

THE POLITICAL ECOLOGY OF THE SEASONAL FISHERY CLOSURE
IN THE VISAYAN SEA, PHILIPPINES

by

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July, 2020

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The seasonal fishery closure (SFC) policy is an important initiative for protecting and conserving the fisheries and aquatic resources in the Philippines, yet there are many problems with its implementation. It lacks consideration of the human dimensions of resource management, and empirical evidence on its effects on the regulated species. Using mixed methods, this study is conducted to gain a better understanding of the effects of the SFC implemented in the Visayan Sea on the fishery resources and stakeholders, as well as the underlying factors that affect policy outcomes.

Chapter 1 provides a brief background on the world fisheries, the Philippine fisheries sector, the SFC policy implemented in the Visayan Sea and its gaps, the objectives of this study and the research questions it attempts to address. Chapter 2 contains the necessary background to the Philippine fisheries, SFC experiences in other countries, a description of the political ecology theoretical framework and its application in this study, as well as examples of political ecology and related studies that have valuable insights and application in fisheries management. Chapter 3

discusses the materials and methods used in data gathering, processing and analysis. It also presents the research framework, description of the study sites and the respondents. Chapter 4 explores how knowledge and perceptions of municipal fisheries stakeholders about the SFC vary among the respondent groups and municipalities, and how this influence their compliance with the SFC. It also examines how the SFC policy affects people's livelihoods, incomes, household dynamics, traditional practices, among other things. The political factors that undermine the conservation goals of the SFC in the Visayan Sea are likewise discussed. The last section of Chapter 4 presents the before-after control-impact (BACI) analysis that empirically tests reports of increasing fish stocks in the Visayan Sea. The conclusions and recommendations are provided in Chapters 5 and 6, respectively.

The research outputs can contribute to improving the present management framework for Visayan Sea and in designing development programs that are in-sync with the specific needs and capacities of municipal fisheries stakeholders towards a more inclusive development in the Philippine fisheries sector.

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IN THE VISAYAN SEA, PHILIPPINES

A Dissertation

Presented to the Faculty of the Department of Coastal Studies
East Carolina University

In Partial Fulfillment of the Requirements for the Degree
PhD in Coastal Resources Management

by

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July, 2020

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ACKNOWLEDGEMENTS

This undertaking would have been impossible without the help of so many people and organizations. I am truly grateful to my Adviser, David Griffith, for the trust, generosity, guidance, and for giving me the freedom to explore new horizons. To my powerhouse panel: Dr. Cynthia Grace-McCaskey, Dr. Rebecca Asch, Dr. Holly Hapke, and Dr. Harold Monteclaro, your critical inputs may have kept me on the edge, but they are very helpful. I am likewise indebted to all the people who helped me during my labor-intensive fieldwork. To Carm and Joe, thank you for your hard work, patience, and humor, despite the challenging work schedule and environment. To my contacts, respondents, and informants, thank you for sharing your time, experiences, and thoughts about our country's fisheries.

I am blessed to have friends, near and far, who kept me in their prayers, their thoughts, and for lifting my spirit when things are going downhill. I am also comforted by the love and support of my family throughout this journey. To my *Ama*, who has always been my source of strength. To my *Ina*, for always reminding me to pray. To *Nanay* and *Tatay* for being our stronghold; thank you very much for the unconditional love and support to us. And most especially, to Odin, Sab, Mahdi, and my better half, Weff, thank you for your patience, understanding, and for keeping me motivated to get up and continue each day. You are all part of this great endeavor.

I would also like to thank the Philippine-American Education Foundation for giving me the opportunity and honor to pursue my PhD in the USA as a Fulbright scholar. I am also thankful to the East Carolina University-Coastal Resources Management Program for providing me with the assistantship, for the fun and challenging experiences, and for preparing me for greater heights.

To the University of the Philippines System, thank you for the fellowship grant. And finally, to my constituent university, the University of the Philippines Visayas, for allowing me to pursue further studies on study leave.

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LIST OF ABBREVIATIONS

ADRA	Adventist Development and Relief Agency
BACI	Before-After Control-Impact
BFAR	Bureau of Fisheries and Aquatic Resources
DA	Department of Agriculture
DID	Difference-in-Difference
DILG	Department of Interior and Local Government
DOLE	Department of Labor and Employment
DSWD	Department of Social Welfare and Development
FAO	Food and Agriculture Organization
FARMC	Fisheries and Aquatic Resource Management Council
FG	Focus Group
FMA	Fisheries Management Areas
GA	Government Agency
IEC	Information, Education, and Communication
GT	Gross Ton
KII	Key Informant Interview
LGU	Local Government Unit
MC	Memorandum Circular
MCS	Monitoring, Control, and Surveillance
MT	Metric Ton
NFRDI	National Fisheries Research and Development Institute
NGA	Non-government Agency
NSAP	National Stock Assessment Program
PFDA	Philippines Fisheries Development Authority
PNP-MG/PCG	Philippine National Police-Maritime Group/Philippine Coast Guard
PSA	Philippine Statistics Authority
RA	Republic Act
SFC	Seasonal Fishery Closure

SSI

Semi-Structured Interview

ZSL

Zoological Society of London

CHAPTER 1. INTRODUCTION

The declining trends in the world fisheries suggest the need to reduce fishing capacity in both large-scale and small-scale fisheries (FAO 2018; Costello *et al.* 2012). A similar trend is observed in the Philippine fisheries (Dalzell *et al.* 1987; Muallil *et al.* 2012; DA-BFAR 2014). Over the years, yields of fish species like the round scads, sardines, and anchovies, which are considered icons of food security, have significantly declined (Ani 2016). Various approaches toward reduction of fishing capacity have been proposed and adopted in many areas. These include vessel or gear restrictions, closed seasons, and incentives that promote limited entry, among others (Smith 1980).

In the Philippines, a closed season (referred to as seasonal fishery closure or SFC in this study) was first implemented in 1939 to conserve important fishery commodities in the Visayan Sea, namely sardines and herrings. In 1989, mackerels were included in the list of regulated species in the Visayan sea during the SFC. These species are among the frequently caught fishes in terms of volume (DA-BFAR 2014), and rank first in marine municipal fisheries, and third in commercial fisheries production (DA-BFAR VI 2017). The SFC is in line with the provisions of the Philippine Fisheries Code of 1998 [Republic Act (R.A.) 8550], which provides the legal framework and guiding principles for the development, management, protection and conservation of fisheries and aquatic resources in the country. Section 9 of this Act states that, “the Secretary of the Department of Agriculture (DA) may declare a closed season in any or all Philippine waters outside the boundary of municipal waters and in bays, for conservation and ecological purposes.” The Act further states that it is unlawful to fish in overfished areas during the closed season (Section 95). Furthermore, “the closed season may be extended to waters under the jurisdiction of special

agencies, municipal waters and bays reserved for the use of the municipal fisherfolk...., provided that there is concurrence and approval or recommendation of such special agency and the concerned local government unit (LGU) and Fisheries and Aquatic Resource Management Council (FARMC)". This is further supported in Section 16 of the R.A. 8550 which states that "municipal or city government, in consultation with the FARMC, shall be responsible for the management, conservation, development, protection, utilization, and disposition of all fish and fishery/aquatic resources within their respective municipality/city waters in the areas to be covered by the closed season".

Municipal fishing in the Philippines is characterized by many small-scale, labor-intensive fishing boats of 3 gross tons (GT) or less, and fishing that does not require the use of fishing vessels, operating within municipal waters (0-15 km seaward from the coastline). Some municipal fishers have non-motorized fishing boats. Commercial fishing on the other hand, involves taking of fishery species by passive¹ or active² gear for trade, business or profit beyond subsistence or sports fishing. This subsector is composed of capital-intensive corporate enterprises with more centralized fishing operations. Commercial fishing is further classified into: small-scale commercial fishing (fishing with passive or active gear utilizing fishing boats of 3.1 GT up to 20 GT); medium-scale commercial fishing (fishing utilizing active gear and boats of 20.1 GT up to 150 GT); and large-scale commercial fishing (fishing utilizing active gears and boats of more than 150 GT). Commercial fishing operations take place beyond the 15 kms boundary of the municipal

¹ Passive fishing gear is characterized by the absence of gear movements and/or the pursuit of the target species, such as, but not limited to, hook and line, fish pots, traps, and gill nets across the path of the fish (R.A. 8550 1998).

² Active fishing gear is a fishing device characterized by gear movements, and/or the pursuit of the target species by towing, lifting, and pushing the gears, surrounding, covering, dredging, pumping, and scaring the target species to impoundments, such as, but not limited to, trawl, purse seines, Danish seines, bag nets, *paaling*, drift gill net and tuna longline (R.A. 8550 1998).

waters up to the seaward edge of the 200-nautical mile Exclusive Economic Zone (EEZ) (R.A. 8550 1998). In some municipalities however, commercial fishing operations are allowed from 10.1 km beyond the coastline depending on municipal ordinances (e.g., some Mayors allow commercial fishers to operate in municipal waters that are deeper than 7 fathoms). While municipal fisheries are closely tied to geographically dispersed coastal fishing communities, commercial fishing operations involve a mix of members of communities (small- to medium-scale) and large fishing companies (large-scale). This classification of municipal and commercial fishing activities shows important distinctions between these groups in terms of fishing objectives and practices. According to Dalzell *et al.* (1991), although production data shows that the commercial and municipal fisheries sectors of the Philippine fishing industry catch roughly equal volumes of fish, gross benefits from the resource are divided between far fewer fishermen within the commercial sector.

Currently, SFCs are implemented in Davao Gulf for big-eyed scads, small mackerel and round scads, Palawan (round scads), Zamboanga Peninsula (sardines), and Visayan Sea (sardines, herring, and mackerels) to help declining fishery stocks recover. This study concentrates on the SFC in the Visayan Sea, one of the major fishing grounds in the Philippines which serves as a traditional fishing ground to many *Visayans*. Fish catch from the Visayan Sea comprises approximately 10-13% of the total production of sardines and mackerel in the country (DA-BFAR 2012). Further, this study focuses on the municipal fisheries stakeholders in the fishing communities surrounding the Visayan Sea primarily because the enclosed area is largely comprised by municipal waters (~75%). Second, the SFC policy is implemented at the municipal level through the LGUs, wherein most of the potential problems resulting from implementation unfold. Hence, it is critical to understand the dynamics of fisheries management at the municipal

level. Third, the municipal fisheries sector is a significant contributor to the country's economy; understanding the municipal fisheries stakeholders' perspectives is vital in its sustainable management. In 2018, the municipal fisheries sector contributed 55% to the country's total fisheries production value (~PhP 93.97 B or USD ~1.88 B).

The SFC in the Visayan Sea is implemented annually, initially from November 15 to March 15 (4 months), for the conservation of sardines and herrings, as per Fish and Game Administrative Order No. 13, s. 1939 (DA-BFAR 1939). During that time, the now Bureau of Fisheries and Aquatic Resources³ (BFAR) was operating under the Department of Agriculture and Commerce⁴. In 1989, the BFAR issued the Fisheries Administrative Order No. 167, s. 1989, which reiterates the stipulations of the Fish and Game Administrative Order No. 13, s. 1939, but this time, it included mackerels in the species covered by the SFC in the Visayan Sea (DA-BFAR 1989). In 1990, the Fisheries Administrative Order No. 167-1, s. 1990, was issued by BFAR, suspending the effectivity of the Fisheries Administrative Order No. 167 from November 15, 1990 to March 15, 1991 (DA-BFAR 1990). This was followed by the Fisheries Administrative Order No. 167-2, s. 1991, which suspends the SFC for the conservation of sardines, mackerels and herrings in the Visayan Sea from November 15, 1991 to March 15, 1992 (DA-BFAR 1991). The most recent issuance related to the SFC is the Fisheries Administrative Order No. 167-3, s. 2013, which shortens the SFC period into 3 months, from November 15 to February 15 (DA-BFAR 2013a).

³ The BFAR is the lead government agency responsible for the development, improvement, management, and conservation of the fisheries and aquatic resources in the Philippines. It has a national office in Quezon City, Manila, and 16 regional field offices in the islands of Luzon, Visayas, and Mindanao.

⁴ The agency has undergone several reorganizations and was placed under different administrative jurisdictions from 1930 until the 60's. It was in 1972 that BFAR finally earned its name and was placed under the Ministry of Natural Resources. The agency's staff function and integration of its regional offices to the Department of Agriculture was fully implemented in 1987.

This change was prompted by the realization on the part of the BFAR management that poor compliance of fishers with the SFC is caused by the longer SFC period.

Despite being in effect for 8 decades, it was only in 2012 that the Philippine government paid serious attention to its enforcement. Strict implementation of the SFCs coincided with the term of then National Director of the BFAR, Atty. Asis Perez, who assumed office in June of 2011. Atty. Perez, who served as the former Executive Director of a public interest environmental office, not only vowed to fight destructive fishing methods and the continuous intrusion of commercial fishers in the municipal waters, but also revitalized the conservation efforts in fisheries (DA-BFAR 2011). It was during his term when the SFCs were not only actively implemented but were also reviewed and amended.

However, the SFC implemented in the Visayan Sea has many grey areas. For example, the Fisheries Administrative Order No. 167-3, s. 2019 specifies the fish species (i.e., sardines, herrings and mackerels) that are banned from fishing during the closure period, but it does not state which specific fishing gears or fishing boats (e.g., municipal or commercial) are not allowed during the SFC. Personal correspondence with BFAR personnel at the regional and national levels reveals contradicting statements (June 2019). According to the national BFAR, the SFC applies only to commercial fishing vessels, while the regional BFAR says the SFC includes both commercial and municipal fishers. Anecdotal evidence indicates that some municipalities extend the fishing ban to municipal fishers [as per principal investigator's personal correspondence with representatives of local government units (LGUs), July 2017].

Further, the BFAR highlights the success of the SFC, noting an increase in fish stocks at the end of the closure period (DA-BFAR 2013b; Ramos 2014). However, empirical evidence has yet to emerge from assessment studies conducted to support these cited positive impacts on the resource or the fishing communities. There is also disagreement about the implementation of the SFC in the country. An article published in the *Business Mirror* captures the varying perceptions of stakeholders about this policy (Mayuga 2017). The National Federation of Small Fisherfolk Organizations in the Philippines (*Pambansang Lakas ng Kilusang Mamamalakaya Pilipinas*), an umbrella organization for fishers in the Philippines, strongly opposes the implementation of the SFC because of the apparent impact on municipal fishers. Questions have been raised about this fishery policy because of the lack of a comprehensive study on its environmental, social, and economic impacts. Oceana Philippines' Senior Scientist further stated that the SFC is not addressing the overfishing problem in the Philippines because it did not consider the biogeographic characteristics of sardines, general fisheries assessment, and the socio-economic impacts, and that such management tool can only be effective when implemented honestly and guided by correct science (Mayuga 2017).

Stakeholders in fisheries have different goals, practices, values, needs, and capacities, and several fisheries management initiatives in the past have failed because resource managers overlooked these critical factors in designing management plans. This study posits that management goals of the SFC in the Visayan Sea must take into consideration the multiple concerns and specific contexts of its various stakeholders, as well as the different factors in the community that influence policy outcomes, for more inclusive fisheries management in the

Philippines. This aligns with the key principles of ecosystem-based management approach that has recently gained momentum in marine management initiatives (Long *et al.* 2015).

Using a political ecology theoretical framework, this study aims to provide a better understanding of the SFC implemented in the Visayan Sea to inform current fishery management framework in the Philippines. Political ecology encompasses the cultural, economic, political, and environmental systems at different scales, with emphasis on access and control over resources, interactions of production, policy and decision-making power relative to environmental changes and adaptations (Andreatta and Parlier 2010).

The study objectives and specific research questions are the following:

1. Determine the knowledge and perceptions of the different fisheries stakeholders about the SFC and its implementation.

Q1: Are fisheries stakeholders knowledgeable about the SFC in the Visayan Sea?

Q2: What are their perceptions about the SFC?

Q3: How does knowledge and perceptions about the SFC policy and its implementation differ across fisheries stakeholders and municipalities?

Q4: How does fisheries stakeholder's knowledge and perceptions about the SFC policy affect compliance and implementation?

Q5: Is there a varying interpretation on who is included in the SFC policy and thus, implementation in the study sites? If yes, why is this so? What is BFAR's standpoint on this?

2. Determine the socio-economic and cultural impacts of the SFC on the fisheries stakeholders.

Q6: What are the socio-economic and cultural impacts of the SFC?

Q7: How do fisheries stakeholders cope with the impacts of SFC?

Q8: Is there any assistance provided to the affected fisheries' stakeholders?

3. Determine the political challenges that affect the implementation of the SFC.

Q9: What political challenges affect the implementation of the SFC?

4. Assess whether the SFC has improved the fisheries production of the banned species.

Q10: Is there an increase in the catch of sardines and mackerels in the study sites?

CHAPTER 2. LOOKING AT THE VISAYAN SEA THROUGH A POLITICAL ECOLOGY LENS

Today, the oceans and the ecosystem services they provide are under more serious threat than ever before because of coastal development, overfishing, population growth, marine pollution, sea-level rise, ocean warming, acidification, and other environmental changes. The many problems caused by either regional mismanagement or global climate change render marine protection a challenge (MARIBUS *et al.* 2015). Most fisheries around the world are managed as common pool resources, hence its rival and non-exclusive nature makes management more challenging (Costello *et al.* 2010), although many regions have been moving toward privatizing fisheries with limited entry and individual transferrable quotas (ITQs) and the state can also restrict access. The Status of Fisheries and Aquaculture 2018 report shows that a portion of fish stocks that are within biologically sustainable levels has decreased from 90.0% in 1974 to 66.9% in 2015, while the percentage of stocks fished at biologically unsustainable levels increased from 10% in 1974 to 33.1% in 2015 (FAO 2018). In 2015, maximally sustainably fished stocks (formerly termed fully fished stocks) accounted for 59.9% and underfished stocks for 7.0% of the total assessed stocks (FAO 2018). The declining trends in world fisheries suggest the need to reduce fishing capacity in both large-scale and small-scale fisheries (FAO 2018; Costello *et al.* 2012).

In the Philippines, a similar declining trend in fisheries has been observed (Dalzell *et al.* 1987; Siason *et al.* 2004; Muallil *et al.* 2012; DA-BFAR 2014; Anticamara and Go 2016). Previous studies show that small pelagic fishery in the country, which are caught largely by small-scale municipal fishermen, were biologically and economically overfished (Dalzell and Ganaden 1987; Dalzell *et al.* 1987, 1990). The expansion of commercial fisheries after the World War II and the

continued growth of the small-scale municipal fisheries sector, coupled by population increase, have led to the overexploitation of the small pelagic fishery in the country. Dalzell *et al.* (1991) explains that the industrialization of fisheries in the Philippines can be attributed to the initial profit potential of this sector, and the increasing poverty in rural areas, which drives people into small-scale artisanal fishing to survive. Prior to the World War II, the level of industrial commercial fishing in the country was limited to Japanese fishermen using beam trawls from sail-powered vessels in Manila Bay since the 1900, and in the late 1920s, this fishery began to expand as the fishing companies operating there introduced diesel-powered vessels (Morgan and Staples 2006). Before that, the occupation of the Spaniards in the country created a huge demand, especially in Manila (the capital), which served as the seat of government and political power when the Philippines became a colony of the Spanish regime. This attracted Chinese immigrants and created opportunities for them, considering that Filipino fishers then were not geared to supply the large urban demand (Spoehr 1984). In 1754, guilds of Chinese fishers were documented in Manila (Diaz-Trechuelo 1966, as cited by Spoehr 1984). These Chinese fishers introduced the large lever net, gill nets, and cast nets to the Philippines.

In 1976, the BFAR and the South China Sea Fisheries Programme analyzed the national BFAR catch data from 1965-1974 to identify possible management action for the heavily exploited stocks of Visayan Sea and Sibuyan Sea areas. Six (6) pelagic species were investigated (i.e., round scads, chub mackerels, sardines and herrings, anchovies, big eyed scads, and squids and cuttlefishes), and results show that catch-per-unit-effort (CPUE) of these species have consistently decreased (SCS/GEN/76/7 1976, as cited by Armada 1999). Sardines and mackerels are among

the commercially important small pelagic fishes that historically dominated the Philippine fishery (Dalzell and Ganaden 1987; Dalzell *et al.* 1990).

In a more recent study conducted by Anticamara *et al.* (2016) that looks at the long-term spatio-temporal trends of Philippine fisheries production based on the landed national fish catch data (1980–2012), shows that total Philippine fish catch volume (in metric tons or MT) of most capture fisheries throughout the country has either stagnated or declined over the last 3 decades. They have also found that the decline is more prominent at the provincial level, suggesting spatial serial depletion of the country's fisheries. Muallil *et al.* (2012) also report that 64% of coastal fisheries in the country are overfished, although this figure is a conservative estimate since impacts of destructive fishing practices and the intrusion of the highly efficient commercial fishers to coastal fishing grounds were not accounted.

The Visayan Sea is a major fishing ground located in central Philippines (FAO 2000; Ferrer 2009) and was among the areas listed by the BFAR as overfished in 1976 (Ronquillo and Llana 1987). Armada (1999) assessed the management of small pelagic fisheries in the Visayan Sea by analyzing BFAR fish catch data from 1975-1984 using the Schaeffer (1954) and Fox (1970) surplus production model and results show that the maximum sustainable yield (MSY) for most of the pelagic species investigated was attained in the mid-70s (Dalzell *et al.* 1991). Further, analysis of species composition of different gears designed to catch pelagic and demersal species in the Visayan sea shows that sardines (*Sardinella fimbriata*, *S. longiceps*⁵) and mackerels

⁵ Previous data reported as Indian oil sardines (*Sardinella longiceps*) is the Bali sardinella (*Sardinella lemuru*), as per BFAR Administrative Circular Oder No. 1 Series of 2019 and PSA approved memorandum of Correcting Nomenclature of Indian oil sardines to Bali sardinella dated 03 July 2019.

(*Rastrelliger kanagurta* and *R. brachysoma*) were the most frequently caught fishes. The same results were observed by Guanco *et al.* (2009) when they assessed the commercial fisheries in the central and western Visayan sea using the National Stock Assessment Program (NSAP) data from 1998-2002: 67% of the catch from commercial fishing vessels (e.g., Danish seine, purse seine, trawl, and ring net) were predominantly pelagic fishes, with sardines and mackerels dominating the catch.

According to Willette *et al.* (2011), areas with high landings of sardines exhibit high rates of primary productivity. Chlorophyll concentrations in the Visayas, for example, were the highest of any Philippine basin measures, which is attributed largely to mobilized nutrients from land (Willette *et al.* 2011). Further, peak sardine productivity and spawning in the Philippines often coincide with the southwest monsoon winds (locally known as ‘*Habagat*’) which occurs from June to October (Dalzell 1990, as cited by Willette *et al.* 2011). The distinct seasonal climate in the Philippines that is largely influenced by rainfall brought by typhoons and tropical storms during southwest monsoon, influences the production of fishes such as small pelagics that live closely to the water surface. For example, Dalzell *et al.* (1991) note that peak production of clupeoid fishes (anchovies, herrings, and sardines) occurs through the periods of maximum rainfall. These observations are supported by the report by Guanco *et al.* (2009), which shows that production⁶ of sardine species such as *S. gibbosa* peaks in August, while production of *S. fimbriata* peaks in June. Production of *S. longiceps* (now identified as *S. lemuru*) on the other hand, peaks in September. Guanco *et al.* (2009) further note that there are 2 recruitment⁷ pulses per year for sardine species

⁶ Production estimate is derived by multiplying the annual catch-per-unit-effort (CPUE) by the actual fishing days and number of fishing boat units (Guanco *et al.* 2009).

⁷ Recruitment is defined as the stage when a stock enters a fishing area (Guanco *et al.* 2009).

in the Visayan Sea, i.e., February-June for *S. gibbosa*, July-September for *S. fimbriata*, and March-May for *S. longiceps*.

A succeeding report by Bayate and Mesa (2012) that reviews the Visayan Sea sardine stock and its fishery conservation initiatives in Western Visayas shows that high spawning of *S. gibbosa* is observed in the months of November and December and dominance of ripe and spawning stage sardines is observed during this period (Figure 1).

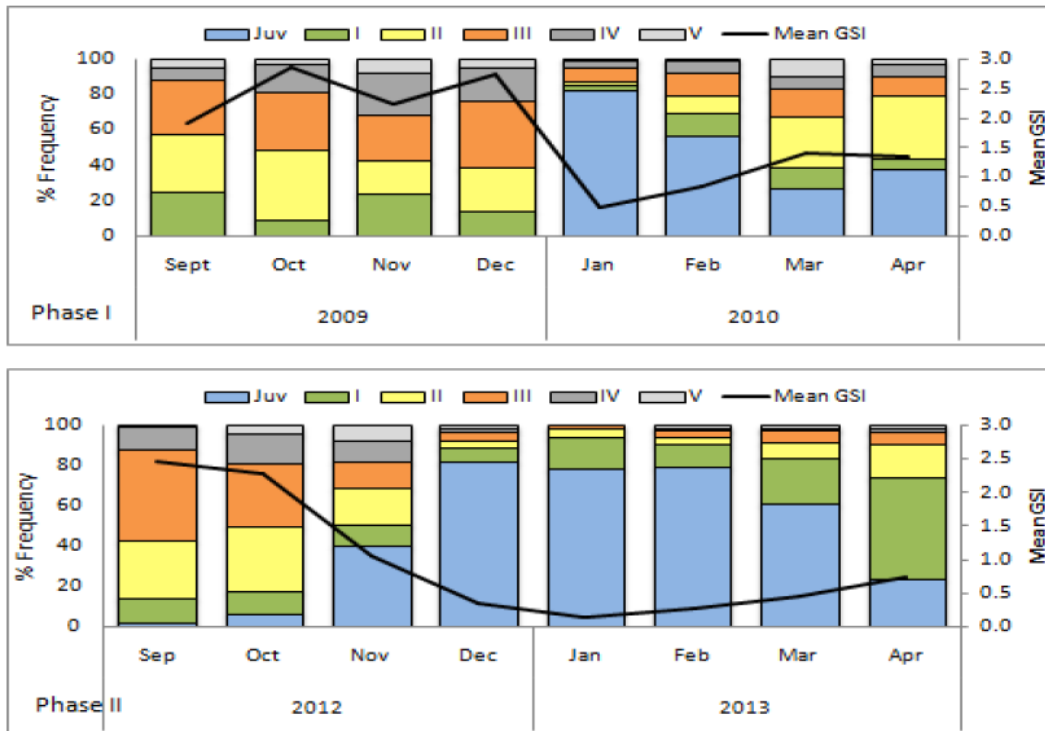


Figure 1. Monthly frequency distribution of gonadal stages and Gonado-Somatic Index (GSI) of female *S. gibbosa* in Western Visayan Sea during the period September 2009 to April 2010 (Phase I) and September 2012-April 2013 (Phase II) (Bayate and Mesa 2012).

Bayate and Mesa (2012) further report that while growth and recruitment overfishing are observed in the Visayan Sea, there is a significant increase in the catch for sardines after the SFC

period, which they attribute to the active implementation of the SFC through their information, education, and communication (IEC) and monitoring, control, and surveillance (MCS) activities.

Sardines are known as migratory species, however, very little is known about sardines' migratory routes and behaviors in the Philippines, except for some anecdotal accounts of arrival of exceptionally high numbers of sardines within the Tañon Strait, between Cebu and Negros Oriental, in late 2009 to late 2010 (Willette *et al.* 2011). Willette *et al.* (2011) further cite anecdotal claims by Bognot (unpublished review) and an unpublished version of the Sulu Sea Management Plan, about a continuous, migrating population sardines between the Visayan and Celebes Seas, and *Sardinella* spp. migrating between northwest Mindanao and the west side of the Sulu archipelago. In terms of distribution, *S. lemuru* and *S. gibbosa* are primarily concentrated in the central Visayan water bodies, southeastern coasts of Luzon, and around the islands in Autonomous Region of Muslim Mindanao and Palawan, with a patchier distribution in northern Luzon and southeastern Mindanao. According to Willette *et al.* (2011), these regions have high primary productivity along their coastlines, but with little correspondence to the offshore upwelling near Mindanao and northwestern Luzon.

While the status of sardines is frequently presented by the BFAR in its reports, there is not much information about the biology and ecology of mackerels in the Philippines. For example, the report by Guanco *et al.* (2009) presents information on *R. kanagurta* only, described with peak months between January-February, and lean months from September-October. Guanco *et al.* (2009) also cite the work of Rasalan (1957) which notes that that peak season for mackerels in the Philippines is between January-May. These observations are also supported by a study of Dalzell

et al. (1991), which notes that certain species of mackerels (and fusiliers) do not appear to have production peaks in concert with the rainfall cycle. However, a study by Szanton (1971) notes that mackerel production in Estancia, Iloilo (one of the municipalities included in the SFC in the Visayan Sea) peaks in June, July, and August.

General information about mackerels are provided in the FishBase website by Collette and Nauen (1983). Adults of *R. kanagurta* are known to form schools and are found in coastal bays, harbors, and deep lagoons, usually in turbid plankton-rich waters. These species feed on phytoplankton (diatoms) and small zooplankton (cladocerans, ostracods, larval polychaetes); adult individuals feed on macroplankton such as larval shrimps and fish. In comparison, *R. brachysoma* is described as an epipelagic, neritic species that tolerates slightly reduced salinities in estuarine habitats and in areas where surface temperature range between 20° and 30°C. Batch spawning is believed to extend from March through September. This species feeds mainly on microzooplankton with a high phytoplankton component (Collette and Nauen 1983).

Despite the yearly closure of the Visayan Sea since the implementation of the Fisheries Administrative Order No. 167 in 1989 (under the BFAR flagship), Santos *et al.* (2017) report that intense fishing pressure for sardines and mackerels persists as shown in their exploitation rates⁸ (E), which are higher than the limit reference point for small pelagic species (E>.60). Intense

⁸ Exploitation rate (E) is the ratio of fishing mortality (F) over total mortality (Z). NSAP set the estimated optimum exploitation of E = 0.50, which is the limit reference point (LRP) for most fishes in the Philippines, with the exception of small pelagics (E=0.60; based on high fecundity and relatively short life cycle of ~3 years) and oceanic tunas (E = 0.40; long lived with a life cycle of ~10-12 yrs). E rates higher than the LRP suggest unsustainable harvest of the fish stocks (Santos *et al.* 2017).

fishing pressure can be associated with the overfishing and the excess fishing capacity in the Philippines.

Excess fishing capacity leads to a number of negative impacts such as resource use conflicts, declines and collapse of fish populations, overfishing, environmental degradation, economic waste, security threat, increased poverty, and a lower overall standard of living and national welfare (Pomeroy *et al.* 2007; Salayo *et al.* 2008). Several strategies have been employed to reduce fishing capacity such as catch share programs (Jardine and Sanchirico 2013; Birkenbach *et al.* 2017), vessel buyback programs (Kirkley *et al.* 2006); bag and possession limits, restrictions on the size of fish and prohibition of retention (Matlock *et al.* 1988); and gear and vessel restrictions (FAO 2008; McClanahan 2010; Farmer *et al.* 2016). In the Philippines, SFC is a fishery management strategy of choice due to the multi-species nature of its fisheries and it is easier to enforce than some of the abovementioned strategies.

Various justifications have been offered for closing fisheries for limited or longer periods. All these share a common objective of protecting the fish stock from exploitation during at least part of its life history or during seasons of high vulnerability and may enclose part or all the range of the resource in question (Caddy 1984). Temporal and closed seasons or SFCs, in many variations, are marine resource management strategies that are easily enforced and often accepted by fishers because of their simplicity (Beets and Manuel 2007). This measure has been widely used in fisheries management to prevent overfishing and reduce bycatch of protected species like the federally protected North Atlantic right whales *Eubalaena glacialis*, resulting in the prohibition of the use of pot gear in the commercial harvest of Black Sea Bass *Centropristis striata* in the

southeastern United States during winter (Farmer *et al.* 2016). In other cases, SFCs are imposed during the breeding period of harvested species with the aim that this will achieve greater annual reproductive output (Arendse *et al.* 2007), but several studies show varying effects (Arendse *et al.* 2007; Jiang *et al.* 2009; Mendonça and Sobrinho 2013; Wang *et al.* 2015). Several scientists argue that the implementation of spawning area closures remains controversial due to the frequent lack of clear objectives, monitoring and empirical evidence (Sadovy and Domeier 2005; Beets and Manuel 2007; Gruss *et al.* 2014b; Clarke *et al.* 2015). Further, the effectiveness of SFCs is rarely tested (Clarke *et al.* 2015). In a paper that reviews the temporal and seasonal closures used in fisheries management in tropical and subtropical regions and important species groups for Hawaii, Beets and Manuel (2007) report that managers conclude that SFCs are beneficial and useful based on perceived benefits and stock effects, although quantitative analyses of the specific value of this fishery management strategy has not been conducted. The design of SFCs also presents a challenge because the net benefits to the fishery or other resources are often unknown (Sanchirico and Wilen 2001; Sanchirico 2005).

Some of the noted failures in SFCs implemented for different fisheries include the groundfish fishery in New England (Sinclair and Valdimarsson 2003; Brodziak *et al.* 2004) and Pacific halibut fishery (Skud 1984), while closed seasons implemented in the Gulf of Mexico shrimp fishery (Beets and Manuel 2007), US Virgin Islands grouper fishery (Beets and Friedlander 1999) and coral reefs in Kenya (McClanahan 2010) show positive results. It is important to note that the success or failure of an SFC can be attributed to a number of factors such as status of the fishery prior to implementation of the closure, design (size and positioning of the enclosed area), law enforcement, and other natural variation in the environment.

The development and implementation of a fisheries management system have important repercussions in terms of biological, economic, and social outcomes for fishers and fishing communities alike (Schmidt 2003). The maintenance of management areas, including the imposition of time-area closures, can result in impacts to a fishery, the other resources affected by the fishery, and fishing communities that rely on the fishery (Cheuvront *et al.* 2005; Beets and Manuel 2007; Farmer *et al.* 2016; Loring 2017). Some of the negative impacts of fishery closures in fishing communities include unemployment (Gien 2000; Chimba and Musuka 2014), economic losses (Beets and Manuel 2007; Ani 2016; Brillo *et al.* 2016), and adverse effects on the psychological well-being of affected individuals (Gien 2000; Smith *et al.* 2003). Overall, any measure that changes the nature and dependence or engagement in fisheries harvesting or processing can affect the community in the following areas: the overall volume of product that is harvested and/or processed; the number of fishing boats that visit the community; the composition of the fleet in terms of boat type and fishery; the number of fishing families that live in the community; the level of community solidarity among fishing families and other community members; political activity and community support; the cultural identity and sense of place among community members (EPA 2002). Further, it affects the community character and historical connection to fishing; population shifts and resulting changes in social services, labor markets, housing, community mobility, social stratification, and power structure; levels of social deviance and conflict on land and at sea; and the overall adaptability of the community to future changes (Cheuvront *et al.* 2005).

The complex and multi-faceted nature of fishery management calls for a holistic approach that views environmental problems as both a social problem and a biophysical condition. This

study draws on a political ecology theoretical framework, an academic discipline that is deemed to be the most important line of recent social scientific thinking about environment and development (Peet and Watts 1996). In a nutshell, political ecology is the study of the relationships between political, economic, and social factors with environmental issues and changes. According to Peet and Watts (1996), political ecology emerged in response to the theoretical need to integrate concerns in ecology with local-global political economy, and the growing politicization of the environment. Biersack (2006) reports that Eric R. Wolf's first use of the term political ecology to signify the study of how power relations mediate human-environment relations marked the departure from the established economic analysis by Marx and Engels, which disregarded nature and environment. Political ecology places power at the core of its analysis and thus, differs from an apolitical cultural ecology that focused on adaptation issues to the environment without regard to the structures of inequality that mediated human interactions (Biersack 2006). By integrating ecology and political economy, political ecology strives to rectify the shortfalls in both frameworks. Over time, the growing field of political ecology has attracted scholars from the fields of anthropology, forestry, development studies, environmental sociology, environmental history, and geography (Robbins 2012).

A review of the term political ecology shows important differences in emphasis. Various scholars provide different definitions of political ecology depending on their research interest. For example, some definitions highlight political economy (e.g., Greenberg and Park 1994), while others focus on the political institutions (e.g., Hempel 1996). Some stress on environmental changes (e.g., Blaikie and Brookfield 1987), while others emphasize narratives about the changes (e.g., Cockburn and Ridgeway 1979). Robbins (2012) categorizes these school of thought within

political ecology into 5 dominant narratives that seek to explain different but interrelated issues that govern human-nature articulations. Robbins' first narrative, the *degradation and marginalization thesis*, posits that environmentally harmless production systems have led to overexploitation of natural resources (on which marginal people depend) as a response to development and globalization. Efforts to improve production systems in response to development resulted in decreased sustainability of local practice which have corresponding negative effect on equitable resource distribution. Second, the *conservation and control thesis*, highlights the adverse effects caused by environmental conservation efforts, which sometimes result in failure. Most of the work in this area demonstrate that where local productions have historically been productive and relatively benign, they have been characterized as unsustainable by state authorities or other players in the struggle to control resources. Third is the *environmental conflict and exclusion thesis*, which explains that increasing scarcities produced through resource enclosure or allocation by state authorities, private firms, or social elites accelerate conflict between groups that are differentiated by gender, class, or ethnicity. Fourth, the *environmental subjects and identity thesis*, links political identities and social struggles to basic issues of livelihood and environmental activity. This thesis posits that people's beliefs and attitudes do not lead to new environmental actions, behaviors, or rules systems; rather, new environmental actions, behaviors, or rules systems lead to new kinds of people. Lastly, Robbins (2012) describes the *political objects and actors thesis*, wherein political and economic systems are shown to be underpinned and affected by the non-human actors with which they are intertwined. This thesis recognizes that people, institutions, communities, and nations assemble and participate in the networks that emerge from such interactions, leveraging power and influence, similar to non-human organisms and communities.

For the purpose of this study, Watts' (2000) description of political ecology is adopted, which states that political ecology seeks to understand the complex relations between nature and society through a careful analysis of the forms of access and control over resources and their implications for environmental state and sustainable livelihoods. It aims to explain environmental conflict, particularly in terms of struggles over 'knowledge, power and practice', and 'politics, justice and governance' (Watts 2000).

In this regard, this study digs deeper into the conservation and control thesis of political ecology, which posits that officials' and managers' decision to pull the control of resources and landscapes from the producers through the implementation of conservation efforts for sustainability, community and nature, results in inevitable repercussions on the local systems of livelihood, production and socio-political organizations. According to Brogden and Greenberg (2005), since bureaucratic structures are set up to simplify and regularize decision making, their responsiveness to local variance and ability to mediate competing claims to resources are limited as the rules of access and use become inscribed in law and administrative procedures. These concepts are explored in understanding the political ecology of SFC policy implemented for the conservation of important fishery commodities in the Visayan Sea, Philippines.

The central premise in political ecology is that environmental problems are fundamentally social and political problems, not technical or managerial, and therefore demand a theoretical foundation for analyzing the complex social, economic, and political relations in which ecological change is embedded (Brookfield and Blaikie 1987). Political ecology attempts to provide critiques, as well as alternatives, in the interplay of these critical factors, i.e., "...critically explaining what

is wrong with dominant accounts of environmental change, while at the same time, exploring alternatives, adaptations, and creative human action in the face of mismanagement and exploitation...” (Robbins 2012: 20). Hence, it has useful applications in: 1) Informing policymakers and organizations of the complexities surrounding environment and development, thereby contributing to better environmental governance; 2) Understanding the decisions that communities make about the natural environment in the context of their political environment, economic pressures, and societal regulations; and 3) Examining how unequal relations in and among societies affect the natural environment, especially in the context of government policy (Healy *et al.* 2019).

Over the years, political ecologists have paid growing attention to the ethnic identities, gender roles and relations, multiform institutions, governance apparatuses, political involvements and other social factors that condition the knowledge, decisions, and actions of diverse land managers (Paulson and Gezon 2005). According to Peet and Watts (1996), political ecology began in the 1980s to “combine the concerns of ecology and a broadly defined political economy...[which] encompasses the constantly shifting dialectic between society and land-based resources” (Blaikie and Brookfield 1987). Hence, it is not surprising that most of the earlier works in this field focused on terrestrial examples such as land management and degradation, water resources, agroforestry, agriculture, and pastoralism. Recently, more scholars have extended the political ecology lens to analyze human-coastal environment articulations, especially in the context of fisheries management. Below are political ecology and other relevant studies that have valuable insights and application in fisheries management.

The state through its national agencies, are responsible for regulating access to the natural resources, such as fisheries. States are the primary intermediary of property relations in most inland and capture fisheries (Campling *et al.* 2012). According to Brogden and Greenberg (2005), as the state defines spaces and organizes resources through the implementation of jurisdictional and administrative rules, it creates an enabling environment for disputes and conflicts because such arrangements draw social and political fault lines, and competing interests tend to influence or control the agencies, laws, and regulations that govern natural resources.

A study by Tan-Mullins (2007) explores how key agents in state agencies at provincial and district levels translate Thai political and legal systems at the local level, showing that access to coastal resources is highly regulated by unequal power relations among actors at various levels. She focuses her analysis on actors, namely local state agencies and grassroots leaders, who have direct influence at the village level. One important point she raises in her study is that while the state and its agencies act under the guise of ‘national’ interest, and thus, are in the position to play a pivotal role in resolving problems at different levels of government, when such broad authority is coupled by administrative inefficiency, unequal power relations at various level and varying willingness of stakeholders to participate in resource management, it empowers local agencies and official to interpret the policies and regulations according to their own interests. Similar results were found by Karnad *et al.* (2013) in their study of Indian fisheries wherein they report that the convoluted interactions between ineffective community and state regulations that guide the fishermen’s actions inhibited them from developing successful fisheries management. Smith (2010) reports the same observation in the European countries’ attempt to manage their common

fisheries resources which resulted in a precarious situation because of the overlapping jurisdictions and competing interests of the member states.

Research in political ecology tends to reveal winners and losers, hidden costs, and the differential power that produces social and environmental outcomes (Robbins 2012). For example, McCay and Finlayson (1996) report that while the moratorium on northern cod fishing (and associated decline or closure of other groundfish fisheries) was a crisis for many fishers and their families and communities, it is not the case for companies positioned to take advantage of the more recent phase of globalization in the fisheries. The large fishery firms of eastern Canada transformed into brokers and imported fish processors, ventures that are much more profitable than the production halted by the moratorium. These observations are corroborated by Loring (2017) in his paper which explores the challenges of a parametric management (i.e., the management of how, where and when fishing occurs) in fisheries, and the possibility to address scientific and political decisions separately, in the context of the commercial net ban enacted in Florida in 1995, and the failed ban on set gillnets in parts of Alaska. He explains that whereas large players in the fishing industry may have the resources to adapt and capitalize on the changes that come with ecological reforms, the consequences for small-scale and artisanal fishers can be livelihood-altering. Loring's (2017) findings demonstrate that ethical considerations are inseparable from the ecological aspects of managing fisheries, and that when communities grapple with the sustainability of fisheries, they are simultaneously seeking to define the socially acceptable uses of those resources (i.e., whether fish ought to be allocated to tourism, local food systems, commerce and export, or some combination of the three). Further, he stresses that when governance focuses on legible concepts like specific fishing gears or sectors, it masks the differences in scale and the varying needs and

concerns of the stakeholders involved. In effect, governance overlooks the fact that members of small-scale fishing families and maritime cultures obtain myriad non-economic benefits from fishing that enhance their health and well-being.

Coastal resource management encompasses a wide range of complex, overlapping, and often contradictory interests. As populations and investment in coastal regions grew in the last 25 years, so are claims over land and biotic resources as new, often global, industries have sought access to and control over fish production through both fisheries and aquaculture (Bush and Marschke 2016). Ideally, fishery governance links government with civil society, harmonizing individual, sectoral, and societal perspectives and maintaining social order and productive socio-ecological systems; it legitimizes and balances stakeholders' interactions, enforces decisions and regulations and maintains coherence across jurisdictional spatial, and time scales (FAO 2016). In practice, however, challenges related to coastal resource management abound that need to be unraveled and contextualized, requiring a holistic framework that political ecology offers.

In fisheries, management decisions (e.g., quotas, the timing or length of a fishing season, and the kinds of fishing gear allowed) are influenced by myriad factors but are in theory, dependent on information and understandings from a probabilistic but deterministic science known as stock assessment (McCay and Finlayson 1996). Blaikie and Brookfield (1987) challenge the heavy focus on technological fixes that is, oftentimes, the response of the scientific community and governmental agencies to environmental problems. Instead, they encourage an approach that represents environmental degradation both in light of a social issue and a biophysical condition. A political ecology framework comes in handy because of its emphasis on the connections between

ecology and social context by matching ecological and social chronologies, thereby contributing to the understanding of their interactions and the social production of landscapes (Vacarro *et al.* 2013). In that sense, using a political ecology framework is a pragmatic approach in fisheries management because as Ostrom (1990) points out, the people, who are embedded in the existing social, political, cultural and economic institutions, are the core of fisheries management initiatives and not the fish.

Political ecology defines the environment as an arena where different social actors with unequal political power are competing for access to and control of natural resources (Bryant and Bailey 1997). Following the framing of Ribot and Peluso (2003) about resource ‘access’, i.e., a bundle of powers that include the assemblage of means, relations, and processes that constrain or enable actors to benefit from the resource, Campling *et al.* (2012) explain that ‘access’ to resources is not only an area of political contestation in fisheries management, but also defined by many moving parts (such as access to capital, indigenous identity, or market access) that dictate fisheries use patterns and their socioeconomic and ecological outcomes.

In their paper entitled ‘Political ecology and conservation policies: some theoretical genealogies’, Vacarro *et al.* (2013) make the case that the declaration and implementation of a conservation policy such as protected areas, is a classic example of competition for control over natural resources because establishment of conservation areas establish jurisdictions and borders that define exclusionary rights. Further, conservation policies are implemented by different social and institutional actors that are more powerful, which affect the less powerful social groups in the society; thus, these actors are entangled in an assemblage of contradictory social relationships.

Furthermore, the establishment of a protected area is not only an ecological project, but also a social process, with corresponding economic and political consequences wherein stakeholders' managerial, and thus, cultural preferences and knowledge play critical roles (Vacarro *et al.* 2013). For example, a study by Holen (2004) shows how the Atna', an Athabaskan people of south-central Alaska, who have no treaty rights to resources, use their traditional ecological knowledge as a tool to maintain their right to the subsistence fishery of the Copper River. According to him, access to resources is always an issue of a historical and political nature. These situations highlight how environmental issues become increasingly prominent in local struggles, national debates, and international policies, and the need for scholars to pay more particular attention to conventional politics and to more broadly defined relations of power, as well as the difference in interaction among human groups and their biophysical environments (Gezon and Paulson 2005).

A study by Chapman (1989) recounts the shortfalls in Hardin's (1986) conventional approach in the 'tragedy of the commons', to highlight the strength of a political ecology framework in analyzing causes of resource depletion in the context of the Amazon fisheries. The 'tragedy of the commons' theory, according to Chapman (1989), overlooks two critical factors that affect decision-making in common property resource-use regions. First is the close relationship between common-property and private resource exploitation that exists in many Third World rural societies, and second, the many adaptations in traditional societies that mitigate the overexploitation of common-property resources. She argues that changes in these factors not only affect the status of the resources, but they are strongly influenced by political ideologies that determine the use of resources of particular groups in the society.

Andreatta and Parlier (2010) use a political ecology framework to examine the lives of small-scale commercial fishers in Carteret County, North Carolina, citing the applicability of political ecology concepts in looking at complexities of the commercial fishing industry and its relationship with natural resources, local state, and international policies and power systems within a socio-economic framework. They posit that the power dynamics involved in a single sphere of access and sustainability requires daily interactions among multiple social, economic, and political levels, and this is the domain of political ecology. In another study, Menon *et al.* (2016) examine the fisheries crisis in the Park Bay using a political ecology lens, paying critical attention to processes of capital accumulation, which include the circuitous nature of capital accumulation and how fisher conflicts, ethnicity and the politics of the nation-state have shaped the spatial practices of accumulation.

McCay and Finlayson (1996) examine the political ecology of crisis and institutional change in the context of the collapse of the northern cod of Newfoundland and Labrador, which has become the classic case of the failure of conventional science-based fisheries management. Contrary to what they had expected, the total collapse of the cod stock did not result in a parallel collapse of the paradigm of science-based fisheries management and its supported institutional structures, processes, and relationship. Instead, the social structure of the fishery collapsed along with the stock. Their analyses allowed them to reflect on the social and political authority of science and concluded that modernist science is firmly grounded in society's consciousness that a much larger crisis than the collapse of fish stocks is required to destabilize such authority.

Using a multi-scale approach that draws on anthropological critiques of common pool resources institutions and political ecology, Grace-McCaskey (2018) describes the historical, social, and political factors that influence how fishery management transpires at different scales, and how it is experienced by the different fisheries stakeholders in St. Croix, US Virgin Islands. Grace-McCaskey (2018) posits that as resources and resource users have become increasingly subjected to regulations and management regulations at multiple levels and scales, it is critical to examine how management institutions across scales impact one another and influence key elements of management, such as stakeholder participation. Her findings show that fishers' and non-fishers' knowledge of and perceptions toward fisheries management are linked to demographic differences (e.g., non-fishers' educational backgrounds and economic livelihoods indicate likelihood of participation in the management process, staying informed about, and support for, fisheries regulations). In addition, factors such as real and perceived lack of enforcement, a highly technical and complex council process, the formal mechanisms through which stakeholder participation is encouraged, and participants' perceptions about the non-inclusive decision-making process of the Caribbean Fishery Management Council (CFMC), affect stakeholders' participation.

Greenberg (2006), in his study of the political ecology of fisheries in the upper Gulf of California, argues that the problems of the upper Gulf are embedded in complex processes that result from the way the upper gulf's fishery and Mexico are integrated into the larger political and economic milieu. He contends that the real tragedy in this situation is the commoditization that often results from managing natural resources as individual commodities, instead of treating them as integral parts of particular ecologies.

Bush and Marschke (2016) explore the tension between governance and equity in Southeast Asian marine fisheries and aquaculture production by reviewing how social, economic and political relations influence the environmental outcomes associated with changing production practices. Using a political ecology lens, the authors consider both the material and discursive conflicts surrounding resource access, use and regulation at a variety of scales. According to them, the narrow managerial approaches (e.g., licensing, co-management, area-based and chain-based approaches) embodied in the ‘governance turn’ in the region do not address the complex human-coastal environment interactions because such simplification tends to depoliticize the wider social and political relations which mediate environmental problems and potential solutions. Bush and Marschke (2016) posit that while these approaches are a step towards the right direction, greater analysis that would reveal the winners and losers produced from such governance mechanisms is imperative.

The very essence of a political ecology framework ultimately lies in its ability to seek answers to difficult questions, specifically on ‘how and why particular interests and values predominate and how power circulates in ways that influence biophysical or social outcomes.’ Studying environmental problems in diverse spaces and on different scales, with methodological attention to unequal power relations within and among spheres, offers a great potential for deeper understanding of the causal connections and complex interactions of the factors at play (Paulson and Gezon 2005). The complex interactions and relationships of the different stakeholders involved in the SFC in the Visayan Sea demands an approach that encompasses the interactive effects of these stakeholders and the factors mediating their interactions at different levels. A political ecology framework provides the necessary lens to understanding these myriad factors,

especially in providing narratives on how this fishery policy is translated at the local level, and the implications of such translation on the managed resources, different stakeholders, and policy outcomes.

CHAPTER 3. METHODOLOGY

Study sites

The Visayan Sea is located in the central Philippines and covers an area of about 10,000 km² (Figure 2). It is surrounded by 3 regions (V-Bicol region, VI-Western Visayas and VII-Central Visayas) and shared by 22 coastal municipalities in 4 provinces, namely: Iloilo, Negros Occidental, Masbate, and Cebu (Guanco *et al.* 2009).

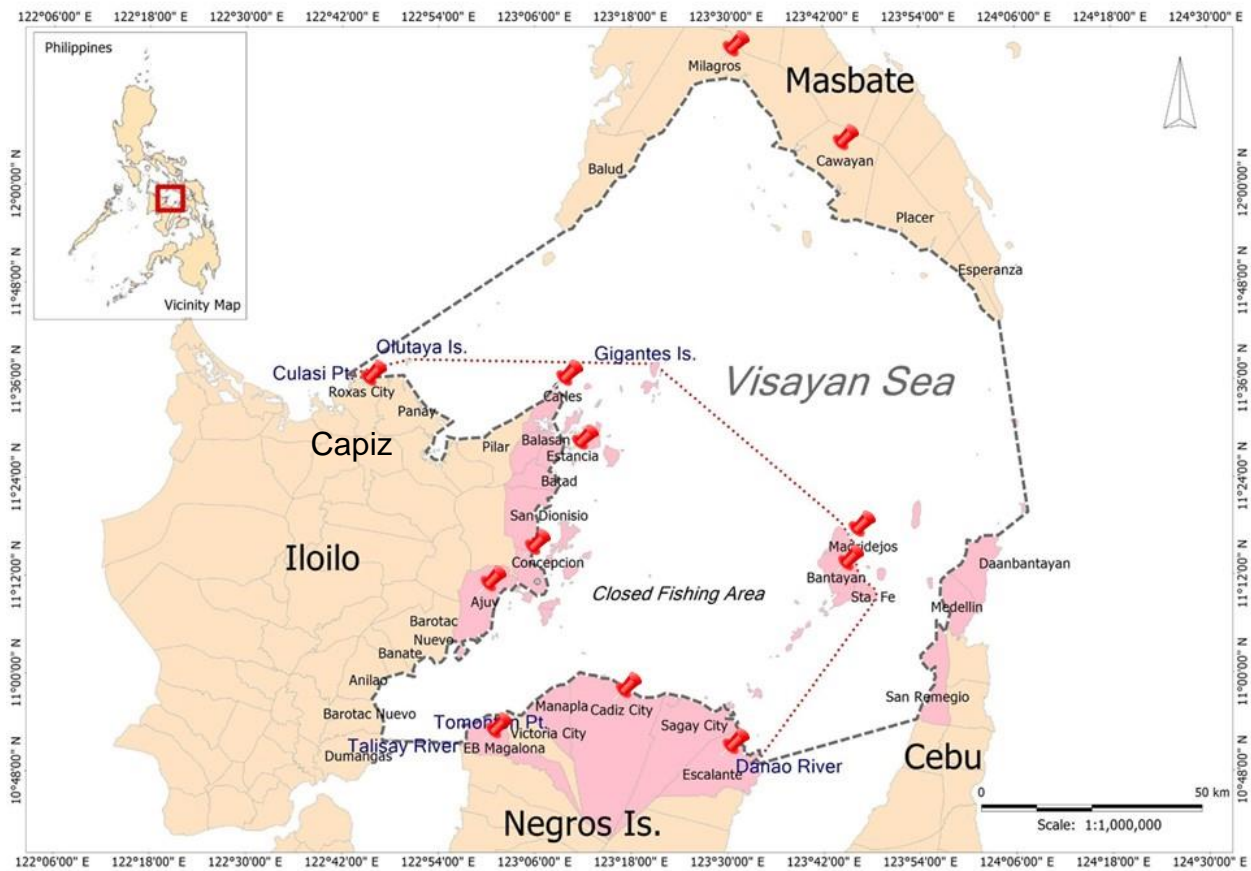


Figure 2. Map showing the study sites (marked by red push pins).

Nine (9) of the 18 municipalities that were initially included in the Visayan Sea SFC (shown in pink shade, Figure 1) were randomly selected to represent the study sites. These include 4 municipalities in the province of Iloilo (Carles, Estancia, Concepcion, and Ajuy), 3 municipalities in the province of Negros Occidental (Cadiz City, E.B. Magalona, and Escalante City), and 2 municipalities in the province of Cebu (Bantayan and Madridejos). Two (2) municipalities in the province of Masbate (Milagros and Cawayan) and 1 municipality in the province of Capiz (Roxas City) were added to the study sites to make the study comprehensive in terms of geographical scope. These additional sites were included to ensure representativeness of the municipalities in the 4 provinces surrounding the Visayan Sea considering that previous studies focused heavily on municipalities in the provinces of Iloilo, Negros Occidental and Cebu. The additional municipalities were selected based on geographical location, accesibility and safety considerations.

Research framework

I used mixed methods to achieve the objectives of this study, i.e., appropriate qualitative and quantitative research methods were employed in answering the research questions for each study objective. Figure 3 shows the research framework of this study.

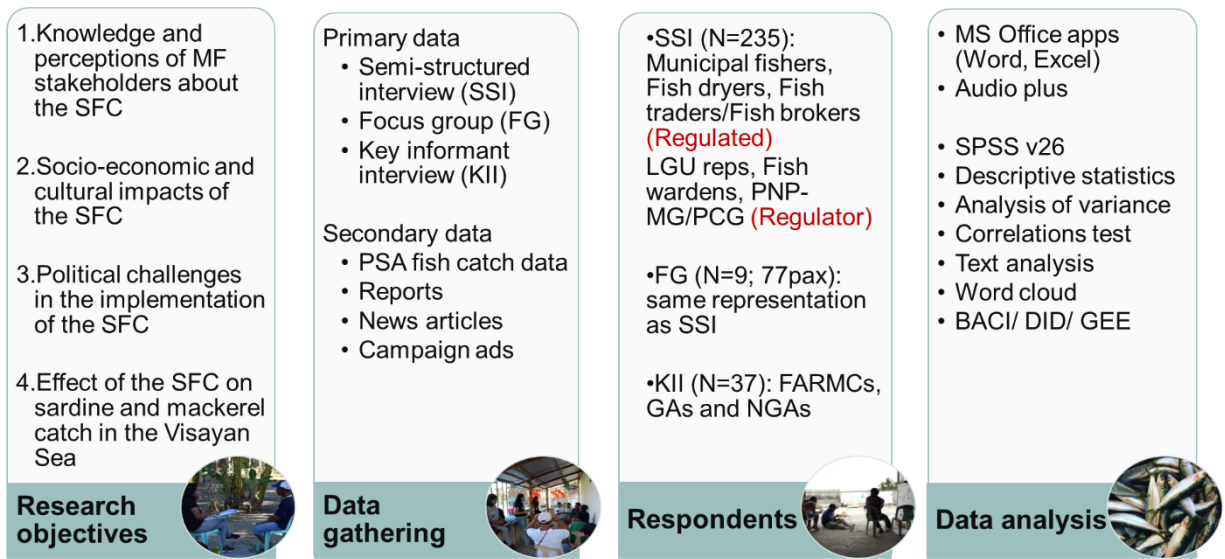


Figure 3. Research framework of this study.

Sampling strategy and respondents

A non-probability, purposive sampling strategy was used to select the interview respondents at the municipal level (Bernard 2017). This sampling strategy allows for selection of respondents that serve the purpose of this study. It also produces in-depth answers to questions of interest, and is more practical, considering the limited resources of this study. Research activities were coordinated with the local government units (LGUs) in the study sites; respondents were pre-determined with the assistance of key informants and established contacts in each municipality. If the identified respondent was not available, a qualified substitute was interviewed as per recommendation of interviewed respondents.

This study focuses on the municipal fisheries stakeholders in the fishing communities surrounding the Visayan Sea primarily because the enclosed area is largely comprised by municipal waters (~75%), hence, it is assumed that municipal fisheries stakeholders are directly

impacted by the SFC. While the BFAR claims that there is not much effect of the SFC on municipal fishers because the SFC is only temporary and fishers can shift to other fisheries during the 3-month fishing ban, there is no empirical study that supports these claims. It is important to understand the context of the SFC from the perspective of the municipal fisheries stakeholders who are experiencing it to inform and guide future decisions in the management of the Visayan Sea. Commercial fishers were not included in this study in consideration of the above, and also, due to limitations on financial resources, time, and access.

Respondents were selected purposely to represent the target stakeholders in the municipality, namely: municipal fishers, fish dryers, fish vendors/fish traders/fish brokers, LGU representatives, fish wardens, and members of the Philippine National Police-Maritime Group (PNP-MG)/Philippine Coast Guard (PCG). The municipal fishers, fish dryers, fish vendors/fish traders/fish brokers comprise the *regulated* group, while the LGU representatives, fish wardens, and members of the PNP-MG/PCG comprise the *regulators* group.

Data gathering methods and analysis

Semi-structured interviews

The semi-structured interview (SSI) questionnaire was prepared initially in English, and then translated to the local dialects since the populations in the study sites speak different dialects (Appendix D). In the provinces of Iloilo and Negros Occidental for example, the primary spoken language is *Hiligaynon*, while in the province of Cebu, people speak *Cebuano/Bisaya*. In contrast, populations in the province of Masbate predominantly speak *Minasbate* that has mutual

intelligibility with *Hiligaynon*; *Cebuano/Bisaya* is also spoken in the southeastern part of Masbate. The SSI questionnaire was pre-tested in the municipality of Ajuy, Iloilo on February 27, 2019 to ensure that the instrument is comprehensive and that questions are clear and easy to understand. Revisions on the questions were made after the pre-test. Actual field interviews were conducted from March-April 2019.

For study objective #1. Knowledge and perceptions of municipal fisheries stakeholders about the SFC policy, questionnaires were administered to a total of 235 respondents composed of municipal fishers (117), fish dryers (35), fish vendors/fish traders/fish brokers (35), LGU representatives (27), fish wardens (10) and members of the PNP-MG/PCG (11). The questionnaire contains 2 sections. The first section focuses on the respondents' *knowledge* and *perceptions* about the SFC. The respondents were asked 6 open-ended questions about their *knowledge* about the SFC, e.g., *are they aware of the SFC implemented in the Visayan Sea; what is the purpose of the of the SFC; who is banned from fishing during the SFC; what species are banned from fishing during the SFC; when is the SFC period; and what are the penalaties for violation of the SFC.* Some of these questions entail multiple answers, and scores may vary according to the number of correct answers provided by the respondent for a particular question. The highest possible score for each respondent for the *knowledge* section is 14 points. Table 1 shows the *knowledge* questions with the corresponding correct answers and equivalent points.

Table 1. Knowledge questions with the corresponding answers and equivalents points.

Knowledge questions	Details	Highest possible score
<i>Q8. Are you aware that an SFC is implemented in the Visayan Sea?</i>	<ul style="list-style-type: none"> • A respondent who answers ‘Yes’ gets a score of 1, otherwise 0. 	1
<i>Q9. What is the purpose of the SFC?</i>	<ul style="list-style-type: none"> • According to the Fisheries Administrative Order No. 167-3, s. 2013, the SFC is for the <u>conservation of sardines, herrings, and mackerels</u> in the Visayan Sea. • Since conservation is very specific, synonym words, concepts and vernacular translation of the policy (as per regional BFAR campaign materials) were considered. • Four (4) themes were identified based on respondents’ answers, namely: Conservation/ Preservation/ Sustainability; Increase the number and size of fish stocks; Egg development/Fish spawning/ Breeding/ Reproduction; and Management. • Each respondent can give multiple answers. A respondent whose answer falls in any of the 4 themes identified gets a score of 1, otherwise 0. 	1
<i>Q10. Who are included in the SFC?</i>	<ul style="list-style-type: none"> • It is not specified in the Fisheries Administrative Order 167-3, s. 2013 who is banned from fishing during the SFC, but it is interpreted that <u>both municipal and commercial fishers who target the prohibited species</u> are banned during this period. • A respondent who answers <i>municipal</i> and <i>commercial fishers</i> gets 2 points, 1 point if the answer is either <i>municipal</i> or <i>commercial fishers</i>, and 0 for other answers. 	2
<i>Q11. What species are banned from fishing during the SFC?</i>	<ul style="list-style-type: none"> • The Fisheries Administrative Order No. 167-3, s. 2013 specifies that <u>sardines, herrings, and mackerels</u> are prohibited to catch during the SFC. 	2

	<ul style="list-style-type: none"> • A respondent who answers <i>sardines/herrings and mackerels</i> gets 2 points, 1 point if the answer is either <i>sardines/herrings</i> or <i>mackerels</i>, and 0 for other answers. 	
<p><i>Q12. What months of the year are covered by the SFC in the Visayan Sea?</i></p>	<ul style="list-style-type: none"> • The Fisheries Administrative Order No. 167-3, s. 2013 states that the SFC is implemented from Nov 15 to Feb 15 yearly. • A respondent gets 1 point for each correct month of the SFC identified. 	4
<p><i>Q13. What are the penalties for violation of the SFC?</i></p>	<ul style="list-style-type: none"> • The Fisheries Administrative Order No. 167-3, s. 2013 states that offender of the SFC will be subjected to: <u>1) imprisonment of six (6) months and one (1) day to six (6) years; and/or 2) fine of six thousand pesos (P6,000.00), and by 3) forfeiture of the catch; and 4) cancellation of fishing permit or license.</u> • A respondent can give multiple answers. Each of the correct answers discussed above is equivalent to 1 point, hence, a perfect score of 4. The fines are simplified into key words such as <i>Imprisonment, Fine, Forfeiture of catch</i> and <i>Cancellation of fishing permit or license.</i> 	4

Respondents' *knowledge* about the SFC was evaluated using a 9-point Likert scale wherein overall mean scores are categorized into the following ratings: Very poor (below 7.0); Poor (7.0-8.75); Fair (8.76-10.5); Good (10.51-12.25); Excellent (above 12.25).

To verify if there are differences in the level of knowledge among the *regulated* respondents (i.e., municipal fishers, fish dryers, fish vendors/fish traders/fish brokers) in the municipalities, I test the following hypotheses:

H₁: There is no difference in the *knowledge* about the SFC of respondents in the *regulated* group in the different municipalities.

H₂: There is no relationship between *regulated* group's *knowledge* about the SFC and *compliance*, therewith.

Compliance data is based on the respondents' answer to the question on whether (or not) they follow or abide by the SFC implementation (see APPENDIX D, Q45).

For the *perceptions* component, respondents were asked how they perceive the implementation of the SFC in terms of *accurateness of information, monitoring, opportunities for dialogue, fairness to stakeholders, compliance, and whether they are benefiting from it*. Responses were measured using a Likert scale [e.g., a score of 5 means the respondent *strongly agrees* with the statement in the questionnaire; lowest score is 1 (*strongly disagree*)]. In addition, respondents were asked to give 5 words that they can think about or associate with the SFC to get an overview of how people perceive the SFC using their own words.

I hypothesize that:

H₃: There is no difference in the *perceptions* about the SFC of respondents in the *regulated* and *regulator's* group.

H₄: There is no difference in the *perceptions* about the SFC of respondents in the *regulated* groups in the different municipalities.

H₅: There is no positive relationship between *regulated* group's *perceptions* about the SFC and *compliance*, therewith.

The second section of the SSI questionnaire contains questions about the impacts of the SFC, which address the study objective #2. Socio-economic and cultural impacts of the SFC. Only the *regulated* group (i.e., municipal fishers, fish dryers, fish vendors/fish traders/fish brokers; N=187) were asked to respond to the questions pertaining to the socio-economic impacts (*e.g., whether their livelihood is affected by the SFC; changes in income, work hours, household dynamics; how they cope with the impacts they have identified; availability of alternative livelihoods, etc.*) the SFC. All the 235 respondents answered the questions on cultural impacts. The Merriam-Webster (2020) defines culture as “the characteristic features of everyday existence (such as diversions or a way of life) shared by people in a place or time”. In this study, the analysis of cultural impacts of the SFC is limited to customary beliefs and practices that are identified by the respondents to be affected by the implementation of the SFC, as well as the shifts in their daily dealings (*e.g., adjustments, coping mechanisms*), as a result of the SFC.

The study objective #3 focuses on the political factors in the implementation of the SFC in the Visayan Sea. Here, all 235 respondents were asked to identify the different factors that they have observed that affect the implementation of the SFC in the Visayan Sea. Responses were analyzed and grouped into emerging themes.

In addition to the specific questions designed for each study objective, information about the respondent’s age, gender, educational level, primary source of income, household size, number of years of residency in the area, were also included in the questionnaire.

Data collected from SSIs were encoded and translated using Microsoft applications such as Word and Excel, and analyzed using the Statistical Package for the Social Sciences (SPSS) v.26, to come up with the necessary statistical and text analyses. Comparison of responses between respondent groups, i.e., the *regulated* (municipal fishers, fish dryers, fish vendors/fish traders/fish brokers) and the *regulators* (LGU representatives, fish wardens, PNP-MG/PCG), and among study sites, i.e., *within Panay Island* (Carles, Estancia, Concepcion, Ajuy, and Roxas City) and *outside Panay Island* (Bantayan, Madridejos, Cadiz City, E.B. Magalona, Escalante City, Cawayan, Milagros) was done using one-way analysis of variance (ANOVA) and correlations test. Panay Island is where the provinces of Capiz and Iloilo are located (Figure 1). I used this geographical location as a basis for comparing respondents' knowledge and perceptions on the SFC because majority of the municipalities included in the SFC, and the BFAR regional office for Western Visayas, are within Panay Island. Thus, Panay Island is considered as a stronghold of the SFC.

The one-way ANOVA is used to determine whether there are statistically significant differences between the means of groups (i.e., respondents groups and municipalities). It tests the following null hypothesis:

$$H_0: \mu_1 = \mu_2 = \mu_3 = \dots = \mu_k$$

where μ =group mean and k =number of groups. If the test returns a statistically significant result (i.e, p -value ≤ 0.05), the alternative hypothesis (H_A), i.e., at least 2 group means are statistically different from each other, is accepted (Laerd Statistics 2020a).

The correlations test measures the strength of association between 2 variables and the direction of the relationship. The value of the correlation coefficient varies between +1 and -1; a

positive sign indicates a positive relationship, while a negative sign indicates a negative relationship (Laerd Statistics 2020b). The correlation coefficient range and strength of relationship is categorized as follows: 0.01-0.20 (Very weak); 0.21-0.40 (Weak); 0.41-0.60 (Moderate); 0.61-0.80 (Strong); 0.80-1.0 (Very strong) (Statstutor 2020). Since my data for the *knowledge and perceptions* are ordinal data, I used the Spearman rank correlation test (r_s) to measure the degree of association between respondents' knowledge and perceptions about the SFC and their compliance.

Further, I used descriptive statistics (e.g., mean, median, frequency) and presented my results in tables and figures. Furthermore, I used text analysis and Word cloud to identify emerging themes in the problems and challenges cited by the SFC in the implementation of the SFC in their respective municipalities.

Focus Groups

To complement primary data collected from the SSIs, focus groups (FGs) were conducted in every municipality from March-April of 2019. Nine (9) FGs were conducted in 9 municipalities in the provinces of Iloilo (Carles, Estancia, Concepcion, Ajuy), Cebu (Bantayan and Madrideojos), and Negros Occidental (Cadiz City, E.B. Magalona and Escalante). A total of 77 individuals representing the different respondent groups participated in the FGs.

The FG has 2 parts. In the first part, FG participants were asked about their views about the SFC, specifically on the following areas: *whether they are in favor of the SFC; their knowledge*

on the SFC; whether the SFC is achieving its purpose; points about the SFC that they agree and disagree with; whether their community is benefitting from the SFC; whether the SFC should be continued; and suggestions on improving the implementation of the SFC.

The second part of the FG was a seasonal calendar activity wherein participants were asked to *identify the lean, average and peak months in a year; types of fishes caught during the specified periods* as well as the *types of fishing gears used to catch these fish species*. The last part of the activity focused on *identifying the challenges and problems they experience in their respective communities in different months of the year*. The data obtained from the FGs were encoded, translated in MS Word and MS Excel and analyzed in SPSS v.26. Results are presented in figures. Further, text analysis was used to gain valuable insights and identify emerging themes from the discussions with the different respondent groups. Quotes from interview transcripts were also used to support discussion of major points identified in the analysis.

Key informant interviews

Twelve (12) key informants from government agencies (GAs) and non-government agencies (NGAs) were interviewed to triangulate results obtained from SSIs and FGs. These include personnel from the national BFAR in Manila, and regional offices in Iloilo and Cebu, who were/are directly involved in the SFC implementation; Iloilo Provincial Agriculture office; Oceana-Philippines; USAID-Fish Right Project; and *PAMALAKAYA-Pilipinas* (National Federation of Small Fisherfolk Organization in the Philippines). In addition, 25 members of the City or Municipal Fisheries and Aquatic Resource Management Councils (C/MFARMCs) in the

study sites were also interviewed between February to July of 2019. A total of 37 KIIs were conducted.

The KII questions explored the view of the informants about the SFC particularly on the *objectives of the SFC; whether the SFC's objectives are met; metrics of success/failure of the SFC; challenges in the implementation of the SFC; their recommendations to address the challenges they have identified; and whether they think there is a better alternative in managing the fisheries in the Visayan Sea*. Interviews were recorded using Recorder plus application, transcribed and translated from the local dialects to English in MS Word. Interview transcripts were analyzed for emerging themes.

Before-after control-impact design analysis

Limitations of the study

For study objective #4, inasmuch as access to the National Stock Assessment Program (NSAP) data was not granted by the BFAR, fish catch data available in the Philippine Statistics Authority (PSA) website was used in the before-after control-impact (BACI) design analysis to achieve study objective 4, which verifies claims on increasing fish stock in the Visayan Sea as a result of the strict implementation of the SFC in 2012. It is also important to note that the provincial data from the PSA used for the treatment group is comprised of fish catch data from different municipalities, some of these are not included in the SFC implemented in the Visayan Sea. I argue that fish catch data at the provincial level can be used for this analysis primarily because the coastal municipalities included in SFC in the Visayan Sea are in these provinces. Hence, I assume that

any increase (or decrease) in fish catch in the participating municipalities will be observed at the provincial level. Further, studies have shown that sardines and mackerels are amongst the predominant catch in these provinces (Armada 1999; Guanco *et al.* 2009; DA-BFAR 2018). There is no available catch-per-unit-effort (CPUE) data on municipal and commercial fishing in the Visayan Sea.

Data

Provincial level, longitudinal marine municipal and commercial fisheries catch data of the regulated fish species included in the annual SFC in the Visayan Sea, namely: Bali sardines (*Tamban*), Fimbriated sardines (*Tunsoy*), Indian mackerel (*Alumahan*), and Indo-pacific mackerel (*Hasa-hasa*) spanning the period of 2007-2018 were downloaded from the portal of the PSA (<http://openstat.psa.gov.ph/>) and used in the analysis. Although herrings are included in the regulated species specified in Fisheries Administrative Order No. 167-3, s. 2013, herrings are not included in the list of regulated species contained in the campaign materials for the SFC issued by the BFAR. Hence, herrings were excluded in the analysis.

The PSA fish catch data used are collected through a Quarterly Municipal Fisheries Survey (QMFS) conducted by the PSA. Using a stratified simple random sampling method, the PSA selects sample traditional landing centers in 67 provinces. Five (5) key informants per landing center provide information on the average daily volume of unloading (in metric tons, or MT) and price per kilogram (PhP/kg) of the top 31 species and other fishes combined in ‘others’ category. Additional data are gathered from non-traditional landing centers that are managed by the Philippine Fisheries Development Authority (PFDA) and LGUs (PSA 2018).

Treatment and control groups

The goal of this empirical work is to analyze the effect of SFC policy on sardines and mackerels catch. The literature indicates that a study of this sort requires data from groups (e.g., municipality, etc.) enforcing the SFC, popularly known as implementing or treatment group, and those not implementing the SFC, also known as control group. Ideally, for a comparative analysis like this, it is preferred that the treatment group and the control group share similar characteristics. In this case, the enclosed area during the SFC in the Visayan Sea is surrounded by the provinces of Capiz, Iloilo, Negros Occidental, Cebu and Masbate, hence, these areas are assigned as the treatment group (also referred to as the Participating group).

I included all other provinces in the Philippines that have reported catch for sardines and mackerels for at least 7 years of the inclusive period (2007-2018) as control group, i.e., Non-participating group. I used 2012 as the base year in my analysis because strict implementation of the SFC policy in the Visayan Sea started around this time. I excluded the provinces wherein an SFC for similar species is implemented.

The correlated data summary and categorical variable information for sardines and mackerels are provided in the following tables. There are 61 provinces analyzed for sardines (Table 2) and 61 provinces for mackerels (Table 3). Since there are 12 within subject-effect (i.e., years 2007-2018), there are a total of 732 observations each for sardines and mackerels (Tables 4 and 5).

Table 2. Correlated data summary for sardines.

Correlated Data Summary			
Number of Levels	Subject Effect	Province	61
	Within-Subject Effect	Year	12
Number of Subjects			61
Number of Measurements per Subject	Minimum		12
	Maximum		12
Correlation Matrix Dimension			12

Table 3. Correlated data summary for mackerels.

Correlated Data Summary			
Number of Levels	Subject Effect	ID	61
	Within-Subject Effect	Year	12
Number of Subjects			61
Number of Measurements per Subject	Minimum		12
	Maximum		12
Correlation Matrix Dimension			12

Table 4. Categorical variable information for sardines.

Categorical Variable Information				
			N	Percent
Factor	Group	Non-participating	672	91.8%
		Participating	60	8.2%
		Total	732	100.0%
Policy	Policy	Before Policy	366	50.0%
		After Policy	366	50.0%
		Total	732	100.0%

Table 5. Categorical variable information for mackerels.

Categorical Variable Information			N	Percent
Factor	Group	Non-participating	672	91.8%
		Participating	60	8.2%
		Total	732	100.0%
Policy	0	0	366	50.0%
		1	366	50.0%
		Total	732	100.0%

Table 6 provides the list of provinces in the Philippines that are included in the control and treatment groups.

Table 6. List of provinces in the control and treatment groups for the BACI design analysis.

	Sardines	Mackerels
Control	<ol style="list-style-type: none"> 1. Capiz 2. Cebu 3. Iloilo 4. Masbate 5. Negros Occidental 	<ol style="list-style-type: none"> 1. Capiz 2. Cebu 3. Iloilo 4. Masbate 5. Negros Occidental
Treatment	<ol style="list-style-type: none"> 6. Agusan del Norte 7. Aklan 8. Albay 9. Antique 10. Aurora 11. Basilan 12. Bataan 13. Batangas 14. Biliran 15. Bohol 16. Bulacan 17. Cagayan 18. Camarines Norte 19. Camarines Sur 20. Camiguin 21. Catanduanes 	<ol style="list-style-type: none"> 6. Agusan del Norte 7. Aklan 8. Albay 9. Antique 10. Aurora 11. Basilan 12. Bataan 13. Batanes 14. Batangas 15. Biliran 16. Bohol 17. Bulacan 18. Cagayan 19. Camarines Norte 20. Camarines Sur 21. Camiguin

	22. Cavite 23. Compostela Valley 24. Davao del Norte 25. Davao del Sur 26. Davao Oriental 27. Eastern Samar 28. Guimaras 29. Ilocos Norte 30. Ilocos Sur 31. Isabela 32. La Union 33. Lanao del Norte 34. Lanao del Sur 35. Leyte 36. Maguindanao 37. Marinduque 38. Misamis Occidental 39. Misamis Oriental 40. Negros Oriental 41. Northern Samar 42. Occidental Mindoro 43. Oriental Mindoro 44. Palawan 45. Pampanga 46. Pangasinan 47. Quezon 48. Romblon 49. Samar 50. Sarangani 51. Siquijor 52. Sorsogon 53. South Cotabato 54. Southern Leyte 55. Sultan Kudarat 56. Sulu 57. Surigao del Norte 58. Surigao del Sur 59. Tawi-tawi 60. Zambales 61. Zamboanga del Sur	22. Catanduanes 23. Compostela Valley 24. Eastern Samar 25. Guimaras 26. Ilocos Norte 27. Ilocos Sur 28. Isabela 29. La Union 30. Lanao del Norte 31. Lanao del Sur 32. Leyte 33. Maguindanao 34. Marinduque 35. Misamis Occidental 36. Misamis Oriental 37. Negros Oriental 38. Northern Samar 39. Occidental Mindoro 40. Oriental Mindoro 41. Palawan 42. Pampanga 43. Pangasinan 44. Quezon 45. Romblon 46. Samar 47. Sarangani 48. Siquijor 49. Sorsogon 50. South Cotabato 51. Southern 52. Leyte 53. Sultan Kudarat 54. Sulu 55. Surigao del Norte 56. Surigao del Sur 57. Tawi-tawi 58. Zambales 59. Zamboanga del Norte 60. Zamboanga del Sur 61. Zamboanga Sibugay
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Difference-in-difference estimation

To isolate the impact of the SFC on sardines and mackerels catch landings, I adopt the difference-in-difference (DID) estimator, which is a variation of the BACI design analysis (Smith 2002). BACI designs are an effective method to evaluate natural and human-induced perturbations on ecological variables when treatment sites cannot be randomly chosen (Conner *et al.* 2016). It is a widely accepted method of directly assessing the effects of area closures (Claudet and Guidetti 2010; Ojeda-Martinez *et al.* 2011; Osenberg *et al.* 2011; Fenberg *et al.* 2012; Cheung *et al.* 2015; Clarke *et al.* 2015). By analyzing the differences before and after the implementation of the SFC policy in the treatment area along with differences in the control area during corresponding years, the effect of the SFC is isolated. The assumption here is that, in the absence of the SFC policy intervention, unobserved differences between treatment and control groups are the same over time. We verify this by testing the difference in means of the outputs (sardines and mackerels) between the treatment group and control group using catch data prior to-and -after the strict enforcement of the SFC in 2012.

Customarily, the DID framework is specified as,

$$\tau^{\text{DID}} = \left[E \left[Y | G_i = 1, T_i = 1 \right] - E \left[Y_i | G_i = 1, T_i = 0 \right] \right] - \left[E \left[Y | G_i = 0, T_i = 1 \right] - E \left[Y_i | G_i = 0, T_i = 0 \right] \right] \quad (1)$$

where E is the mean or expected, Y is the outcome, G is the group (=1 if SFC is enforced in the province, 0 if otherwise), and T is the year (=1 years after 2012, 0 for years 2012 and below), τ is the average effect of the SFC on outcome. However, for a longitudinal data with more than two

time periods, a DID regression framework is preferred. This framework also allows for controlling for other covariates. For this study, I specify the DID regression framework as,

$$Y = \alpha + \beta_1 T_{it} + \beta_2 G_{it} + \tau(TxG)_{it} + \varepsilon \quad (2)$$

where Y , T , and G are as defined in equation 1, wherein: i is province; t is year, α , β , and τ are parameters to be estimated and ε is error term. Similar to equation 1, the parameter τ in equation 2 indicates the average effect of the SFC on outcome.

To estimate the parameters in equation 2, several models are considered. First, I considered the ordinary least squares (OLS) which estimates the model as pooled OLS, thus, does not account for the panel nature of our data. To account for the panel data, the random effect and fixed effect models are preferred. However, these models are not capable of handling potential correlation of errors across time which is the case for panel data (Fitzmaurice and Ravichandran 2008; Wilson and Lorenz 2015). The Generalized Estimating Equations (GEE) is the known model that can handle panel data and the potential correlation of errors across time. The GEE focuses on estimating the ‘population-averaged’ effects. The GEE approach was introduced by Liang and Zeger (1986) and is an extension of generalized linear models (GLMs). It allows for obtaining coefficient estimates when analyzing correlated data without relying on a joint distribution of the responses which is usually unknown (Wilson and Lorenz 2015). Further, it uses quasi-likelihood estimation rather than maximum likelihood estimation (MLE) or OLS which are more sensitive to variance structure specification (PSU 2018), thus, it is a popular alternative to likelihood-based generalized linear mixed model which is mor sensitive to variance structure specification. The

GEE estimation routine in SPSS v.26 was used in this study. I specified the link function as identity, and the covariance matrix as exchangeable.

Secondary data gathering

Secondary data such as municipal profiles, reports, fisheries administrative orders, memorandum circulars, news articles, campaign ads, were collected and analyzed to complement primary data. I also attended the following activities conducted by GAs and NGAs that are actively involved in the fishery management in the Visayan Sea, to keep abreast with the current initiatives done in this topic :

1. Consultative Meeting with Region 6 National Agencies with programs on Sustainable Livelihood, May 27, 2019, Iloilo City;
2. Stakeholder's Forum on Fishery Management Area, Sulo Riviera Hotel, Quezon City, June 18, 2019; and
3. Visayan Sea Judges and Prosecutor's Training, SEDA Hotel, Iloilo City, July 31, 2019.

CHAPTER 4. RESULTS AND DISCUSSION

Respondent groups

A total of 235 municipal fisheries stakeholders composed of municipal fishers, fish dryers, fish vendors/fish traders/fish brokers, LGU representatives who are directly involved in the SFC implementation in their respective municipalities, fish wardens, and members of the PNP-MG/PCG were interviewed for this study (Table 7).

Table 7. Respondent groups interviewed for this study.

		Respondent group			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Municipal fisher	117	49.8	49.8	49.8
	Fish dryer	35	14.9	14.9	64.7
	Fish vendor/Fish trader/Fish broker	35	14.9	14.9	79.6
	LGU representative	27	11.5	11.5	91.1
	Fish warden	10	4.3	4.3	95.3
	PNP-MG/PCG	11	4.7	4.7	100.0
	Total	235	100.0	100.0	

Municipal fishers

The municipal fishers operate within the municipal waters, i.e. from shoreline to 15 kms seaward, using fishing gears that catch either of the regulated species (i.e., sardines or mackerels). These include seine nets, gill nets, ring nets, small trawl, among others. Majority of them are males (91%), married (91%), and use a motorized boat (87%). Forty-three percent (43%) of them have

attained elementary level of education, while 25% of them reached high school level. Majority of them have been residing in their respective municipalities for at least 36 years.

Fish dryers

Only the fish dryers who dry sardines or mackerels are included in this study. Fish dryers earn their living by drying variety of fishes. Majority of them claim that at least 80% of their income comes from fish drying. Further, majority of them are females, married, and at least 50 years old. The fishes that they dry are either caught by their husbands or other household members or bought or loaned from fishers within their communities or neighboring municipalities. They process the fishes by soaking them in a brine solution, sun-drying them, and selling the dried fishes themselves or a *comprador* (wholesaler) buys the dried fish in crates. Some of these fish dryers work for big fishing boat operators by processing and drying their fish catch, on a contract basis (e.g., per *bañera*⁹ or per drying panel made of bamboo slats), while others have their own fishing boats that target sardines or mackerels which they used as raw material for their fish drying business. Fish dryers who have bigger financial capital finance fishing boat operators who target sardines or mackerels and get their catch as payment.

Fish vendors/fish traders/fish brokers

Majority of the fish vendors/fish traders/fish brokers interviewed are females (54%), married (83%), at least 40 years old (80%), and have reached at least high school level of education (77%). They have been residents of their respective municipalities for 39 years, on the average. In this study, fish vendors are defined as individuals who buys fresh fish from fish traders and sell

⁹ *Bañera* is a bucket made of plastic or steel which fishers use to haul their fish catch. One (1) *bañera* can contain approximately 40 kgs of fish.

them in market stalls, locally called as *pwesto*. Fish vendors usually sell a couple of *bañera* of fishes in a day, depending on the size of their market stall and financial capital. Fish traders are individuals who buy fishes in bulk from fish brokers (for fresh fish) and fish dryers (dried fish), and resell them to fish vendors, retailers, and buyers in other areas. Fish brokers acquire catch from fishers in bigger volumes, usually in *bañeras* or boxes. They set the pricing of the fishes landed in fishing ports and distribute them to different fish traders and retailers. Sometimes, fish traders can also be fish brokers at the same time, depending on the expanse of their business operations. Some fish traders/fish brokers also finance fishers by providing them loan to cover for their daily subsistence and fishing operations and wait for the fisher's catch as form of payment based on agreed terms.

Local government unit representatives

These are the LGU personnel who are involved in the fisheries management in their respective municipalities. Majority of them are males (78%), married (78%), at least 40 years old (85%), have attained college of level of education (85%), and have been residents of their municipalities for an average of 39 years.

Fish wardens

Fish wardens are deputized individuals, locally known as *Bantay-dagat*, who are tasked to help in the MCS of fishing activities in their respective municipal waters. They normally do patrol to deter illegal fishing activities and they also aid during rescue operations at sea. Fish wardens are residents of these municipalities; some of them are also fishers or members of a fishing household. Fish wardens in certain municipalities receive allowances from their constituent LGU,

while others serve as volunteers. All the fish wardens interviewed are males; with a median age of 42. They have been residing in their respective municipalities for 42 years, on the average.

Philippine National Police-Maritime Group /Philippine Coast Guard

These are members of the PNP-MG¹⁰ and PCG¹¹ stationed in the municipalities included in the study sites. They are part of the composite team (together with the LGU representatives, fish wardens, BFAR personnel) that conduct MCS activities and enforce laws at sea. Respondents under this group are all males. Majority of them are between 31-50 years old (73), married (81%), and have went to college (100%).

¹⁰ The PNP-MG is one of the National Operational Support Units of the Philippine National Police mandated to perform police functions over the country's territorial waters, i.e., lakes, rivers, coastal areas, including ports, harbors, and small islands (PNP-MG 2020).

¹¹ The PCG is mandated and responsible to perform maritime search and rescue, maritime law enforcement, maritime safety, marine environmental protection, and maritime security (PCG 2020).

Knowledge and perceptions of municipal fisheries stakeholders
about the SFC in the Visayan Sea

Introduction

Stakeholders have varying perceptions about the SFC policy in the Philippines. While the BFAR management is claiming success of the SFC policy implemented in the Visayan Sea, interest groups strongly oppose its implementation because it lacks general fisheries assessment, failing to consider the biogeographic characteristics of the fish species being regulated. Further, it failed to conduct a socio-economic impacts study prior to implementation. Finally, it is not only affecting the municipal fishers but also, it is not addressing the overfishing problem in the country. While perspectives about the SFC of observers outside the managed area are presented in news articles, social media, and fora, there is no information about the perspectives of the local people who are experiencing the SFC implemented in the Visayan Sea.

Several studies emphasize that while fishery management strategies are designed to conserve important aquatic resources, compliance with set regulations entail local acceptance and cooperation, and people's perception about a fishery influence their use patterns and fishery management at the local level (Castillo and Saysel 2005; Beddington *et al.* 2007; Bavinck and Johnson 2008; Pramatisari *et al.* 2015). A study by Acheson (2010) describes the varying support for different management goals between lobster fishermen and biologists in New England that is attributed to their conflicting beliefs on what controls the lobster boom and bust experience. The lobster fishermen distrust the scientific information offered by the federal and state fisheries agencies. The different background and orientation of the user groups and the management institutions contribute to group biases which add to the challenge of attaining sustainability. Grace-

McCaskey's (2018) study also describes factors that influence participation in the multi-scale fisheries management in St. Croix, US Virgin Islands, which include real and perceived lack of enforcement, a highly technical and complex council process, the formal mechanisms for stakeholder's participation and stakeholder's perception of the non-inclusive decision-making process of the Caribbean Fishery Management Council (CFMC).

Analysis of knowledge and perceptions in managing coastal resources in Fiji by Kitolelei and Sato (2016) shows how diverse knowledge on coastal resources and environments influence perceptions among people in a complex way, and transformation of perceptions promote collective action that provide opportunities for social learning for different stakeholders. Kitolelei and Sato (2016) posit that sustainable management of coastal resources depends on human knowledge and perceptions of natural resources and coastal environments.

The study by Karnad *et al.* (2013) about the influence of fishermen's perceptions on the sustainability of Indian fisheries shows that fishermen increase their fishing area and time spent, change their gear, and overlap fishing zones, in response to their perceived decline in catch and bycatch. Karnad *et al.* (2013) reports that the convoluted interactions between ineffective community and state regulations that guide the fishermen's actions inhibited them from developing successful fisheries management. Smith (2010) reports similar observation in the European countries' attempt to manage their common fisheries resources which resulted in a precarious situation because of the overlapping jurisdictions and competing interests of the member states. In Thailand, local people perceive national marine parks (NMPs) to have either limited or negative impacts to fisheries and agricultural livelihoods and negligible benefits for tourism livelihoods,

which they attribute to the NMPs undermining access to or lacking support for development of cultural, social, political, financial, natural, human, physical, and political capital assets (Benneth and Dearden 2014).

The importance of understanding time and space from the perspective of the people being studied cannot be overemphasized. This chapter draws from this rich literature and incorporates the views of both the *'outsiders'* (regulators) implementing the SFC policy, and the *'insiders'* (regulated) who are actually experiencing the SFC. It evaluates the knowledge and perceptions of these different municipal fisheries stakeholders about the SFC in the Visayan Sea and explores how these factors differ across respondent groups and municipalities, and affect compliance.

Knowledge of municipal fisheries stakeholders about the SFC

The majority of the respondents (97%) are aware of the SFC implemented in the Visayan Sea. The 7 individuals who said they are not aware about the SFC are from the study sites in Masbate province, namely Milagros and Cawayan. These findings are not surprising especially since the data shows that 94% of the respondents from these areas (N=70) said the SFC is not implemented in their respective municipalities.

Respondents were asked about the purpose of the SFC. Predominant responses across the respondent groups for the purpose of the SFC are *Egg development/Fish spawning/Breeding/Reproduction* (60.9%) and *Increase the number and size of fish stocks* (39.1%)

(Figure 4). At least 85% of the respondents in the respective respondent groups are knowledgeable about the purpose of the SFC with the *regulators* group predominantly getting the answers.

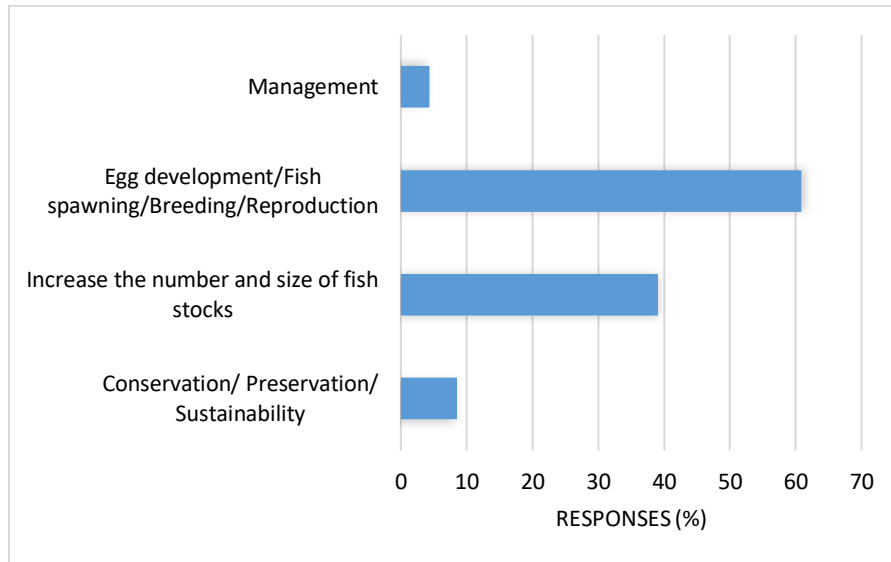


Figure 4. Respondents' answers to the question 'What is the purpose of the SFC?'.

Majority of the respondents (75.3%) are aware that *both municipal and commercial fishers* are banned from fishing during the SFC, while the other 20% of the respondents have a split answer between *municipal* and *commercial fishers* (Figure 5). Some respondents also specified that if the fishing gear used is targeting the regulated fish species then it is prohibited, regardless if it is a municipal or commercial fisher operating it.

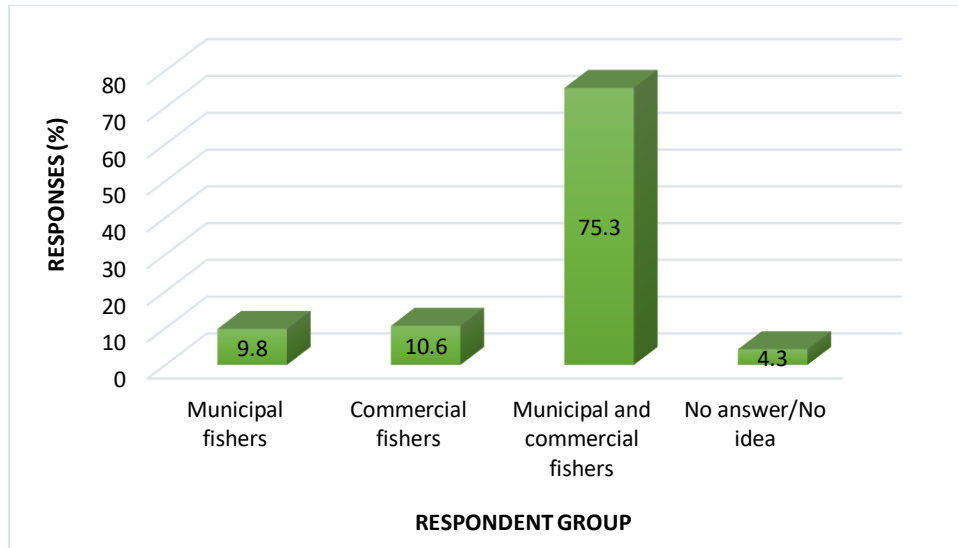


Figure 5. Respondents' answers to the question 'Who are included in the SFC?'.

Responses by respondent group show that while 74.4% of the municipal fishers answered both *municipal and commercial fishers* are banned from fishing during the SFC, 11.1% believe that *only commercial fishers* are not allowed to fish during this period. On the contrary, 25.7% of the fish dryers think that *only municipal fishers* are included in the SFC. There is also confusion among LGU representatives and the PNP-MG/PCG on who are included in the SFC; 85.2% of the LGU representatives interviewed got the correct answer, but the remaining 15% have split answers between municipal and commercial fishers. Apparently, some LGUs are lenient on municipal fishers as far as implementation of the SFC is concerned. On the other hand, 54.5% of the PNP-MG/PCG respondents got the correct answer (Figure 6).

This confusion is not surprising since it is not explicitly stated in the Fisheries Administrative Order No. 167-3, s. 2013 who or what fishing gears are banned during the SFC. A quote from an article posted by the BFAR Region 6 states:

“The Bureau of Fisheries and Aquatic Resources Regional Office 6 is strictly enforcing Fisheries Administrative Order No. 167-3, declaring the period between November 15 to February 15 of every year as the closed season for sardines, herrings and mackerels. Offender will be subject to imprisonment of six (6) months and one (1) day to six (6) years and/or fine of six thousand pesos (P6,000.00), and by forfeiture of the catch and cancellation of fishing permit or license. FAO 167-3 prohibits the catching, killing, selling or possessing the sexually mature sardines, herrings and mackerels or their larvae, fry or young known locally as ‘*lupoy*’, ‘*silinyasi*’, ‘*linatsay*’ or ‘*manansi*’ in the portion of the Visayan Sea and adjoining waters enclosed by line drawn through following points and coastlines: from the mouth of Danac River on the northeastern tip of the Bantayan Island to Madrideojos, thru the lighthouse on Gigantes Island, to Clutaya Island, to Culasi Point in Capiz province, eastward along the northern coast of Capiz to Bulacaue Point in Carles, Iloilo, southward along the eastern coast of Iloilo to the mouth of Talisay River, westward across the Guimaras Strait to Tomonton Point in Occidental Negros, eastward along the northern Coast of the Island of Negros and back to the mouth of Danao River in Escalante, Negros Occidental.”

However, it is interpreted that both municipal and commercial fishers who target the prohibited species are banned during this period. As per the comment of one LGU representative:

“(The) FAO (Fisheries Administrative Order) 167 is very broad; there is no law that prohibits certain fishing gear.... many grey areas.” [LGU representative, Estancia, Iloilo]

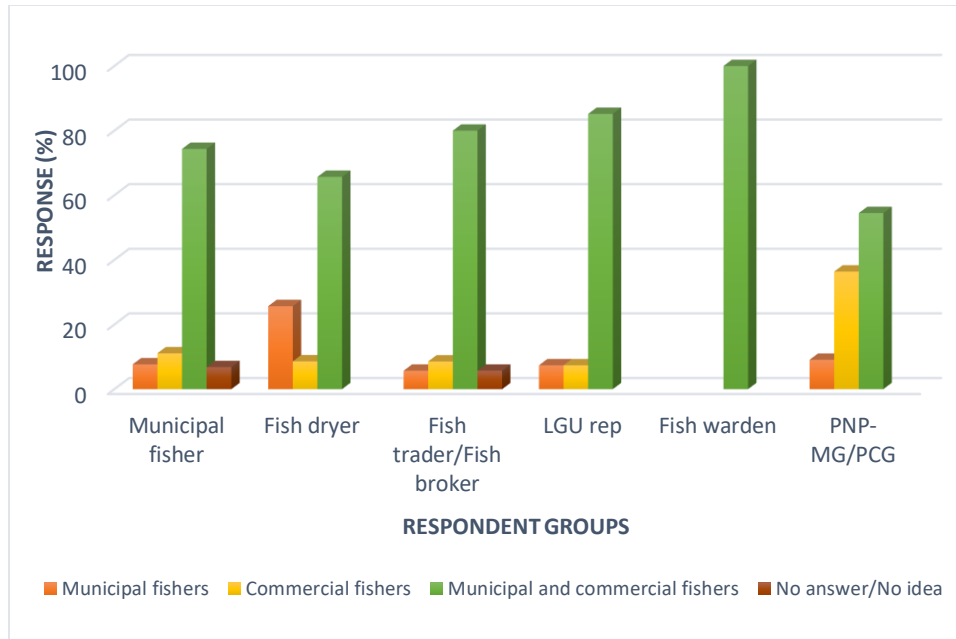


Figure 6. Responses to the question 'Who are included in the SFC?', by respondent group.

The BFAR management at the regional and national levels also have varying views on who are included in the fishing ban as shown in the interview transcripts below:

“We are always asked about that...regarding the law ... because it does not mention there that it is only for commercial (fishers). My take there is it should not be because in terms of production or catch, they (commercial and municipal fishers) have an equal contribution. Meaning, it has a significant effect if we will allow the municipal fishers to fish during the closed season. So, what’s in the law should be implemented although we do not elaborate more whether they (municipal fishers) are exempted or not.” [Regional BFAR]

“The municipal fishers are not prohibited from fishing during the closed season because in the operationalization of the closed season, they are not supposed to be restricted..... But it is just right not to include everyone (excluding municipal fishers from the closed season) because that was the original intent of the law also when it started.” [National BFAR]

These findings have implications for the implementation of the SFC in the different municipalities surrounding the Visayan Sea. As one respondent notes:

“You can find your way around (the law) because the Implementing Rules and Regulations are not specific.” [LGU representative, Estancia, Iloilo]

It is important to clarify whether municipal fishers are part of the SFC because it is difficult to implement a policy that is vague. As one key informant explains:

“The closure is about space and fishing gear (plus the specified fish species). Even if you allow the municipal (fishers) but you only allow specific fishing gears like hook and line, then it is fine. But since you do not have specific provision for allowing and disallowing, then it is vague.” [Key informant, Fisheries expert]

According to another key informant:

“Ideally for the closed season, the implementing guidelines should be clear in the ordinance. The local (government) should have an ordinance.” [Key informant, NGA Environmental lawyer]

The problem is some municipalities do not even have their coastal resource management plans, let alone a fishery ordinance on the implementing rules and regulations of the SFC in their municipality.

When respondents were asked what species are banned from fishing during the SFC, 71.5% of the respondents answered *sardines and mackerels* while 9.4% said *sardines only*. Other respondent groups have different responses as to what species are not allowed to catch during the SFC (Figure 7).

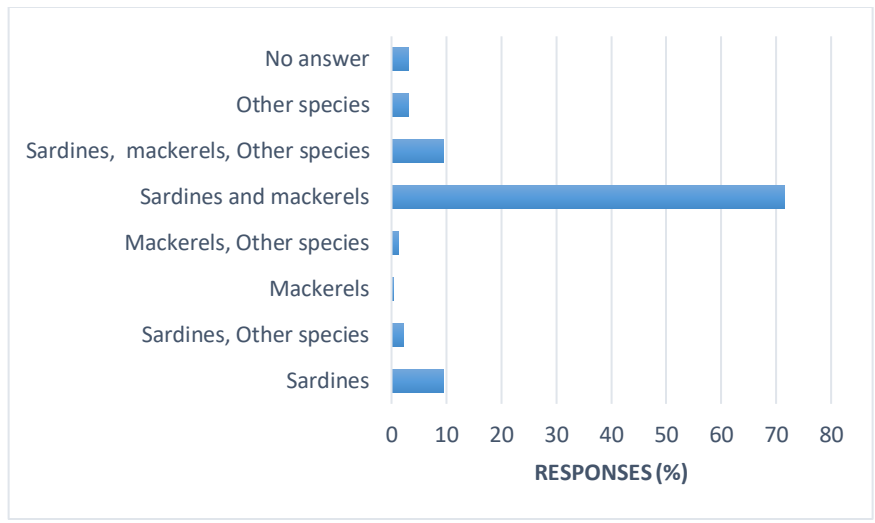


Figure 7. Respondents' answers to the question 'What species are banned from fishing during SFC in the Visayan Sea?'.
SFC in the Visayan Sea?'

According to a BFAR key informant, both species are given priority in the conservation effort, however, sardines are usually highlighted because it ranks number one in terms of production.

Analysis of responses between respondent groups show that most of the municipal fishers (80.3%) and LGU representatives (96.3%) know which fish species are banned during the SFC (Figure 8).

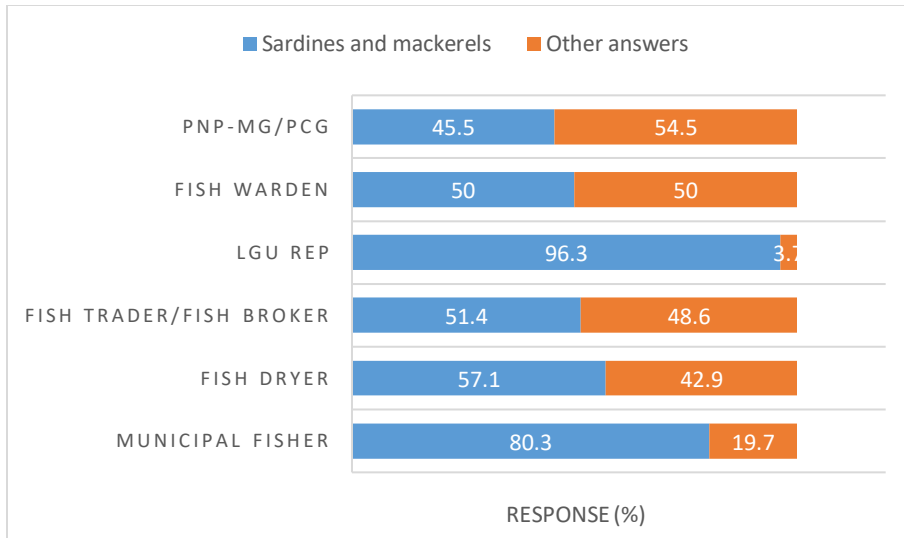


Figure 8. Responses to the question 'What species are banned from fishing during SFC in the Visayan Sea?', by respondent group.

Respondents were also asked what months of the year are covered by the SFC in the Visayan Sea. Figure 9 shows that majority of the respondents are knowledgeable about the specific months when the SFC is implemented (i.e., November-February).

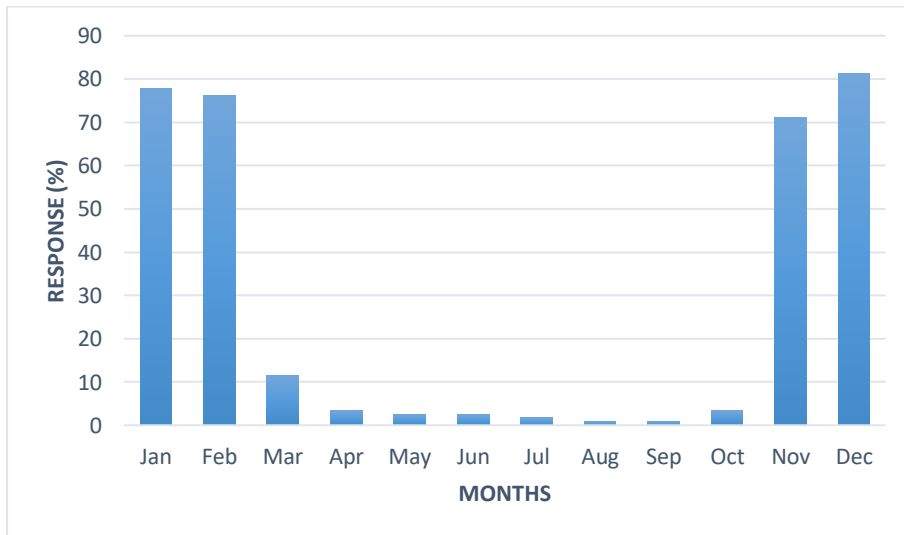


Figure 9. Responses to the question 'What months of the year are covered by the SFC in the Visayan Sea?', by respondent group.

For the penalties for violation of the SFC, Figure 10 shows that respondents are more aware of penalties such as *fines* (78%), *forfeiture of catch* (36%), and *imprisonment* (33%), but not so much about *cancellation of fishing permit or license* (1%). Twelve percent (12%) the respondents have either *No answer/No idea* about the penalties for the violation of the SFC because they said they have never been apprehended, or they have *other answers* such as impoundment of fishing gears and/or fishing boats, issuance of warning depending on the number offenses (e.g., first, second, third warning), or their municipality has no fishery ordinance in place.

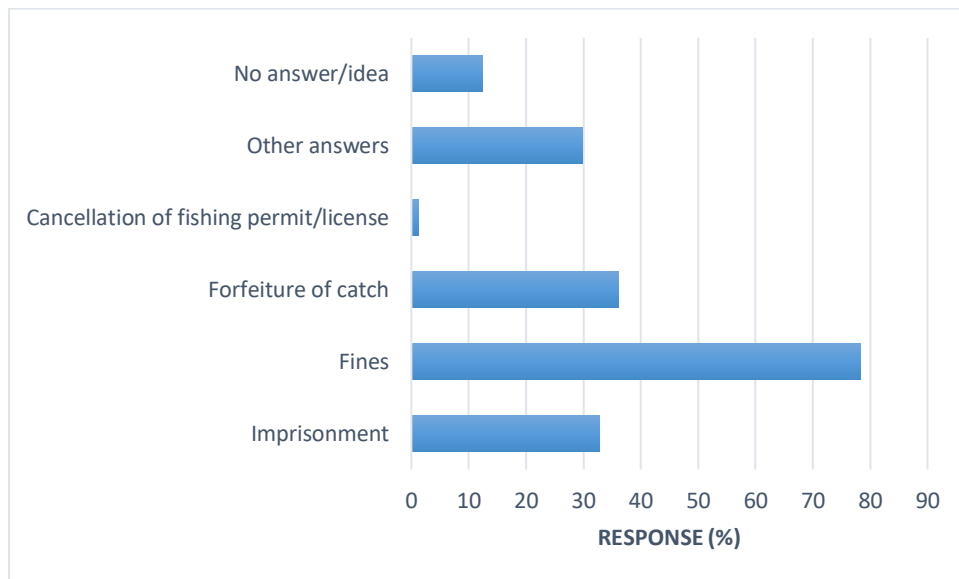


Figure 10. Respondents' answers to the question '*What are the penalties for violation of the SFC?*'.

Figure 11 shows how respondent groups fared in the *knowledge* questions, with LGU representatives at the top spot (mean score of 11.37), while the PNP-MG/PCG and Fish dryers are the bottom 2 with mean scores of 9.27 and 9.43, respectively.

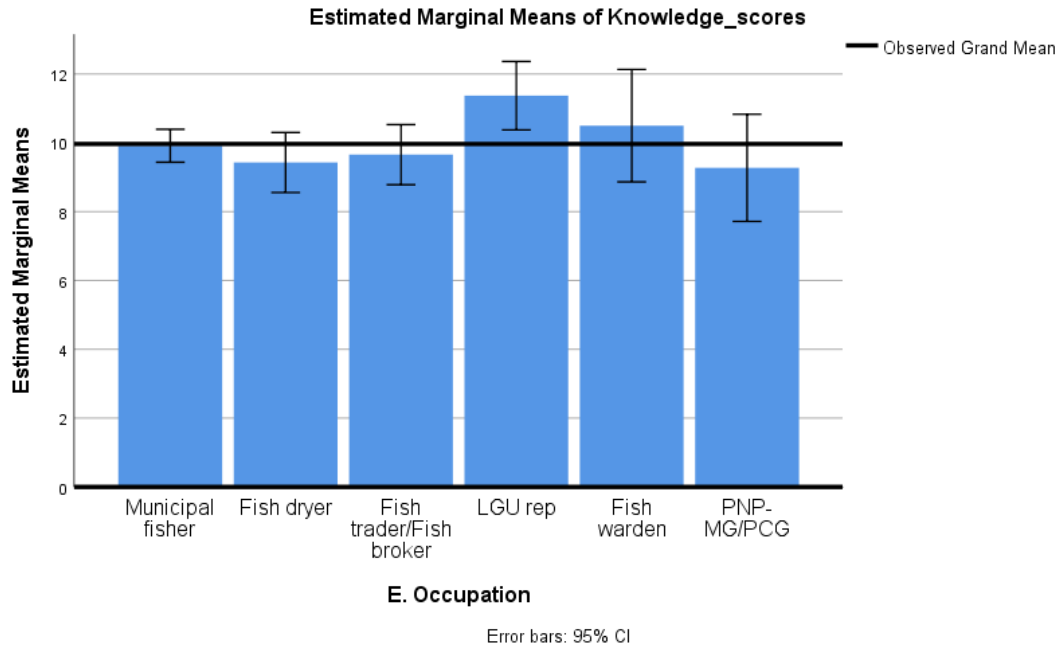


Figure 11. Mean scores for *knowledge* about the SFC, by respondent group.

Overall, respondent groups scored low on the *penalties for violation of the SFC* (Figure 12). The fish dryers, fish vendors/fish traders/fish brokers, and members of the PNP-MG/PCG also scored low on the question on the inclusive months of the *SFC period* (mean score=2.8). Respondents from the PNP-MG/PCG also scored low on questions on *who are included in the SFC* (mean score=1.5) and *species banned during the SFC* (mean score=1.4). These results highlight the need for members of the authority to brush up their knowledge on the provisions of the SFC policy, especially that they are part of the MCS team. They are also the one apprehending violators. Hence, it is imperative that they understand the law to enable them to enforce it properly.

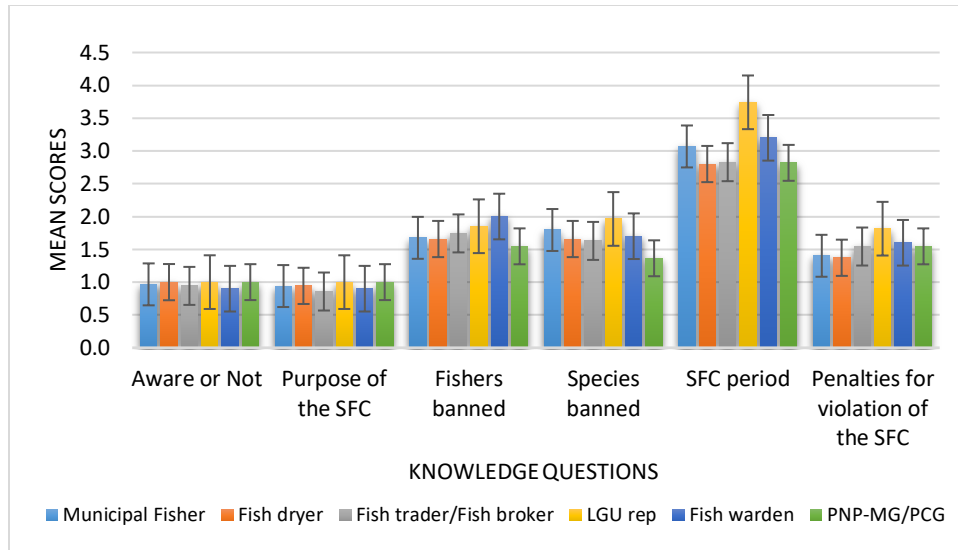


Figure 12. Mean scores for individual *knowledge* questions about the SFC, by respondent group.

Figure 13 shows how the different municipalities fared in the *knowledge* questions. The municipalities of Carles (mean score=12.05), Ajuy (mean score=12.05), and Estancia (mean score=11.77) in the province of Iloilo, and Roxas City (mean score=11.35), in the province of Capiz, got the highest mean scores, while the municipalities of Cawayan (mean score=4.94) and Milagros (mean score=6.24) in the province of Masbate got the lowest mean scores. These results are reflective of the varying priorities and capacities of the different municipalities. A more thorough discussion of these factors is provided in the results under political challenges that affect the implementation of the SFC in the Visayan Sea.

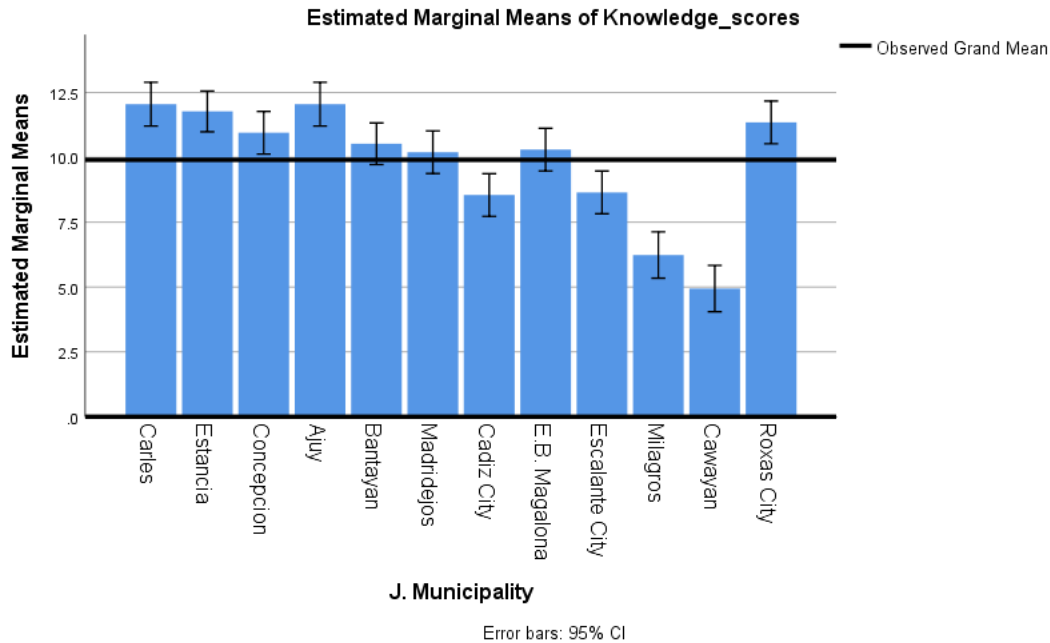


Figure 133. Mean scores for *knowledge* questions about the SFC, by municipality.

The municipalities at the bottom 4 struggled with the questions on *fish species banned during the SFC* and *inclusive months of the SFC*. Knowledge about the types of fishes banned and the specific months when the SFC is implemented are important in ensuring compliance among the *regulated* groups. These findings can direct the efforts of the BFAR management and the LGUs, specifically on areas which they need to work in terms of IEC campaign about the SFC.

Table 8 shows the overall ratings of the respondents by respondent group and by municipality for the *knowledge* questions. Only the LGU representatives got a *Good* rating (11.37), while the rest of the respondent groups got a *Fair* rating. These results are indicative of the poor transfer of information about the SFC policy from the LGU levels to the municipal fisheries stakeholders involved in the SFC.

Table 8. Respondent's overall ratings for knowledge questions about the SFC, by respondent group, and by municipality.

By respondent group	Mean	Rating*
Municipal fisher	9.85	Fair
Fish dryer	9.43	Fair
Fish vendor/fish trader/fish broker	9.54	Fair
LGU rep	11.37	Good
Fish warden	10.30	Fair
PNP-MG/PCG	9.27	Fair
<hr/>		
By municipality		
Carles	12.05	Good
Estancia	11.77	Good
Concepcion	10.95	Good
Ajuy	12.05	Good
Bantayan	10.52	Good
Madrirdejos	10.20	Fair
Cadiz City	8.55	Poor
E.B. Magalona	10.30	Fair
Escalante City	8.65	Poor
Milagros	6.24	Very poor
Cawayan	4.94	Very poor
Roxas City	11.35	Good

*Rating: Very poor (below 7.0); Poor (7.0-8.75); Fair (8.76-10.5); Good (10.51-12.25); Excellent (above 12.25)

Respondents' overall ratings by municipality show that all the study sites in Panay Island (Carles, Estancia, Concepcion, Ajuy, and Roxas City) have consistently earned *Good* ratings on the *knowledge* questions, while 2 of the study sites in the neighboring island of Negros have earned *Poor* ratings. The *very poor* ratings earned by the municipalities of Milagros and Cawayan in Masbate Island are rather expected since the enclosed area during the SFC is largely comprised by the municipal waters of the study sites in the provinces of Iloilo, Negros Occidental, and Cebu.

Figure 14 shows the estimated marginal means of the *regulated* group's overall *knowledge* about the SFC in the Visayan Sea (N=187). In general, *regulated* groups in the municipalities in

Panay Island namely: Carles, Estancia, Concepcion, Ajuy and Roxas City are more knowledgeable about the SFC in the Visayan Sea compared to their counterparts.

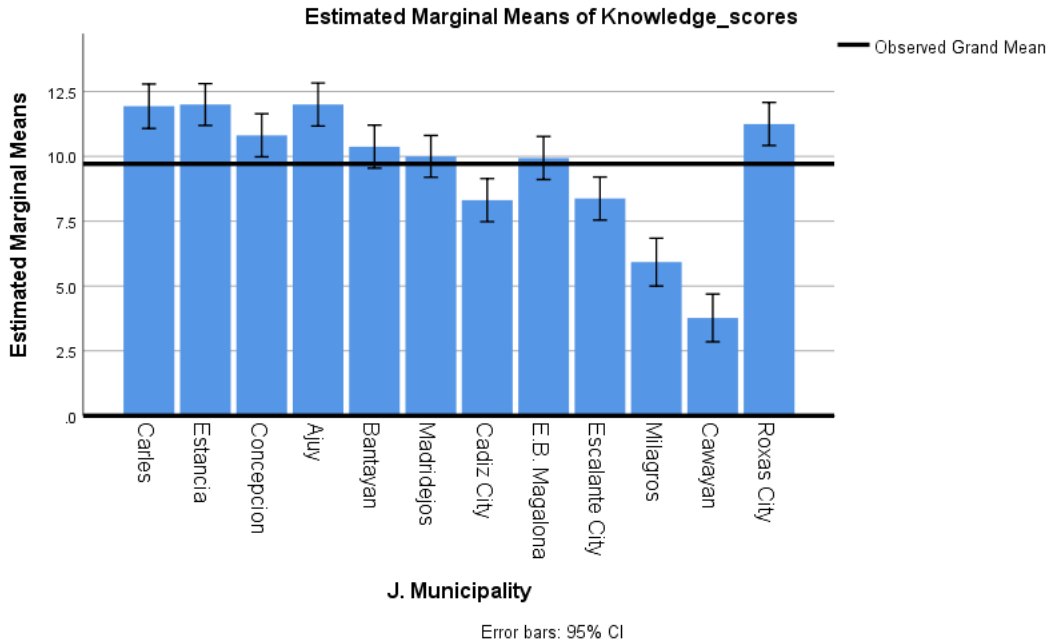


Figure 14. Estimated marginal means of the *regulated* groups' overall *knowledge* about the SFC.

Analysis of variance shows statistically significant differences in the *regulated* groups' *knowledge* about the SFC in the Visayan Sea in the different municipalities ($p < .05$) (Table 9).

Table 9. Analysis of variance of respondent's *knowledge* about the SFC in the *regulated* group in the different municipalities.

ANOVA

Knowledge_scores					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1018.930	11	92.630	32.716	.000
Within Groups	495.477	175	2.831		
Total	1514.406	186			

These findings can be attributed to the proximity of the study sites in *Panay Island* to the BFAR regional office which is located in the same island hence, these municipalities are more accessible to BFAR personnel when they conduct information drive on the SFC, compared to the municipalities in the provinces of Negros Occidental, Cebu, and Masbate. The municipalities with the top 4 highest scores for example, belong to the Iloilo province, while Roxas City is in the neighboring province of Capiz. Although some of these municipalities have island barangays which can only be reached by boat, most of these coastal towns are accessible by land transportation. The other study sites are in the islands of Negros Occidental, Cebu and Masbate. This might have affected BFAR's campaign due to the distance and remoteness of these areas. It can also be attributed to the leadership and more vigorous fishery law enforcement in the municipalities in *Panay Island*.

A non-parametric correlations test shows a positive and statistically significant correlation ($p < .05$) in the *regulated* groups' *knowledge* about the SFC and their *compliance* therewith (Table 10). However, the strength of the correlation¹² is weak ($r_s = .269$). The weak correlation between *knowledge* and *compliance* among the *regulated* respondents may be attributed to socio-economic, cultural and political factors which are largely influencing respondents' decision to comply with the fishery policy. This is discussed in length in the following section.

¹²Correlation coefficient range and strength of relationship: 0.01-0.20 (Very weak); 0.21-0.40 (Weak); 0.41-0.60 (Moderate); 0.61-0.80 (Strong); 0.80-0.99 (Very strong).

Table 10. Correlations test on *regulated* group's *knowledge* about, and *compliance* with, the SFC.

		Correlations		
			Knowledge_ scores	Compliance
Spearman's rho	Knowledge_scores	Correlation Coefficient	1.000	.269**
		Sig. (2-tailed)	.	.001
		N	187	156
	Compliance	Correlation Coefficient	.269**	1.000
		Sig. (2-tailed)	.001	.
		N	156	156

** . Correlation is significant at the 0.01 level (2-tailed).

Perceptions of fisheries stakeholders about the SFC

Figure 15 shows that ~65% of the respondents (N=235) agree that *there is sufficient and accurate information in support of the implementation of the SFC in the Visayan Sea*. However, about 20% of the respondents *do not agree* with this statement.

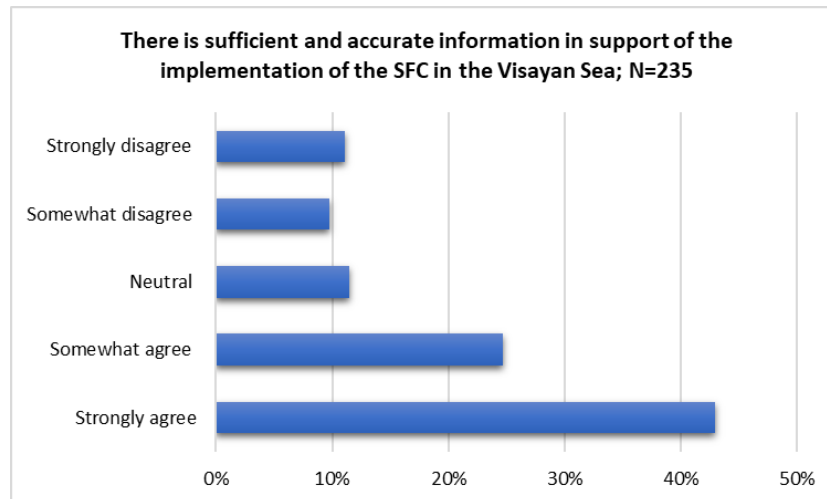


Figure 15. Respondents' *perceptions* on whether *there is sufficient and accurate information in support of the implementation of the SFC in the Visayan Sea*.

At least 60% of the respondents *agree* that *there are opportunities for consultation and dialogue with different stakeholders about the SFC*, while 20% of them think otherwise (Figure 16).

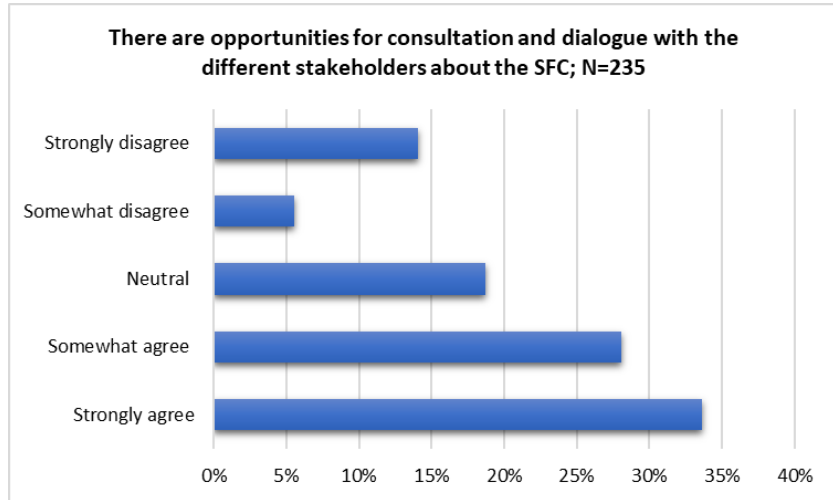


Figure 16. Respondents' *perceptions* on whether *there are opportunities for consultation and dialogue with the different stakeholders about the SFC in the Visayan Sea*.

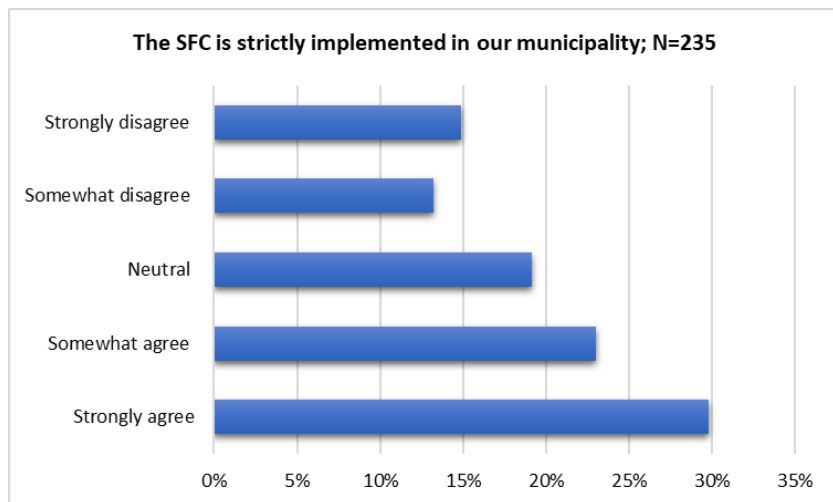


Figure 17. Respondents' *perceptions* on whether *the SFC is strictly implemented in their municipality*.

While 30% of the respondents *strongly agree* that *the SFC is strictly implemented in their respective municipalities*, about 15% (N=35) said they *strongly disagree* with this statement (Figure 17). Majority of the of the 35 respondents who '*strongly disagree*' that the SFC is implemented in their municipality are municipal fishers (Figure 18a) and are from the municipalities of Milagros and Cawayan in the province of Masbate (Figure 18b). Several respondents report that illegal fishing activities are still rampant in these areas, thus, the implementation of the SFC policy is a secondary concern for them.

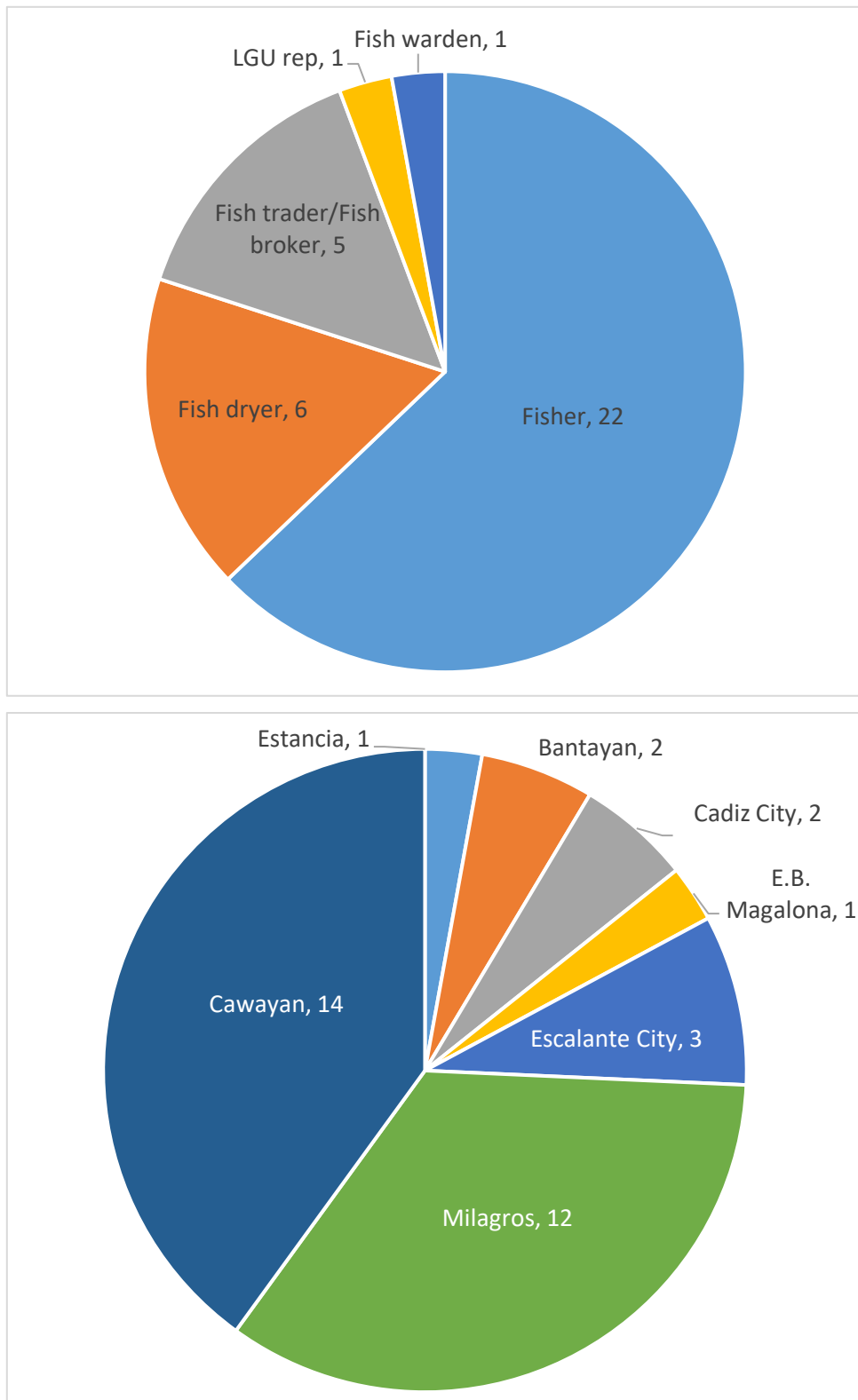


Figure 18. *Strongly disagree* response re 'The SFC is strictly implemented in our municipality',
 a) by respondent group (top); and b) by municipality (bottom).

Forty percent (40%) of the respondents have a *neutral* stand on whether *the SFC is strictly implemented in other municipalities*, while ~20% said they *strongly disagree* with this statement (Figure 19).

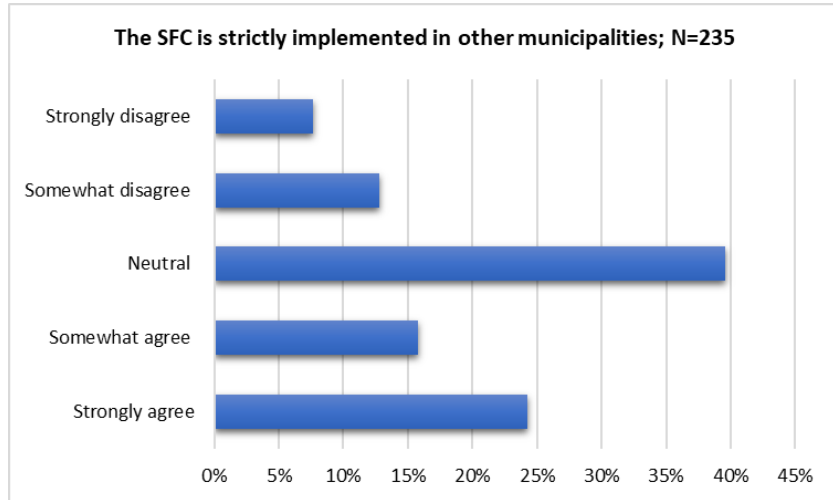


Figure 19. Respondents' *perceptions* on whether *the SFC is strictly implemented in other municipalities*.

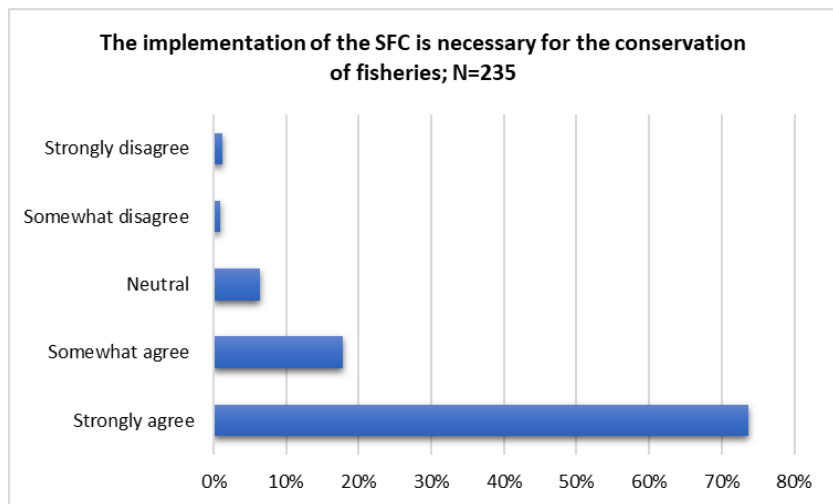


Figure 20. Respondents' *perceptions* on whether *the implementation of the SFC is necessary for the conservation of fisheries*.

Interestingly, there is a *strong agreement* among respondents that *the implementation of the SFC is necessary for the conservation of fisheries* in the Visayan Sea (Figure 20). This is very important especially that the main purpose of the SFC is to conserve sardines, herrings and mackerels in the area that has been observed to be declining over the years (Armada 1999).

Respondents were also asked if there is an observed increase in the catch of sardines in the last 5 years and at least 50% of the respondents confirmed that catch for sardines has been increasing in their respective municipalities (Figure 21). However, such observation may only be referring to the increase in catch at the end of each SFC, which is an expected trend at the beginning of an open season. Further, the perceived increase in the catch for sardines does not coincide with the results of the BACI analysis conducted to determine the effect of the SFC before and after its strict implementation in 2012. Results show a significant decline in the catch for sardines in the provinces participating in the SFC (discussed in detail in the following section). Respondents also note an increase in catch for *S. lemuru* (locally called as *tuloy* or Bali sardines), but not *S. gibbosa* (locally called as *tabagak* or Gold stripe sardines).

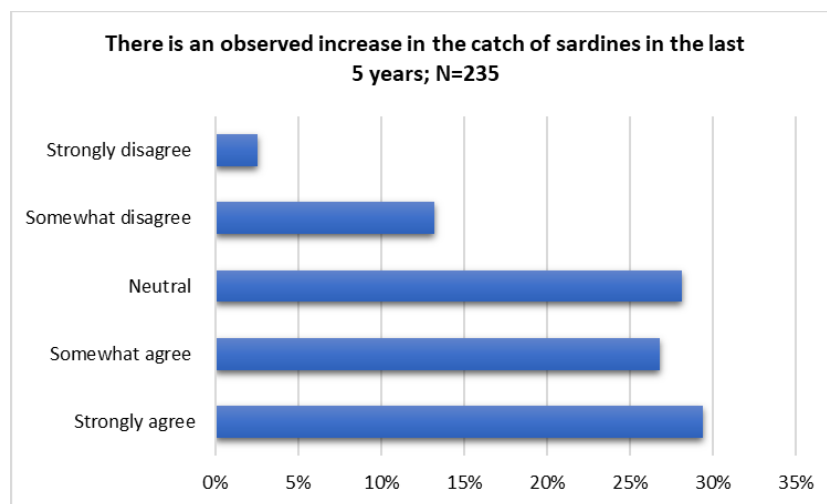


Figure 21. Respondents' *perceptions* on whether *there is an observed increase in the catch for sardines in the last 5 years*.

In contrast, 40% of the respondents have a *neutral* stand when asked if there is an observed increase in the catch of mackerels in the last 5 years (Figure 22). Some respondents claim they do not catch mackerels in their areas (e.g., Milagros, E. B. Magalona, Roxas City). Also, results of the BACI analysis (in the following section) show an insignificant effect of the SFC on catch for mackerels after the strict implementation of the SFC in 2012.

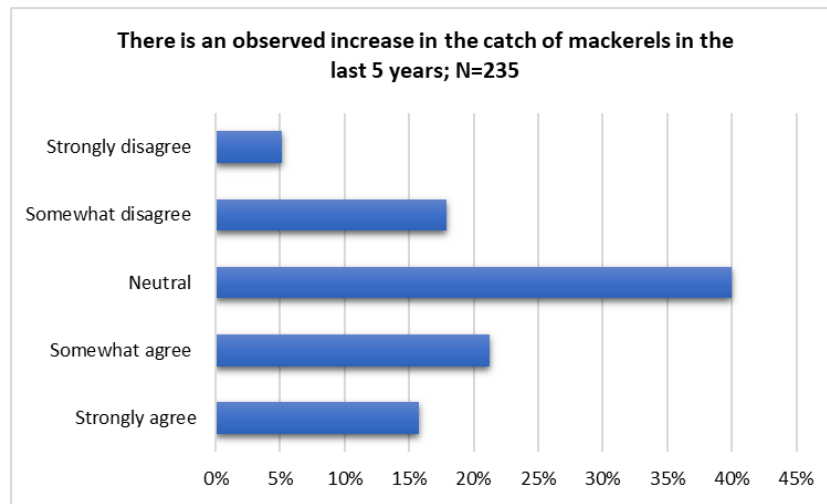


Figure 22. Respondents' *perceptions on whether there is an observed increase in the catch for mackerels in the last 5 years.*

Although many of the respondents believe that they are benefitting from the SFC (~60%) (Figure 23), analysis of the socio-economic and cultural impacts of the SFC show adverse impacts, specifically on the *regulated* group's livelihoods. The contradiction between the respondents' perceptions about the SFC and the reality of its impact suggests a cognitive dissonance, which may stem from the suggested overall benefits that a conservation program such as the SFC, offers.

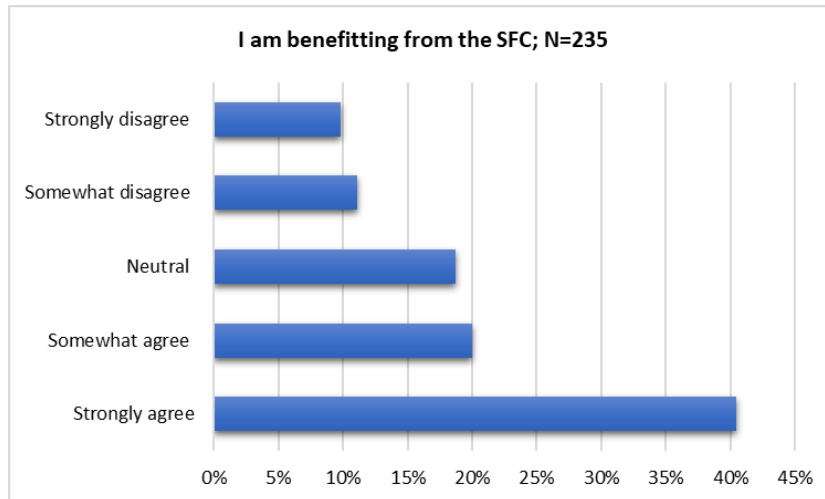


Figure 23. Respondents' *perceptions* on whether *they are benefitting from the SFC*.

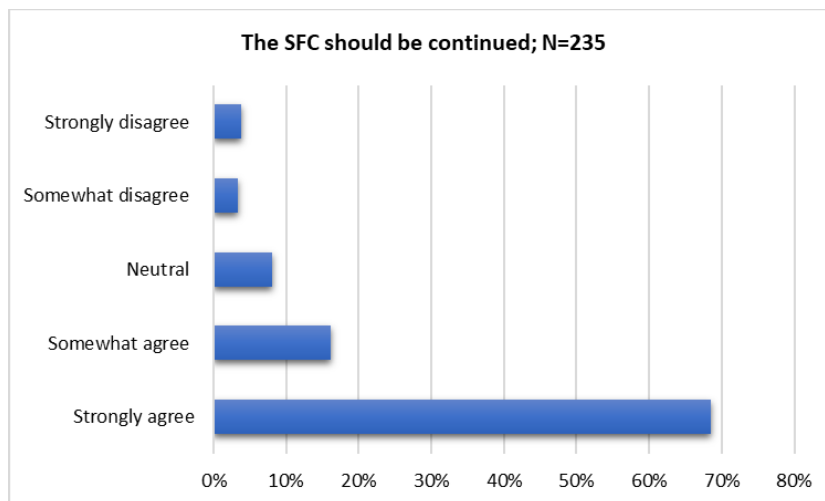


Figure 24. Respondents' *perceptions* on whether *the SFC should be continued*.

Although a majority of the respondents *strongly agree* that the SFC should be continued (Figure 24), 27% think that the SFC's provisions should be revised. On the other hand, more than 50% of the respondents do not think revising the provisions of the SFC is necessary (Figure 25).

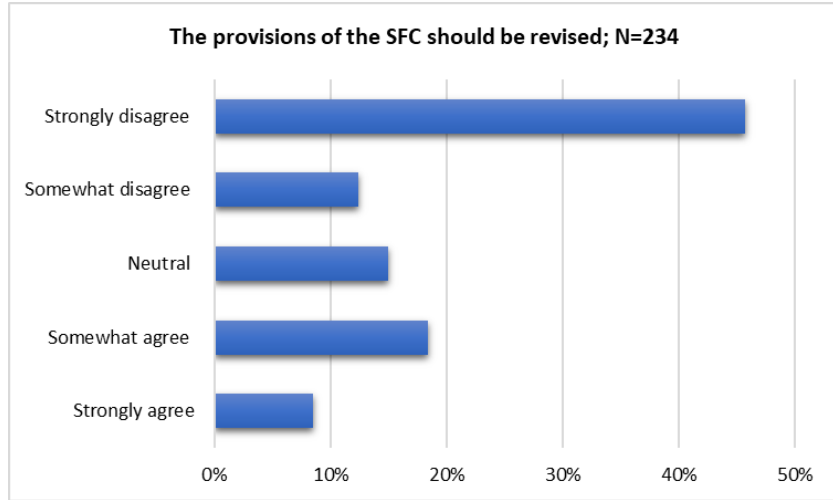


Figure 25. Respondents' *perceptions* on whether *the provisions of the SFC should be revised*.

Figure 26 shows that in general, the *regulated* groups have relatively similar *perceptions* about the SFC in the Visayan Sea, except for respondents in Escalante City, in Negros Occidental and municipalities of Cawayan and Milagros, in Masbate, wherein *perception* scores are below than the observed grand mean score.

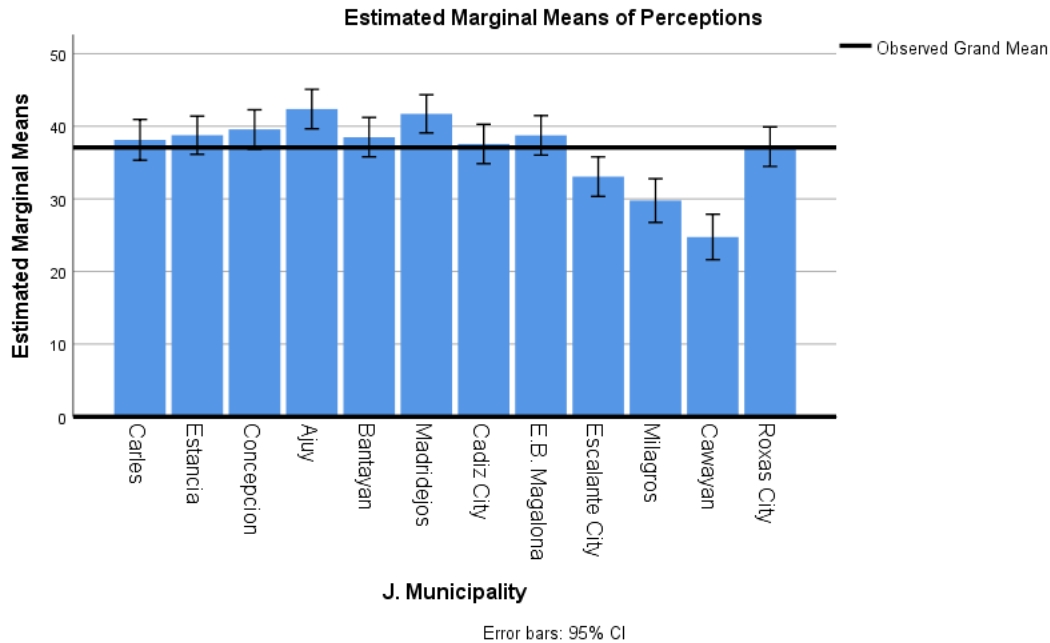


Figure 26. Estimated marginal means of *regulated* group's *perceptions* about the SFC.

Analysis of variance shows a statistically significant difference in the *perceptions* of respondents in the *regulated* and *regulator's* group ($p < .05$; Table 11). The respondents in the *regulator's* group have significantly higher level of perceptions about the SFC compared to the respondents in the *regulated* group. This is rather expected because the *regulated* stakeholders are the ones affected by the SFC implemented in the Visayan Sea.

Table 11. Analysis of variance in the *regulated* and *regulator groups'* *perceptions* about the SFC.

ANOVA					
Perceptions	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	205.459	1	205.459	4.502	.035
Within Groups	10588.425	232	45.640		
Total	10793.885	233			

Interestingly, analysis of variance also shows a statistically significant difference in the *perceptions* of the *regulated* groups in the different municipalities ($p < .05$) (Table 12). These results are consistent with the results from the knowledge section, i.e., municipalities that earned low mean scores in knowledge questions about the SFC also have lower level of perceptions about the SFC policy.

Table 12. Analysis of variance of *regulated* group's *perceptions* about the SFC.

ANOVA					
Perceptions					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3834.067	11	348.552	11.506	.000
Within Groups	5270.879	174	30.292		
Total	9104.946	185			

Furthermore, there is a moderate correlation between the *regulated* groups' *perceptions* about, and *compliance* with, the SFC in the Visayan Sea ($r_s = .511$). The correlation is statistically significant at 0.01 level ($p = .000$; Table 13). Similar to the findings in the *knowledge and compliance* analysis, the weak correlation between the *regulated* group's *perceptions* about the SFC and their *compliance* therewith, is affected by myriad factors that have a more direct impact on their livelihoods and daily operations.

Table 13. Correlations test on the *regulated* group's *perceptions* about, and *compliance* with, the SFC.

Correlations

		Perceptions	Compliance	
Spearman's rho	Perceptions	Correlation Coefficient	1.000	.511**
		Sig. (2-tailed)	.	.000
		N	186	156
	Compliance	Correlation Coefficient	.511**	1.000
		Sig. (2-tailed)	.000	.
		N	156	156

** . Correlation is significant at the 0.01 level (2-tailed).

Figure 27 shows the words that most respondents associate with the SFC in the Visayan Sea. While respondents think about the SFC in a positive light because they associate it with *increase in fish stocks* (11%) and *fish spawning* (5%), respondents cited more words that have negative connotations such as *poor* (12%), *less fish supply* (5%), *limited/scarcity* (8%), *loan* (4%), *arrest* (4%), *arrest* (4%), *no fishing* (4%), *high fish price* (3%), *no/less income* (4%), *hunger* (3%), *limitation* (4%), and *ban/prohibited* (2%). Some respondents also associate the SFC in the Visayan Sea with neutral words such as *livelihood/alternative livelihood* (5%), *abide* (3%), *budget* (2%) and *law* (2%).

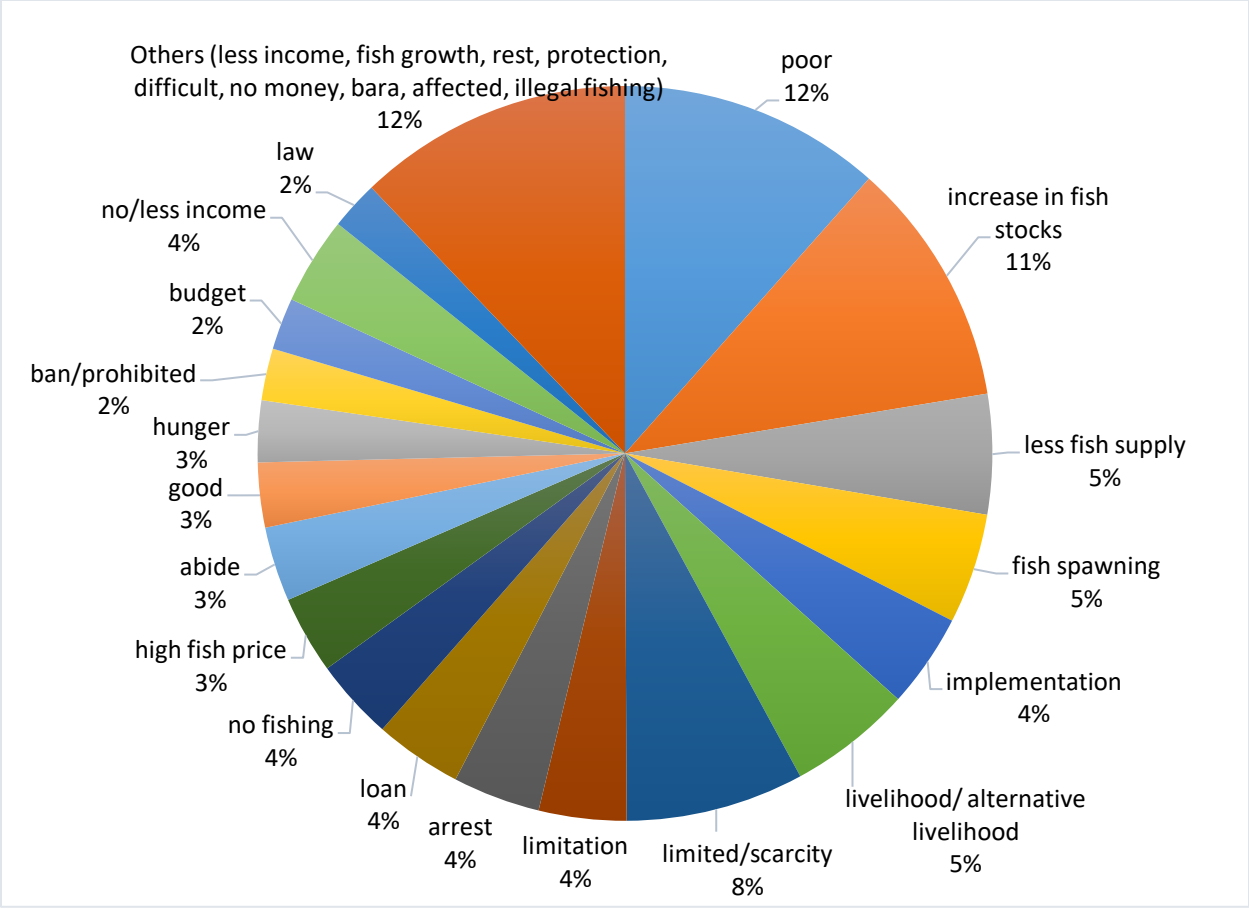


Figure 27. Words that respondents associate with the SFC (N= \geq 10 responses).

Socio-economic and cultural impacts of the SFC in the Visayan Sea

Introduction

Resource managers are often under extreme time pressure to implement regulations and political pressure to satisfy diverse constituents, causing them to focus on a specific management element even though the problem may require a multi-faceted approach (Degnbol *et al.* 2005). This can be attributed to the great variety of types of information they deal with in their work and their frequently having to rely on incomplete data when making decisions affecting the livelihoods of many people. In the process, they become instrumental not only in instituting and legitimizing certain conditions that lead to inequality in the society, but also in causing conflict over natural resources (Johnston 1995; Bennett *et al.* 2001; Tan-Mullins 2007; Fabinyi 2015)

Several anthropological studies that focus on fisheries and environmental management highlight how socio-economic, cultural, and political systems affect resource management and development outcomes and vice versa (Johnston 1995; McCay *et al.* 1995; Griffith 1999; Polioudakis and Polioudakis 2000; Russell and Alexander 2000; Griffith and Valdés-Pizzini 2002; Acheson 2006; Pinkerton and Edwards 2009; Cruz-Torres 2012; Eder 2012; Fabinyi 2012; Fabinyi *et al.* 2015; Grace-McCaskey 2018; Griffith 2018). For example, Johnston (1995) explains that efforts to protect a ‘healthy environment’ may in some cases result in human rights abuse and may ultimately fail to meet original environmental integrity objectives if there is adverse social response. Conversely, focusing on human rights needs alone, including the right to development, while ignoring the environmental context may serve as a temporary intervention rather than a long-term solution. According to Johnston (1995), this conundrum underscores the need for analyses that consider the political, economic, and cultural factors shaping and at times distorting efforts to

respond to human environmental crises. In his book entitled “The Estuary’s Gift”, Griffith (1999) discusses how development along the Mid-Atlantic Coast not only affects watermen lifeways and fishing families but also reduces the cultural and biological diversity in the area because development disturbs the environmental balance and erodes the most intimate understandings of coastal ecosystems.

In fisheries management, the recognition and appreciation of the importance of these critical factors are part of what McCay (2000) refers to as ‘sea changes’, which are represented through the concepts of *co-management* (e.g., democratization of fisheries management), *community* (e.g., place, interest, shared identities, histories and futures, etc.), *chaos* (e.g., problem of knowledge and uncertainty about the environment), and *commodification* (e.g., changes in property rights and other institutions that enable open market forces to operate towards improved efficiency). Most of the anthropological scholarship in fisheries, if not all, share a common goal of gaining deeper understanding of the relationship of local people with their coastal environment (e.g., access, control, and utilization of resources, among others) as this relationship gets entangled in the larger web of cultural, socio-economic and political systems, and the outcomes of such interactions (Acheson 1979, 1981, 1987; McCay 1980; Durrenberger 1992; McCay *et al.* 1995).

Despite the recognition of the importance of balancing social and ecological goals, a biocentric approach to fishery management is still apparent in the Philippines. The current fishery management framework is not cognizant of the varying needs and capacities of different stakeholders in the fisheries sector, resulting in differential effects of the SFC implemented in the Visayan Sea. While the BFAR is optimistic about the beneficial effects of this conservation

measure (DA-BFAR 2013; Ramos 2014), there are varying perceptions about such a claim because empirical evidence is lacking. The consequences of resource management policy on communities are not usually included explicitly under the rubric of resource management and while economists are quick to suggest positive multiplier effects, they seldom discuss the negative multiplier effects of policies that have measurable costs (King and Durrenberger 2000). It is important to address the uncertainty in the projected impacts of a closure not only to reliably compare alternatives, but also to illuminate the impacts of a closure (Farmer *et al.* 2016). Further, understanding the intricacies of regulations is necessary in achieving that, particularly in determining their cumulative effects (Cheuvront *et al.* 2005). Effective fishery management entails understanding of its diverse, complex and dynamic features, hence the motivation for this study.

Socio-economic impacts of the SFC

Livelihood

The livelihoods of 59.1% of the respondents (N=235) are affected by the SFC implemented in the Visayan Sea. Analysis per respondent group shows that the livelihood of 71.8% of the municipal fishers (N=117), 80% of the fish dryers (N=35), and 74.3% of the fish vendors/fish traders/fish brokers (N=35) are affected by the SFC (Figure 28).

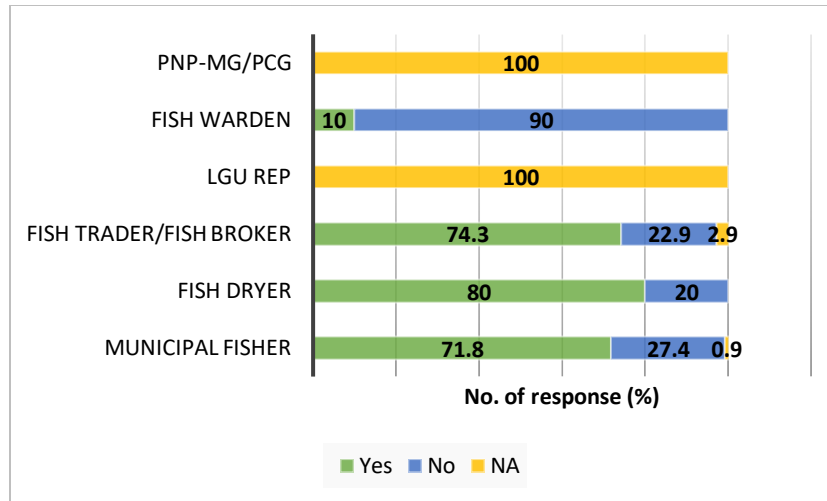


Figure 28. Responses re 'Is your livelihood affected by the SFC?', by respondent group.

When respondents were asked how the SFC affects their livelihoods, predominant answers include: *no/limited/low fish catch or fish supply* (N=63); *no/scarce income, scarcity, no livelihood/alternative livelihood* (N=76); and *stop/limited fishing* (N=38) (Figure 29). These responses are interrelated. Since the majority of the affected respondents rely on fishing or fishing-related activities for their livelihood, a 3-month fishing ban evidently restricts their fishing activities and thus, results in lower fish catch or sales, especially for those whose target species are sardines and mackerels and do not have resources to shift to other fishing gears. This has a ripple effect on their income and can often result in scarcity. For example, sardines are the target species of fishers in Barangays Nasidman and Barrido in Ajuy, in Iloilo Province. There are reports of food shortage in these fishing communities during the 3-month fishing ban because they abide by the SFC religiously. It is important to note that small pelagic fishes, such sardines and mackerels, serve as a main source of inexpensive animal protein, especially for the poor and lower-income populations in the country. In 2017, the mean per capita consumption of fish and fishery products

in the Philippines is 40 kg/year or 109 grams/day; fish and fishery products constitute 12.8% of the total food intake of Filipinos (Lamarca 2017).

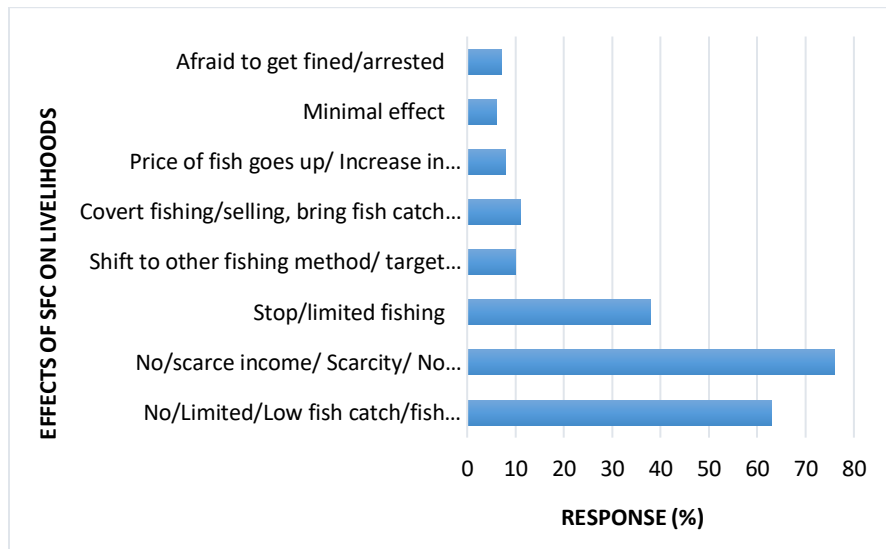


Figure 29. Cited effects of the SFC on respondents' livelihoods; N=139.

The *regulated* groups were also asked to identify *lean* and *peak* months in a year to see periods of stress. The municipal fishers have a 100% response rate to this question, but only 37% of the Fish dryers (N=13) and 60% of the fish vendors/fish traders/fish brokers (N=21) responded. Hence, some of the analyses in this chapter focuses mainly on the Municipal fishers.

Figure 30 shows that *lean* months for the municipal fishers are *January, February, and December* which coincide with the SFC. For the fish vendors/fish traders/fish brokers, *lean* months are *March, April, and May* which coincide with the end of school year and start of summer. Unlike the municipal fishers who are directly impacted by the fishing ban during the identified lean months, the fish vendors/fish dryers/fish brokers have other variety of fish which they can sell during this period. Also, fish vendors/fish dryers/fish brokers respondents report that the high

temperature during summer months affects the overall fish catch from the sea, resulting in lower volumes of fish landed. This might explain the difference in the *lean* period identified by the 2 groups.

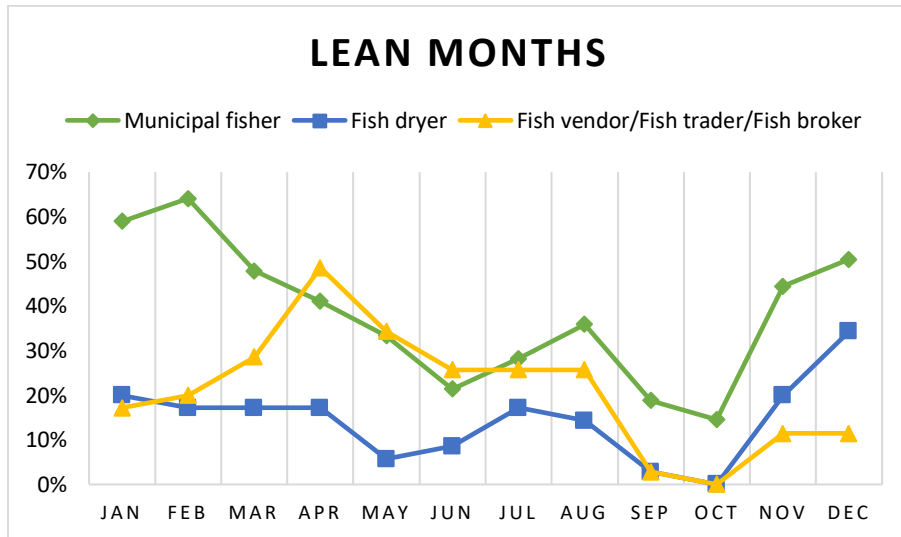


Figure 30. Identified *lean* months by the *regulated* group.

On the other hand, *peak* months are *August, September* and *October* for municipal fishers and *October, November* and *December* for fish vendors/fish traders/fish brokers (Figure 31). According to the fish vendors/fish traders/fish brokers, although there is a low supply of fishing during this period, they can command a better price for the fishes they sell which is favorable to them. Prices of goods also go up towards December in anticipation of the holidays.

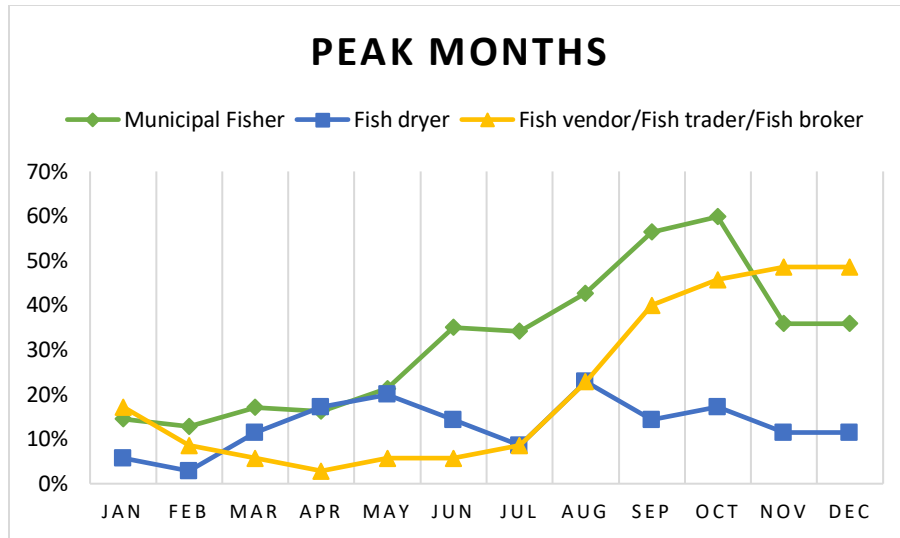


Figure 31. Identified *peak* months by the *regulated* group.

On the average, municipal fishers go fishing for 15 days during the *lean* months while during *peak* season, they fish for an average of 26 days. Some respondents report that they only stop fishing during full moon and when the weather conditions are not favorable. In terms of volume of catch, 76.1% of the municipal fishers (N=117) catch between 1-10 kgs per day only during the *lean* season (Figure 32). Further analysis shows that the median catch for municipal fishers is 5 kgs/day during *lean* months and 150 kgs/day during *peak* months.

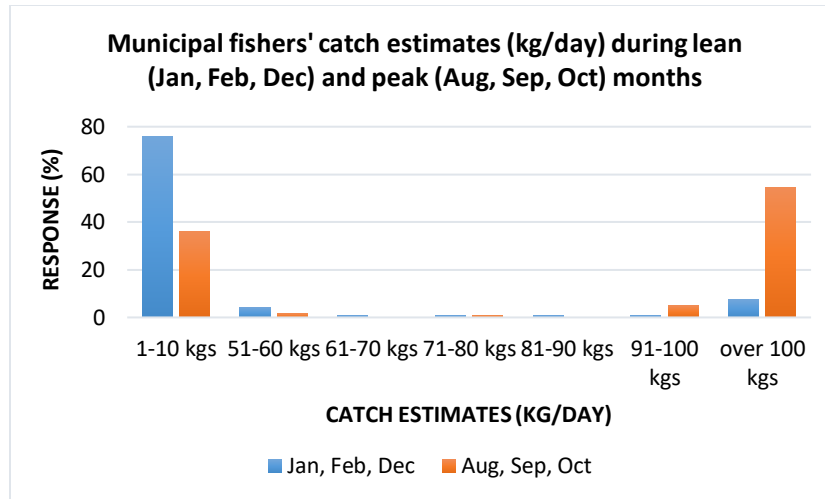


Figure 32. Municipal fisher’s catch estimates (kg/day) during *lean* and *peak* months.

While municipal fishers’ catch (i.e., fishers catching over 100 kgs/day) dramatically increases during the *peak* season, 36.5% of the municipal fishers remain at the 1-10 kgs/day catch range (Figure 32). These findings can be attributed to the small boat capacity of the municipal fishers. Data shows that while 87.2% of the municipal fishers have motorized boats, the majority of these boats have a 1-3-person capacity which indicates the limited capacity of municipal fishers. A key informant explains the big difference between commercial and municipal fishers’ operations:

“The catch of commercial fishers is automatically canned in canning factories, while the small fishers only have 10 pcs of ice. It is very sad. Small (municipal) fishers only aim for a small catch and goes home. They cannot catch more than their gear capacity because their nets will be damaged. Hence, it is sustainable fishing.” [Key informant, NGA]

Municipal fishers have smaller boats that do not have on-board refrigeration; hence, they cannot stay out fishing for longer periods of time and are compelled to do ‘day trips’ so that they can land their fish catch before it spoils. This limitation greatly affects their production potential

compared to the commercial fishers, who have the resources to stay at sea. McGoodwin (2001) reports that the prevailing fishing technologies used in traditional small-scale fishing communities emerge from extensive cumulative experience that is mediated by limitations in what they can afford to acquire outside their community.

Income

Median income for the municipal fishers during *lean* months is PhP 475.00/day (\$9.5) and PhP 6,400/day (\$128/day) during *peak* months. Analysis also shows that during the *lean* months, 36.8% (N=43) of the municipal fishers are earning below the PhP 275.00 (~\$5.5) minimum wage set by the Department of Labor and Employment (DOLE 2019) for Agriculture/Non-plantation category for Regions V-Bicol and VI-Western Visayas (Figure 33). The other 31.6% of the municipal fishers are earning between PhP 276-1,000 (\$5-20) per day.

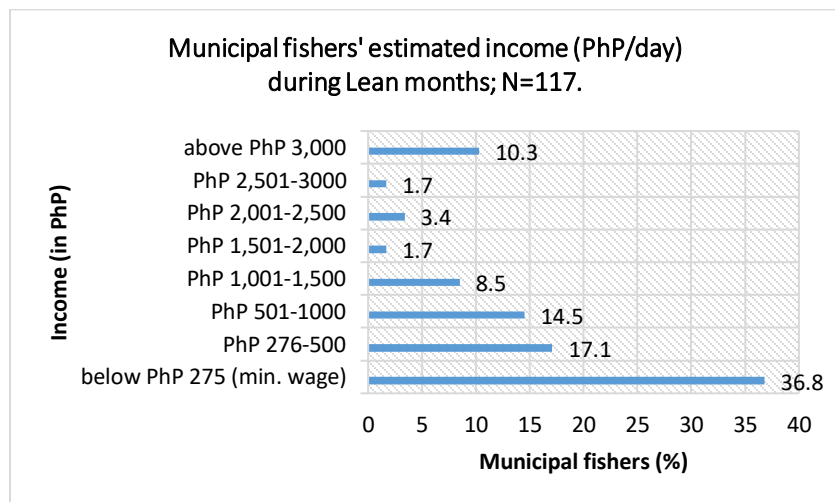


Figure 33. Municipal fisher’s estimated income (PhP/day) during *lean* months.

According to the Philippine Statistics Authority (PSA), a family of 5 needs no less than PhP 7,337 (\$146.74) per month [or PhP 245 (~\$5) per day], on the average, to meet the family's basic food needs. But to meet both basic food and non-food needs, a family of 5 needs no less than PhP 10,481 (\$209.62) per month [or PhP 349 (~\$7) per day], on the average (PSA 2019). Analysis shows that 30 of the 43 municipal fishers who are earning below the minimum wage (~\$5.5/day) during *lean* months have a family of 4-6, and 24 of them have no secondary source of livelihood. During *peak* season, 62.4 % of the municipal fishers in general, earn more than PhP 3,000 (~\$60) per day, while the rest of the respondents reported that their daily income comparatively increases during this period (Figure 34). This *peak* income can clearly compensate for the poor income of municipal fishers during the *lean* months. Some municipal fishers are accustomed with the seasonality of fishing and save in anticipation of the *lean* months.

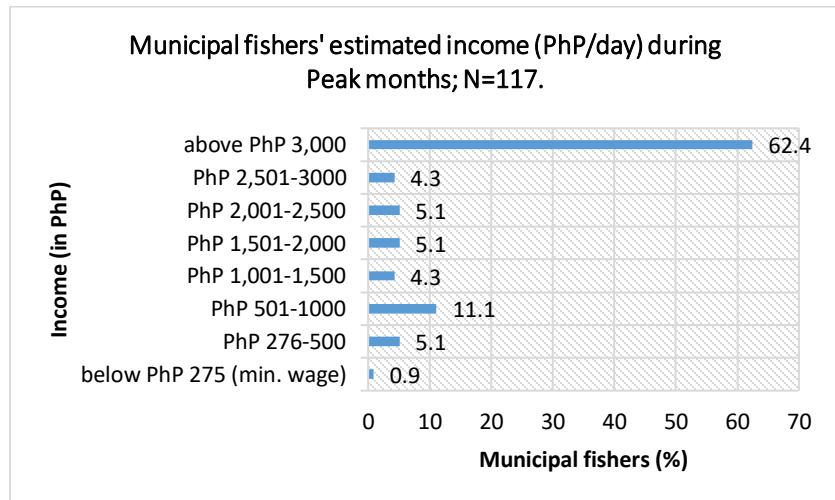


Figure 34. Municipal fisher's estimated income (PhP/day) during *peak* months.

McGoodwin (2001) underscores the importance of maintaining occupational pluralism in small-scale fishing communities as a means for minimizing the risks and uncertainties that are

associated with fishing activities. Because of the unpredictability of the sea, small-scale fishers need other means of livelihood which they can turn to when fishing activities are not productive or in the case of the SFC in the Visayan Sea, restricted.

Household dynamics

Eighty percent (80%) of the respondents whose livelihoods are affected by the SFC (N=139) said they get less income during the SFC period which has negative implications on their *household budget*. This results in a shortage not only in terms of basic needs like food, but their children's schooling is affected as well, because they do not have enough money for school fees, allowance, and fare. Respondents who reported *no or minimal effect* of the SFC on their household (8%) either *have other sources of livelihood, savings, or are receiving financial assistance from their working children* (Figure 35).

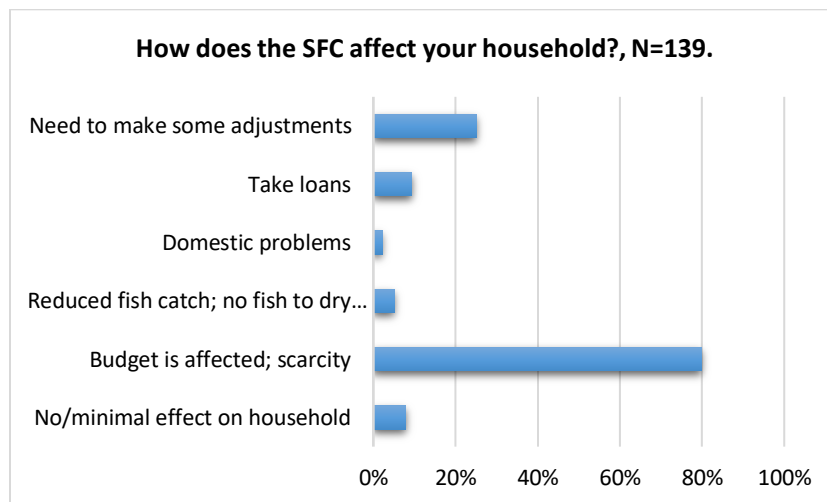


Figure 35. Cited effects of the SFC in the households.

Since small-scale fishers and others working in fisheries activities often experience periods without incomes, they are more likely to find temporary support from their close kinsmen than from more socially distant persons (McGoodwin 2001), a practice that is commonplace in the Filipino culture because of close-knit family ties. In addition, respondents reported frequent fights in the household because *there is no money* and *household members easily get irritated because there is no food*.

Cultural impacts of the SFC

A majority of the respondents (80.9%) said there are no cultural beliefs and practices in their municipality that are affected by the SFC. Some respondents said people have got used to the SFC that they regard it as part of the norm, and thus, embedded in the local culture. On the other hand, 16.6% of the respondents said that traditional holidays (e.g., Barangay and Town Fiesta, Christmas and New Year), and events (e.g., birthday) are affected because they coincide with the SFC period (Figure 36).

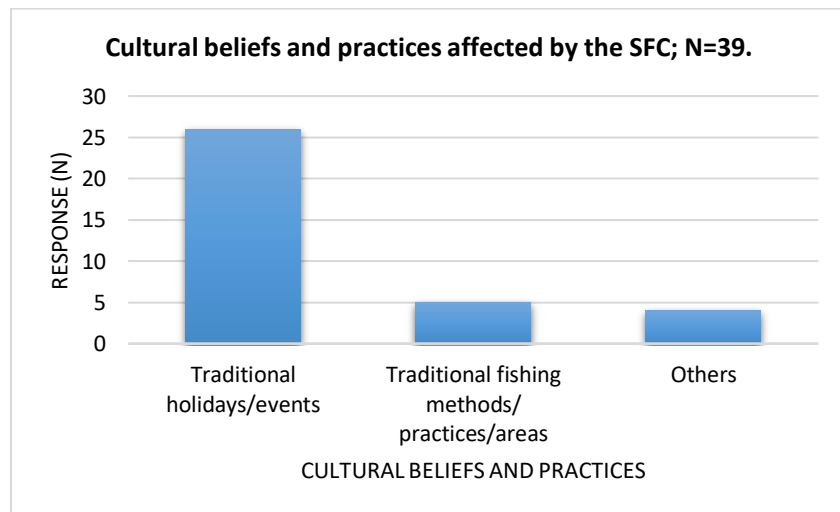


Figure 36. Cultural beliefs and practices that are affected by the SFC.

Almost every province and city/municipality in the Philippines celebrates different kinds of *Fiesta*, a practice inherited from the Spaniards after more than 300 years of colonization under Spain and has since been embedded in the Filipino tradition. Most of these festivities have religious origin, i.e., honoring the patron saint of a city/municipality or province, and are comprised of a series of activities such as holding a mass, novena, grand parade, beauty pageants, processions, and other activities that bring the members of the community together to express gratitude to God (Ethnic Groups of the Philippines 2019). Filipinos, especially those living in provincial areas, go out to celebrate this festivity to ensure comfort in the coming year, believing that the more they spend, the more returns they will obtain. Filipinos living abroad come home to celebrate this momentous event with their families whom they have not seen for a long time. The religious content of a festival (e.g., praying to St. Peter and St. Nicholas who are the patron saints of fishermen and seafarers) also recognizes the risks, uncertainties, and dangers that accompany fishing activities, thereby helping seafarers cope with the adversities they often face (McGoodwin 2001). Hence, *Fiesta* is an important traditional activity to many Filipinos because it reflects Filipino religions and faith which are essential part of the Filipino society owing to Spanish influence. The Philippines is the only Christian country in Asia; at least 80% of its population practice Roman Catholic.

Similarly, Christmas and New Year's Eve are some of the biggest yearly traditions that many Filipinos look forward to celebrating. In fact, Christmas season in the Philippines starts as early as September 1st, which marks the start of decorating houses and plazas with many *Parol* (Christmas lanterns) and Christmas lights. Filipinos also celebrate a midnight meal called *Media Noche* on the eve of the New Year. Households prepare a sumptuous meal to share with their

families; others prepare 12 different kinds of fruits with circular shapes and wear clothes with polka dots which symbolize money. Since celebration of these events coincide with the implementation period of the SFC, some of the affected fisheries stakeholders are not able to participate in these traditional events due to budget shortage.

Respondents also mentioned that activities like beach seining, ring net fishing, drift gillnet, and fish aggregating device (locally called as *payao*), which they consider as traditional fishing practices, are affected by the SFC. Despite these claims, the temporary nature of the SFC allows these traditional fishing practices to persist, especially that some of these fishing methods are very efficient in catching fishes such that the promise of a bountiful catch during the open season can offset the losses incurred during the SFC.

According to McGoodwin (2001), fisheries activities in most small-scale fishing communities support a significant portion of the local population. Thus, the many fishing occupations that many community members pursue are interwoven through the whole fabric of the community's local culture. Further, fishing technologies (and practices) that have been long used in highly traditional fishing communities encode the community's accumulated experience in fisheries in a similar way that an organism's genes encode its evolutionary development and adaptive success. In this light, fishing technology requires not only the material items, but also the technical knowledge on how such materials are acquired, used and maintained, which ultimately forms an integral component of a small-scale fishing community's culture and social relationships.

Furthermore, fishing technologies (and associated items) used in small-scale fishing communities are often important cultural symbols which figure importantly in the fishers' and community's cultural identity (McGoodwin 2001). For example, the *Tikab-tikab* Festival recognizes and celebrates the importance of scallops to the people of Carles, Iloilo. Another example is the *Panagat* Festival in Estancia, Iloilo which showcases the living creatures under the sea through a tribal dance. In their book entitled 'Fishers at Work, Workers at Sea', Griffith and Valdés Pizzini (2002) explain that people who rely on natural resources for some or most of their survival (e.g., fishers, hunters, gatherers, etc.) gain much satisfaction from these activities beyond the tangible benefits (i.e., cash, food) they provide. Most importantly, these activities often lie at the core of small-scale producer's identities such that they deliberately strive to maintain and reproduce these ways of life to preserve and reproduce their cultural heritage (Griffith and Valdés Pizzini 2002). In recent years, fisheries managers have begun to focus more on the social aspects and functions of fisheries because of the realization that the viability of fisheries management systems, and fishers' adherence to the rules, depend largely on social and cultural aspects and to a lesser degree on biological and economic aspects of fishing (Schmidt 2003).

Respondents also expressed that their access to their traditional fishing areas are restricted, forcing them to fish farther out to the sea and increasing their fuel expenses and fishing time. Some respondents said some of the neighboring municipalities allow them to fish in their municipal waters, depending on certain arrangements such as acquisition of fishing permit from the LGU or payment of fees, while the others poach, which sometimes result in conflicts, arrests, and fines.

Small-scale fishers usually assert their rights to certain marine resources based on locally developed beliefs and practices which they have established for managing the fisheries they utilize (McGoodwin 2001). As one key informant expressed:

“We (small fishers) are the true protectors of our fisheries because since then, we do sustainable fishing through our simple fishing gears and methods. We only catch based on our capacity; we do not have surplus catch. We only get just enough to have a decent living. The problem is our fishing ground is becoming smaller and smaller...” [Municipal fisher, NGA]

Going out far to the sea poses additional risks to municipal fishers because of the significant hazards that the marine environment presents not only to their success but also safety. According to McGoodwin (2001), small-scale fishers are seldom equipped with modern lifesaving gear such as life jackets or survival suits, and many do not have access to timely weather advisories or effective communications, nor they can count on rescue services should they run into danger while at sea. This holds true with most of the municipal fishers in the Visayan Sea (and in the rest of the country) as they are not required by the government to equip their boats with life vests and global positioning system (GPS) device. While technologies that provide weather advisories and rescue services have become a common commodity, such as smart phones, municipal fishers are generally poor, thus, most them do not have access to such sophisticated technologies.

Coping mechanisms of affected stakeholders

Figure 37 shows the different mechanisms employed by the affected fisheries stakeholders (N=139) to cope with the impacts of the SFC. Thirty-eight percent (38%) of the affected respondents look for *land-based alternative livelihoods* such as farm work (e.g., cutting, weeding, planting and harvesting); selling fruits, vegetables and root crops; service-oriented occupations

(e.g., labor in fishponds, construction, carpentry, laundry, cleaning, baby-sitting, fetching water for other people); livestock farming; small-scale business ventures (selling different goods, cafeteria, vending cooked food, convenience store, operating a computer shop); and transport services (operating a pump boat, pedicab, tricycle), among others.

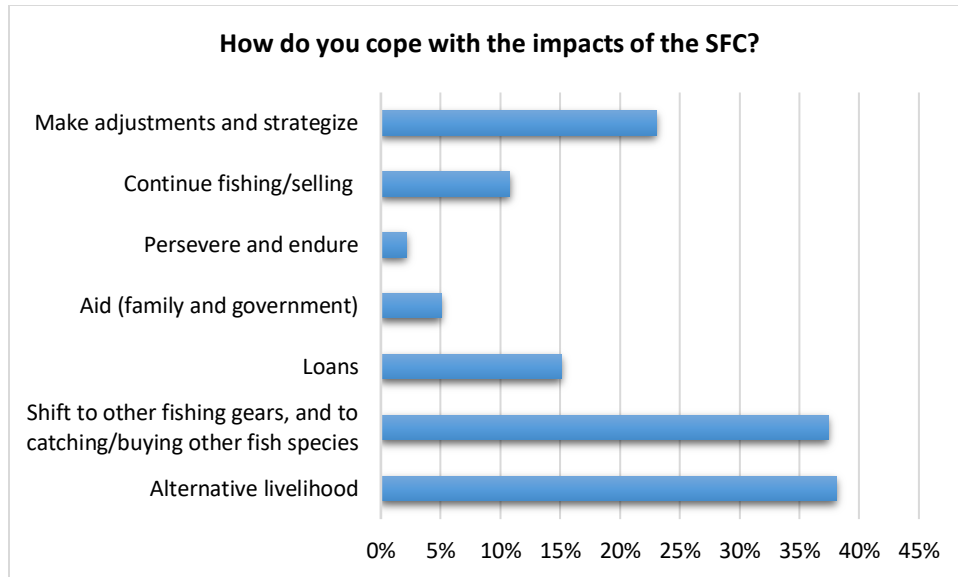


Figure 37. Cited coping strategies to impacts of SFC.

Thirty-seven percent (37%) of the respondents said they *shift to using other fishing gears, or to catching or selling of other fish species*. This is very typical of small-scale fishers in tropical regions like the Philippines due to the multi-species fishery and variety of fishing gears they use; a certain fishing gear may lay idle for certain period when the target species is not available. Affected respondents also reported adjusting to the situation by *strategizing, budgeting, being thrift, and preparing for the SFC by saving some money and investing in other ventures like poultry* (23%). Below are some of the interview excerpts on the respondents’ coping strategies in response to the impacts of the SFC in the Visayan Sea:

“If catch is good in other areas, we transfer there.” [Fish dryer, Carles, Iloilo]

“Since prohibited fishes cannot be sold (in the market), we barter them with other variety of fish or with rice or vegetables in the mountains.” [Municipal fisher, Concepcion, Iloilo]

According to Spoehr (1984), the symbiotic relationship between fishers and farmers bartering their produce has a respectable antiquity in the Philippines and in Southeast Asia. This historical relationship between fishers and farmers stems from the monsoon climatic pattern that is characteristic of Southeast Asia. Fishing may be impossible during certain periods of the year and fishers may turn to other economic activities like farming. Similarly, farmers who lack irrigation and rely solely on rainfall for their crops, or during off-season in the farm, may turn to fishing if they are close to the coast.

Municipal fishers also target other species during the SFC, thus shifting fishing pressure to other aquatic species (e.g., seashells, crabs and squids). While some of these species have higher market value (e.g., crabs and squids), catch for these species are relatively lower compared to catch for sardines and mackerels because municipal fishers claim that their operations are small, and they only catch them as an alternative source of income and food. In the case of the fish vendors/fish traders/fish brokers, they said they buy fish from other areas and sell these in their municipality.

In a study by Guanco *et al.* (2009) in the Visayan Sea, they note overfishing in the area as shown in the catch of Danish seine and otter trawl that was comprised predominantly by squids, indicating a shift in species composition in the Visayan Sea, thus, a shift in fishing pressure to

other species. In his book, Robbins (2012) discusses how enclosures commonly force fishing effort into less productive areas or displace groups that fish in different areas into shared management areas, causing competition in reduced ranges and exacerbating rather than reducing overfishing. For seasonal closures, like the SFC in the Visayan Sea, another possible effect could be a change in fishing seasonality in a way that does not lower the fishing effort when integrated across the year. One sure effect of the SFC in the Visayan Sea though, is its contribution to the marginalization of the municipal fishers. Robbins (2012) defines marginalization as a process whereby politically and socially (disempowered) people are pushed into ecologically marginal (vulnerable and unstable) spaces and economically marginal (dependent and narrowly adaptable) social positions, resulting in their increasing demands on the marginal (increasingly limited) productivity of ecosystems. As a result, the marginalized fishers tend to increase their efforts on the resource-base, in this case, either by racing to fish before or after the SFC as observed by the BFAR management in the last couple of years:

“But these last few years (2016-2017), we encountered problems again with the closed season implementation. This time, it is the LGUs that became our problem because fishers race to fish as soon as the closed season is declared.” [BFAR Region VI]

This was corroborated by a key informant from an NGA:

“What appears to be happening now is after the closed season, it is like being on diet, 1 or 2 days after opening, they double or triple their effort’....’Even the fishers admit that. One way of getting ahead is to use powerful gears.” [Key informant, NGA]

In some cases, household dynamics also change when the wife or other members of the household take the lead in generating income for the family. Eder (2012) notes that households in the coastal zone are accustomed to exploiting different economic activities simultaneously and in

ways that involve a complex interdependence of the labor of the male and female coheads. But women in small-scale fishing communities generally spend more of their time in the community compared to their male counterparts, who are always at sea to work; thus, women often develop more richly ramified local socio-economic networks (McGoodwin 2001). As such, the different activities of women have a more direct bearing on the welfare of the family as they generally look after all the members of the household as well (Bagsit and Jimenez 2012). For example, Eder (2012) highlights that whereas the income-generating activities of men in coastal Philippine communities mostly involve fishing (and other supplemental livelihoods), women may pursue a wide variety of activities in addition to their housekeeping and childrearing responsibilities, to generate income for the household. The multiple roles which women usually play in small-scale fishing communities underscore their fundamental importance not only in their communities' social and economic spheres (McGoodwin 2001). This is evident in some of the households affected by the SFC.

“(My) wife looks for a job to augment income then stops working again when fishing season starts.” [Municipal fisher, Carles, Iloilo]

“Wife sells different goods to add to income.” [Municipal fisher, Estancia, Iloilo]

“Wife works on the side as babysitter.” [Municipal fisher, Concepcion, Iloilo]

“Wife helps in the household expenses.” [Fish trader, Cadiz City, Negros Occidental]

“Wife takes a side job.” [Municipal fisher, Roxas City, Capiz]

Griffith and Valdés Pizzini (2002) call these odd jobs described above as *chiripas*, which is a colloquial term for casual, varied and temporary work that is characterized by varying work schedules and pay. But like Griffith and Valdés Pizzini's (2002) observations, these odd jobs are not 'odd' at all but are central to many working households' strategies to survive. In addition, respondents report that other members of fishing households are expected to work together cooperatively to make ends meet and for the mutual benefit of the rest of the household members.

According to a Fish dryer:

“Household members who have work opportunity in a farm can work.” [Fish dryer, Carles, Iloilo]

“We receive financial support from our children.” [Municipal fisher, Estancia, Iloilo]

“Children with work give financial assistance for our medicine and household expenses.” [Fish dryer, Cadiz City, Negros Occidental]

“We ask for financial assistance from our children.” [Fish dryer, Carles, Iloilo]

According to respondents, they also resort to loans to cover for their families' basic needs during periods of scarcity.

“Take loans even if the interest is very high.” [Fish dryer, Escalante City, Negros Occidental]

“Take loans to pay for school fees and food.” [Fish trader, Escalante City, Negros Occidental]

“Loan rice and viand at a convenience store and pay when there is fishing again.” [Fish dryer, Madridejos, Cebu]

“Take loans from financier and lending entities and pay on open season.”
[Municipal fisher, E.B. Magalona, Negros Occidental]

In general, fishers and farmers have the highest registered incidence of poverty in the Philippines at 34% among the basic sectors (PSA 2017). Most of the poor engaged in fishing and farming live in rural areas (Dy-Liacco 2014; IFAD 2016), which are not only lagging in terms of economic growth, but also have higher rates of underemployment. This can be partly attributed to limited access to productive capital, knowledge, technology, and markets of rural people (IFAD 2016). In a typical fishing community, for example, a municipal fisher’s catch ends up either peddled within or in the neighboring community by the fisher’s wife and/or children or bought by a known buyer in the community at a low price. Idemne *et al.* (unp.) describes the fisheries value chain in coastal communities in Antique, Philippines, wherein the local traders serve as the primary financiers and buyers at the same time, while municipal fishers with non-motorized boats (*banca*) serve as the “captured” supplier of the fish. These financiers practically pay for everything from the mortgage of the fishing boat, fuel costs, and fishing gears to the purchase of fresh bait for the target pelagic and demersal species. The fisher’s daily catch goes directly to financiers and they handle the marketing of the catch, which is usually sold in the public market or the neighboring towns. The fisher, who takes care of the maintenance of the fishing boat and fishing gears, and who goes out to the sea every day to fish, receives only a percentage of his catch value from the financier. These practices are in some way reflected in the relationship between the *regulated* groups in the Visayan Sea wherein fishing boat operators reported supporting their workers and their families so that they will not leave them. A fish broker describes a special relationship that exists between loyal fisher clients and fish traders and fish brokers:

“Loyal fishers take loans from us to buy rice and fuel for their fishing boats.”
[Fish broker, Madridejos, Cebu]

A study by Andriesse (2017) emphasizes the importance of global value chain governance in the Philippine agriculture and aquaculture business to ensure cooperation among actors within a node (e.g., farmers and fishers) and actors at different nodes (e.g., farmers and fishers, intermediaries, processors), especially that intermediaries, who are often the dominant players, are not inclined to respond to impoverished smallholders. This situation becomes more difficult in the municipalities included in the SFC in the Visayan Sea as findings of this study show lack of alternative livelihoods for the affected fisheries stakeholders during the 3-month SFC in the Visayan Sea. In a study which looks at the role of gender in the reduction of fishing effort in the coastal Philippines, Eder (2012) reports that one important reason for project failure has been the lack of alternative income-generating activities for fishers whose fishing incomes suffer due to coastal resource management project measures and who are consequently reluctant to cooperate with project implementers and their goals.

What is remarkable in this case, however, is that some respondents rise to the occasion and help their workers and their families tread through the SFC until the open season begins by providing loans or temporary work (e.g., net and boat repair, including meals during work). In many small-scale fishing communities, affluent community members such as food merchants, boat owners, fish brokers, middlemen, and businessmen, often extend economic protections which are analogous to business insurance (McGoodwin 2001). However, because of the high risks and uncertainty associated with fishing activities, such protection often comes with a hefty price and normally requires the fishers to sell their catches at predetermined prices and only to certain buyers. This situation traps the marginal fishers in a vicious cycle of dependency, and thus, economic marginality. A municipal fisher explains:

“During open season, the fishers can no longer return to fishing because they have sold everything they own, and they have incurred debts during the closed season. The open season is a time for them to pay for their debts and when the closed season comes again, the same cycle happens.” [Municipal fisher, Estancia, Iloilo]

Interestingly, 10.8% of the affected respondents said they take their chance and continue to fish or sell prohibited fish species covertly because they need to survive (Figure 37). This is rather expected especially that ~79% the respondents in the *regulated* group (N=187) reported that at least 80% of their income is generated from fishing or fishing related activity (Figure 38). Fifty-one percent of the affected fisheries stakeholders (N=139) have secondary source of livelihood.

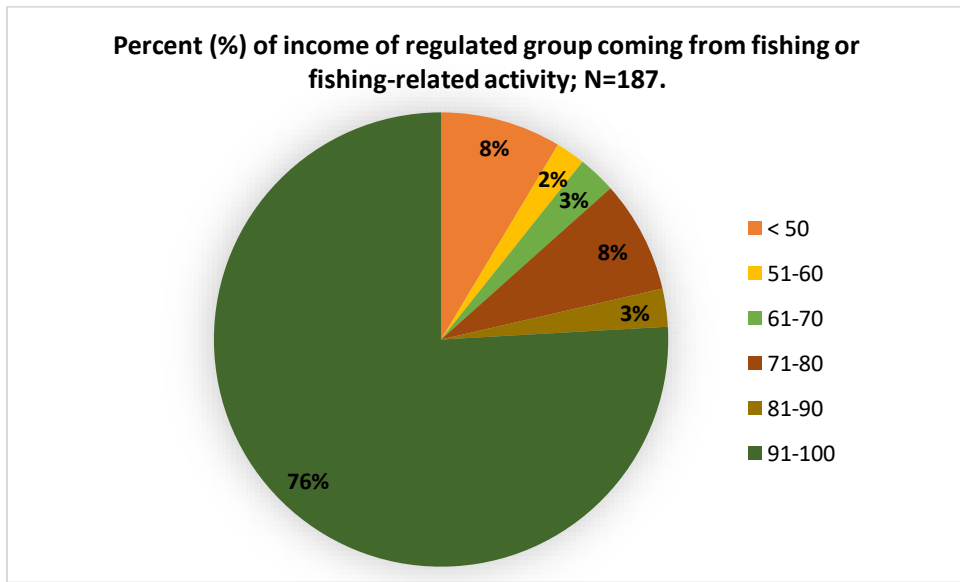


Figure 38. Percent (%) of income of *regulated* group from fishing or fishing-related activity.

Only 87 of the 187 *regulated* respondents (~47%) have secondary livelihoods. Figure 39 shows that fishery-related activities are the most common secondary source of income cited by these respondents (36%). These include hook and line fishing, crab and squid fishing, shrimping, beach seining, fish drying, fish vending and lending, repair of fishing nets, and gleaning. One

interesting finding of this study is that municipal fishers consider participation in trawling or purse seining operations as secondary livelihoods, when their primary fishing activity is constrained. This suggests a change in the composition of the municipal and commercial fishing sectors in certain times of the year.

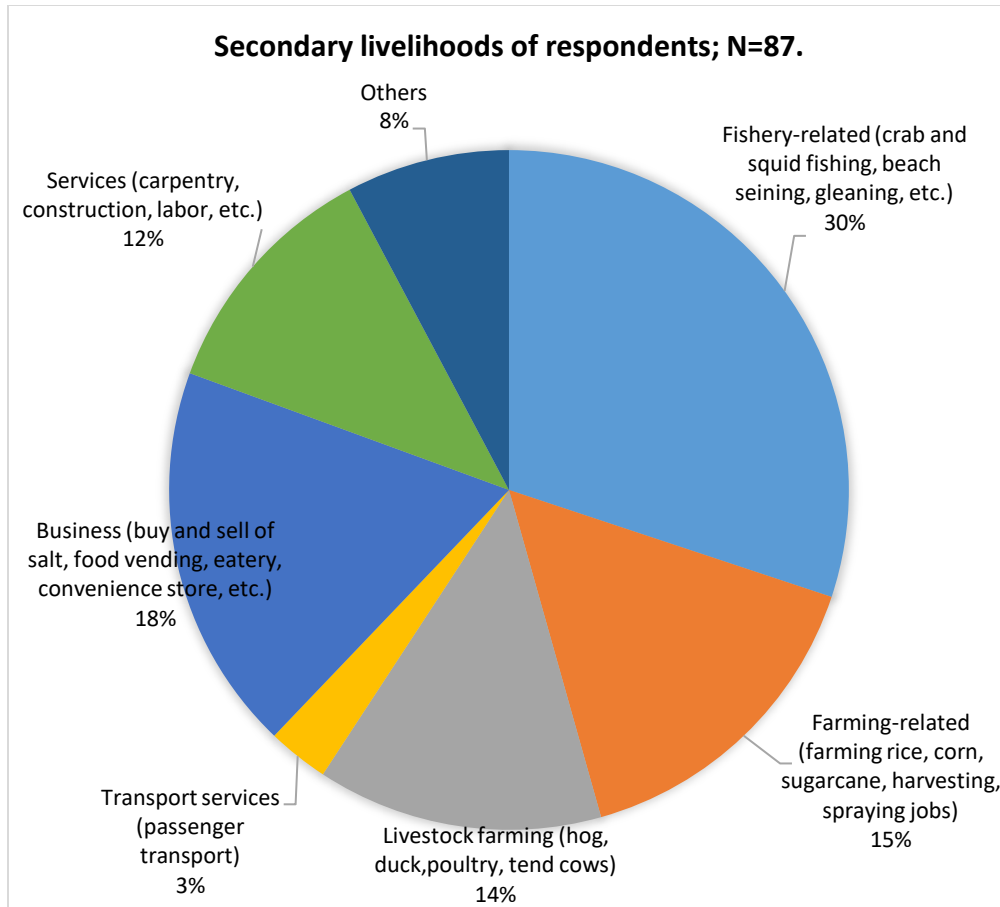


Figure 39. Secondary livelihoods of respondents.

In a study by Salayo *et al.* (2008) that examines various approaches in managing excess fishing capacity in small-scale fisheries in Southeast Asia, they have found that fishers choose to remain fishing as this activity is a way of life for them and any other job will not be as psychologically gratifying (Salayo *et al.* 2008). According to Thomson (1984), to be a fisherman

is not just for the sake of earning money, but to commence a life career - and not just a life career, but for him the only logical career in life. Thereafter his experiences and companionships within the industry will further cement him into the fishing fraternity. Findings of a study led by the University of East Anglia (2012) also show that fishers are unwilling to stop fishing even when it would be an economically rational decision because they often find occupational attachment, job satisfaction, family tradition, culture, and a sense of identity with this vocation. Thomson (1984) further stated that for a fisherman to leave the industry is a traumatic step, and most traditional fishermen will leave the sea only if obliged to do so by reasons of ill health or severe economic hardship. For other fishers, new livelihoods should provide an income that is at least equal to what they are getting from fishing for them to consider that as an option (Salayo *et al.* 2008; Slater *et al.* 2013). In the Philippines, government funding for livelihoods is limited and opportunities outside the fishery are lacking (Muallil *et al.* 2013). Interview results corroborate the findings of Muallil *et al.* (2013); regulated respondents report the lack of opportunities for other livelihoods. Further, the majority of the respondents in the *regulated* group are between 41-60 years old, and have attained High school level of education, which further limits their occupational prospects outside the fishing industry.

Other secondary livelihoods cited by the respondents are *business* (e.g., convenience store, food vending, eatery, buy and sell of salt, computer shop, etc.); *farming-related activities* (e.g., farming of corn, rice and sugarcane, milling, rice trading, harvesting of coconut, spraying pesticides on a mango farm, etc.); livestock farming (e.g., hog, duck and poultry, tends cows); transport services (e.g., drive passenger vehicles, motorcycle, pedicab; others use their boats for tourism activities); services (e.g., carpentry, construction, labor, glasswork, work for other people).

The other respondents either receive financial support from their family members from domestic and abroad or receive salary as a Barangay Captain, Barangay Secretary or Barangay Councilor.

These results are similar to the findings of Eder's 2003 study in the Philippines wherein he observed that fishing is alternated with farming in many net-fishing oriented households in the Visayas region. According to Eder (2003), while some fishing households continue to fish year-round and experience reduced catch and thus, income, many others seek alternative employment in the agricultural economy. Further, Muallil *et al.* (2013) makes the case that food security is a critical consideration when introducing more traditional fishing controls, such as closed seasons and no-take areas. The type of alternative livelihood is the most important factor influencing fishing effort, and employment in alternative occupations that can provide for immediate food or cash needs are to be preferred above those that require longer-term investments to realize benefits (Muallil *et al.* 2012). Similar concerns were raised by many respondents as SFC is synonymous to scarcity, especially to the marginal fishers. As one of respondents expressed:

“While fishers appreciate livelihood programs, they also appeal that they would be given more immediate assistance like rice allowance for the 3-month period. Livelihood projects like hog-raising does not only takes time to reap the benefits but also entails cost on feeds.” [Key informant, NGA]

Respondents were asked if there are alternative livelihoods provided by GAs or NGAs during the SFC; of the 235 respondents, 88.5% said 'No' and only 8.9% said 'Yes'. However, none of the alternative livelihood identified by the respondents were specific to the SFC; they were either given as aid after a calamity or generic programs of the LGU. The other respondents were either not sure about the kind of livelihoods given or they have no answer (Table 14). Despite this, 9 of the 21 respondents said these livelihoods help augment their income.

Table 14. Cited alternative livelihood programs by the respondents.

Livelihood	N
Milkfish (<i>Bangus</i>) fishpond (cannot identify the organization)	1
Fish drying	1
Fish processing, banana cracker, seaweeds farming (ADRA); Seaweeds farming (I-Code)	1
Fishing net (for mackerels) from LGU	1
Fishing supply through Association (Save the Children); fish net from (Christian Aid; after Yolanda)	1
Floating oyster (<i>talabahan</i>) raft given after Yolanda (FAO)	1
Gear swapping of Danish seine (<i>hulbot-hulbot</i>) to other gears (BFAR program through LGUs)	1
Assistance in the form of food packs (LGU in collaboration with DSWD); Projects to fisherfolk associations (e.g. oyster culture) (DA); Assistance to those affected (usually sugarcane workers) by the dead season " <i>tiempos muertos</i> " (LGU)	1
Mangrove planting (LGU-DA)	1
Not sure what livelihood (LGU)	1
<i>Pedicab</i> distribution in barangay (LGU)	1
Rice distribution	1
Seaweeds farming, abalone shells culture, scallop (BFAR and LGU)	1
Seaweeds planting (LGU-DA)	1
Seaweeds, mariculture (ZSL)	1
Swap/change from fine mesh net (e.g., ' <i>pangbulao</i> ' at least 3cm) (LGU)	1
Tourism (tour guide, floating cottage) (LGU)	1
Unspecified livelihood related to shifting to other gears (BFAR)	1
No answer	3
Total	21

In developing and promoting alternative livelihood options for the community, Pomeroy and Carlos (1997) emphasize the importance of consultation with the community members on their preferred types of projects, and training of fishers and household members on cooperatives and entrepreneurship for alternative livelihoods to ensure that alternative programs match with the site

where they will be introduced and the preferences and skills of the recipients. This concern was brought up by participants of the FGs conducted in Bantayan, Cebu, and Carles, Iloilo:

“They gave seaweeds (‘*Guso*’) for farming, but it is not feasible here because of the southwest monsoon (‘*Habagat*’) and because of the (strong) current. The ocean is hot; the seaweed got ‘ice-ice’ (disease). In the islands, it (seaweeds farming) is possible.....We prefer different fishing nets and fishing gears (as alternative livelihood), those with mesh size 10/9.” [Focus group, Bantayan, Cebu]

“Make sure that the alternative (livelihood) being given are also used; because what happens is, they sell the gears, e.g. for seaweeds projects, they sell the gears and declare them as losses. They sell it because they do not like that livelihood.” [Focus Group, Carles, Iloilo]

According to Bisack and Das (2015), a closure may be the preferred policy instrument for the regulator while the individual being regulated may prefer gear modifications allowing them continued fishing in the enclosed area. This has been constantly expressed by the respondents during the interviews and FGs; they said they are fine with the SFC implementation as long as they are provided with alternative fishing gears so that they can continue fishing and support their families. The SFC in the Visayan Sea is particularly tricky because it is temporary, i.e., the 3-month fishing ban is too long to persist without income but not too long enough for fishers to become resettled in a new livelihood before fishing re-opens again. This situation could cause people to persist in a state of limbo as a result.

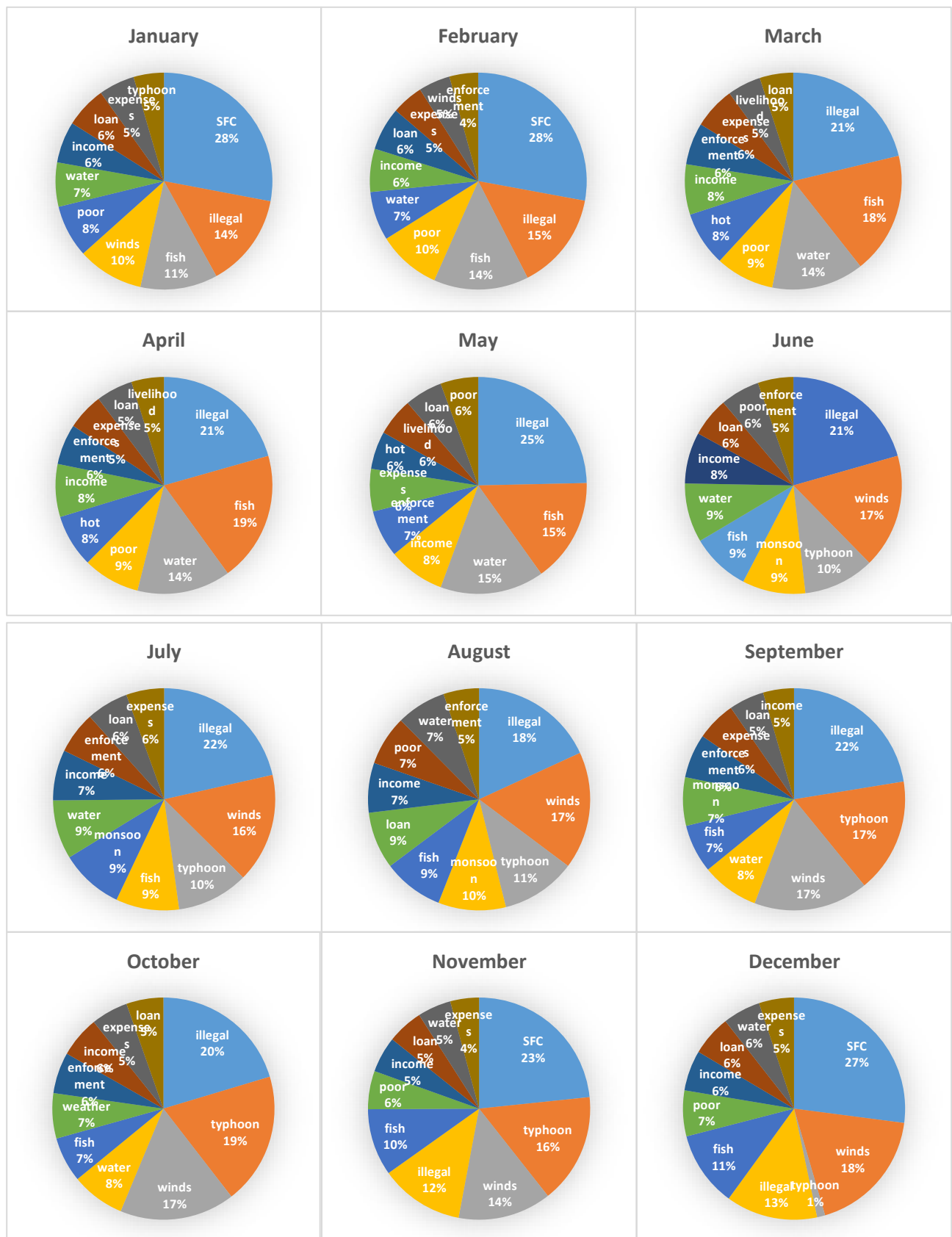


Figure 40. Common problems identified by the respondents in their respective municipalities.

Figure 40 shows the top 10 problems identified by the respondents during different months of the year. Interestingly, while the SFC is one of the major problems identified by the respondents from November to February, illegal fishing is a consistent problem faced by coastal communities all year long.

Respondents expressed that conservation efforts by the government are futile if illegal fishing practices persist. FG participants identified illegal fishing as an obstacle in achieving the objectives of the SFC. Illegal fishing was a recurring topic discussed by the participants during the FGs:

“We do not think the objectives of the closed season are met because there are still illegal fishing gears operating within municipal waters like ‘*sensoro*’ (seine net) and ‘*tangkal*’ (stationary lift nets) which use fine mesh nets. Why do they allow these fishing gears to continue operating?” [FG, Estancia, Iloilo]

“Yes (the objectives of the SFC will be met), if the illegal fishers do not catch them (prohibited species).” [FG, Ajuy, Iloilo]

“During closed season, illegal fishers do not stop their operations.”
[FG, Bantayan, Cebu]

According to the respondents, some of these illegal fishers are also members of their communities but are in the island barangays. The other illegal fishers are commercial fishers from other municipalities who poach in their municipal waters.

In addition, respondents experience weather disturbances such as *typhoons*, *strong winds* and *monsoons* from June-December, while *shortage in water* and *low fish supply* are also a problem among respondents during summer. Unanticipated changes in water supply, weather

conditions, and fish behavior in response to natural variations in the marine environment may undermine fisher's success (McGoodwin 2001). And unlike farmers who have access to crop insurance, fishers in general, have difficulty obtaining the same services primarily because of the high risks associated with fishing activities and the high cost of insurance. This situation makes fishers highly vulnerable especially during periods of stress.

As per interview with a BFAR representative, the informant mentioned that the BFAR is exploring ways of helping the affected fisheries stakeholders by tapping partners who can potentially provide them assistance:

“With the creation of Visayan Sea Ecosystems and Fisheries Management (EFM) Workplan, one of the components of this is really to give them (fishers) alternative livelihoods during closed season. This is relatively new (less than 1 year) and everything is still in the process. BFAR will tie up with LGUs and other government agencies and other partners that can help them (fishers). It is the only way for them to be compliant to the policy.” [BFAR Region VI]

Results of this study show the overlapping challenges that municipal fisheries stakeholders must deal with in their daily subsistence. These findings are valuable information to the LGUs and other GAs and NGAs when thinking about potential programs that will be introduced to coastal communities during periods of vulnerability.

Political factors that affect the implementation of the SFC in the Visayan Sea

Introduction

Most often, development projects treat development as a technical and non-political process, ignoring the concerns among development recipients about ‘political realities’ that greatly affect the development process (Fabinyi *et al.* 2015). The multi-scalar nature of the issues associated with the SFC in the Visayan Sea offers a very good opportunity to advance knowledge in political ecology, particularly in thinking about ‘framing, carrying out and analyzing research that stretches across different spaces, scales, and social groups’; and ‘in better conceptualizing the political in studies of environmental changes, problems, and issues’ (Paulson *et al.* 2005). Situations like the SFC in the Visayan Sea, increases prominence of environmental issues in local struggles, national debates, and international policies, and attracts more attention to conventional politics and to more broadly defined relations of power, as well as the difference in interaction among human groups and their biophysical environments (Gezon and Paulson 2005). The creation of a conservation area is as much as a social process that has political and economic consequences as it is an ecological project in which stakeholders’ managerial, and consequently, cultural preferences and knowledge, play a fundamental role (Vaccaro *et al.* 2013).

According to FAO (2016), fishery governance creates the governing principles and objectives of the fisheries sector by developing policy and regulatory frameworks. It not only links government with civil society, harmonizing myriad perspectives and maintaining social order and productive socio-ecological systems, but also legitimizes and balances stakeholders' interactions, enforces rules and conventions and maintains coherence across jurisdictional, space and time

scales. Finally, it conditions the allocation of power, resources, and benefits and maintains the governance system capacity to learn and change. In practice, however, challenges related to fishery governance, particularly in policy implementation, abound that need to be unraveled and contextualized, creating a need for more holistic studies such as this. This chapter presents the political factors that affect the implementation of the SFC in the Visayan Sea. It explores how these factors affect the relationship among fisheries stakeholders, as well as their implications for the environment, livelihoods of stakeholders and policy outcomes.

Political landscape, power relations, and the SFC

For the purpose of this study, I adopt Foucault's (1982) definition of power as the ability of an individual to influence and modify the actions of other individuals in order to realize certain goals. Hamilton and Sharma (1996) relate power to similar concepts such as *authority* (i.e., the power of the acting agent to enforce obedience, whose right to do so is assumed and acknowledged by the acted-on agent); *domination* (i.e., which includes having commanding influence over a certain territory, aspect, or person); *control* (i.e., directing or constraining action or right of supervision or a means of verification); *rule* (i.e., a principle, norm, or standard to which action conforms or should conform); *influence* (i.e., a conforming pressure visibly or invisibly exercised or an ascendancy or moral power); and *force* (i.e., strength, energy, impetus, violence, and coercion). The government, through the BFAR, deploys the SFC policy as a form of access control in the Visayan Sea. The SFC is implemented at the local level by appointed authorities (e.g., LGUs, Fish wardens, PNP-MG/PCG) that are backed by the laws of the land. These concepts are important in understanding the fishery governance and the complex interactions among the fisheries stakeholders involved in the SFC in the Visayan Sea.

National and local government

The local governments comprised of the provinces, municipalities, cities, and barangays, form the backbone of the Philippine government. While these political subdivisions are under the general supervision of the President through the Secretary of the DILG, they enjoy autonomy. These local governments are agencies of the national government in the matter of collection of taxes, law enforcement, and other governmental functions, which may be delegated by the national government to local governments. Since an average citizen has more interface with the LGUs than with the national or provincial government, the acts of the LGUs affect the ordinary citizen more directly (DILG 2019a).

Bottleneck in the legal frameworks for fisheries management in the Philippines

The implementation of the SFC is in line with the provisions of the R.A. 8550, also known as the Philippine Fisheries Code (as amended by R.A. 10654), which provides the legal framework and guiding principles for the development, management, protection and conservation of fisheries and aquatic resources in the country under the leadership of the BFAR. Under Section 9 of R.A. 8550, the Secretary of the Department of Agriculture (D.A.) may declare a closed season in any or all Philippine waters outside the boundary of municipal waters and in bays, for conservation and ecological purposes. The Act further states that it is unlawful to fish in overfished areas during the closed season (Section 95). However, it also stipulated in the Section 9 that:

“The closed season may be extended to waters under the jurisdiction of special agencies, municipal waters and bays reserved for the use of the municipal fisherfolk. . . ., provided that there is concurrence and approval or recommendation of such special agency and the concerned Local Government Unit (LGU) and Municipal Fisheries and Aquatic Resource Management Council (MFARMC).”

The LGUs also have the exclusive authority to grant municipal fishery privileges in municipal waters and impose rentals, fees or charges thereof (Section 149 of the R.A. 7160 1991).

Further, Section 16 of the R.A. 8550 (as amended by R.A. 10654) states that:

“The municipal/city government shall have jurisdiction over municipal waters as defined in this Code. The municipal/city government, in consultation with the FARMCs shall be responsible for the management, conservation, development, protection, utilization and disposition of all fish and fishery/aquatic resources within their respective waters respective municipality/city waters in the areas to be covered by the closed season.”

Furthermore,

“The LGUs shall have authority over municipal waters to enforce all fishery laws, rules and regulations and valid fisheries ordinances enacted by the city/municipality council.”

In simple terms, while the SFC technically applies to both commercial and municipal fishing boats, the LGUs surrounding the Visayan Sea have the prerogative whether to implement it or not in their respective municipal waters. This is corroborated by key informants from the regional and national BFAR offices:

“The commercial sector is regulated by BFAR. But for the municipal, for as long as the local executives will not implement (the SFC), the BFAR cannot do anything.” [BFAR Region VI]

“Because for us (BFAR), we do not have jurisdiction over the small, municipal fishers. On the regulation, we have to say that the closed season is intended for the commercial fishers.” [BFAR Region VII]

“We do not have jurisdiction over municipal waters.” [National BFAR]

This alone can serve as a major obstacle in the implementation of the SFC in the Visayan Sea because this situation makes the MCS activities quite challenging for both the LGUs and the BFAR because most often, there is no clear demarcation between the municipal and commercial waters. Further, the implementation of the SFC does not make sense if only a few municipalities surrounding the Visayan Sea support it. Although uneven support from the municipalities may still lower the net fishing effort and lead to some, albeit more limited, conservation benefits, a uniform implementation across the municipalities should be preferred to see the maximum effect of this policy.

According to Vacarro *et al.* (2013), the declaration and implementation of a conservation policy is a standard example of competition for environmental control because conservation areas have established jurisdictions and borders that define exclusionary rights which are implemented by different social and institutional actors (often powerful), experienced by other social groups (often not so powerful), and enjoyed by yet another set of players (tourists and scientists), ultimately resulting in contradictory social relationships. These actors define the nature, legitimacy, rights, or use of the conservation measure in very different, and culturally dependent, ways. Further, the relationship between actors, and the links between actors and the physical environment, are conditioned by power relations (Bryant 1997). This is evident in the different levels of management of the Visayan Sea (e.g., among members of the regulatory group, and between members the regulatory and the regulated groups).

The administrative arrangements in the implementation of the SFC in the Visayan Sea have critical implications not only in the SFC implemented in the Visayan Sea, but also in the fisheries management of the entire country. This situation contradicts the principles of ecosystem approach to fisheries management which has recently gained momentum after realizing the mistakes of past management schemes. The ecosystem approach to fisheries management highlights the importance of an integrated management approach across coastal and marine areas and their natural resources for the conservation and sustainable use of the whole ecosystem (SEAFDEC 2019). However, the autonomy given to each LGU has resulted in a fragmented approach to managing their adjacent waters. According to a Fisheries expert:

“The government’s move from a national scale to a local government unit (LGU) scale has somehow affected the ecosystems scale because each LGU treats its body of water as its own without thinking about the interconnectivity of the ecosystems. The inter-LGU arrangement is still a very big factor.” [Key informant, NGA Fisheries Expert]

He further added:

“Now, we have about 4 existing inter-LGU arrangements: Banate Bay, 2 in Northern Negros, and on paper, there is also one in Masbate. But that is only in paper, it is not really functioning. That’s the challenge.”

Recently however, the BFAR has adopted the ecosystem approach to fisheries management in implementing its plans, programs, projects, and activities (BFAR FOO-164, s. 2016, as cited by Guzman 2019). With this new development, the BFAR is expected to shift its focus from sustainable harvest of target species only, to systems and decision-making process that balance ecological well-being with human and societal well-being, within improved governance

frameworks. Following this, the BFAR issued the Fisheries Administrative Order No. 263, s. 2019, which provides for the establishment of fisheries management areas (FMA) for the conservation and management of fisheries in Philippine waters (DA-BFAR 2019). The BFAR and LGUs shall endeavor to work together synergistically to manage the straddling and shared fish stocks within the FMAs (Guzman 2019). Similar to current management arrangements, the LGUs retain their jurisdiction over municipal waters, while the BFAR has jurisdiction in areas beyond the municipal waters. But the Fisheries Administrative Order No. 263, s. 2019 also brought new concepts to the fishery management in the Philippines such as harvest control rules, shared and straddling fish stocks, and reference point, as well as governance mechanisms that pin responsibilities and accountability to the parties involved (DA-BFAR 2019). These developments indicate progress and a desire for an improved fishery management in the country.

The regulators and the regulated

A study by Tan-Mullins (2007) which evaluates how key agents in state agencies at provincial and district levels translate Thai political and legal systems at the local level, shows that access to environmental resources is highly regulated by unequal power relations between actors at various levels. In political ecology theory, according to Tan-Mullins (2007), the state through national agencies, serves as the ‘steward’ of the ‘common resources’ and is responsible for regulating access to these ‘common resources’. However, when such broad authority is coupled by administrative inefficiency, unequal power relations between agencies at various levels (e.g., national, provincial and local) and the varying willingness of stakeholders to participate in the management of resources, it empowers local state agencies and individual officials to interpret

policies and regulations according to their own interests (Tan-Mullins 2007). These are evident in the SFC in the Visayan Sea. Respondents and key informants have repeatedly expressed their dismay over the system of fishery governance in their respective municipalities:

“No initiative from the Local Chief Executive.” [Municipal fisher, Milagros, Masbate]

“The regulation of the activities at sea is not yet a priority of the law enforcement.” [PNP-MG, Milagros, Masbate]

“They do not restrict the big fishing operators because they have connections.” [Municipal fisher, Roxas City, Capiz]

“The LGU does not uphold all recommendations of the MFARMC which sometimes become the cause of conflicts.” [MFARMC representative, Ajuy, Iloilo]

“Politics has a big influence (in fisheries management) because the politicians are the ones recognized in local governments. If you think about it, whose interests are served by the laws that are implemented. For example, in the Fisheries Code, the municipal waters should be from shoreline to 15 kms, but small- and medium-scale commercial fishing vessels are allowed from 10.1 kms. Then commercial fishing vessels can also fish in waters deeper than 7 fathoms. These are boats weighing more than 3 GT. In effect, the 15 kms municipal waters rule is non-existent.” [Key informant, NGA]

Notably, the R.A. 7160 provides LGUs with broad governmental powers to manage fisheries and aquatic resources within municipal waters (The World Bank 2005). Although its intent is to provide Mayors with a set of basic service functions and regulatory powers to meet area-specific needs and concerns, it could also serve to reinforce the dominance of local kingpins

and warlords (Pagsanghan 1993), or in some cases, results in inefficient governance as per account of several respondents.

“One which goes near to your subject is the politics part. Who are the commercials? If you profile who are the owners of commercial (boats), these are the middle to upper class who can afford to buy politics.” [Key informant, NGA]

“Most of the owners of commercial fishing boats are politicians. If not the Mayor or Governor, their siblings, relatives, friends or benefactors during election.” [Key informant, NGA]

“When the local government (i.e., Mayor and Governor) is not involved in commercial fishing, they are strict in the implementation of the closed season. Or, they can also be lenient.” [Key informant, NGA]

“They give consideration to violators who are caught; instead of PhP 2,500/crew fine, others just fine 2 crews so that it will not be too much of a burden.” [PNP-MG, Concepcion, Iloilo]

“Municipal fishers are warned only because they appeal to the Mayor.” [Municipal fisher, E.B. Magalona, Negros Occidental]

“The municipal government is not strict.” [Municipal fisher, Escalante City, Negros Occidental]

“Because of poverty, people continue fishing; the Mayor allows them (to fish).” [Fish dryer, Madridejos, Cebu]

“People appeal to the Mayor so it’s (SFC implementation) not strict. They (fishers) are advised to limit their catch.” [Municipal fisher, E.B. Magalona, Negros Occidental]

“We try to understand those who continue fishing that is why it (SFC) cannot be strictly implemented.” [Municipal fisher, Estancia, Iloilo]

“The City (government) is not serious in implementing the SFC.” [LGU representative, Roxas City, Capiz]

“The Mayor allows us to buy prohibited fishes because of scarcity, but only a small amount (maximum of 10 kgs only).” [LGU representative, Madridejos, Cebu]

According to the BFAR management, some municipalities do not even know that they are implementing the SFC. The BFAR should use this as an indicator to gauge their performance as far as raising awareness among LGUs surrounding the Visayan Sea and engaging them to support the SFC implemented therein.

“Other municipalities do not mind. It depends on the level of awareness and the leadership.” [BFAR Region VI]

In response to this, key informants said that LGUs themselves are not clear on their role in the SFC implementation:

“Inasmuch as they are engaging LGUs, one thing that even our LGUs were saying was that, they really did not know their part in this one (the SFC).” [Key informant, NGA]

“The role of the LGUs is not properly spelled-out. And that is the richest part (municipal waters). And that is the part where these boats are going into.” [Key informant, NGA]

Rola *et al.* (2018) report similar results in their study on the SFC implemented for sardines in Zamboanga Peninsula, in the southwestern Philippines. The LGUs in Zamboanga Peninsula reported lack of clarity, consistency, and coherence in the SFC policy’s provisions and implementing mechanisms.

In other cases, social relationships get in the way of enforcing the fishery policy. For example, one respondent said:

“Sometimes, the apprehending person is their ‘*kumpare*’ (Godfather of his child or vice versa).” [FGD participant, Estancia, Iloilo]

A study by Russell and Alexander (2000) in south central Luzon, Philippines shows that even when access is restricted (e.g., municipal waters, exclusive economic zone), informal exchanges and rights affect the utilization of resources because people put more premium on their relationships with one another (that is built on sharing system) rather than upholding legal fishing practices and conservation efforts that can ensure the sustainable supply of the fishery resources on which they depend. Russell and Alexander (2000) capture the dynamics that contribute to poor law enforcement and proliferation of illegal fishing activities in the area by showing how these things are deeply rooted in the intertwined interactions and relationships (blood relations, political clans, social relationships, etc.) of the people at the local level. In general, the catch sharing practice in many fishing communities in the Philippines extends a long way because it ensures an eventual reciprocal act from those people who benefit from it, including those with social and economic positions. This becomes a cycle of give-and-take relationship that transcends beyond fishing activity because of ‘*utang na loob*’ (‘I owe you’) culture, which greatly influences future dealings of people within the community and beyond.

While interview results show that 83.8% of the respondents (N=235) said the SFC is implemented in their respective municipalities, analysis of responses by municipality reveals that 94% of the respondents (N=70) in Milagros and Cawayan, in the province of Masbate, claimed

that the SFC is not yet implemented in their municipalities (Figure 41). However, as per interview with the BFAR representatives, Masbate province is included in the SFC in the Visayan Sea.

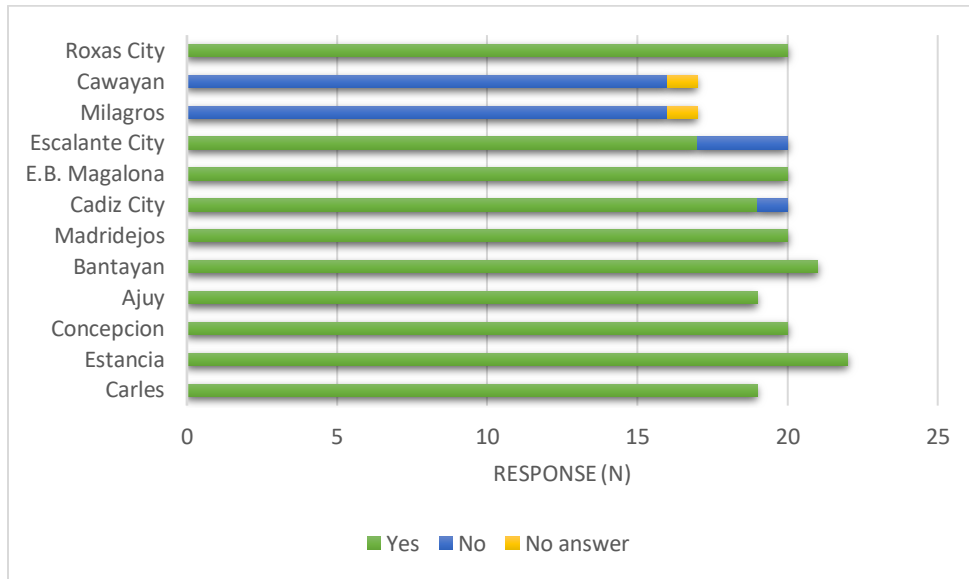


Figure 41. Responses re *'Is the SFC implemented in your municipality?'*, by municipality.

Further, results show that while majority of the respondent groups said that the SFC is implemented in their respective areas, there is not a single respondent group that has a solid agreement on this, which suggest that some fisheries stakeholders are either unaware of the SFC or are not restricted from fishing during the SFC (Figure 42).

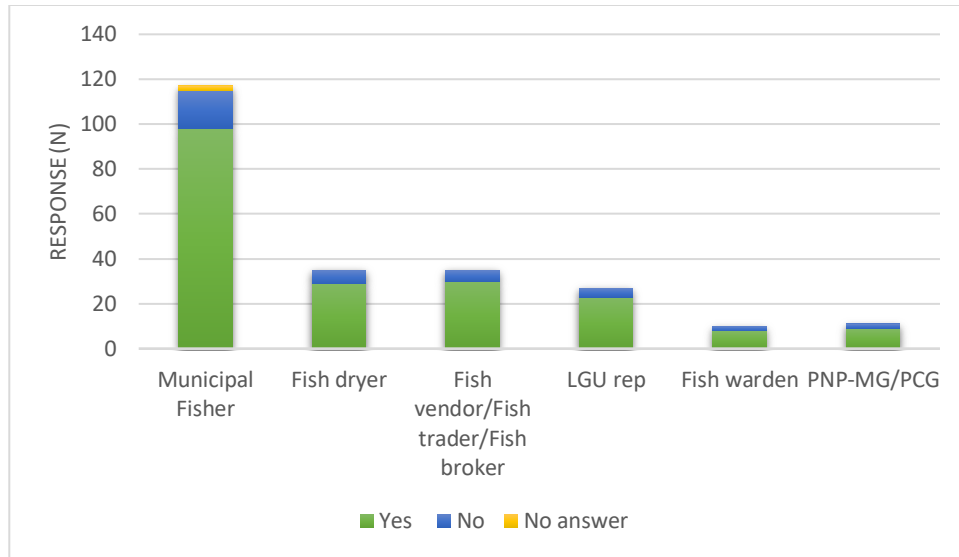


Figure 42. Responses re ‘Is the SFC implemented in your municipality?’, by respondent group.

In an earlier study conducted by Szanton (1971) in Estancia, Iloilo, he notes that because of the weak enforcement of the SFC (locally referred to as *limitasyon*), its existence hardly affects the local economy in the area. Instead, it merely marks the natural low point of the fishing cycle with an official designation.

Recently, the DILG have issued the Memorandum Circular (MC) No. 2018-59 which contains the Policies and Guidelines on the Regulation and Monitoring of Fishery Activities in Municipal Waters (DILG 2018a). This is a conscious effort by the government to improve the current state of fisheries management at the local level. However, such issuance has a delicate tone to it because it only enjoins to LGUs to act on it. Section 2 of MC No. 2018-59 stipulates:

“The purpose of this policy is to ensure that LGUs play an active role and hold them accountable to their action/inaction towards monitoring and regulation of fishery activities in municipal waters as part of their territorial jurisdiction. This policy issuance shall serve as a reminder to LGUs to exercise their powers in ensuring that the law is strictly enforced, followed and implemented. This policy

issuance intends to enjoin LGUs to undertake the responsibility of improving the management of water resources.”

Realizing the lack of an accountability element in the MC No. 2018-59, the DILG issued another memorandum, the MC 2018-147, which provides the Guidelines on the Implementation of the Fisheries Compliance Audit (FishCA) to monitor compliance of LGUs to MC 2018-59 and to R.A. 8550 (as amended by R.A. 10654) (DILG 2018b). The FishCA is a tool that contains a list of 95 indicators which the LGUs can use to gauge their performance as far as regulation and monitoring of fishery activities is concerned. However, one of the weak points of the FishCA is that LGUs are the ones rating themselves which can be biased. According to a key informant from an NGA:

“It’s self-assessment; local governments can always lie. It needs to be verified. That is its weakness. It needs a third- party verification. And the law or memorandum circular did not provide for that one.”

In general, the Philippine fisheries industry is comprised of multiple actors that are involved in a complex multitude of activities hence, it is important to think about fisheries stakeholders as a heterogenous group and be mindful of the unequal power relations and constraints to equity. The classification of municipal and commercial fishing activities for example, shows important distinctions between (and within) these groups in terms of capacity, fishing objectives and practices, which may require more specific management approaches rather than a blanket regulatory solution like the SFC. This was confirmed during an interview with a BFAR representative from Region VI:

“Unlike other closed seasons where you would see specific gears being restricted, in the Visayan Sea closed season, everything is banned.” [BFAR Region VI]

When a fisheries expert was asked about his opinion about this, he said:

“Commercial fishers will still be banned from fishing in the enclosed area during the SFC. But for the municipal fishers, LGUs can still allow them to operate provided there is differentiation because some of them have a very low fishing effort which may not even dent the closure.” [Key informant, Fisheries Expert]

Hence, it is not surprising that municipal fishers push their luck and take chances in order to survive. The allure of immediate gains to a hungry man is unquestionable. As one respondent said:

“Despite the risk of getting fined, small-scale (municipal) fishers do not have a choice but to continue fishing covertly for their family’s survival. With the passage of the R.A. 10654 (with bigger fines), small fishers argue that commercial fishers remain cocky in violating the law because they have the money for bail. Unlike the small fishers, when they get caught and imprisoned, there is that ripple effect (family go hungry, children stop school).” [Key informant, NGA]

Varying capacities and priorities of the LGUs

In the Philippines, LGUs namely provinces, cities, and municipalities are classified into 6 income classes (Table 15) based on their annual income for the last 4 years (Executive Order No. 249 1987).

Table 15. Income classification of provinces, cities, municipalities in the Philippines (DOF 2008).

<i>Income classification of Provinces and Cities</i>	
First class	Average annual income of PhP450 M (Provinces)/PhP400 M (Cities) or more
Second class	Average annual income of PhP360 M (Provinces)/PhP320 M (Cities) but less than PhP450 M (Provinces)/ PhP400 M (Cities)
Third class	Average annual income of PhP270 M (Provinces)/PhP240 M (Cities) but less than PhP360 M (Provinces)/ PhP320 M (Cities)
Fourth class	Average annual income of PhP180 M (Provinces)/PhP160 M (Cities) but less than PhP270 M (Provinces)/ PhP240 M (Cities)
Fifth class	Average annual income of PhP90 M (Provinces)/PhP80 M (Cities) but less than PhP180 M (Provinces)/ PhP160 M (Cities)
Sixth class	Average annual income of less than PhP90 M (Provinces)/ PhP80 M (Cities)
<i>Income classification of Municipalities</i>	
First class	Average annual income of PhP55 M or more
Second class	Average annual income of PhP45 M or more, but less than PhP55 M
Third class	Average annual income of PhP35 M or more, but less than PhP45 M
Fourth class	Average annual income of PhP25 M or more, but less than PhP35 M
Fifth class	Average annual income of PhP15 M or more, but less than PhP25 M
Sixth class	Average annual income of less than PhP15 M

This serves as the basis for determining the financial capability of LGUs to provide in part or in full, the funding requirements of developmental projects and other priority needs in their respective locality. Table 16 presents the study sites' income classification and FishCA ratings.

Table 16. Income classification and FishCA ratings of the study sites.

Region	Province	Municipality	Class ^a	FishCA rating ^b
V	Masbate	Cawayan	2nd	Failed
V	Masbate	Milagros	1st	Medium compliance
VI	Capiz	Roxas City	3rd	High compliance
VI	Iloilo	Ajuy	2nd	Medium compliance
VI	Iloilo	Carles	2nd	Low compliance
VI	Iloilo	Concepcion	3rd	High compliance
VI	Iloilo	Estancia	2nd	High compliance
VI	Negros Occidental	Cadiz City	2nd	Medium compliance
VI	Negros Occidental	Escalante City	4th	Low compliance
VI	Negros Occidental	E. B. Magalona	2nd	Low compliance
VII	Cebu	Bantayan	1st	Medium compliance
VII	Cebu	Madridejos	4th	Medium compliance

^aBLGF. Retrieved from <http://blgf.gov.ph/wp-content/uploads/2016/10/updated-reclass-CY-2008-4-27-16.pdf>, 11/16/2019; <http://blgf.gov.ph/wp-content/uploads/2016/10/updated-reclass-CY-2008-4-27-16.pdf>, 11/16/2019

^bDILG (2019b). Retrieved from <https://www.dilg.gov.ph/reports-and-resources/resources-and-downloads/3/, 11/2/2019>

The disparity among the LGUs' income classification can give a better picture of the financial capacities of LGUs and therefore, their ability to direct development efforts (Diokno-Sicat 2018). However, it is also important to note that while financial capacity is an essential component in accomplishing development goals at any level of government, other factors such as leadership priorities is just as important because it determines which programs will be given critical attention and funded. For example, Milagros in Masbate province, and Bantayan in Cebu province, are the only municipalities among the study sites that have a 1st class income classification [average annual income of PhP 55 M (~US\$ 1.1.M) or more] yet, they have a 'Medium compliance' rating in the FishCA. In contrast, the municipalities of Concepcion (3rd class), and Estancia in the province of Iloilo (2nd class), have comparatively lower income classification, but have high compliance ratings in the FishCA. Overall, the study sites in Panay Island have comparatively high compliance in terms of regulating and monitoring of fishing activities within their municipal waters compared to their other LGU counterparts in other islands.

The varying capacities of the municipalities in the study sites can be observed in their activities and accomplishments in relation to fishery management (e.g., fishery ordinances passed, presence or absence of a coastal resource management plan, record keeping, etc.). For example, the municipalities of Carles, in Iloilo, and Madridejos, in Cebu, have yet to come up with their coastal resource management plans. Other municipalities do not have a fish catch monitoring system (e.g., Ajuy). Further, they do not have an updated registry of fishers and fishing boats in their municipality even though they comply with the ongoing fisher registration (FishR) and boat registration (BoatR) programs of the BFAR.

Results show that 88% of the municipal fishers (N=117) interviewed are registered in their respective municipalities. While this figure seems to be high, it shows that not all municipal fishers are accounted at the LGU level due to various reasons such as tedious registration process and remoteness of the islands where some of these fishers reside, among others. Several respondents highlight the lack of capacity of the LGUs in implementing the SFC in their respective municipalities:

“Fish wardens are still waiting for their budget since June 2018.” [Fish warden, Ajuy, Iloilo]

“The PNP has no patrol boat thus, they only rent. There used to be a patrol boat, but you have to request it from the LGU.” [PNP-MG, Bantayan, Cebu]

“Fish wardens lack faster patrol boats; they do not have insurance as well.” [LGU representative, Madridejos, Cebu]

“Lack of enforcers (manpower) for monitoring.” [LGU representative, Ajuy, Iloilo]

“It (SFC) has a very wide scope. When the sea is rough, it is difficult to do roving because they (authorities) have small pump boats.” [PNP-MG, Cadiz City, Negros Occidental]

“Lack of coordination, sometimes there is no Police during the operation.” [LGU representative, E.B. Magalona, Negros Occidental]

“Lack of personnel who will focus on information drive in other coastal barangays.” [LGU representative, Escalante City]

“No floating assets, they (enforcers) sometimes rent a pump boat.” [PNP-MG, Roxas City, Capiz]

‘We need support like manpower; the *‘Bantay Dagat’* should be stationed in specific areas so response will be faster.’ [LGU representative, Estancia, Iloilo]

Availability of manpower and logistical support are just some of the basic elements in fisheries MCS, which are generally lacking at the municipal level. Support in terms of finances, manpower, technical assistance from the LGUs is a vital element in the implementation of fisheries laws in any community (Catedrilla *et al.* 2012). According to a key informant from an NGA:

“When you start to close an area, there must be some degree of control over the area in terms of vessels coming in and out. The problem is, we have very, very little control of this.” [Key informant, NGA]

Further, respondents expressed their sentiments towards national agencies, particularly the BFAR:

“BFAR’s presence in not felt; BFAR’s implementation seems to be purely theory.” [Fish broker, Estancia, Iloilo]

“Gaps in the monitoring of the BFAR especially that some islands are not easily accessible to them.” [PNP-MG/PCG]

“Lack of counterpart from the national government (e.g., Navy, PNP, BFAR); no presence of BFAR.” [LGU representative, Escalante City, Negros Occidental]

The BFAR management acknowledges that even at their level, they are just starting to gain momentum:

“It is only (recently) when we have the manpower complement, as well as floating assets. And we program already the effective implementation of the closed season where we work together with the local government units.” [BFAR Region VI]

The shortfalls in the SFC implementation are readily understood considering the lack of accountability and sense of responsibility, especially when *regulators* point fingers at their counterparts. On the part of the BFAR regional management, key informants from this agency highlight the pivotal roles that LGUs play in fisheries management.

“We only started having the intervention for the implementation of the closed season because closed season is in the municipal waters and it is within the jurisdiction of the LGUs.”

“BFAR is still facing the (lack of) manpower complement from the LGUs because one of our mandates is to capacitate them. But there are LGUs who do not have the manpower.”

But according to a key informant from an NGA:

“The delineation of the municipal waters became the grey area because what is happening is, it can be used by the LGU or the BFAR, for not doing anything. So, what is happening is, that particular part of the law that delineates the BFAR or municipality to intervene is being used by both sides for not doing their jobs. Both (BFAR and LGU) are trading their laments. So, what happens is that the LGU has a way of going around the rules. The same with BFAR.”

The LGUs and BFAR are also going back and forth on whose responsibility is the provision of assistance to affected fisheries stakeholders.

“Fishers ask for alternative livelihood or fishing gear, but we do not have anything to give them.” [LGU representative, Ajuy, Iloilo]

When this issue was brought to the BFAR’s attention during an interview, the key informant from the agency said:

“That depends on LGUs. They should know that they can tap other agencies for that particular concern. For example, DWSD (Department of Social Welfare and Development), DOLE (Department of Labor and Employment) ... So, there are available immediate _____. Because we from BFAR are only limited to fishery projects, we cannot provide for basic needs like medicine, rice, food, etc.” [BFAR Region VI]

Despite their limitations, the BFAR recognizes that providing alternative livelihood (i.e., different livelihood or source of income that is not restricted by fishery regulations) to affected fisheries stakeholders is necessary for the successful implementation of the SFC in the Visayan Sea.

“We understand that if we are to regulate them (fishers), we must give them alternative livelihood. The only way we will be able to let them comply is if they have income. Even if you tell them to stop, they will not comply because their main consideration are their families. This remains a challenge on the part of the BFAR because we are limited in terms of livelihood programs.”

Livelihood enhancement programs of the BFAR include distribution of environment-friendly fishing gears and paraphernalia such as *‘payao’* or fish aggregating device, fish pots and motor engines. The BFAR also provides incentives to coastal municipalities/cities in recognition of their outstanding initiatives and contributions to sustainable fisheries development, through a

program called *Malinis at Masaganang Karagatan (MMK)* Search for the Most Outstanding Coastal Community in Western Visayas, that comes with a prize of PhP 2 million worth of fisheries livelihood projects.

Recognizing the need to provide alternative livelihood is very important because results of this study show that this is a primary concern among respondents (Figure 43).

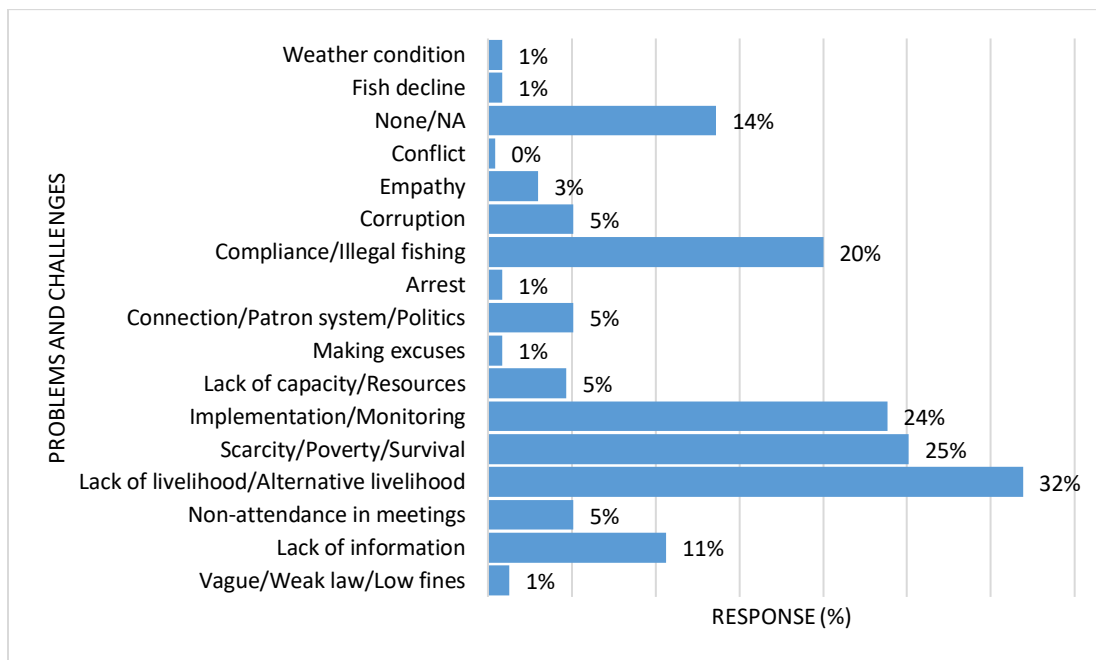


Figure 43. Problems and challenges in the implementation of the SFC in the Visayan Sea, N=235.

Results show that the majority of the municipal fishers rely heavily on fishing for their livelihood, hence many of them tenaciously adhere to this occupation and continue to fish covertly despite of the uncertain economic rewards, while others do so because they see their fellow fishers continue fishing without getting arrested. Apparently, the deterrent effect of law enforcement in most of the study sites is weak; hence, the incentives for non-compliance among fishers are high.

Other challenges identified by the respondents include *scarcity/poverty/survival* (25%), *implementation/monitoring* (24%), and *compliance/Illegal fishing* (20%).

Fabinyi (2012) makes the case that unless we understand the narratives and meanings that different sets of actors attach to political or environmental initiatives, the effective design of conservation projects is likely to fail especially if effective alternative livelihood projects are not implemented. In the case of the SFC in the Visayan Sea, initially resource managers were largely concerned with conservation and resource use control during the 3-month period without much regard to its economic implications, especially on the municipal fishers. While there are indications that the BFAR is addressing the gaps in its decisions and trying to improve the way it is doing things (e.g., establishing harvest controls, reference points, etc.), municipal fisheries stakeholders continue to suffer from the inefficiencies in the implementation of the SFC in the Visayan Sea.

For example, it is not very clear how the BFAR is evaluating the success of the SFC. During the interviews, key personnel from the BFAR management who are engaged in the SFC were asked how they are measuring the effectiveness of the SFC implemented in the Visayan Sea (e.g., indicators of success, etc.). Elicited responses were inconsistent considering that this fishery policy has been in effect for 8 decades now, although its active enforcement is much more recent.

“The measurement of success is first, in terms of governance, the cooperation, coordination among partners and the LGUs who are now really on board in terms of implementing the closed season. And then, the data shows, I cannot tell you the exact figure, but it shows that based on reports, there was an increase in harvest or catch of sardines. There is an increase compared to before when we do not have 100% intervention in the closed season.....For long as there is an increase. We really do not have definite measurement or real target in terms of quantity. But it is shown, based on our monitoring, that there is an increase. It does not matter whether it is 10% or 15%. So far, there is an increase of production.....So, it is in

the production and on the governance of the local government units and other agencies who are helping us in the law enforcement.” [_____, BFAR VI]

“Other than market observations, the BFAR have metrics. The National Stock Assessment Program (NSAP) has catch and market monitoring component. We do not just monitor the catch. Our primary indicator in the success of the closure is the catch rates of the fishing gears that target sardines. The catch data alone is not a good measure. Even if the catches are high if the number of frequency or intensity of the fishing activity of vessels is also high, then it is just a dummy. We zeroed-in that in the catch rates and we noticed the increase in the effort after the declaration of the fishing season.” [_____, Region VI]

“The NSAP presents their findings every year. In terms of enforcement, we also have reporting in terms of compliance.” [_____, BFAR VI]

“I think our scientific authority can... the National Fisheries Research and Development Institute (NFRDI), they are doing the research. They can attest to this, the abundance of fish after the closed season.” [_____, BFAR VII]

Interestingly, there is no published comprehensive report about this and the NSAP and BFAR are hesitant to share the data they have, which could support their claim about the success of the SFC in the Visayan Sea. There are also divided views among the BFAR personnel about the claimed success on the SFC, as evident in the following excerpts:

“For me, I do not think the objective of the closed season is met if the objective is to improve the fish stocks. Based on the studies of NSAP, although it shows a positive result, but after the closure, fishers are racing to fish. In addition, the closed season is not implemented in all coastal municipalities surrounding the Visayan Sea.” [_____, BFAR VI]

“Yes. After the implementation (2013-2015) when there was very good compliance, there is an abrupt increase in fish population.” [_____, Region VI]

“As of this point, I think, we are not yet 100% in terms of attaining the objectives for reducing the overfishing of these species and increasing the catch of the fisherfolks in Visayan Sea.” [_____, BFAR VI]

“The closed season is very successful based on our observation and anecdotal evidence from fishers, people on the local level.” [_____, BFAR VII]

“During closed season, there is no commercial fishing there. So practically, I do not see why it will not be effective because the commercial fishers catch at least 50 tons per day, which is substantial. So, if that is not caught, of course they can lay eggs. So, if there is still doubt if it is going to be effective or not, that is very unlikely. It is not possible that there is no effect. The question is, are we able to measure it properly. Can you imagine every night you save at least 100 tons and these 100 tons of fish are about to lay eggs? Can you imagine if it was not saved and not allowed to lay eggs? Do we still need science there? That will tell you there is (positive effect) but as to metrics how you are going to capture that, that is it, in my opinion. Now, is it important for me to capture the metrics? In a way yes, but what is important for me is I’m able to save them and allow them to lay eggs. Whether you are able to identify little or ____ (huge success), it does not matter to me as long as it happens. For me, that is the idea behind. That is why I am not really concerned about showing what it is because I know what happened and I know what could have happened without that. It (fisheries) could have collapsed.” [_____, National BFAR]

The NSAP, which is administered by the National Fisheries Research and Development Institute (NFRDI), should be providing the evidence for the success or failure of the SFC. According to the NFRDI website, the agency shall serve as the primary research arm of the BFAR and under the law, the NFRDI shall have a separate budget specific to its manpower requirements and operations to ensure the independent and objective implementation of its research activities (NFRDI 2019). Essentially, the NFRDI should be functioning as an independent entity. In fact, their research output should serve as the audit for BFAR’s performance as far as conservation

efforts are concerned. But as stated, NFRDI serves as the research arm of the BFAR and this has a conflict of interest.

Despite these challenges identified by the respondents, 90.2% of them claimed they are *in favor* of the SFC. However, while majority of the respondents are in favor of the SFC, when asked if they follow the SFC, only 66.8% of the 235 respondents said *yes*; 12.3% answered *sometimes* and the 15.7% who answered *NA* are the respondents who said that SFC is not implemented in their municipality (Figure 44).

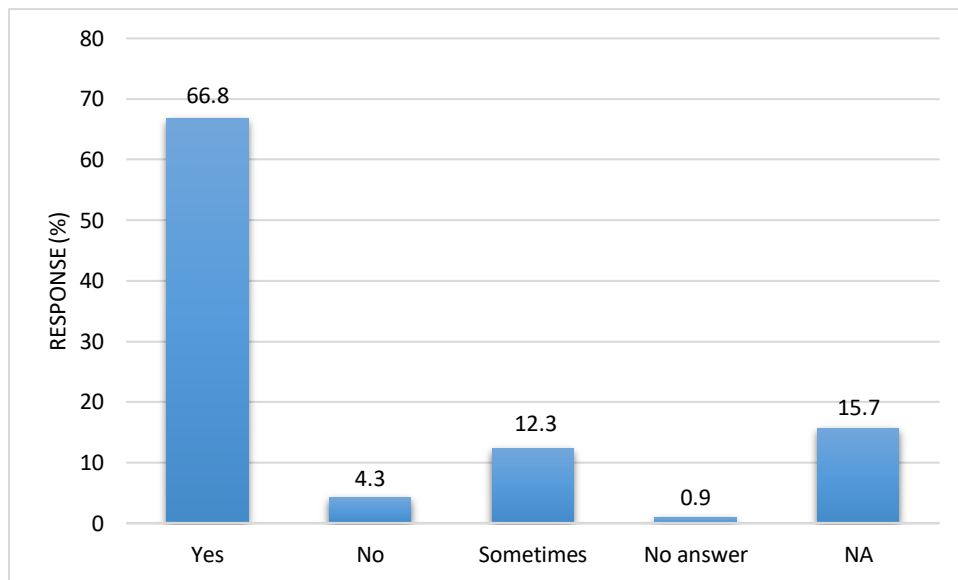


Figure 44. Responses re ‘Do you follow the SFC?’.

This shows that while majority of the respondents have definite ideas and positive opinions regarding the SFC in the Visayan Sea, this does not mean they always put these into practice. Further analysis shows that only 70.8% of the respondents who said they are in favor of the SFC (N=212) follow the SFC, while 11.8% said they do follow the SFC *sometimes*.

Even though majority of the respondents said both municipal (76.2%) and commercial (80.9%) fishing boats are included in the SFC, most of them gave a *moderately low* rating for compliance for both municipal (32.8%) and commercial (29.4%) fishers (Figures 45-46).

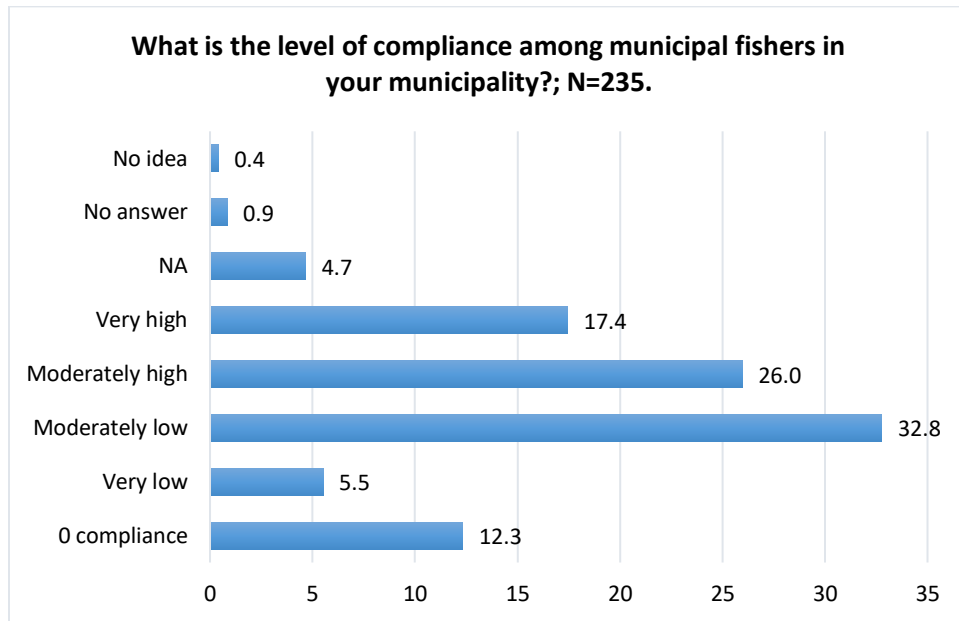


Figure 45. Respondent groups' ratings for compliance of municipal fishers with the SFC in the Visayan Sea.

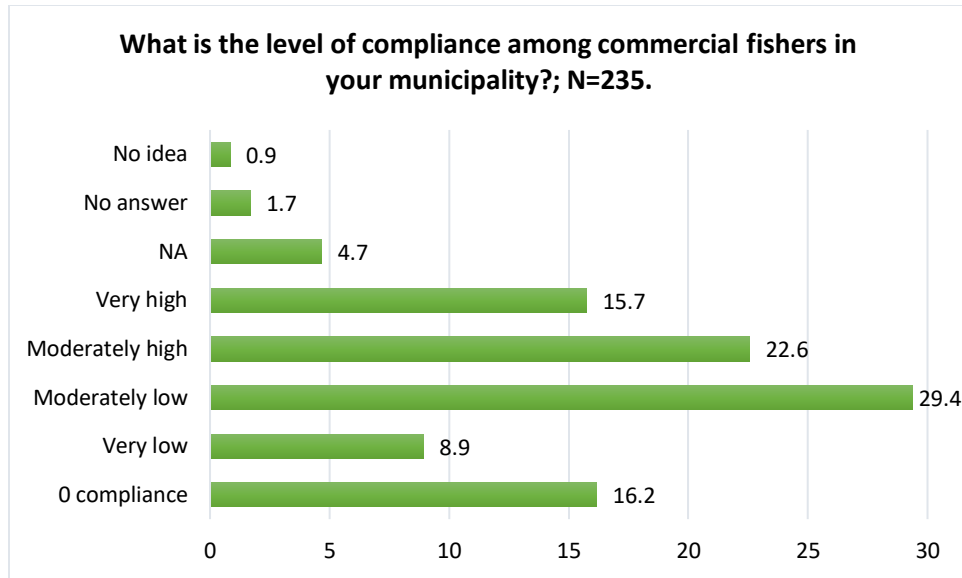


Figure 46. Respondent groups' ratings for compliance of commercial fishers with the SFC in the Visayan Sea.

The above findings can be attributed to the lack of alternative livelihoods for the affected fisheries stakeholders at the municipal level. For the commercial fishers, with their capacity to pay the fines, continue to violate the SFC policy and other fishery regulations (e.g., use of illegal fishing gears are still rampant in the study sites). Power plays between commercial and municipal fishers can also be observed in their behavior at sea. Conflicts between municipal- and commercial- scale fishers were noted during interviews wherein respondents reported destruction of their fishing gears by active fishing gears such as Danish seine and trawls (operated by the commercial-scale fishers). These gears are some of the most efficient fishing devices used by mankind and their adoption in the Philippines has resulted in intense competition between commercial fishers who use them, and the municipal fishers using other types of gears. Danish seine vessels fish along the seabed using a herding principle to catch fish mainly on the continental shelf. The net is similar to a trawl net but has wings and is attached halfway along a seine rope (FRDC 2017). The operation of these gears, which involves dragging along seabed, can damage

bottom-set gears of municipal fishers. Further, the non-selective nature of these gears can adversely affect a wide range of species, to the detriment of the marine environment on which small-scale fishers depend (Spoehr 1984). This creates animosity between municipal and commercial fishers and the municipal fishers are at the losing end because they cannot do anything to rectify the situation. Such conflict also reveals overlap in the fishing grounds where these groups are operating, and poor monitoring and control of fishing activities in municipal waters. According to Spoehr (1984), in the absence of strictly enforced regulatory measures, resource competition between small-scale fishers and more highly capitalized levels of fishing inevitably leads to the marginalization of small-scale fishers.

Catedrilla *et al.* (2012) highlight the importance of having an understanding of how the fisheries laws are being enforced, as well as the fishers' reasons for compliance and non-compliance with fisheries laws, by coastal resource management program implementers especially in planning for effective dissemination and implementation as well as in increasing participation of stakeholders in the management of a particular resource. When respondents were asked about people's biggest motivation for not complying with the SFC, predominant responses include *poverty, scarcity, income, survival and lack of alternative livelihood* (Figure 47).

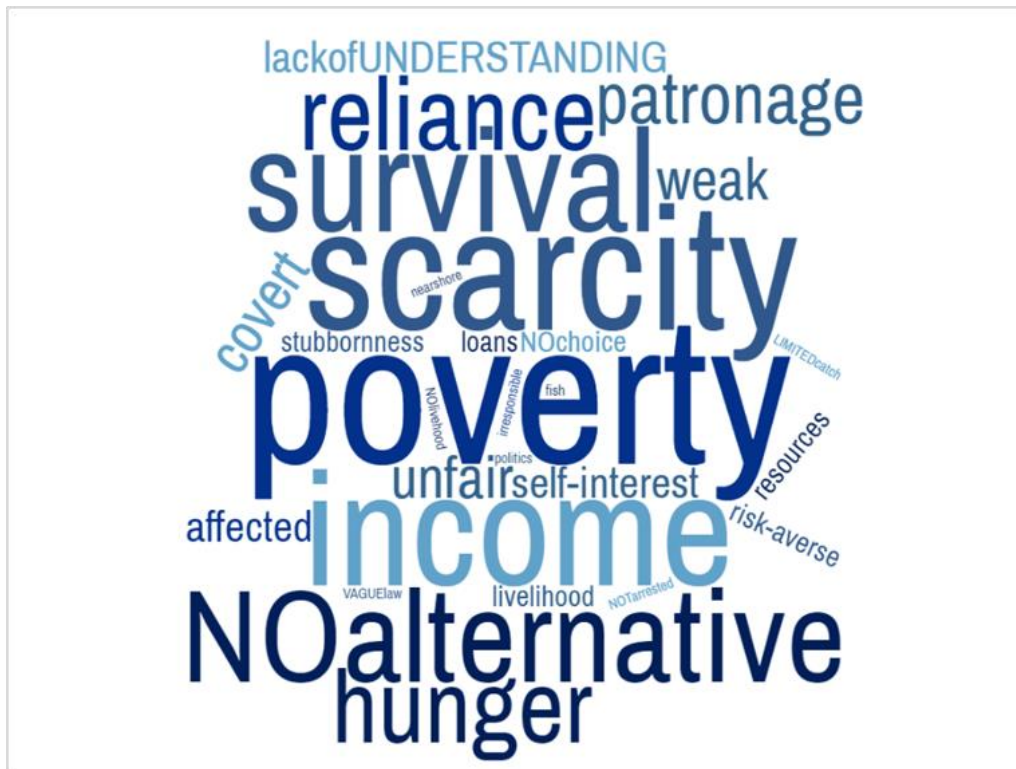


Figure 47. Cited motivations for not complying with the SFC in the Visayan Sea.

During the FG in Estancia, Iloilo, one municipal fisher suggested:

“The government should really study what is appropriate for the people because the reason why some fishers violate the closed season is because 60% of the population in Estancia are fisherfolks, majority of them are small-scale. The government should think about alternative livelihood programs for areas that are affected by the closed season. That is the best solution so that people will no longer violate the closed season. It is not possible for them not to fish for 3 months because fishing is their livelihood and that is how they support their families.”

Non-compliance with regulations can derail resource management objectives thus, understanding the underlying motivation of behavioral responses to regulations is crucial and may allow us to design more successful policy instruments (Bisack and Das 2015).

Patronage system and corruption

One of the recurring responses from the respondents when asked about problems and challenges in the implementation of the SFC in the Visayan Sea is the existing patronage system. A succinct description of a patronage system is provided by Encyclopedia.com (2019): “Patron–client systems are organized by people of power, both men and women, who build and keep the loyalty of people of more humble position. Both patrons and clients regard the link between them as a personal attachment similar to the bond of affection holding members of a family or kin group together. However, unlike families, where the linkage is regarded as permanent and often is taken for granted, a patron–client relationship must be renewed constantly and renegotiated continuously.” This situation is captured in the following statements by the respondents:

“One of the things we want is alternative livelihood so that during closed season, people will have other sources of income. This is usually the problem because once you stop their illegal activities, they do not have other means of livelihood. How will they earn? The LGU gives assistance but sometimes, only those with connection to politicians can receive the assistance.” [MFARMC representative, Estancia, Iloilo]

“Some (commercial fishers) are confident to violate the SFC because they get protection.” [LGU representative, Estancia, Iloilo]

“Big fishing operators have the money and the connection.” [Municipal fisher, E.B. Magalona, Negros Occidental]

“BFAR itself does not strictly implement (the SFC) especially if the fishers know ‘someone.’” [LGU representative, Estancia, Iloilo]

“The political environment is difficult to challenge.” [PNP-MG/PCG, Bantayan, Cebu]

“People (fishers) appeal to the Mayor. They are advised to limit their catch.”
[Municipal fisher, E.B. Magalona, Negros Occidental]

“During operation, there is an informant who warns illegal fishers ahead of time.”
[LGU representative, Bantayan, Cebu]

“It (implementation of the SFC) should be fair; no favors.” [Municipal fisher,
Madrirdejos, Cebu]

“(The lack of) political will is the main reason, it is difficult to fight that;
patronage system.” [LGU representative, Milagros, Masbate]

“Patron system was noted in the apprehension report.” [LGU representative,
Roxas City, Capiz]

“This has been a perennial problem here in Carles because those in the position who use their power can do that. No matter how the fisherfolks or the Bantay-Dagat (Fish wardens) monitor these activities, they persist because of payments at the higher level. For example, at the PNP level, they have their problem within their organization because some of their members apprehend violators, but they end up releasing them because someone at their rank called and advised them to do so. These are real accounts of what is happening on the ground.” [Key informant, MFARMC, Carles, Iloilo].

In the above situations, the clients (i.e., violators) gain protection, access to the resources and information, as well as opportunities for advancement of their personal interests, from their patrons (i.e., fish wardens, LGU representatives and officials, BFAR) who are the higher ranks of government. In return, the patrons receive allegiance, electoral votes, and sometimes payments, from their clients which ultimately results in corruption. According to some members of the

regulatory group, settlement of cases involving apprehended illegal fishers is not uncommon and although they do not condone such practice, it is beyond their pay grade.

Sumaila *et al.* (2017) interpret corruption in fisheries to comprise other acts of ‘cheating’ whereby individuals or larger entities act in illegal manner that undermines both the fishery resources and efforts to manage those resources. For the purpose of this study, the definition of corruption by Transparency International (2019) is adopted, which is the abuse of entrusted power for private gain. Both sides involved in the corrupt act benefit, either in terms of money or undue advantage. Normally, bribe-takers receive an advantage (i.e., in cash, in kind, or favors) for looking the other way, or for carrying out functions that are anyway their duty to perform. Mbaku (1996) makes the case that when bureaucrats realize that they can earn more income from providing services to groups seeking state favors than from their regular jobs, they are likely to pay more attention to the demands of such interest groups than to the proper enforcement of state laws and regulations and the effective implementation of national development plans.

Results of this study reveal that the SFC in the Visayan Sea has become an avenue for corruption for the *regulators* (i.e., LGU representatives and officials, Fish wardens, PNP-MG/PCG, and BFAR) as per account of several municipal fisheries stakeholders interviewed:

“One thing that is difficult to stop is the acceptance of ‘*payola*’ or bribe (from fishers within and outside Carles) by a Carles official. Usually, the commercial boat operators are from outside Carles and they give ~PhP 50,000/month (~\$1,000).” [FARMC representative, Carles, Iloilo]

“They do not really test the effect of the policy at the ground level; there is a transaction going on between the authority and the violators.” [Fish broker, Roxas City, Capiz]

“(The) people who implement the closed season accept payments; corruption, those who do the roving are corrupt.” [Municipal fisher, Bantayan, Cebu]

“The authorities are corrupt; they take money from the big fishing operators.” [Municipal fisher, Madridejos, Cebu]

“BFAR is accepting money from commercial (fishers).” [PNP-MG/PCG, Bantayan, Cebu]

“Violators give to the Fish wardens hence they do not get caught.” [Fish broker, Madridejos, Cebu]

“Big fishing operators give politicians monthly payments so that people will survive.” [Fish dryer, Roxas City, Capiz].

“Illegal fishing continues because of corruption; the small-scale (municipal) fishers who do not have the money to pay are hapless especially those who have children and students.” [Fish broker, Roxas City, Capiz]

The same sentiment was expressed by participants of the FG conducted in Estancia, Iloilo:

“We use *likos* (ring net) in our operation which targets *tabagak* (sardines) hence, we are the ones prohibited to operate during closed season. However, other fishing gears like *zipper* or *hulbot-hulbot* (Danish seine), which are illegal fishing gears, are not prohibited. We follow the law and wait for 3 months before we operate again. Yet, these fishing gears operate year-round. It is a money game; anything is possible if you have money.”

This situation can be ascribed to many factors that were discussed previously (e.g., unequal power relations, patronage system, etc.). Another factor that contributes to corruption is the lack of appropriate compensation for the *regulators*, especially the Fish wardens.

“In terms of monitoring, there are lapses because you cannot really police all the coastal barangays. The Fish wardens in _____ are not really into full

implementation. The fish wardens have their own reasons why they cannot be obliged to apprehend violators because they do not have the resources/capacity to do so and they do not have compensation. They do voluntary work. There is no salary given by the LGU. It is okay for the Police because they have salary..... Every barangay designates Fish wardens. If you are the Fish warden, you wake up at night to do patrolling and if something happens to you at sea, what will happen to your family? That is why they cannot oblige the fish wardens to work.” [MFARMC representative, Ajuy, Iloilo]”

“There is no honorarium for the Fish wardens (Bantay-dagat) in the barangay that's why they also slack at work; they also have to find another means of income for their family.” [LGU representative, Madridejos, Cebu]

Interview results show that some of the Fish wardens serve as volunteers, while others receive allowances. In Cadiz City, Negros Occidental for example, the team leader of the fish wardens receives PhP 2,000 (\$40) per month, while his members receive PhP 1,200 (\$24) per month. But according to some fish wardens, they normally sell their salary in advance to regular LGU employees for their daily subsistence, thus, this meager amount becomes much smaller because of interest. Some LGU personnel are employed on a contractual basis (i.e., renewable every 6 months) and are receiving a very low salary. Illegal fishers are aware of the plight of some of these *regulators*, hence, they take advantage of this situation and tend to pay them off. According to Mbaku (1991), in societies where civil service compensation levels are relatively low, a significant part of the public employee's total compensation may be derived from engagement in outside activities, resulting in a significant increase in bureaucratic corruption.

According to a civil society representative:

“What happens is that, the law is used for corruption among law enforcers and the small-scale (municipal) fishers are at the losing end. Even the small fishers are forced to pay protection money so that they can continue fishing for survival

because they do not have other source of livelihood. Imagine the effect on one person who depends solely on fishing.” [Key informant, NGA]

A study by Polioudakis and Polioudakis (2010) about the resource management system in a local Muslim community in Southern Thailand shows how informal management arrangements are influenced and constrained by local political structures. The relationship between the state and local people affect the dynamics of the resource management that resulted in stratification and in turn, affected management of the fishery resources and relationships between the local people and the state. Similar circumstances can be observed in the SFC in the Visayan Sea wherein the *regulators* who control the access to fisheries, are sometimes the ones perpetuating illegal activities therein.

“There are LGUs that would be happy with PhP 10,000/week (~\$200/week). For big bosses, that would be PhP 25,000 (~\$500). On the average, a Chief of Police is PhP 5,000 (~\$100). So that is weekly. So, they (fishers) have to produce (catch) more to gain some profit. And that still depends on how many (enforcers) boarded their vessel that day. They also give *bañeras* of fishes (1 *bañera*=40 kgs). Sometimes, because they do not have cash on hand, they give their (fish) catch in *bañeras*. So, there are current prices. The ones that are asking for premiums are the Masbate police and local government. With the closed season, that area (Masbate) is the only area where they can fish because it is not guarded. And we know for a fact after our enforcement summit in the Visayan Sea that the Masbate area is not patrolled that much. So that is where they (fishers) are going. And since local governments know that, they are asking for something like a rental of their municipal waters. And we are talking about commercial fishing so there is no enabling law that will give the local government the power to have an area rented out. That is what is being practiced right now.” [Key informant, NGA]

“In their municipal waters in Iloilo, they have this secret zoning wherein they have areas where they allow commercial fishers to enter. The boat gives a bond to the LGU personnel, but this is among themselves; it is not written. That bond will give the commercial fisher access to that area and he is also given power to act as fish warden so that no other commercial boats can enter. So that is exclusive fishing zone. He (commercial fisher) gives out *bañeras* of fish.” [Key informant, NGA]

The above situation facilitates illegal practices that undermine the purpose of the SFC in the Visayan Sea. It further creates distrust among people, resulting in poor implementation on the side of the *regulators* and thus, poor compliance on the side of the *regulated* group. According to the Transparency International (2019), corruption corrodes the fabric of the society by undermining people's trust in political and economic systems, institutions, and leaders. Further, corruption constitutes a significant threat to the marine environment, global food security, national economies, and local livelihoods in coastal communities (Sumaila *et al.* 2017).

The on-going corruption related to the SFC implementation in the Visayan Sea can be described as both grand (it involves large sums of money) and petty or administrative (everyday corruption at the interface between public institutions and citizens or clients, such as bribery, linked to the implementation of existing laws, rules, and regulations). While petty corruption is considered minor, it can result in great costs when it is prevalent. Sumaila *et al.* (2017) argues that corruption has likely worsened in the fisheries as wild-caught fish have become scarcer due to overexploitation and increasingly demand for fish by an increasing human population. As fishery resources becomes scarcer, access to them becomes more valuable. Thus, this situation provides an enabling environment for corrupt practices to become more prevalent. This shows that even when fisheries management measures are in place to help address overfishing and rebuild the fish stocks, corrupt practices can negate efforts toward achieving these ends.

These above findings reflect results of Sithirith's (2014) study wherein the existing disproportionate degree of influence, political and economic power among a relatively small fishery elite with established connections with relevant state agencies in Cambodia has resulted in

many smaller scale fishers becoming trapped in cycles of debt and relational dependency, insecurity, and ever diminishing returns from overexploited fish stocks.

The patronage system and corruption that exist in the SFC in the Visayan Sea results in uneven implementation of the fishery policy which the respondents find unfair. Respondents have expressed their dismay over this situation:

“There is no problem here (referring to Barangay Nasidman); there should be strict implementation in other areas.” [Municipal fisher, Ajuy, Iloilo]

“Unfair implementation (of the SFC) here in Ajuy.” [Municipal fisher, Ajuy, Iloilo]

“It is unfair that implementation (of the SFC) is not uniform.” [LGU representative, Bantayan, Cebu]

“Unfair because sometimes small fishers get caught, but not the big fishing operators.” [LGU representative, Estancia, Iloilo]

“They do not arrest the fish dryers.” [Fish dryer, Madridejos, Cebu]

“They do not conduct arrest in the markets during closed season.” [Fish vendor, Cadiz City, Negros Occidental]

According to Robbins (2012), contemporary conservation not only drives traditional residents and users to the margins, it often fails on its own terms, producing unsustainable results while perpetuating injustices and conflict. The importance of criteria of fairness in designing social institutions, which emphasizes that social allocation of rules should not injure those who are the most disadvantaged in the society, has been recognized and applied to natural resource

management (Rawl 1971). In an article that calls for a modified approach to fisheries improvement projects (FIPs and small-scale fisheries (SSF), Barr *et al.* (2019) discuss that perceived fairness, equity and legitimate benefit-sharing mechanisms will be key to long-term success of FIPs within SSF, which ultimately determines compliance with the fishery reform rules.

In fisheries, the valuable resources and high level of human activity that characterize coastal areas lead to inevitably competing and conflicting claims over the allocation and use of such resources (FAO 2014). Disputes arise regularly from conflicts over allocation of scarce fisheries resources, over the division of fishery benefits among stakeholders and over short-term management arrangements between fishers and government/resource managers (Charles 1992). For example, a study by Matlock *et al.* (1988) shows how the rule prohibiting retention of the red drum and spotted seatrout on a permanent basis set by the Texas Parks and Wildlife Commission in response to a fish kill was adamantly opposed by the fishermen in East Matagorda Bay, Texas. The fishermen found the rule unnecessary, discriminatory and without basis, and devastating to their economic welfare. Moreover, the implementation of the Atlantic Groundfish Plan in 1977, recommended by the New England Regional Fishery Management Council, pushed for the regulation of the annual landings of haddock, cod, and yellowtail, and this resulted in opposition from fishermen in Gloucester as the decisions favored certain fishing groups like the *greasers* (a derogatory term for new immigrants) and mid-sized boats. The groundfish closure pitted fishermen against fishermen based on different economic considerations associated with inshore and offshore fishing. In effect, Gloucester fishermen were disorganized, demoralized, and thoroughly bewildered by their occupational fix (Miller and van Maanen 1979).

Introduction

Seasonal fishery closures (SFCs) have been widely used in fisheries management to prevent overfishing and reduce bycatch of protected species. In other cases, SFCs are imposed during the breeding or spawning period of species with the belief that this will reduce fishing mortality directly, thus, achieving greater annual reproductive output (Murawski 2000; Arendse *et al.* 2007). Clarke *et al.* (2015) make the case that for a spawning closure to have a net benefit to population growth, there should be a reduction in the annual fishing mortality. However, experts also underscore that if the spawning fishes are not particularly susceptible to capture during spawning or there is a change in fishing effort that negates the seasonal reduction in mortality, a spawning closure may have no effect (Gruss *et al.* 2014a; Gruss and Robinson 2015). Further, Everson (1986) argues that even though banning fishing during spawning periods is a worthy objective in principle, it is unlikely that it will have any real effect on future stocks given the enormous number of eggs that are produced by an individual fish; additional catching capacity will likely to be introduced if the SFC is successful in building up a stock, and unless the open season is shortened, fishing mortality may ultimately tend to return to its original level.

Despite the potential benefits from SFCs, there are varying reviews about this management strategy (Arendse *et al.* 2007; Jiang *et al.* 2009; Mendonça and Sobrinho 2013; Wang *et al.* 2015). In particular, the implementation of spawning area closures remains controversial due to the frequent lack of clear objectives, monitoring and empirical evidence (Sadovy and Domeier 2005; Beets and Manuel 2007; Gruss *et al.* 2014b; Clarke *et al.* 2015). Further, the effectiveness of SFCs

is not consistently tested (Clarke *et al.* 2015). In a paper that reviews the temporal and seasonal closures used in fisheries management in tropical and subtropical regions and important species groups for Hawaii, Beets and Manuel (2007) report that although quantitative analyses of the specific value of this fishery management strategy have not been conducted, managers who evaluated SFCs concluded that they have been useful and beneficial based on perceived benefits and stock effects. Furthermore, the design of SFCs presents a challenge because the net benefits to the fishery or other resources are often unknown (Sanchirico and Wilen 2001; Sanchirico 2005).

This study is conducted to empirically test the anecdotal claims about the increasing fish catch in the Visayan Sea as a result of the SFC implemented in this area annually, from November 15-February 15. This period is identified by the BFAR as the spawning season for sardines, herrings, and mackerels. The implementation of the SFC in the Visayan Sea received varying perceptions about its impacts. Although the BFAR, the agency that is mandated to manage the fisheries and aquatic resources in the Philippines, is very optimistic about the positive effects of this conservation strategy, there is no published empirical evidence that supports this claim. To better inform policy makers, managers, and stakeholders on the impact of the current SFC policy in the Visayan Sea, this study is conceptualized to verify anecdotal claims about the increasing catch in the Visayan Sea as a result of the SFC. This is particularly important especially since people's livelihoods are at stake, and the government is allocating scarce resources for the implementation of this fishery policy. Farmer *et al.* (2016) emphasize the importance of addressing the uncertainty in the projected impacts of a closure not only to reliably compare alternatives, but also to illuminate the impacts of a fishery closure. Hence, this study aims to empirically test the

hypothesis that the implementation of the SFC in the Visayan Sea has increased the catch for sardines and mackerels.

Catch trends for sardines and mackerels

Figures 48 and 49 present the mean catch for sardines and mackerels compared between the participating (treatment) and non-participating (control) groups, both before and after the strict implementation of the SFC in 2012. The catch for sardines in the participating group has been declining since 2009, but a sharp drop is observed in 2013, particularly in the participating group (Figure 48). This decrease in the catch for sardines coincides with the period when strict implementation of the SFC in the Visayan took effect. The non-participating group shows a relatively decreasing catch trend for sardines.

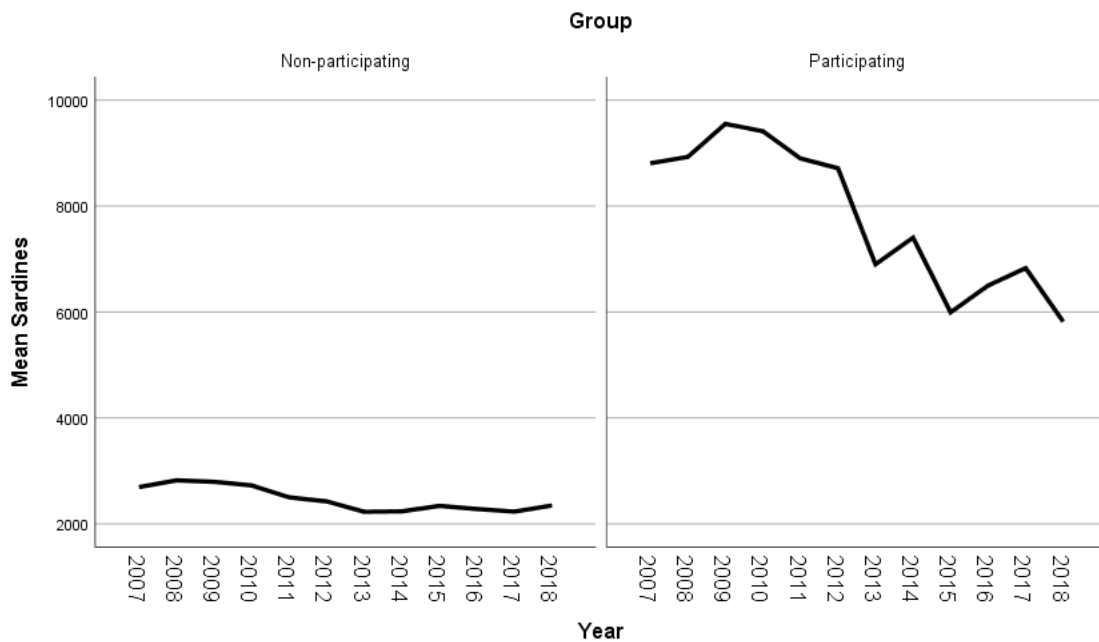


Figure 48. Catch trends for sardines (in MT) in the non-participating (left) and participating groups (right) within the period 2007-2018.

Catch landings for mackerels in the non-participating group show a relatively decreasing trend. In comparison, the participating group shows a more erratic catch trend for mackerels (Figure 49).

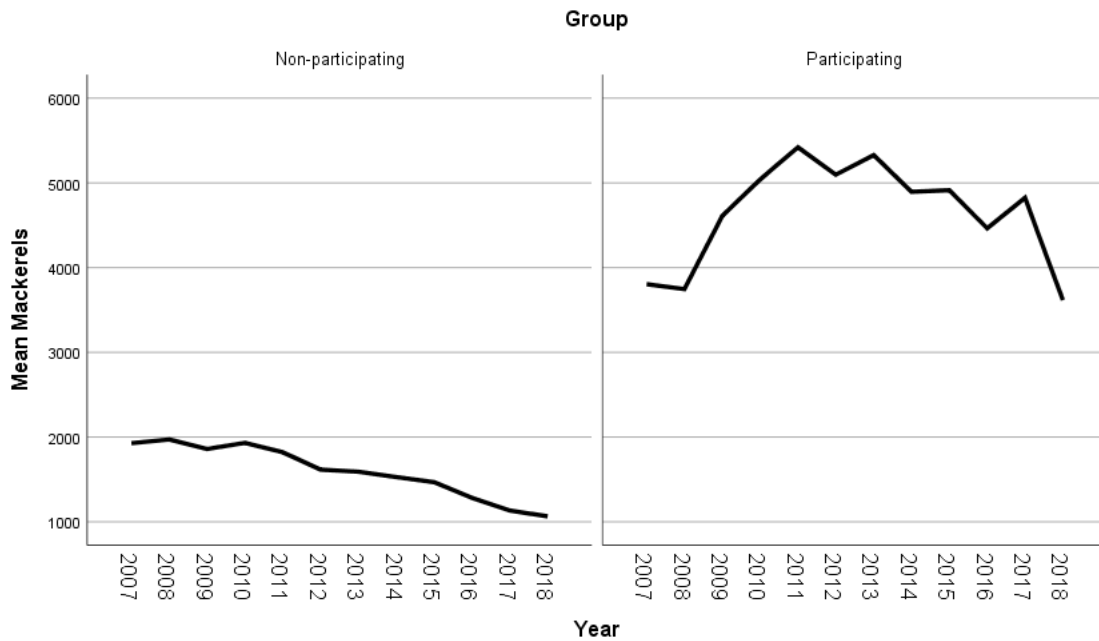


Figure 49. Catch trends for mackerels (in MT) in the non-participating (top) and participating groups (bottom) within the period 2007-2018.

Paired samples test shows significant differences in the catch for sardines in the participating and non-participating groups before ($p < .05$) and after ($p < .05$) the strict implementation of the SFC policy. Both groups experienced significant declines in sardines' catch after the strict enforcement of the SFC (Table 17).

Table 17. Paired samples test for the catch for sardines in the participating and non-participating groups, before and after the strict implementation of the SFC policy.

		Paired Samples Test							
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Non-participating group after SFC - Non-participating group before SFC	-383.008	181.144	73.952	-573.107	-192.909	-5.179	5	.004
Pair 2	Participating group after SFC - Participating group before SFC	-2478.837	766.631	312.976	-3283.367	-1674.306	-7.920	5	.001

In comparison, there is a significant difference in the catch for mackerels in the non-participating group after the strict implementation of the SFC policy in the Visayan Sea ($p < .05$), but not in the participating group (Table 18).

Table 18. Paired samples test for the catch for mackerels in the participating and non-participating groups, before and after the strict implementation of the SFC policy.

		Paired Samples Test							
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Non-participating group after SFC - Non-participating group before SFC	-510.090	142.199	58.053	-659.318	-360.861	-8.787	5	.000
Pair 2	Participating group after SFC - Participating group before SFC	53.770	1148.344	468.810	-1151.343	1258.884	.115	5	.913

Sardines

DID estimation results show a statistically significant effect of both the Group ($p < .05$) and Policy ($p < .05$) parameters on the catch for sardines (Table 19). The interaction between the Group and Policy (i.e., τ in the DID regression framework in equation 2) shows ~2,000 MT decline in the catch for sardines after the strict implementation of the SFC policy in 2012. The decline is statistically significant ($p < .05$).

Table 19. DID estimates for catch for sardines.

Parameter	B	Std. Error	95% Wald Confidence Interval		Hypothesis Test		
			Lower	Upper	Wald Chi-Square	df	Sig.
(Intercept)	6574.096	1042.5492	4530.737	8617.455	39.763	1	.000
[Group=0]	-4298.048	1125.0352	-6503.077	-2093.020	14.595	1	.000
[Group=1]	0 ^a	.	.	.	.	.	.
[Policy=0]	2478.837	989.5028	539.447	4418.227	6.276	1	.012
[Policy=1]	0 ^a	.	.	.	.	.	.
[Group=0] * [Policy=0]	-2095.828	1014.7327	-4084.668	-106.989	4.266	1	.039
[Group=0] * [Policy=1]	0 ^a	.	.	.	.	.	.
[Group=1] * [Policy=0]	0 ^a	.	.	.	.	.	.
[Group=1] * [Policy=1]	0 ^a	.	.	.	.	.	.
(Scale)	13979560.72						

Dependent Variable: Sardines

Model: (Intercept), Group, Policy, Group * Policy

a. Set to zero because this parameter is redundant.

The parameter estimates in Table 13 can be better interpreted visually in Figure 50. There is a significantly higher catch for sardines in the participating group compared to the non-participating group, before and after the strict implementation of the SFC Policy. Although there is an observed decline in the catch for sardines in the non-participating group after the SFC Policy (by ~383 MT), the drop is not as drastic as in the participating group, wherein a dramatic decrease

in catch for sardines is observed after the strict implementation of the SFC policy (~2,478 MT; $p < .05$).

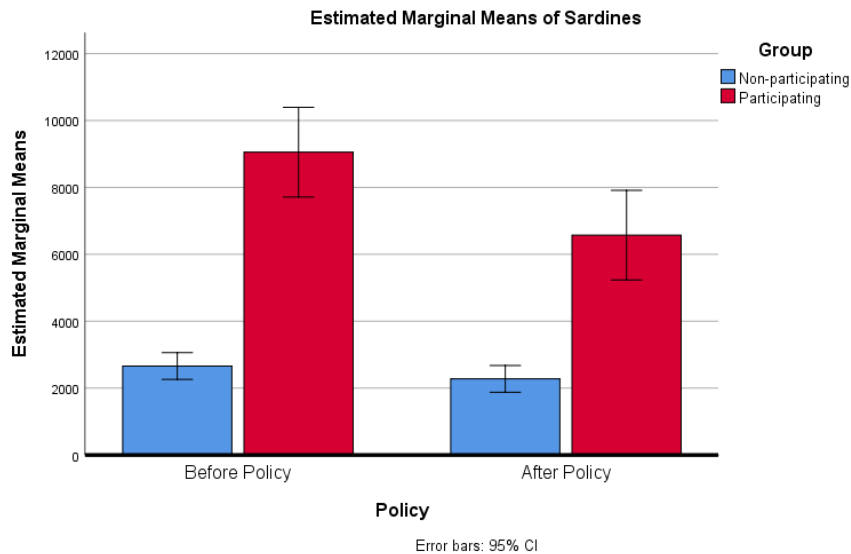


Figure 50. Estimated marginal means of catch for sardines (in MT) between the non-participating group and participating groups, before and after the strict implementation of the SFC policy in the Visayan Sea.

Mackerels

DID estimation results show a statistically significant effect of the Group on the catch for mackerels ($p < .05$), but not the Policy ($p > .05$) (Table 20). There is a statistically significant decrease in the catch for mackerels in the non-participating group (~3,000 MT; $p < .05$). While the interaction between the Group and Policy suggests an increase in the catch for mackerels in the participating group by ~500 MT after the strict implementation of the SFC policy, the increase is not significant.

Table 20. DID estimates for catch for mackerels.

Parameter	B	Std. Error	95% Wald Confidence Interval		Hypothesis Test		
			Lower	Upper	Wald Chi-Square	df	Sig.
(Intercept)	4673.599	685.3938	3330.251	6016.946	46.497	1	.000
[Group=0]	-3329.348	747.2575	-4793.946	-1864.750	19.851	1	.000
[Group=1]	0 ^a	.	.	.	.	.	.
[Policy=0]	-53.770	607.1556	-1243.773	1136.233	.008	1	.929
[Policy=1]	0 ^a	.	.	.	.	.	.
[Group=0] * [Policy=0]	563.860	633.6065	-677.986	1805.706	.792	1	.374
[Group=0] * [Policy=1]	0 ^a	.	.	.	.	.	.
[Group=1] * [Policy=0]	0 ^a	.	.	.	.	.	.
[Group=1] * [Policy=1]	0 ^a	.	.	.	.	.	.
(Scale)	7609737.115						

Dependent Variable: Mackerels

Model: (Intercept), Group, Policy, Group * Policy

a. Set to zero because this parameter is redundant.

Figure 51 shows the estimated marginal means of catch for mackerels between the participating and non-participating group, before and after the strict implementation of the SFC policy. In general, the participating group has higher catch for mackerels compared to the non-participating group. The figure also shows the significant decrease in the catch for mackerels in the non-participating group after the SFC policy ($p < .05$).

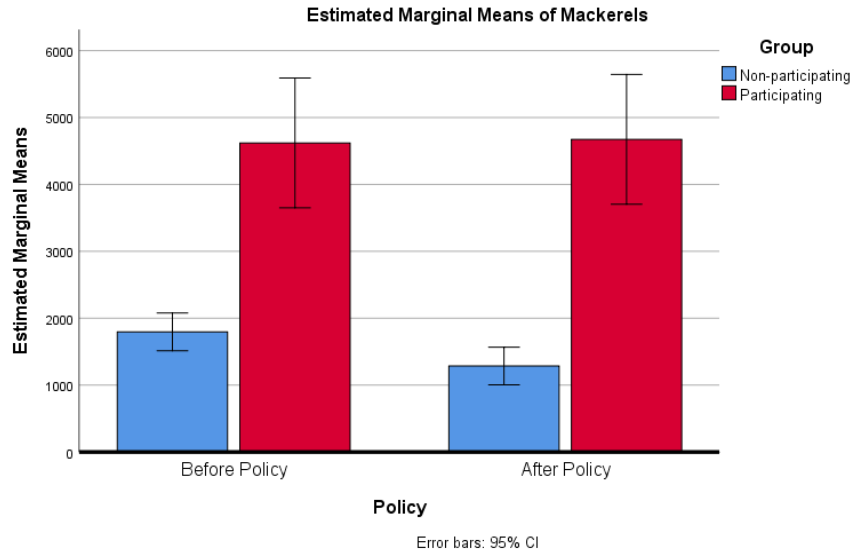


Figure 51. Estimated marginal means of catch for mackerels (in MT) between the non-participating group and participating groups, before and after the strict implementation of the SFC policy in the Visayan Sea.

The above findings are contrary to the report of the BFAR which highlights the success of the implementation of the SFC policy in the recovery of the regulated fish species. For example, the BFAR reported that sardines catch has increased in 2013, as shown in Figure 52 (DA-BFAR 2013; Mesa 2014; DA-BFAR 2018). This increase is attributed to the BFAR’s intensive IEC and MCS activities (Mesa 2014).

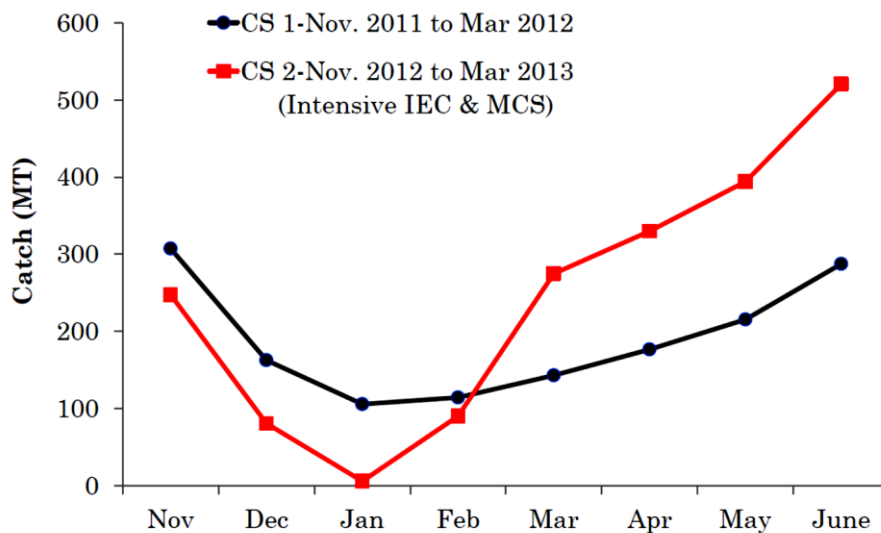


Figure 52. Graph showing landed catch (MT) of sardines observed on 2 succeeding closed season (CS) from C.Y. 2011-2012 and C.Y. 2012-2013 (Mesa 2014).

However, this study argues that mere comparison of fish catches before and after the implementation of the SFC program in a normal seasonal cycle is misleading because fishers race to fish as soon as the open season begins, thus, the reported increase. This has been confirmed by the BFAR representatives during an interview wherein key informants report that fishers indeed, tend to ‘race to fish’ as soon as the SFC is declared, and immediately after the fishing ban is lifted. Further, the graph by the BFAR (Figure 52) is not convincing because fishing effort is indeed expected to decline during the SFC and increase afterwards, producing a catch pattern exactly as shown in the graph above. Furthermore, the reported increase in the catch for sardines by the BFAR may not be conclusive that the SFC program is successful because 2 years of implementation is a very short period to observe a meaningful impact of the SFC policy especially that previous studies on sardine populations in the Philippines indicate that these species reach sexual maturity in 2-3 years (Willette *et al.* 2011). Although other authors note that sardine species such as the Indian oil

sardines becomes sexually mature at age 1 year old (Hornell and Nayudu 1924, as cited by Nair 1959). Interview with BFAR key informants also reveals that the agency has no clear metrics for evaluating the success or failure of the SFC policy, hence, no solid basis for the reported increase in the catch of the regulated fish species.

In general, an SFC (or closed season) management strategy is primarily based on effort control; it aims to reduce fishing mortality by limiting the fishing activity to an appropriate level thereby increasing the stock size. However, Beets and Manuel (2007) argues that predicting fishing mortality based on effort control may be difficult because that would depend on how fishers respond to set regulations. Fishing effort may be diverted to other resources that may be overfished or nearing an overfished condition or at a higher level than before during open season (Anderson 1977). A key informant from an NGA that is involved in ocean conservation in the Philippines also confirmed that fishers try to compensate for their losses by using more powerful fishing gears and by doubling or tripling their fishing effort when the fishing ban is lifted. According to the President of the *PAMALAKAYA-Pilipinas* (National Federation of Small Fisherfolk Organization in the Philippines), the SFC policy is futile because it is business-as-usual for commercial fishers after the closed season (Mayuga 2017). Hence, whatever gains accrued during the 3-month SFC is readily lost to commercial fishing operations especially that some LGUs allow commercial fishing within municipal waters. This has serious implications to the small-scale fishers because their livelihood is greatly affected.

Further, studies have shown that the design of SFCs presents a challenge because the net benefits to the fishery or other resources are often unknown (Sanchirico and Wilen 2001;

Sanchirico 2005). Clearly, the implementation of the SFC alone is not enough to effect positive results in the management of sardines and mackerels in the Visayan Sea, particularly in increasing fish catch. Although there might be positive effects on the overall population size of these species, this remains unknown. The BFAR management should consider adopting a more direct and effective method of controlling fishing mortality other than SFCs, such as controlling for catch levels or landings, and controlling access to the resource (Caddy 1984), although these strategies may also have associated challenges such as funding requirement, among other things. Given the limited resources of the BFAR and the LGUs, strict monitoring in the market and landing sites is a more feasible strategy.

Despite being in effect for 8 decades now, it is not surprising that concerns on the rationale of SFC policy linger. During an interview with the President of the *PAMALAKAYA-Pilipinas*, he expressed that their organization is not totally against the SFC, but there is a need for a careful study on why implementing a fishing ban in a particular area is necessary. He further said that the declaration of the fishing ban is useless if the reason behind the decline in the fisheries production is unknown. This is particularly important for sardines and mackerels because studies in other areas indicate that their populations are sensitive to ocean climate and productivity (Checkley *et al.* 2017; Spijkers and Boonstra 2017; Das *et al.* 2020). Thus, a careful study on the SFC is imperative to ensure that management efforts, and thus, government expenditure, translate to measurable outcomes towards sustainable fisheries in the Visayan Sea.

Various studies have shown that fish abundance fluctuates as a result of fishing activity, and productivity shifts between high and low regimes unrelated to abundance (Gilbert 1997;

Mantua and Hare 2002; Axenrot and Sture 2003; MacKenzie *et al.* 2007; Vert-pre *et al.*, 2013). For example, the collapse of stocks of Peruvian anchoveta (*Engraulis ringens*), the Alaskan Pollock (*Theragra chalcogramma*) and the ‘northern’ cod (*Gadus morhua*) off eastern Canada have been attributed to the combined effects of changing ecosystems and overfishing (Alheit and Niquen 2004; Bailey 2011; Lilly *et al.* 2013; Skern-Mauritzen *et al.* 2015).

In a study that looks at the relationship of climate and populations of anchovy and sardine, Checkley *et al.* (2017) conclude that anchovy and sardine populations vary primarily in response to climate, and while fishing may change the fluctuations in anchovy and sardine stocks, it neither causes nor prevents these fluctuations. Several studies have also pointed out the wide changes in the production levels of sardine and anchovy fisheries, which has sustained periods of high and low catch occurring almost simultaneously during the same years in different systems, suggesting some global interdecadal phenomenon than links these events, rather than just the effect of independent fishing pressure (Kawasaki and Omori 1998; Kawasaki *et al.* 1991; Lluch-Belda *et al.* 1989; Lluch-Cota *et al.* 1997).

For example, Kawasaki and Omori (1988) observe that the high sardine and low anchovy abundances in Japan, California, and Peru-Chile Systems are associated with globally sustained warm periods, while the high anchovy high and low sardine abundances are associated with sustained cold periods. On the contrary, Crawford *et al.* (1987) report an opposite pattern for sardine-anchovy abundances in the Benguela System. This led to the concept of ‘regimes’, which refer to this scale of small pelagic variability (Lluch-Cota *et al.* 1997).

Some studies point to the El Niño Southern Oscillation (ENSO¹³) events as the cause of the high-low patterns in the pelagic fisheries around the world (Caviedes and Fik 1992; Miller and Fluharty 1992; Cubillos and Arcos 2002; Cushing 2013; Shetye *et al.* 2019). However, Lluch-Cota *et al.* (1997) explain that ENSO changes are often regarded as high frequency, year-to-year variations, whereas the most significant changes of the pelagic stocks and their environment are believed to occur over the interdecadal-regime-time scale.

In another study which evaluates the proportion of fish stocks (where productivity is primarily related to abundance versus those that appear to manifest regimes of high or low productivity), Vert-pre *et al.* (2013) examine the harvest and abundance of 230 fish stocks and tested 4 hypotheses, namely: abundance (i.e., production is always related to population abundance), regimes (i.e., production shifts irregularly between regimes not related to abundance), mixed (i.e., even though production is related to abundance, there are irregular changes in this relationship), and random (i.e., production in random from year to year). Their results reveal that the regimes hypothesis best explains 38.6% of the stocks; the mixed hypothesis, 30.5%; the abundance hypothesis, 18.3%; and the random hypothesis, 12.6%.

There are also accounts of observed variability in the fish migration at the local setting. For example, in a study that looks at the economic growth in the rural fishing community of Estancia (one of the study sites), Szanton (1971) reports that the annual fish migration in the area is highly

¹³ ENSO is a recurring climate pattern, ranging from about 3-7 years, that involve changes in the temperature of waters in the central and eastern tropical Pacific Ocean. The surface waters across a large swath of the tropical Pacific Ocean warm or cool by anywhere from 1°C to 3°C, compared to normal (NWS 2020). According to Cai *et al.* (2015), ENSO is the most important year-to-year fluctuation in our climate system on the planet¹, varying between anomalously cold (La Niña) and warm (El Niño) conditions.

variable, i.e., particular species may arrive a month or 2 before or after their usual schedule such that in 1 year, all the species may be unusually plentiful; the next year, only 1 species will be abundant, and the following year, total quantity of fish suddenly declines.

Notwithstanding the current debate on the causes of these variabilities in the environment, fisheries management agencies need to acknowledge that irregular changes in productivity are common and that harvest regulation and management targets need to be flexible to productivity changes (Vert-pre *et al.* 2013). In the case of the SFC in the Visayan Sea, in addition to monitoring fish catch landings, it will be valuable for resource managers to understand the ecosystem drivers of fish stock productivity in the area because fish stock production is dependent on the physical and biological conditions of the ecosystem (Skern-Mauritzen *et al.* 2015; Fowler *et al.* 2018; Kurota *et al.* 2020). This is fundamental for the BFAR management especially that the agency has recently adopted the ecosystem approach to fisheries management to managing the Visayan Sea (DA-BFAR 2018), and one of the main pillars of this approach is the inclusion of the impacts of ecosystem processes on fish stock production (Skern-Mauritzen *et al.* 2015).

CHAPTER 5. CONCLUSIONS

Having an understanding of the interrelationships of different factors that help shape the success or failure of the SFC policy is critical. This study demonstrates how the interplay of different factors at different levels, i.e., the stakeholders' knowledge and perceptions about the SFC policy, the stakeholders' interactions and social relationships at different levels, their socio-economic circumstances, and the cultural and political environment in the different municipalities surrounding the Visayan Sea, greatly influence the way the SFC policy is implemented at the local level.

Knowledge and perceptions of municipal fisheries stakeholders about the SFC in the Visayan Sea

This study shows that while municipal fisheries stakeholders in the Visayan Sea have relatively fair knowledge about the SFC, there are differences in the level of knowledge, not only among stakeholders, but also among municipalities. Analysis by respondent group shows that only the LGU representatives have a *good* level of knowledge about the SFC, while analysis by municipality shows that all municipalities in Panay Island have a *good* level of knowledge about the SFC. On the other hand, the municipalities of Milagros and Cawayan in Masbate Island have *very poor* knowledge about the SFC. These findings can be attributed to the fact that the enclosed area is largely comprised by the municipal waters of the study sites in the Panay Island and the neighboring islands of Negros and Cebu. Hence, municipal fisheries stakeholders in these areas are more aware about the SFC than those in Masbate Island.

There is a statistically significant difference in the level of knowledge of respondents about the SFC in the regulated groups in the different municipalities. Regulated groups in the municipalities in Panay Island are more knowledgeable about the SFC compared to the respondents in other areas. Although there is a positive and significant correlation between the regulated group's knowledge about, and compliance, with the SFC, the correlation is weak. These results may be driven by socio-economic and cultural factors, which have a more direct influence on the regulated group's compliance with the SFC.

Majority of the respondents think that: 1) There is sufficient and accurate information in support of the implementation of the SFC in the Visayan Sea (67.7%); 2) There are opportunities for consultation and dialogue with different stakeholders about the SFC (61.7%); 3) The SFC is strictly implemented in their respective municipalities (52.8%); 3) There is an observed increase in the catch of sardines in the last 5 years (56.2%); and that 4) They are benefitting from the SFC (60.4%). Further, respondents believe that the implementation of the SFC 5) is necessary for the conservation of fisheries (91.5%); and 6) should be continued (84.7%). Furthermore, 7) majority of the respondents disagree that revising the provisions of the SFC policy is necessary (57.8%). On the other hand, majority of the respondents are not decided whether 8) The SFC is strictly implemented in other municipalities (39.6%). Respondents have varying views whether 9) There is an increase in the catch of mackerels in the last 5 years.

There is a statistically significant difference in the perceptions of the regulated and regulator's group about the SFC. Similarly, there is a statistically significant difference in the regulated groups' perceptions about the SFC in the Visayan Sea in the different municipalities.

Regulated groups in the municipalities of Carles, Estancia, Concepcion, and Ajuy (Iloilo Province); Bantayan and Madridejos (Cebu Province); Cadiz City and E.B. Magalona (Negros Occidental Province) and Roxas City (Capiz Province) have relatively high perceptions about the SFC in the Visayan Sea. On the contrary, regulated groups in Escalante City (Negros Occidental Province) and Cawayan and Milagros (Masbate Province) have relatively low perceptions about the SFC. There is a positive and significant correlation in the regulated groups' perceptions about, and compliance with, the SFC in the Visayan Sea.

Overall, there is a varying interpretation of the SFC policy at different levels of management, i.e., national BFAR, regional BFAR, and LGUs. While the municipalities claim that they are implementing the SFC, there are differences in the degree of implementation and thus, differences in compliance.

These findings provide a feedback to the BFAR management on which municipalities they need to focus on in terms of IEC campaigns with regards to the SFC policy. Fisheries stakeholder's compliance is vital to the success of the SFC implemented for the Visayan Sea, hence, the BFAR should be mindful of the stakeholders' level of knowledge and perceptions about the SFC policy as these clearly affect their level of compliance.

Socio-economic and cultural impacts of the SFC in the Visayan Sea

A majority of the *regulated* group is affected by the SFC implemented in the Visayan Sea. The *regulated* group's livelihoods and households are affected because they experience no/ limited or low fish catch or fish supply during the SFC. This situation is exacerbated by the lack of

alternative livelihoods for the disenfranchised municipal fisheries stakeholders during the 3-month fishing ban, which affect their income and thus, has cascading effects on food availability, children's schooling, and household dynamics.

In terms of cultural impacts, the majority of the respondents said there are no cultural beliefs and practices affected by the SFC implemented in the Visayan Sea. Respondents claim that they have grown to accept the SFC as part of the norm and the local culture. However, 16% of the respondents said traditional holidays and events such as Christmas, New Year, *Fiestas* and birthdays are affected by the SFC because the celebration of these holidays and events coincide with the SFC period and some respondents are not able to participate in these traditional events due to budget shortage. Traditional fishing methods and practices (e.g., use of seine nets, ring nets, and fish aggregating devices), and traditional fishing areas are likewise affected by the SFC implementation in the Visayan Sea. The municipal fishers are also forced to fish further to the sea, posing additional risks and costs to them, as well as longer fishing time.

Although some respondents cited availability of alternative livelihoods, none of the livelihood programs identified were specific to the SFC. These were either given as aid after a calamity or generic programs of the LGU. Thus, these programs are not addressing the concerns of the disenfranchised stakeholders during the 3-month fishing ban.

To cope with the impacts of the SFC, respondents look for land-based alternative livelihoods such as farm work (e.g., planting, cutting, weeding, and harvesting); selling fruits, vegetables and root crops; service-oriented occupations (e.g., labor, construction, carpentry,

laundry, cleaning, baby-sitting, fetching water for other people, etc.); livestock farming; small-scale business ventures (e.g., managing a convenience store or computer shop; buy and sell of different goods, eatery, vending cooked food, etc.); and transport services (operating a pump boat, pedicab, tricycle), among others. Affected respondents who have the resources adjust, either by shifting to allowable fishing methods such as hook and line, beach seine, squid and crab fishing, gleaning, or by catching or selling other aquatic species.

The BFAR management must be cognizant of these socio-economic and cultural impacts of the SFC policy as these can undermine the effective management of the Visayan Sea. Recognizing the differential impacts of the SFC policy among fisheries stakeholders is imperative to ensure that appropriate livelihood programs are provided to those who needed them most.

To cope with the impacts of the SFC, the affected municipal fisheries stakeholders resort to myriad strategies which include engaging in land-based alternative livelihoods, namely: farm work; service-oriented occupations like labor, construction, carpentry, laundry, working for other people, etc.; livestock farming; small-scale business venture; and transport services (utilizing boat for passenger transport or driving pedicab, tricycle, or vehicle). Those who have the resources adjust, either by shifting to allowable fishing methods such as hook and line, beach seine, squid and crab fishing, gleaning, etc., or catching or selling other aquatic species.

Political factors that affect the implementation of the SFC in the Visayan Sea

There is a grey area on jurisdiction in the management of the Visayan Sea because existing legal frameworks provide that registration and management of the commercial fishing boats (and commercial waters, i.e., beyond 15 kms) is under the BFAR, although some municipalities allow commercial fishing boats to operate from 10.1. kms seaward. Management of municipal fishing boats and municipal waters (from shoreline to 15 kms seaward) on the other hand, is within the jurisdiction of the LGUs. The decision to implement the SFC in the municipalities covered by the SFC is left with the Mayors. Thus, MCS activities can be quiet challenging because there is no clear demarcation between the municipal and commercial waters. Further, the LGUs are responsible for regulating and monitoring fishery activities within their municipal waters. While the DILG enjoins the coastal LGUs to regulate and monitor fishery activities within their municipal waters, however, there is no accountability mechanism in place. The complex interactions of the different stakeholders in the Visayan Sea at various levels are conditioned by power relations (i.e., what enables who to do what to whom) that emanate from these administrative arrangements. The unequal power relations among these fisheries stakeholders provide opportunities to perpetuate illegal activities which can lead to failures in achieving management goals of the SFC and equity among the fisheries stakeholders. Further, the LGUs have varying priorities and financial and logistical capabilities that greatly affect the implementation of the SFC in their respective municipalities. While majority of the study sites claim that they are implementing the SFC, there are differences in the level of enforcement and thus, compliance. The level of compliance with the SFC policy is influenced by multiple factors on both the regulated and regulatory sides.

Some members of the regulatory group (i.e., LGU representatives, Fish wardens, PNP-MG/PCG and BFAR) who are overseeing the implementation of the SFC in the Visayan Sea misuse their authority over the resources and their clients for illegitimate private gains. The patronage system and corruption embedded in the system result in the uneven implementation of the SFC in the different municipalities which perpetuates inequality and distrust between the regulated fisheries stakeholders and regulators. These illegal practices also undermine enforcement and management goals, injuring further the already disadvantaged fisheries stakeholders in the community. Further, these result in ineffective use of government funds because fishery management goals are compromised. Furthermore, the SFC in the Visayan Sea does not serve the interests of the different fisheries stakeholders, contrary to what is often claimed by the government.

For the SFC policy to be effective, the BFAR management and the participating LGUs need to address the identified factors that weaken the implementation of the SFC in the Visayan Sea. As it is now, the government's expenditure in implementing the SFC policy does not translate into achieving its goals of conserving the sardines and mackerels' populations in the Visayan Sea.

Effects of the SFC on the sardine and mackerel catch in the Visayan Sea

Using a BACI design analysis with DID estimation strategy, anecdotal claims about the increasing catch of sardines (and mackerels) in the Visayan Sea was verified by evaluating the differences before and after the strict implementation of the SFC policy in 2012 in the participating (treatment) and non-participating (control) provinces. Results of this study show that catch for

sardines significantly declined after the strict implementation of the SFC policy in 2012. While there is an observed increase in the catch for mackerels, the increase is not significant. These findings do not support the claims by the BFAR on the increasing catch of sardines in the Visayan Sea. These results are also contrary to the perceptions of the municipal fisheries stakeholders in the Visayan Sea about the increasing catch for sardines catch in the area in the last 5 years.

The fluctuation in the abundance of the regulated species in the Visayan Sea may be a result of the combined effects of fishing activity and productivity shifts driven by changes in the environment. Understanding the underlying mechanisms that govern the fluctuations in the abundance of fish stocks is critical to the appropriate management of the fisheries.

Coming full circle to the political ecology framework

Analyzing the SFC in the Visayan Sea is a complex undertaking, but a necessary challenge. To understand it requires the examination of its parts and how these are interrelated, and a political ecology framework is useful in this aspect. By using a political ecology framework, this study was able to show how and why particular interests dominate in the SFC in the Visayan Sea, and how power circulates at different levels and scales, in ways that influence the biophysical and social outcomes. The SFC in the Visayan Sea needs to be understood in terms of why fisheries stakeholders act the way they do, and how their actions and interactions with each other are influenced by the socio-economic, cultural and political environment around them, which in turn shape practice, the environmental, and policy outcomes. A political ecology framework lends itself

useful in understanding the degree to which such outcomes are ‘non-incident, persistent, and repetitive’ (Robbins 2012).

Findings of this study validate some of the arguments made by scholars engaged in the field. One of which is by Watts (2000), which highlights the importance of understanding communities in terms of hegemonies because according to him, “not everyone participates or benefits equally in the construction and reproduction of communities, or from the claims made in the name of community interest”. The SFC implemented in the Visayan Sea has garnered varying support from its surrounding municipalities and has caused differential impacts to the fisheries stakeholders. These municipalities are internally differentiated in complex social, economic, and political ways, which influence resource use and conservation efforts in the Visayan Sea. The decision of the government to control access to resources through the implementation of conservation efforts like the SFC, results in inevitable repercussions on the local systems of livelihood and production. While some would argue that the SFC is only for 3 months and thus, has limited impacts, its temporary nature makes it particularly challenging because it leaves the stakeholders vulnerable and confused because the 3-month fishing ban is too long for them to persist without income, but not too long enough for them to become re-settled in a new livelihood before open season begins again.

Results of this study also corroborate Brogden and Greenberg’s (2005) argument that as the rules of access and use become inscribed in law and administrative procedures, this limits the bureaucratic structures’ responsiveness to local variance and their ability to mediate competing claims over resources because they tend to simplify and regularize decision making. The

classification of municipal and commercial sectors in the Philippines for example, shows critical variations even within the same sector (e.g., municipal sector), which indicate different fishing objectives and practices. Such simplified sectoral categorization masks the differences in scale and the varying needs and concerns of the stakeholders involved in the fisheries, which may require a more specific management approach, rather than a ‘blanket solution such as the SFC.

Further, results of the study validate one of the theoretical foundations of the conservation and access thesis of political ecology on territorialization of conservation, which proves to be problematic because conservation areas poorly match ecosystem functions and flows in the environment. The enclosed area in the Visayan Sea serves as an example of a conflict between a political geography and ecological geography, especially that some of the LGUs included in the SFC overlook the interconnectivity of the ecosystems in their respective municipal waters.

This interdisciplinary study extends the political ecology lens in analyzing human-coastal environment articulations, specifically in understanding the intricacies of the SFC in the Visayan Sea. It is direct response to a criticism of political ecology, i.e., the lack of attention that political ecology has given on the actors’ (i.e., the farmer, scientist, the regulator, the politician, and so on) social construct of the environment and environmental issues (Watts 2000). Finally, this body of work is a contribution to the growing literature on political ecology studies that focus on coastal resource management.

CHAPTER 6. RECOMMENDATIONS

This study has provided the preliminary work which points to areas that need urgent attention regarding the SFC in the Visayan Sea. The following are some ‘food for thought’ which may be helpful when thinking about ways to go forward:

1. Future efforts by the government, through the BFAR and LGUS, should pay critical attention to the cumulative and differential impacts of the SFC and the political realities in its implementation, to ensure that the disadvantaged stakeholders in the Visayan Sea will not sustain further injury. A key step to this is to identify the most affected stakeholders in the coastal communities included in the SFC and revisit existing programs to accommodate their needs and concerns during the 3-month fishing ban. Assistance in the form of food subsidies, provision of allowable fishing gears or nets, and land-based livelihoods designed for both women and men members of the fishing households must be explored.
2. To facilitate effective implementation of the SFC, the BFAR must come up with implementing guidelines that specify the fishing gears that target sardines and mackerels as their primary catch, including those that are known to catch these species as bycatch. The guidelines must also specify a catch ceiling for the allowable ‘subsistence fishing’ of the regulated species (e.g., 5 kgs as the maximum) such that small-scale fishers will be guided accordingly. This will make MCS activities much easier for the members of the regulatory group.
3. The dichotomous classification of the capture fisheries sector should be revisited. According to Pauly and Mines (1982), the oversimplified distinction between the municipal and commercial fishing sectors based on boat tonnage was an arbitrary decision

that was codified in 1932 to define ‘commercial fishing’ for taxation and licensing purposes only. This needs to be reviewed and re-classified based on appropriate criteria such as financial capital, scale of operation, degree of ownership of fishing boats, gear type, among others. A more detailed proposal by Spoehr (1984) on this matter can be found in his paper entitled ‘Change in Philippine capture fisheries: An historical overview’. The re-classification of the capture fisheries in the Philippines will be beneficial to both the BFAR and the fisheries stakeholders (especially the small-scale fishers). First, this will capture the specific sectoral variations and nuances, which could help the BFAR come up with a sound and ‘implementable’ management actions. Second, the re-classification will afford fisheries stakeholders with the commensurate regulation and privileges, based on their classification. For example, subsistence fishing will be exempted from the SFC.

4. There should be a stricter monitoring and law enforcement at the marketplaces and landing sites to discourage both the fishers from catching, and the fish vendors, fish traders, and fish brokers, from selling the regulated species. Perhaps, combining the SFC with a ‘sales ban’ will render a more efficient outcome as enforcement will shift its focus on marketplaces and landing sites, thereby reducing fuel costs from seaborne patrol.
5. The BFAR should strictly monitor issuance of certifications for catch of sardines and mackerels caught outside the enclosed area while the SFC is in effect, to ensure authenticity and to avoid corruption. Findings of this study show that some certifications are issued by municipalities that are also included in the SFC, or by some unauthorized individuals who use the certification as an opportunity to commit fraud (e.g., Barangay captain). There must only be one template for the certification, and it should have security features to verify its

authenticity. A protocol should also be established among the members of the regulatory group, as well as the port managers, for better coordination and accountability.

6. An appropriate reporting system must be in place for all fishing boats to ensure transparency, accountability, traceability, and good record keeping. Information about the boat (captain, crew, tonnage), fishing gears used, target species, date and time of operation, among others, should be reported as a requirement for fish landing. Fishers' compliance to such reporting system can be used as a basis for the issuance or renewal of their fishing license.
7. The government, through the BFAR and LGUs, must explore ways to help fishers acquire insurance for their protection. If the agriculture sector can provide insurance for farmers, fishers must be accorded with the same services. Similarly, all deputized fish wardens must have an insurance.
8. The BFAR should clearly define the objectives of the SFC policy and develop a metrics for the appropriate evaluation of impact the policy, not only on the fishery resources, but also on the stakeholders whose livelihoods are dependent on these resources.
9. In addition to monitoring fish catch landings, it will be valuable for the NFRDI management to collect biophysical data (e.g., sea temperature, chlorophyll-a, dissolved oxygen, salinity, among others) to aid in understanding the ecosystem drivers of fish stock productivity in the Visayan Sea because several studies have shown that physical and biological conditions of the ecosystems in other areas greatly influence fish migration and recruitment.
10. It will be very helpful if the BFAR/NFRDI will allow access to the NSAP data they have collected to facilitate a more robust analysis of their programs which can be beneficial to

the stakeholders and policymakers. This will ultimately redound to informed decision-making and improved fisheries management framework, appropriate programs for the affected fisheries stakeholders, as well as efficient and responsible spending of government funds.

11. In addition to the ongoing IEC campaign about the SFC, the BFAR should conduct a regular seminar for members of the PNP-MG, PCG and fish wardens in the different municipalities to ensure that they understand the provisions of the SFC policy. This has been raised by respondents from these groups during our interviews, as they admittedly lack adequate information about the SFC.
12. There must be an independent body that audits the performance of the regulatory groups (i.e., BFAR, LGUs, fish wardens, PNP-MG, PCG) to ensure coherence, credibility, organizational integrity, and engagement in the management of the fisheries in the Visayan Sea in accountable ways.
13. The BFAR should create incentive structures for municipalities and stakeholders that are actively supporting not only the conservation program for sardines and mackerels, but also similar activities aimed towards achieving sustainable fisheries. This will motivate good behavior among the participating groups in the SFC which could translate to reduced MCS activities, thus, reduced operational costs.

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APPENDIX A. IRB APPROVAL



EAST CAROLINA UNIVERSITY
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Notification of Continuing Review Approval: Expedited

From: Social/Behavioral IRB

To: [Farisal Bagsit](#)

CC: [David Griffith](#)

Date: 10/7/2019

Re: [CR00008064](#)
[UMCIRB 18-001454](#)

The Political Ecology of the Seasonal Fishery Closure in the Visayan Sea, Philippines

The continuing review of your expedited study was approved. Approval of the study and any consent form(s) is for the period of 10/7/2019 to 10/6/2020. This research study is eligible for review under expedited category #7. The Chairperson (or designee) deemed this study no more than minimal risk.

Changes to this approved research may not be initiated without UMCIRB review except when necessary to eliminate an apparent immediate hazard to the participant. All unanticipated problems involving risks to participants and others must be promptly reported to the UMCIRB. The investigator must submit a continuing review/closure application to the UMCIRB prior to the date of study expiration. The Investigator must adhere to all reporting requirements for this study.

Approved consent documents with the IRB approval date stamped on the document should be used to consent participants (consent documents with the IRB approval date stamp are found under the Documents tab in the study workspace).

The approval includes the following items:

Document	Description
Consent Letter for Expedited Survey Research(0.04)	Consent Forms
Data from BFAR (0.01)	Dataset Use Approval/Permission
Dissertation proposal(0.01)	Study Protocol or Grant Application
Focus group guide(0.02)	Interview/Focus Group Scripts/Questions
IRB COI disclosure form(0.01)	COI Disclosure Form
KII guide(0.01)	Interview/Focus Group Scripts/Questions
Survey instrument(0.03)	Surveys and Questionnaires

The Chairperson (or designee) does not have a potential for conflict of interest on this study.

APPENDIX B: CONSENT FORM

Study ID:UMCIRB 18-001454 Date Approved: 11/9/2018 Expiration Date: 11/8/2019

Dear Participant,

I am a *Farisal U. Bagsit*. I am a *PhD student* at East Carolina University in *Coastal Resources Management*. I am asking you to take part in my research study entitled, “*The Political Ecology of the Seasonal Fishery Closure in the Visayan Sea, Philippines*”.

The purpose of this research is to better understand *the impacts of seasonal closure fishery policy on the resources and different stakeholders, as well as the underlying factors that affect policy outcomes*. By doing this research, I hope to learn *how are municipal fisheries stakeholders affected by the closed season? How do they cope with the impacts? Does BFAR or LGUs provide alternative livelihood to affected stakeholders? Are municipal fisheries stakeholders knowledgeable about the closed season in the Visayan Sea? What are their perceptions about the closed season? Is there an agreement between fisher’s and LGU representative’s knowledge and perceptions about the closed season? Is there a varying interpretation of the closed season policy across municipalities? If yes, why is this so? How does it affect the implementation of the closed season? What is BFAR’s standpoint on this? What are the political challenges encountered by LGUs and BFAR in the implementation of the closed season? Are there specific strategies adopted to address the challenges? Is there an organizational structure in the implementation of the closed season? Has the closed season improved the productions of the banned species?* Your participation is completely voluntary.

You are being invited to take part in this research because *you identify as a fisheries stakeholder in the Visayan Sea*. The amount of time it will take you to complete this survey/focus group/key informant interview is *about 45 minutes*. If you agree to take part in this survey/focus group/key informant interview, you will be asked questions that relate to *your knowledge and perceptions about the seasonal closure; cultural, socio-economic and political impacts of the seasonal closure; and political factors that affect the implementation of the seasonal closure*. *Only the key informant interview will be audio-recorded*.

This research is overseen by the University and Medical Center Institutional Review Board (UMCIRB) at ECU. Therefore, some of the UMCIRB members or the UMCIRB staff may need to review your research data. *However, the information you provide will not be linked to you*. Therefore, your responses cannot be traced back to you by anyone, including me.

If you have questions about your rights when taking part in this research, call the Office of Research Integrity & Compliance (ORIC) at 252-744-2914 (days, 8:00 am-5:00 pm). If you would like to report a complaint or concern about this research study, call the Director of ORIC, at 252-744-1971.

You do not have to take part in this research, and you can stop at any time. If you decide you are willing to take part in this study, *we will continue with the survey below*.

Thank you for taking the time to participate in my research.

Sincerely,

Farisal U. Bagsit
Principal Investigator

APPENDIX C: LETTER TO MAYORS

Date _____

Hon. _____

Municipality of _____

Province of _____

Dear Mayor _____:

My name is Farisal U. Bagsit, a PhD in Coastal Resources Management student at the East Carolina University, Greenville, North Carolina, USA. I am currently working on my dissertation entitled 'Political ecology of the seasonal closure in the Visayan Sea, Philippines'. This study aims to provide a better understanding of the impacts of the closed season policy on the fishery resource and stakeholders in the Visayan Sea, as well as the underlying factors that influence policy outcomes. The results of this study will not only provide invaluable information that can help improve current fishery management framework for the Visayan Sea but will also inform future decisions towards a more inclusive development of the fisheries sector in the Philippines.

In this regard, I would like to request for assistance from your office specifically in identifying respondents and participants for our interviews and focus groups, as well as in the secondary data gathering in your municipality on _____.

Activity	Respondents
Semi-structured interviews	<ul style="list-style-type: none">• 10 Municipal fishers• 3 Fish brokers/fish traders• 3 Fish dryers• 2 LGU representatives involved in fisheries management• 2 members of the <i>Bantay Dagat</i> or PNP Maritime Group
Focus groups (participants should be different from SSI respondents)	<ul style="list-style-type: none">• 3 Municipal fishers• 3 Fish brokers/fish traders/fish dryers• 2 LGU representatives involved in fisheries management• 2 members of the <i>Bantay Dagat</i> or PNP Maritime Group
Key informant interviews	<ul style="list-style-type: none">• 2 members of the Municipal Fisheries and Aquatic Resource Management Council (MFARMC)

Additionally, we will be visiting your municipality on _____, to pre-test our interview instrument. I am looking forward to your positive response on this request. Thank you very much.

Sincerely yours,

FARISAL U. BAGSIT

Email: bagsitf16@students.ecu.edu

Mobile no: 0918 2872690

APPENDIX D. SEMI-STRUCTURED INTERVIEW QUESTIONNAIRE

Date (*Petsa*): _____ Time started (*Oras sang pagsugod*): _____ Time ended (*Oras sang pagtapos*): _____
Resp. #. ___ Gender (*Kasarian*): ___ Age (*Edad*): ___ Marital status (*Estado*): ___ Ethnicity (*Tribo*): _____
Primary source of livelihood (*Primerong pangabuy-anan*): _____
% of income from fishing/fishing-related activity (*% sang kita nga halin sa pagpangisda o kun panglab-as*): _____
Highest educational level (*Pinakataas nga naeskwelahan*): _____
Household size (*Pila kamo sa sulod balay?*): ___ Brgy/Municipality (*Barangay/Munisipyo*): _____
No. of yrs of residing in the area (*Pila ka tuig na gaistar sa in inga lugar*) _____

SCREENING QUESTIONS

(Municipal fishers)

1. Is your boat motorized or non-motorized? 1 – Non-motorized 2 – Motorized
(*Ano imo baroto?*) (*1 – De sagwan*) (*2 – De motor*)
2. What is your boat engine type (*Ano ang makina sang imo baroto?*) _____
3. What is your engine's horsepower (*Pila ka horsepower?*) _____
4. What is your boat length (*Pila ka sangkad imo baroto?*) _____
5. What is your boat tonnage (*Pila ka tonelada imo baroto?*) _____
6. How many boat crews do you have (*Pila ka tawo gaupod sa imo mangisda?*) _____
7. Are you a registered fisher? 1 – Yes 2 – No
7.1. If Yes, where (*Kung huo, sa diin?*) _____
7.2. How much did you pay (*Pila imo ginbayad?*) _____

KNOWLEDGE AND PERCEPTIONS ABOUT THE SEASONAL FISHERY CLOSURE (SFC)

(Municipal fishers, Fish dyers, Fish traders/fish brokers, LGU reps, FW, PNP-MG/PCG)

8. Are you aware that an SFC is implemented in the Visayan Sea? 1 – Yes 2 – No
(*Kabalo ka bala nga may ara SFC nga gina-implementar sa Visayan Sea?*) (*1 – Huo*) (*2 – Indi*)
9. What is the purpose of the SFC? (*Ano ginatuyo sang SFC?*)

10. The SFC applies to (*Ang SFC para sa*):
1- Municipal fishers 2 - Commercial fishers 3 - Both
(*1- Munisipal nga mga mangisingisda 2 – Komersyal nga mga mangisingisda 3 – Parehos*)
11. What species are banned for fishing during the SFC in the Visayan Sea?
(*Ano ang mga isda nga ginadilian dakop sat ion sang SFC?*)
1- Sardines 2 - Mackerels 3 – Both 4 – Other species

(*1- Tamban, Tabagak 2 – Alumahan, Hasa-hasa 3 – Parehos 4 – Iban nga isda*)

12. What months of the year are covered by the SFC in the Visayan Sea (*Ano nga mga binulan gina-implementart ang SFC sa Visayan Sea?*)

Jan (Ene)	Feb (Peb)	Mar (Mar)	Apr (Abr)	May (May)	Jun (Hun)	Jul (Hul)	Aug (Ago)	Sep (Set)	Oct (Okt)	Nov (Nob)	Dec (Des)

13. What are the penalties for violation of the SFC? (*Ano ang pena sa biolasyon sa SFC?*)

- 1 - Imprisonment of 6 months and 1 day to 6 years (*6 nga bulan kag 1 ka adlaw asta 6 ka tuig nga pagpreso*)
- 2 - Fine of PhP 6,000 (*Multa nga gabalor PhP 6,000*)
- 3 - Confiscation of catch (*Pagkumpiska sa hulik*)
- 4 - Cancellation of fishing permit or license (*Pagkansela sa fishing permit o kun lisensya*)
- 5 - Other answers (*Iban nga sabat*) _____

Please encircle the number that corresponds to the extent you agree or disagree with the following statements.
(*Palihog bilugan ang numero sang sabat nga nagakaangay sa imo pagpati o kun pagdumili sa hambalanun*)

Choices: *strongly agree 5; somewhat agree 4; neutral 3; somewhat disagree 4; strongly disagree 1*
(*Mga pilian: Nagapati guid ako 5; Medyo gapati ako 4; Nyutral 3; Medyo wala ako gapat 4; Wala guid ko gapati 1*)

(Municipal fishers, Fish dryers, Fish traders/ fish brokers, LGU reps, FW, PNP-MG/PCG)

- | | | | | | |
|--|---|---|---|---|---|
| 14. There is sufficient and accurate information in support of the implementation of the SFC in the Visayan Sea (<i>May ara supisyente kag tsakto nga impormasyon sa pagimplementar sang SFC</i>). | 5 | 4 | 3 | 2 | 1 |
| 15. There are opportunities for consultation and dialogue with the different stakeholders about the SFC (<i>May ara mga oportunidad para sa konsultasyon kag dialogo kaupod ang mga nagkalain-lain nga stakeholders parte sa SFC</i>). | 5 | 4 | 3 | 2 | 1 |
| 16. The SFC is <u>strictly</u> implemented in our municipality (<i>Ang SFC ay strikto gid nga gina implementar sa amon munisipalidad</i>). | 5 | 4 | 3 | 2 | 1 |
| 17. The SFC is <u>strictly</u> implemented in other municipalities (<i>Ang SFC ay strikto gid nga gina implementar sa iban nga munisipalidad</i>). | 5 | 4 | 3 | 2 | 1 |
| 18. The implementation of the SFC is necessary for the conservation of fisheries (<i>Kinahanglan gd ang implementasyon sang SFC para sa pagkonserbar sang pangisdaan</i>). | 5 | 4 | 3 | 2 | 1 |
| 19. There is an observed increase in the catch of sardines in the last 5 years (<i>May naobserbahan nga pagdamo sang hulik sang tuloy/tabagak sa nagligad nga 5 ka tuig</i>). | 5 | 4 | 3 | 2 | 1 |
| 20. There is an observed increase in the catch of mackerels in the last 5 years (<i>May naobserbahan nga pagdamo sang hulik sang alumahan/hasa-hasa sa nagligad nga 5 ka tuig</i>). | 5 | 4 | 3 | 2 | 1 |
| 21. I am benefitting from the SFC (<i>Nagabenepisyo ako sa SFC</i>). | 5 | 4 | 3 | 2 | 1 |
| 22. The SFC should be continued (<i>Kinanglang padayunon ang SFC</i>). | 5 | 4 | 3 | 2 | 1 |
| 23. The provisions of the SFC should be revised (<i>Kinaglan bag-uhon ang mga probisyon sang SFC</i>). | 5 | 4 | 3 | 2 | 1 |

SOCIO-ECONOMIC, CULTURAL, AND POLITICAL IMPACTS OF THE SC
(Municipal fishers)

24. What are the *lean, average, peak* months in a year (*Ano nga mga binulan nga tig-kiliwi, tama-tama lang kag tig-bawi*)?
25. How many days per month do you fish during *lean, average and peak* months (*Pila ka adlaw kada bulan kamo naga-pangisda kung tig-kiliwi, tama-tama lang kag kung tig-bawi*)?
26. What are the fishing gears do you use during *lean, average and peak* months (*Ano nga mga gamit pangisda ang inyo gina-usar kung sa mga binulan sang tig-kiliwi, tama-tama lang kag tig-bawi*)?
27. What species do you catch during *lean, average and peak* months (*Ano nga mga sahi/klase sang isda ang inyo makuha sa mga binulan sang tig-kiliwi, tama-tama lang kag tig-bawi*)?
28. What is your estimated income per day during *lean, average and peak* months (*Sa imo pagbanta, pila ang imo kita sa kada adlaw sa mga binulan sang tig-kiliwi, tama-tama lang kag tig-bawi*)?
29. What is your estimated catch per day during *lean, average and peak* months (*Sa imo pagbanta, pila ka kilo ang imo hulik sa isa ka adlaw*)?

Month	L: lean (<i>tig-kiliwi</i>); A: average (<i>tama-tama</i>); P: peak (<i>tig-bawi</i>) (24)	No of days/ month (<i>Pila ka adlaw/bulan</i>) (25)	Fishing gears used (<i>Gamit pangisda</i>) (26)	Species Caught (<i>Sahi sang hulik</i>) (27)	Estimated catch/ operation (<i>Hulik sa banta/adlaw</i>) (28)	Estimated income/day (<i>Kita sab anta/adlaw</i>) (29)
Jan						
Feb						
Mar						
Apr						
May						
Jun						
Jul						
Aug						
Sep						
Oct						
Nov						
Dec						

30. Do you continue fishing during SFC (*Naga-sige ka sigihapon pangisda bisan SFC*)? (fishers only)
1 – Yes (*Huo*) 2 – No (*Indi/wala*)

30.1. If Yes (*Kung huo*) → Where (*sa diin*) (show graded map)?

31. Are you allowed to fish in other municipalities (*Gina tugutan kamo mangisda sa iban nga munisipalidad*)?
1 – Yes (*Huo*) 2 – No (*Indi/wala*)

31.1. If yes, where (*Kung huo, sa diin*)?

(Municipal fishers, Fish dryers, Fish traders/fish brokers)

32. Is your livelihood affected by the SFC (*Gaka-apektohan ang imo pangabuhian tungod sa SFC*)? 1 – Yes (*Huo*) 2 – No (*Indi/wala*)

33.1. If Yes, how (*Kung hu, sa diin*)? _____

33.2. How does this affect your household (*Paano nagaka-apektohan sang SC ang inyo panimalay*)? (e.g., migration (*pag-saylo puluy-an*), change in gender roles in the household (*pag-bago sang buluhaton sang lalake kag babaye*), etc.)

33. How do you cope with the impacts of the SFC (*Paano mo gina-kaya ang epekto sang SFC*)?

34. Do you have secondary sources of livelihood (*Luwas sa pangisda, may iban pa ikaw nga ginakuha-an sang pangabuhian*)? 1 – Yes (*Huo*) 2 – No (*Wala*)

34.1. If Yes, please enumerate (*Kung may ara, palihog lista*) _____

35. How do you compare your income from fishing/fishing-related activity during open and SFC (*Paano mo makomparar ang imo kita halin sa pagpangisda o kun mga buluhaton nga may koneksyon sa pagpangisda sa mga binulan sa tion sang open o SFC*)?

Season (<i>Panahon</i>)	Higher (<i>Mataas</i>)	Lower (<i>Manubo</i>)	The same (<i>Parehos lang</i>)
Open	3	2	1
Closed	3	2	1

(Municipal fishers, Fish dryers, Fish traders/fish brokers LGU reps, FW, PNP-MG/PCG)

36. Is there any alternative livelihood provided during the SFC (*May ara bala iban nga alternatibo nga pangabuhi-an nga ginhatag sa ti-on sang SFC*)?

1 – Yes (*Huo*) 2 – No (*Indi*)

36.1. If Yes, what kind of livelihood and from which organization (*Kung may ara, anu nga klase sang pangabuhi-an kag anu nga organisasyon*)?

Livelihood (<i>Pangabuy-anan</i>)	Sponsoring organization (<i>Ang naghatag nga organisasyon</i>)

36.2. Are there alternative livelihoods provided able to augment your income (*May ara bala nga alternatibo ngapalangabuhi-an nga gin hatag sa pag padaku sang inyo kita*)?

(Municipal fishers, Fish dryers, Fish traders/fish brokers)

1 – Yes (*Huo*) 2 – No (*Indi*)

(Municipal fishers, Fish dryers, Fish traders/fish brokers, LGU reps, FW, PNP-MG/PCG)

37. What are the problems/challenges experienced by the community during the different months of the year (*Anu ang mga problema/upang nga na agyan sa komunidad sa ti-on sang naga kalain-lain nga binulan sang tu-ig*)?

Problems/challenges (<i>Problema/upang</i>)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

38. Are there cultural beliefs and practices in your municipality that are affected by the implementation of the SFC (*May ara bala sang mga gina patihan kag gina praktis sa inyo munisipalidad nga naga kaapekto o kung aka apektohan sa pag implementar sang SFC*)?

1 – Yes (*May ara*) 2 – No (*Wala*)

38.1. If Yes, please cite examples (*Kung may-ara, lihog hatag sang halimbawa*)

39. Is the SFC implemented in your municipality (*Ang SFC gin implementar bala sang inyo municipalidad*)? 1 – Yes (*Huo*) 2 – No (*Indi*)

If Yes (*Kung hu*o),

39.1. Are municipal fishing boats included in the fishing ban (*Ang munisipalidad nga baroto sa pag pangisda nadala bala sa fishing ban?*)? 1 – Yes (*Huo*) 2 – No (*Indi*)

39.2. Are commercial fishing boats included in the fishing ban? (*Ang komersyal nga baroto sa pag pangisda nadala bala sa fishing ban?*)? 1 – Yes (*Huo*) 2 – No (*Indi*)

39.3. What is the level of compliance among fishers in your municipality (*Anu ang lebel sa pag sunod sang mangingisda sa inyo munisipalidad?*)?

Fishers	Very high compliance	Moderate compliance	Moderately low compliance (<i>Medyo</i>)	Very low compliance	0 compliance (<i>Wala nagasunod</i>)
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	<i>(Nagasunod guid)</i>	<i>(Medyo nagasunod)</i>	<i>manubo nga pagsunod)</i>	<i>(Manubo nga pagsunod)</i>	
Commercial (Komersyal)	5	4	3	2	1
Municipal (Munisipal)	5	4	3	2	1

40. What is the reason for your rating (*Anu ang rasun sa imu pag grado*)?

41. What are the challenges encountered in the implementation of the SFC in your municipality (*Anu ang mga upang nga nasugata sa pag implementar sang SFC sa inyo munisipalidad*)?

42. Are you in favor of the SFC (*Pabor ka bala sa SFC*)?

1 – Yes (*Huo*) 2 – No (*Indi*)

43. What are the things you agree and don't agree about the SFC (*Anu ang mga butang nga imu gina tugutan kag wala gina tugutan parti sa SFC*)?

Things you agree about CS <i>(Mga butang parte sa SFC nga nagasugot ka)</i>	Things you don't agree about CS <i>(Mga butang parte sa SFC nga wala ka nagasugot)</i>

44. Will you support revisions in its provisions (*Ma suportar ka bala sa revisions kag sa provisions*)?

1 – Yes (*Huo*) 2 – No (*Indi*)

44.1. If Yes, in what aspect (*Kung Huo, sa anu nga aspeto*)?

45. Do you follow the SFC (*Naga sunod ka bala sa SFC*)?

1 – Yes (*Huo*) 2 – No (*Indi*) 3 – Sometimes (*Kun kis-a*)

46. What is the biggest motivation in following or not following the SFC (*Anu ang daku nga rasun nga nag inganyo sa pag sunod ukon wala nag sunod sa SFC*)?

Motivation for following (<i>mga rason nga naga-inganyo sa pagsunod sa SFC</i>)	Motivation for not following (<i>mga rason nga naga-inganyo sa hindi pagsunod sa SFC</i>)

(Municipal fishers, Fish dryers, Fish traders/fish brokers, LGU reps, FW, PNP-MG/PCG)

47. Have you ever been apprehended for violating the SFC (*Naka agi ka bala nadakpan sa pag lapas sang SFC*)?

1 – Yes (*Huo*) 2 – No (*Indi*)

If Yes (*Kung hu*):

48.1. Who apprehended you (*Sin-o naka dakop sa imu*)? _____

48.2. How was the case handled (*Anu natabo sa kaso*)? _____

48.3. What was the penalty (*Ano ang multa*)? _____

48.4. Who were the people/agencies that handled it (*Sin-o ang mga tawo ukon ahensya nga nag pangamot sa kaso*)?

48.5. Who helped you (*Sin-o nag bulig sa imu*)? _____

48. Do you know anyone who has been apprehended for violating the SFC (*May ara ka bala sang nabal-an nga nag lapas sang SFC*)? 1 – Yes (*Huo*) 2 – No (*Indi*)

48.1. If Yes, was the offender from (*Kung Oo, taga diin*)?

1 - your municipality (*sa inyo munisipalidad*) 2 – other municipality (*sa iban nga munisipalidad*)

49. Can you give 5 words which you can think about, or you associate with, the SFC? (*Maghatag sang lima ka tinaga kung sa diin sa pamatyag mo kag sa imu ka updanan ang parti sa SFC*)?

_____	_____
_____	_____
_____	_____

APPENDIX E. INTERVIEW CODES

Value	Variable Values		Label
Gender	1		Female
	2		Male
Status	1		Single
	2		Married
	3		Co-habit
	4		Separated
	5		Widow/Widower
Ethnicity	1		Ilonggo
	2		Davaoeña
	3		Waray
	4		Cebuano
	5		Negrosanon
	6		Bantayanon
	7		Lawisnon
	8		Cadiznon
	9		Sarabiahanon
	10		Bisaya
	11		Sorsogeoño
	12		Roxasnon
	13		Capiznon
	14		Masbateño
Respondent group	1		Municipal fisher
	2		Fish dryer
	3		Fish vendor/Fish trader/Fish broker
	4		LGU representative
	5		Fish warden
	6		PNP-MG/PCG
Educational attainment	1		Elem level
	2		Elem grad
	3		Hs level
	4		Hs grad
	5		Coll level
	6		Coll grad

	7	Vocational
	8	Post grad
Municipality	1	Carles
	2	Estancia
	3	Concepcion
	4	Ajuy
	5	Bantayan
	6	Madrideojos
	7	Cadiz City
	8	E.B. Magalona
	9	Escalante City
	10	Milagros
	11	Cawayan
	12	Roxas City
Boat type	1	Motorized
	2	Non-motorized
	3	NA
Are you a registered fisher?	1	Yes
	2	No
Are you aware that an SFC is implemented in the Visayan Sea?	1	Yes
	2	No
Q9. Score	0	Wrong answer
	1	Correct answer
Who are included in the SFC?	1	Municipal fishers
	2	Commercial fishers
	3	Municipal and commercial fishers
	4	No answer/No idea
Q10.Score	0	Wrong answer
	1	Correct answer
What species are banned from fishing during SFC in the Visayan Sea?	1	Sardines
	2	Mackerels
	3	Sardines and mackerels
	4	Other species
	5	No answer
Q11.Score	0	Wrong answer
	1	Correct answer
What months of the year are covered by the SFC in the Visayan Sea?	0	Other months
	1	Nov-Feb

Q12.Score	0	Wrong answer
	1	Correct answer
What are the penalties for violation of the SFC?	1	Imprisonment
	2	Fines
	3	Forfeiture of catch
	4	Cancellation of fishing permit of license
	5	Other answers
	6	No answer/No idea
Q13.Score	0	No idea/No answer
	1	1 pt
	2	2 pts
	3	3 pts
	4	4 pts
There is sufficient and accurate information in support of the implementation of the SFC in the Visayan Sea.	1	Strongly disagree
	2	Somewhat disagree
	3	Neutral
	4	Somewhat agree
	5	Strongly agree
There are opportunities for consultation and dialogue with the different stakeholders about the SFC.	1	Strongly disagree
	2	Somewhat disagree
	3	Neutral
	4	Somewhat agree
	5	Strongly agree
The SFC is strictly implemented in our municipality.	1	Strongly disagree
	2	Somewhat disagree
	3	Neutral
	4	Somewhat agree
	5	Strongly agree
The SFC is strictly implemented in other municipalities.	1	Strongly disagree
	2	Somewhat disagree
	3	Neutral
	4	Somewhat agree
	5	Strongly agree
The implementation of the SFC is necessary for the conservation of fisheries.	1	Strongly disagree
	2	Somewhat disagree
	3	Neutral
	4	Somewhat agree

	5	Strongly agree
There is an observed increase in the catch of sardines in the last 5 years.	1	Strongly disagree
	2	Somewhat disagree
	3	Neutral
	4	Somewhat agree
	5	Strongly agree
There is an observed increase in the catch of mackerels in the last 5 years.	1	Strongly disagree
	2	Somewhat disagree
	3	Neutral
	4	Somewhat agree
	5	Strongly agree
I am benefitting from the SFC.	1	Strongly disagree
	2	Somewhat disagree
	3	Neutral
	4	Somewhat agree
	5	Strongly disagree
The SFC should be continued.	1	Strongly disagree
	2	Somewhat disagree
	3	Neutral
	4	Somewhat agree
	5	Strongly agree
The provisions of the SFC should be revised.	1	Strongly disagree
	2	Somewhat disagree
	3	Neutral
	4	Somewhat agree
	5	Strongly agree
Do you continue fishing during the SFC?	1	Yes
	2	No
Is your livelihood affected by SFC?	1	Yes
	2	No
	3	NA
Do you have secondary sources of livelihood?	1	Yes
	2	No
	3	NA
Is there any alternative livelihood provided during the SFC?	1	Yes
	2	No
	3	NA
	4	No answer/No idea

Are the alternative livelihoods provided able to augment your income?	1	Yes
	2	No
	3	NA
	4	No answer
Are there cultural belief and practices in your municipality that are affected by the SFC?	1	Yes
	2	No
	3	Not sure
	4	No answer
Is the SFC implemented in your municipality?	1	Yes
	2	No
	3	NA
	4	No answer/No idea
Are commercial fishing boats included in the fishing ban?	1	Yes
	2	No
	3	NA
	4	No answer/No idea
Are commercial fishing boats included in the fishing ban?	1	Yes
	2	No
	3	NA
	4	No answer/No idea
What is the level of compliance among commercial fishers in your municipality?	1	0 compliance
	2	Very low
	3	Moderately low
	4	Moderately high
	5	Moderately high
What is the level of compliance among municipal fishers in your municipality?	1	0 Compliance
	2	Very low
	3	Moderately low
	4	Moderately high
	5	Very high
Are you in favor of the SFC?	1	Yes
	2	No
Do you follow the SFC?	1	Yes
	2	No
	3	Sometimes
	4	No answer
	5	NA
	1	Yes

Have you been apprehended for violating the SFC?	2	No
Age group	1	17 and under
	2	18-30
	3	31-40
	4	41-50
	5	51-60
	6	61-70
	7	71 and over
% income from fishing and fishing-related activities	1	< 50
	2	51-60
	3	61-70
	4	71-80
	5	81-90
	6	91-100
Household size	1	1-3
	2	4-6
	3	7-10
	4	11 and above
Years of residency	1	< 5
	2	6-15
	3	16-25
	4	26-35
	5	36-45
	6	46 and over
No of boat crew	1	1-3
	2	4-6
	3	7-10
	4	11 and over
Q8. Score	0	No
	1	Yes
No of fishing days_Lean months	0	0
	1	1-7 days
	2	8-14 days
	3	15-21 days
	4	22-30 days
No of fishing days_Peak Months	0	0
	1	1-7 days

	2	8-14 days
	3	15-21 days
	4	22-30 days
Knowledge Category	1	Very Poor
	2	Poor
	3	Fair
	4	Good
	5	Excellent
Catch _Lean months	1	1-10 kgs
	2	11-20 kgs
	3	21-30 kgs
	4	31-40 kgs
	5	41-50 kgs
	6	51-60 kgs
	7	61-70 kgs
	8	71-80 kgs
	9	81-90 kgs
	10	91-100 kgs
	11	over 100 kgs
Catch_Peak months	1	1-10 kgs
	2	11-20 kgs
	3	21-30 kgs
	4	31-40 kgs
	5	41-50 kgs
	6	51-60 kgs
	7	61-70 kgs
	8	71-80 kgs
	9	81-90 kgs
	10	91-100 kgs
	11	over 100 kgs
Income_Lean months	1	below PhP 275 (min. wage)
	2	PhP 276-500
	3	PhP 501-1,000
	4	PhP 1,001-1,500
	5	PhP 1,501-2,000
	6	PhP 2,001-2,500
	7	PhP 2,501-3,000
	8	above PhP 3,000

Income_Peak months	1	below PhP 275 (min. wage)
	2	PhP 276-500
	3	PhP 501-1,000
	4	PhP 1,001-1,500
	5	PhP 1,501-2,000
	6	PhP 2,001-2,500
	7	PhP 2,501-3,000
	8	above PhP 3,000
	1	Selected
Respondent Group	1	Regulated group
	2	Regulator's group