16.424	21.580	-.761	.447	1.000
2.0-8.0	-9.046	21.557	-.420	.675	1.000

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same. Asymptotic significances (2-sided tests) are displayed. The significance level is .05.

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