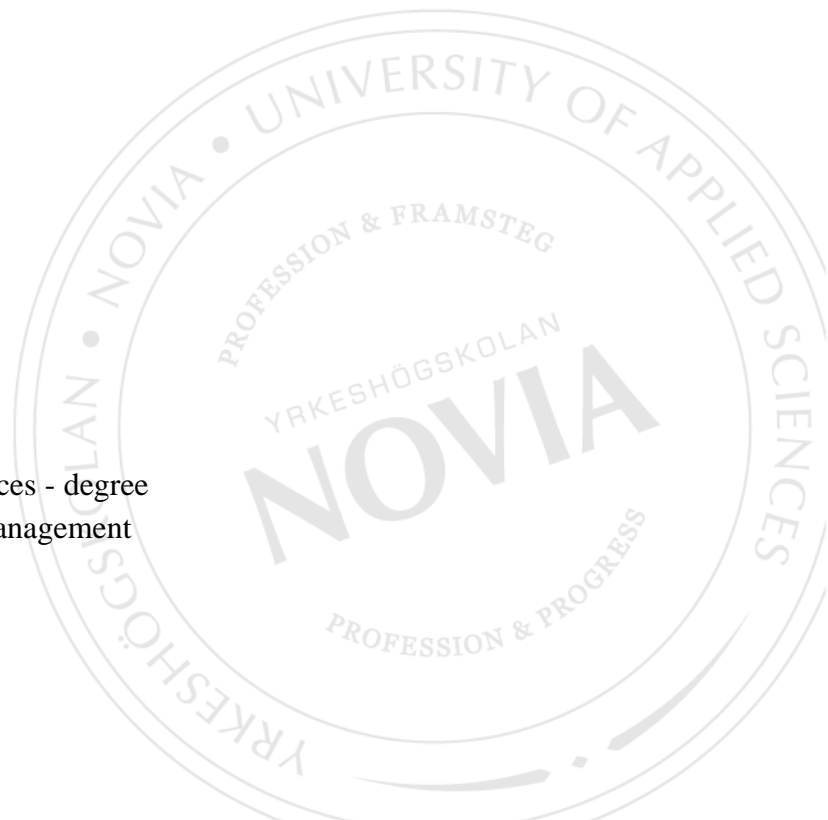




Why artisanal fisher folks are selective with compliance of fisheries laws in Ghana?

A case of legitimacy and need for food security

Author: Priscilla Osei
Thesis for Novia University of Applied Sciences - degree
Degree Programme of Sustainable Coastal Management
Raseborg/Raasepori, 2017



BACHELOR'S THESIS

Author: Priscilla Osei

Degree Programme: Sustainable Coastal Management

Supervisors: Anna Granberg and Najir Lazar

**Title: Why artisanal fisher folks are selective with compliance of fisheries laws in Ghana?
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Date: Number of pages: 45

Appendices: 1

Summary

The demand for fish product in Ghana is always increasing due to the use of fishing delicacies and its high level of protein. Fish is being illegally fished using some methods such light fishing and the use of monofilament nets. These methods to some extent have over exploited some fish stocks. This research focuses on the description and understanding the mismatch between fisher folk's compliance of specific regulations 'light fishing' and the use of monofilament nets. A survey of 50 fishermen and 50 fish processors was completed and data from this study was used to understand the mismatch with legitimacy and compliance of 2010 fisheries regulation in Ghana. The result showed that most fishermen were aware of the fisheries regulations and knew that 'light fishing' was illegal and a threat to their livelihood. Whereas the fish processors, were not aware about the fisheries regulations of Ghana 2010 and testified that the decrease in fish stock would not be much of a threat to their livelihood since import frozen fish was always available for processing. In conclusion, although most fishermen have some knowledge of the laws, they still violate them. The scarcity of fish and need of minimal livelihood resources seem to be the driving force for fishermen to break the law. Women processors tend to adopt the social learning theory and deterrence model of compliance in fisheries laws in Ghana. However, fishermen tend to believe in legitimacy model in compliance in fisheries regulation.

Language: English **Key words:** landing beach, artisanal fishermen, compliance, legitimacy

ACKNOWLEDGEMENT

I thank the Almighty God for my life and taking me through the challenges I faced during my studies.

I would like to express my sincere gratitude to my supervisor Anna Granberg, who has been a great inspiration to me throughout my studies. Also, big thanks go to Maria Kihlström, Veronika Bäckman, Soile Gustafsson and all the staffs in Sustainable Coastal Management for making an impact in my life.

I would like to show my profound appreciation Dr Brian Crawford(Chief of Party) and Najih Lazar, Senior fisheries advisor at Coastal resource Centre, University of Rhode Island for the support and supervision throughout my internship and thesis writing and all the staffs working in USAID Sustainable fisheries management project, Ghana.

I would like to thank my family for supporting me regardless the situation and, to all my friends especially Nasir Kofi Essuman for making an impact in my life.

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1 Introduction

One billion people depend on seafood as their primary source of protein and 25% of the world's total animal protein comes from fisheries (Pomeroy, 1998). Marine fisheries resources are the most traded commodities in the world and are of immense socio-economic importance, especially to coastal people. The West Africa waters are endowed with one of the world's largest concentration of highly cherished fish, crustaceans and molluscs, which are exploited by various categories of fishing groups in the fishing industry (Falaye, 2008).

In Ghana, with a coastline of 550 km, the fisheries sector plays a very important role in providing sustainable livelihoods, poverty reduction, food security and foreign exchange earnings to several hundred thousand households and hundreds of communities (MOFA, 2013). Fish is one of the country's most important non-traditional export commodity and the fisheries sub-sector accounts for about 5 percent of the agricultural GDP. Export earnings from fish and fishery products on average account for approximately 60 million US Dollars annually (MOFA, 2016). Ghana's fish production comes from two main sources; marine and inland.



Figure 1 Map of Ghana.

Fish catch from the marine sector constitutes about 85% of total domestic fish production. The marine fishery sector has four fishing fleets; namely artisanal (canoes), inshore, industrial and tuna fleets (FAO, 1998). The Ministry of Fisheries and Aquaculture is responsible for the management of fisheries in their respective jurisdictions.

The activities in the marine sector range from artisanal canoe operations through inshore to industrial operations. Both pelagic and demersal fishery resources are exploited. Marine fisheries in Ghana are affected by a seasonal upwelling that occurs in Ghanaian coastal waters. During upwelling periods (December/January–February and July–September) biological activity increases in the sea which results in an increased production of fish food and abundance

of most marine fishes. These periods are the main fishing seasons in Ghana.

Fishery resources can be classified as:

- small pelagic species (sardinellas, anchovies and mackerel)
- large pelagic species (tuna and skipjacks)
- Demersal species or bottom fish (red fish, groupers, snappers, soles, cuttlefish, octopus, etc.)

The average production is about 400,000 tons per year with a value of over \$300 million and total revenue of about \$1 billion per year. The fisheries sector provides about 200,000 direct jobs and over 2 million jobs in the indirect industries (fish processing, marketing, transportation, boat building, etc.).

However, the fisheries resources have experienced a state of overfishing as a result of excess fishing capacity (number of boats) and increase in the number of fishermen.



Figure 2 Canoes at Tema Harbor landing beach

In recent times, there are a very high number of fishers obtaining very little returns (King, 2007). Biomass, density and catch rates of demersal species experienced a decline from 1933 to 1997 (Quartey, 2004). Indeed, many experts agree that the exploitation limit of marine resources has been reached, if not exceeded, and that this overcapacity of fleets, excessive fishing quotas,

illegal fishing practices and the generally poor management of most fisheries are to blame. This is to say, weak governance, illegal fishing methods among others have contributed partly the depletion of fish stocks in Ghana. Some fishermen have adopted the use of unsustainable fishing methods including but not limited to light fishing, Carbide, Cyanide, Dynamite fishing, insecticides and other obnoxious substances (Yamoah, 2012).

Fishing regulations are directives made to regulate and conserve the marine resources in a country or a specific region. Its aim is to prevent lawlessness and disorder on marine resources. In 2010, a Fisheries Regulation of Ghana was passed to support the existing Fisheries Act, Act 625 of 2002. However, with the passage of this law, effective mechanisms have not been put in place to enforce the laws and promote voluntary compliance and effective enforcement of the law (Yamoah, 2012). There seems to be little or no recognition of how policies and the policy process may affect the extent of compliance with regulations. Policy analysis and formulation frequently assume perfect compliance can be achieved at no cost. Yet, when things go wrong, as they often do, enforcement is cited as one of the principal reasons for failure, and more and better enforcement is demanded. (Sutinen, 1999) However, the problem relies on compliance not enforcement capabilities.

A common assumption is that the fishermen are aware of, and understand how to comply with a law or regulation when it is enacted. However, this basic assumption is unrealistic with an artisanal, dispersed and poor population involved at all aspects of the fisheries value chain. The responsibility of policymakers does not end with the enactment of regulatory law. New regulations may need to be accompanied by information campaigns in order to ensure that they are brought to the notice of and made comprehensible to the target population.

In this paper, I address some aspects of regulatory compliance in the fisheries sector in Ghana and why fishermen seem to disregard the laws with particular focus on a practice often too common with fishermen but illegal under the 2010 fisheries regulation in Ghana, known as light fishing and monofilament net susage.

1.1 Research Objectives

- Assess the level of knowledge of fisher folks on prohibited fisheries methods and its penalty or punishment.
- Investigate social factors affecting compliance to Section 11 of the Fisheries Regulation of Ghana (Prohibited fishing methods).
- Propose ways forward on how to reduce the risk of policy failure through increased compliance.

The **Section 11.1** of the Fisheries Regulation of Ghana (2010) states that;

“A person shall not within the fishery waters of this country

- a. Use any fishing method that aggregates fish by light attraction including use of portable generator, switchboard, bulbs beyond 500 watts or bulbs whose cumulative light intensity attracts fish and long cable to facilitate light production or any other contrivance for aggregating fish by light”.
- b. Use bamboo for aggregating fish
- c. Use explosives, obnoxious chemicals and any other prohibited fishing methods which render fish more easily caught; or
- d. Operate pair trawling.

The **section 8.1.b** and **c** of the fisheries Regulation of Ghana (2010) states that a person shall not use a monofilament set net the mesh size of which is less than seventy-five millimeters in stretched diagonal length in a river system or a monofilament set net in the marine waters.

It is assumed that most fishers refuse to comply with the light fishing and monofilament regulation among others, due to declining catches and fish stocks. Fishers argue that it is the only way they can catch fish and that their inability to resort to these prohibited methods could result in their inability to fend for their families without use of light fishing. The use of light to aggregate fish has contributed to over-exploitation small pelagic and other species as it is highly effective at attracting and catch fish and one of the reasons why it is banned. The artisanal fishery resource will likely run into extinction and subsequently deepen poverty and increase the rate of unemployment in fishing communities if the overfishing continues. (Akpalu, 2002)

According to Bannerman & Quartey (2004) the reduced catches over the past couple of years, especially with the canoe fishers have caused them to accuse the inshore operators of light fishing as the reason for their declining catches. They reason that the light detains the fish further off-shore thus preventing the fish from coming down into their area of operation. The sections of the law that seek to regulate fishing methods have seen fierce resistance from some fishers, yet adequate communication channels and platforms has not been created for stakeholders and fisher folks to participation in the implementation of the laws (Yamoah, 2012). The lack of monitoring and controlling of artisanal fishers has hindered the ability to understand the extent of decline in Ghana's fishing sector.

There are generally gaps in the knowledge about submerged light fishing and there is lack of scientific understanding by fisher folks of how light fishing affects their fisheries and trade. There is also the question of quality of the fish caught with the light. Most operators in the canoe fishery believe that the process of forcing the fish from the depths suddenly to the surface may be the cause of the eviscerated and bloody appearance of the light attracted landings which subsequently lowers the price of the fish on the market and by association, lowers the price of the canoe catch (Bannerman & Quartey, 2004).

Not much research has been done on light fishing as an aggregating tool and use of monofilament net in Ghana's artisanal fisheries. The Fisheries Scientific and Statistical Division were tasked to find out any operational deficiencies in the light fishing practice that could be brought into the management sphere. The aim was to bring sanity and efficiency to the fishing industry and to come out with a report which may be used in managing the activities of the light fishing operators (Bannerman & Quartey, 2004). There is need to describe the light operation in the Ghanaian fishing industry which has not been documented in any academic or technical literature.

This study therefore focuses on the description and understanding the mismatch between fishermen compliance to Section 11 of the Fisheries Regulation, 2010 of Ghana which talks about prohibited fishing methods. This study would help them manage conservation of Ghana's fisheries resource.

2 Literature Review

This chapter seeks to investigate the principles and practices in the area of marine resources, fisheries livelihoods and the theoretical link between regulatory compliance and artisanal fisher folks. The chapter will define the major terms used in the study from various authors and narrows the definitions down in terms of relevance to the present study. Literature is reviewed on similar works done and finally ends with a look of the situation as pertaining to Ghana.

2.1 Marine Resource

2.1.1 Artisanal Fisheries

Artisanal fishing or traditional/subsistence fishing includes various small-scale, low technology, low-capital, fishing practices undertaken by individual fishing households as opposed to commercial companies. This mainly occurs on islands and coastal countries. Most of the countries involved are in the African and Asian continents; they include Mozambique, Ghana, Thailand, Indonesia, Seychelles, China and Vietnam etc.



Figure 3 Picture of Canoes

Most artisanal fishermen make short overnight fishing trips close to the shore. Their produce is usually not processed and is mainly for local consumption. Artisan fishing uses traditional fishing techniques such as rod and tackle, drift nets and harpoons, cast nets, and small traditional fishing boats (Pauly. D, 2006).

Artisanal fishermen are, however, often influenced by traditions associated with gear that is either condoned or not by elders (Ruddle 1996; McClanahan et al. 1997). Understanding the selectivity of the fishing gears combined with traditional values could be particularly important for management because the gear will influence catch composition and the size and frequencies of target species (Wright & Richards 1985; Gobert 1994; Stergiou et al. 1996) Also the artisanal fisheries in the Ghana, policies are formulated to ensure sustainable management of fishery resources in Ghana have the aim of benefitting both men and women in the same manner without paying much attention to the differences in the needs of both groups. In the end, these policies tend to inure to the benefit of the men more than the women (Amu, 2005). Even in the fishing communities, the formulation of rules tends to be skewed towards the benefit of the fishermen than the fish processors (most of whom are women). (SFMP, 2016) However, overall leadership lies with male groups with the chief fisherman and his council, who are all men, playing a supervisory role (Torell, Owusu, & Okyere-Nyako, 2015). This is strongly linked to leadership or the power embedded in gender relations in the form of male dominance and female subordination (Duerst-Lahti & Kelly, 1995). Autonomy is not absolute. This mostly leads to the views of the women being side-lined in the management of the fishery resources. This has implications not only at the community level but also at the national level, making resource management incomplete ((Torell, Owusu, & Okyere-Nyako, 2015).

2.1.2 Characterization of Fishing Gears

The artisanal fishery in Ghana is characterized by the use of several gears. These include purse seine nets, beach seine net, set nets, drifting gillnets and hook and line. These gears are operated from dugout canoes. There are over 11,200 canoes and more than 124 000 fishers operating actively from over 16,300 landing sites located along the entire 550 km length of the coastline. About 50 percent of these canoes are powered by outboard motors with engine power of up to 40 horsepower (Amador et al., 2006).

Various artisanal gears target different resources: the artisanal purse seines and beach seines are exploiting mainly small pelagic. Purse seines are used to exploit adult sardinellas and chub mackerel during the upwelling periods when these species move into coastal waters to spawn. During the non-upwelling periods, anchovies and juvenile sardinellas in coastal waters are targeted with this gear. Beach seines are operated from the beach and exploit adult sardinellas, during the upwelling periods and anchovies and juvenile sardinellas during the non-upwelling periods. The artisanal sector accounts for about 90 percent of total landings of the small pelagic resources (E. Bennet, 2004).

Hook and line and beach seines are the main artisanal gears used to exploit demersal resources. Hook and line canoes operate in deep waters of about 80 meters on hard bottoms. Some of the hook and line canoes have facilities for storing ice to preserve fish and are therefore capable of staying up to three days at sea. They target sea breams (mainly *Dentexgibbosus*, *Pagruscaeruleostictus* and *Dentexcanariensis*) snappers (*Lutjanusfulgens*, *Lutjanusgoreensis*) and groupers (*Epinephelusaeneus*).

The beach seine exploits both adult and juvenile demersal fish but mainly juvenile fish. Some of their target species include burrito (*Brachydeuterusaenoides*), red snapper (*Lutjanusfulgens*), grey snapper (*Lethrinusatlanticus*), mullet (*Pseudupeneusprayensis* and *Mugil* spp.) and ribbonfish (*Trichiuruslepturus*). The artisanal sector accounts for about 50 percent of total demersal fish landings annually (Amador et al, 2006). Drifting gillnets are used offshore to exploit mainly large pelagics such as sharks (*Carcharhinus* spp.) tunas (*Thunnusalbacares*, *Thunnusobesus*) sailfish (*Istiophorusalbicans*) and swordfish (*Xiphiasgladius*).

Artisanal gears are also used to exploit molluscs and crustaceans. Until 1983, the beach seines were the main exploiter of cuttlefish in Ghanaian waters; accounting for over 60 percent of landings annually. Currently, the industrial trawlers account for over 80 percent of landings annually (NAFAG, 2007).

Beach seines are used to exploit shrimps mainly *Parapenaeopsisatlantica* and *Penaeuskerathurus* (both adult and juvenile) and juvenile *Penaeusnotialis* as they move from the estuaries into marine waters. Lobster set nets target the spiny lobster, *Panulirusregius* on rocky bottoms and in depths of about 40 m. The artisanal fishery contributes over 70 percent of total fish landings

annually (Quartey, 1997).

There are motorised canoes, which specialise in hook and line, using insulated containers and ice to preserve high valued fish. Some of these canoes are equipped with electronic fish finding devices such as echo sounders (FAO, 2007). Marine fishing enterprises in Ghana range from the very small scale (one-man) canoes through to the industrial vessels operating off shore in international waters. The Ghanaian coastal fishing fleet can be divided into four sectors: by far the largest is the small-scale fleet of artisanal canoes totalling some 8641 vessels and employing an estimated 101,000 fishers as crew. An estimated 58.7% of the canoe fleet has outboard motors (GOG, 1995).

2.2 Regulatory Compliance in Fisheries

The first compliance study carried out in Malaysia was by Kuperan & Sutinen (1998), who studied the compliance behaviour of fishermen with zoning regulations in the Malaysian Fishery. In that study, they used both the Positive Theory (Deterrent Theory) and the Normative Theory (Social Influence and Cognitive Theory) to estimate a compliance model. Based on a sample of 318 trawler fishermen, Kuperan & Sutinen included variables relating to social influence, behavioural norms and the legitimacy of regulations. They noted that, in practice, the costs of enforcing fisheries regulations resulted in relatively low probabilities of detection, but the penalties were not usually sufficiently high to produce a deterrent effect. Despite this, the authors observed that a high proportion of fishermen complied with regulations. This led them to look for other factors that explained individual compliance behaviour (Ali and Abdullah, 2010).

The researchers developed an extended model that, alongside monetary incentives, included variables such as “moral obligation” and “social influence”. In their model, moral obligation included variables related to moral norms, as well as the perceived legitimacy of the regulator and the regulations (Ali and Abdullah, 2010). The influence of power, and the imbalances that exist, are necessary to understand in the context of fisheries compliance. It is not enough to simply ‘address’ those who are not complying with laws, but a more in-depth understanding is required that focuses on the evolution of those laws in the first place, and their impact on social and economic inequities (Hauck 2007).

Fisheries are regulated to mitigate overexploitation and conflicts among user groups. The overfishing resulting from open access to fish resources is often addressed with regulations that restrict gear and vessel operations, setting of minimum fish-size limits, time and area closures and quotas, and requirement of licenses to fish (Anderson 1986; Clark 1990). User conflicts are often addressed with gear prohibitions or restrictions and zones to separate user groups. Fishermen, like most regulated economic agents, are typically controlled through monitoring, surveillance, and enforcement. Frequently the most costly element of fishery management programs, enforcement, commonly accounts for a quarter to over a half of all expenditures. Also, compliance with regulations is usually far from complete, seriously jeopardizing the effectiveness of management (Sutinen et al. 1990; Sutinen 1993). This raises questions on whether there are ways to improve the cost-effectiveness of traditional enforcement, and whether there are ways to secure compliance without heavy reliance on costly enforcement. To clarify access rights, grant legal recognition to community management and exclusive use rights to communities (usually geographically defined), governments must however be prepared to devolve management responsibilities to a community level (Kurien 2007)

2.2.1 Specific Regulations of Interest in This Study

The **Section 11.1** of the Fisheries Regulation of Ghana (2010) states that person shall not within the fishery waters of this country;

- *'Use any fishing method that aggregates fish by light attraction including use of portable generator, switchboard, bulbs beyond 500 watts or bulbs whose cumulative light intensity attracts fish and long cable to facilitate light production or any other contrivance for aggregating fish by light'.*



Figure 4 Light fishing equipment

- *‘Use explosives, obnoxious chemicals and any other prohibited fishing methods which render fish more easily caught;’ or*

The **Section 8.1.b** and **c** of the fisheries Regulation of Ghana (2010) states

- *‘A person shall not use a monofilament set net the mesh size of which is less than seventy-five millimeters in stretched diagonal length in a river system or a monofilament set net in the marine waters.’*

The penalty and punishment of illegal fishing methods are clearly stated in the fisheries act. For instance, according to section 88(3) of the Fisheries Act ‘A person who lands, sells, receives or possesses fish taken by any means which contravenes sub section (1) a and who knows or has reasonable cause to believe that the fish has been so taken, commits an offense and is liable on summary conviction to a fine of not less than

a) 250000 dollars and not more than 2 million in respect of a local industrial or semi-industrial fishing vessel or a foreign fishing vessel or

b) 25 penalty units and not more than 50 penalty units in any other case

And in addition, the catch, fishing gear or other apparatus or any combination of them used in the commission of the offence shall be forfeited to the state.



Figure 5 Weaving fishing nets

The fisheries are frequently open to access with no restrictions on entry or total catch and regularly lack even simple tools for management, such as landing records. In such poor institutional settings, individual's actions and interactions is of utmost importance to whether or not fish stocks can be sustained. The seminal contribution by Becker (1968) outlined a choice between the legal and the illegal option. The major determinant for this choice is the expected payoff, which, simply put, is a function of the risk of being punished, the expected punishment, and the net profit from violating the law. On the one hand, the management implications from the deterrence model are that monitoring must increase and that penalties must be higher. On the other hand, it is socially desirable for the enforcement policy to create marginal deterrence, which rules out the use of severe penalties for relatively mild violations such as fishing a closed area or landing fish below minimum size. If the marginal deterrence effect were to disappear, a

criminal engaged in a minor crime might as well commit a more brutal, and more profitable, crime (Persson and Siven, 2007).

Monitoring and enforcement of fisheries is costly and accounts for 25–50 per cent of the public expenditures on fisheries (Sutinen and Kuperan, 1999), which raises doubt as to whether increased monitoring and enforcement leads to social net benefits. Recent research in the social sciences also extends the deterrence model to include normative aspects of complying with the law, such as personal morality and legitimacy (Tyler, 1990; Eisenhauer, 2004). A few empirical studies of fisheries in developed or medium-developed countries have arrived at mixed evidence. Kuperan and Sutinen (1998) and Hatcher et al. (2000) found that compliance depends on both deterrence and normative variables, while Hatcher and Gordon (2005) only confirmed the deterrence effect. Arguments for the necessity and desirability of these governance reforms are built on the assumption that fisherfolk themselves, as rights holders (whether individual or communal) will have every incentive to participate in this process, as their livelihoods depend on its success. With a focus on small-scale developing-country fisheries in particular, we argue that basing the case for fishery governance reform on the assumed economic incentives for action by fishers requires a broad understanding of the factors that shape those incentives – factors that may be external to the fishery. Our argument responds to the call for an incentives based fisheries governance reform that builds on a better understanding of fishers’ economic motives for resource conservation (Grafton et al. 2006).

2.2.2 Fisheries Commission

Established under the Fisheries Commission Act 457 of 1993, and operating under the Fisheries Law PNDC Law 256 of 1991, the Fisheries Commission has the mandate of regulating and managing fishery resources and coordinating fishery policy. Specifically, the commission ensures that fisheries resources are exploited on a sustainable basis, settles disputes and conflicts among operators, advises government on all matters related to fisheries, and advocates on issues to protect, promote and develop the fishing industry. The Commission is, however, constrained by lack of funding to effectively deliver its mandate. (FAO, 2004)

2.2.3 Department of Fisheries (DoF)

The Department of Fisheries (DoF) now serves as the implementation secretariat of the Fisheries Commission, as stipulated by the Fisheries Act 625 of 2002. It fulfils this role by:

- preparing fishery resource management plans;
- developing regulations for the fishing industry;
- organizing MCS for the national fishery resources and ensuring compliance with national fisheries law; and
- Institutionalizing co-management concepts.

DOF deliver these functions through several mechanisms, including sea patrols; observer programmes; port and landing inspection; licensing; vessel registration; formation and strengthening of CBFMCs; statistics gathering and analysis; and consensus building. The DOF MCS Division was established under the Fisheries Subsector Capacity Building Project (FSCBP). The mandate of the Division is to enforce the Fisheries Laws.

The MCS Division, with the collaboration of the Ghana Navy, conducts sea patrols to exclude industrial fishing vessels from the 30-m IEZ, reserved for artisanal fisheries. The Division also carries out quayside inspection of industrial vessels at the fishing ports of Tema and Takoradi, checking for valid fishing licences, legality of fishing gear, skipper's certificate, log book and crew composition, and effects similar supervision of the Lake Volta fisheries. (FAO, 2004)

2.2.4 District Assemblies

Operating under PNDC Law 327 of 1993, the Ministry of local Government and Rural Development (MLGRD) is the key institution with responsibility for facilitating the establishment and development of a vibrant and well-resourced decentralized system of local government. MLGRD is responsible for managing fishers, fish processors and fishery resources at district and sub district levels.

Recently, the District Assemblies in collaboration with DOF, have been mandated to facilitate fishery resource management by: helping in forming and sustaining CBFMCs; cooperating with the DoF MCS units; providing legal and financial support to the CBFMCs; and approving levies proposed by the CBFMCs. (FAO, 2004)

2.2.5 Community-Based Fisheries Management Committees

A Community-Based Fisheries Management Committee (CBFMC) is defined as a local committee, formed in a fishing community, based on existing traditional leadership authority and local government structures, legally empowered by Common Law, and comprising all stakeholders, to oversee the management and development of the fishing industry. The genesis of the CBFMCs was derived from DoF's interest in ensuring a more sustainable national fishery resources through co-management. The principal responsibility of the CBFMCs is to enforce national fisheries laws at community level, as well as to enact and enforce their own by-laws to the same end.(FAO, 2004)

2.2.6 Other institutions

Other institutions that contribute to the management of fisheries resources in Ghana include:

- The Volta River Authority.
- NGOs, such as Friends of the Earth and the Adventist Development and Relief Agency.
- Private commercial entities, such as the Agricultural Development Bank, Rural Banks, and Continental Christian Trader (a dealer in fishing nets).
- Fisher associations, such as the National Inland Canoe Fishermen's Council (NICFC), Ghana National Canoe Fishermen's Council (GNCFC), Ghana National Association of Farmers and Fishermen, and Ghana Co-operative Fisheries Association. (FAO, 2004)

3 Methodology

In this study data was collected using both primary and secondary data. Primary data were gathered through the use of a series of survey instruments, personal and phone interviews in different locations at the coast. Secondary data were collected through an extensive literature review of articles and reports on Compliance and legitimacy of fisher folks. Data collected was analyzed using SPSS.

This study was conducted from April to August 2016 in the fishing communities of Ghana focusing specifically on the small-scale or artisanal fisheries sector. Primary data to achieve the objectives concerning why artisanal fisher folks are selective to the compliance and legitimacy of the fisheries regulation of Ghana, 2010 was gathered through structured interviews (including open and closed-ended questions), informal talks and observation. The first phase of the research was devoted to getting used to the environment, building trust, and having informal talks with fishers, participating in a few community engagements, and recording observations at the various landing sites.



Figure 6 Questionnaire administration

During the final phase of the research, a structured interview was designed based on what was learned in previous months. The structured interview

- a. Assessed the level of knowledge of fisher folks on prohibited fisheries methods and its penalty or punishment.
- b. Investigated social factors affecting compliance to specific Fisheries Regulations of Ghana, 2010 pertaining to this study and
- c. Proposing ways forward on how to reduce the risk of policy failure through increased compliance

Also, a 5- point likert scale was used to understand how much artisanal fisher folks knew the content of the fishing regulation of Ghana. It was also to understand the extent of believe they had in the fisheries regulations was meant to protect the fish stocks. The Likert-scale statements allowed for quantification of predetermined topics such as fishers' perceptions on the sense of responsibility towards the conservation of marine resource, local authorities concern towards enforcement of regulations; and fishers' reasons of using unapproved fishing methods. Open-ended questions allowed the fishers to express their opinions more freely about what was currently causing the non-compliance of most fisher folks and how best the situation of illegality can be solved by stakeholders. The selection of interviewees was opportunistic due to unavailability of fishers at landing site always. A total of 100 interviews (majority being phone interviews) were conducted with 50 being fishermen and 50 fish processors from different fishing communities along the coast of Ghana.

4 Results

4.1 The level of knowledge of fisher folks on prohibited fisheries methods and its penalty or punishment.

The fishermen's knowledge on content of the Ghana's fisheries regulation, 2010 was assessed. This was done to know their level of knowledge on the regulation. The below figure 7 shows the result of fishermen's level of knowledge on the regulation.

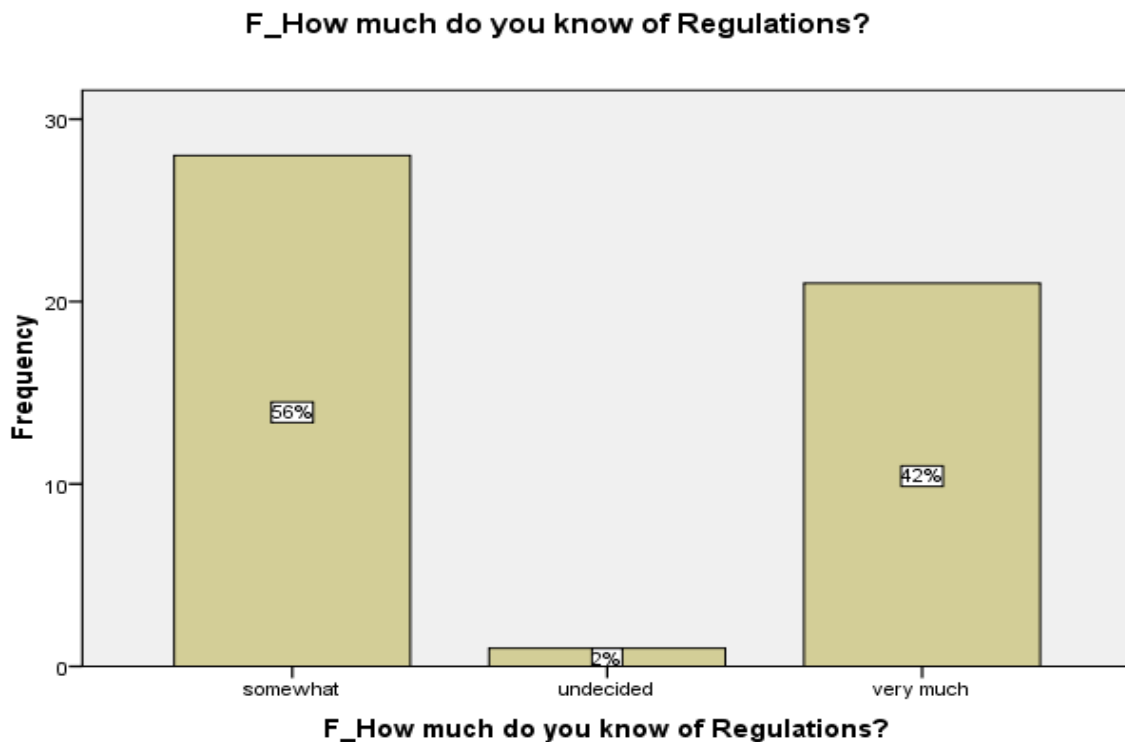


Figure 7 Responses of fishermen's knowledge on Ghana's fisheries regulation, 2010.

From figure 7 above, 56% of the fishermen moderately knew about the regulations which means they did not know it very much. 42% of the fishermen knew the regulation very much and 2% of the fishermen were not about to decide on whether they knew it or not.

The knowledge of fish processors on content of the Ghana's fisheries regulation, 2010 was also assessed to know their level of knowledge on the regulation. The below figure 8 shows the result of fish processors level of knowledge on the regulation.

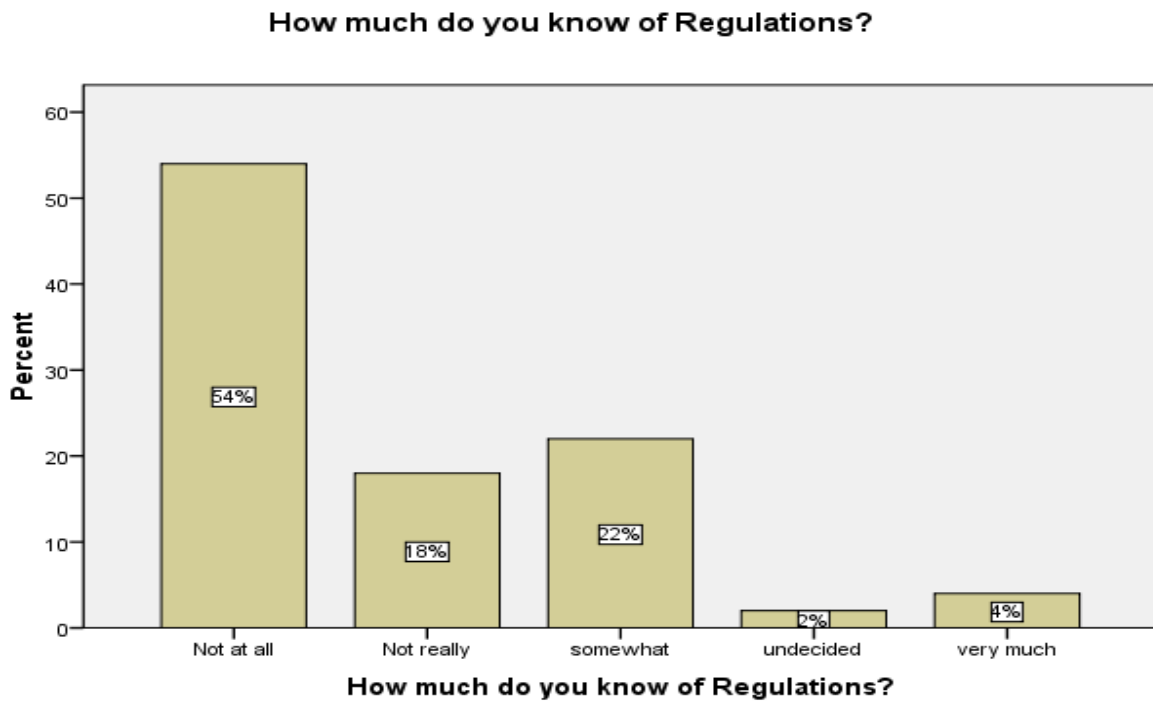


Figure 8 Response of fish processors knowledge of the Ghana's fisheries regulation, 2010

The above figure 8 shows that, 54% of the fish processors did not know about the regulation, 18% of the fish processors said they do not know but they have heard about some regulations, 22% of the fish processors knew moderately about the regulation, 2% of the fish processors were not about to decide on whether they knew it or not and 4% of them were very much aware of the regulation.

The fishermen were asked if they were aware light fishing is an illegal method of fishing since it's mostly practiced. This result of their awareness is shown in figure 9 below.

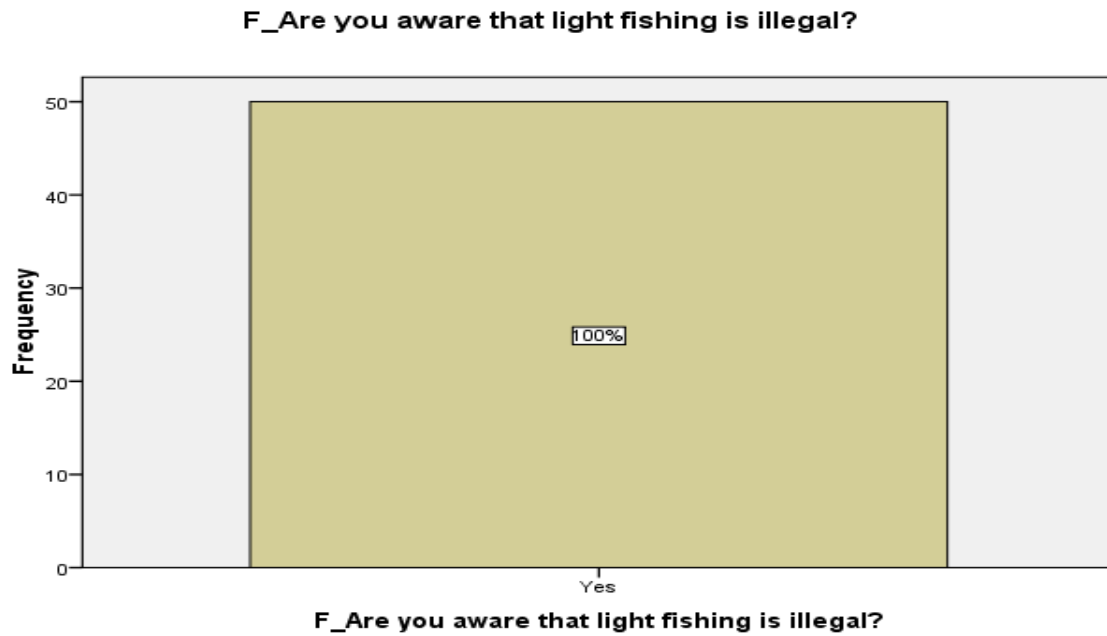


Figure 9 Fishermen's awareness on light fishing.

As it can be seen in figure 9 above, all the fishermen were aware that light fishing is an illegal method of fishing.

The fish processors were also asked if they were aware light fishing is an illegal method of fishing since they always see the fishermen practicing it. The result is shown in figure 10 below.



Figure 10 Fish processors awareness of light fishing.

Figure 10 above indicates that, 94% of the fish processors aware light fishing is an illegal method of fishing thus almost all of them knew light fishing was illegal method of fishing. Only 3% of the fish processors were not aware it was illegal fishing method.

The fishermen were where asked if there were aware using monofilament net in fishing is an illegal method of fishing. These results of their awareness are shown in table 1 below.

Table 1 Fishermen's awareness on usage of monofilament net

Are you aware that monofilament net is illegal? Fishermen				
	Frequency	Percent	Valid Percent	Cumulative Percent
No	2	4.0	4.0	4.0
Yes	48	96.0	96.0	100.0
Total	50	100.0	100.0	

From table 1 above, 96 percent of the fishermen said they were aware using monofilament net in fishing was an illegal method of fishing and 4 percent of the fishermen said they were not aware using monofilament net in fishing was an illegal method of fishing.

The fish processors were also asked if they were aware using monofilament net in fishing was an illegal method of fishing. The result of their awareness is shown in table 2 below

Table 2 Fish processors awareness on usage of monofilament net

Are you aware that monofilament net is illegal? Fish processors				
	Frequency	Percent	Valid Percent	Cumulative Percent
No response	3	6.0	6.0	6.0
No	1	2.0	2.0	8.0
Yes	46	92.0	92.0	100.0
Total	50	100.0	100.0	

The above table 2 shows that, 92 percent of the fish processors said they were aware using monofilament net in fishing was an illegal method of fishing, 2 percent of them said they were not aware using monofilament net in fishing was an illegal method of fishing and 6 percent of them did not responds to this question.

The fishermen were asked how they frequently see people using light for fishing. Table 3 below shows the result.

Table 3 Fishermen visibility to light fishing.

Have you seen people using light fishing before? Fishermen					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	7	14.0	14.0	14.0
	Yes	43	86.0	86.0	100.0
	Total	50	100.0	100.0	

From the above table 3, 86 percent of the fishermen said they frequently see people using light for fishing and 14 percent of them said they do not frequently see people using light for fishing.

The fish processors were also asked how they frequently see people using light for fishing. Table 4 below shows the result.

Table 4 Fish processors visibility to light fishing.

Have you seen people using light fishing before? Fish processors					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No response	3	6.0	6.0	6.0
	No	19	38.0	38.0	44.0
	Yes	28	56.0	56.0	100.0
	Total	50	100.0	100.0	

From table 4 above, 56 percent of the fish processors said they frequently see people using light for fishing, 19 percent of them said they do not frequently see people using light for fishing and 3 percent of them did not respond to this question.

To find out if fishermen were aware of the punishment when got using light for fishing of using monofilament net for fishing, they were asked if they knew about the penalties and fines. The result is shown in figure 11 below.

Figure 11below shows fishermen response on awareness of penalties and fines

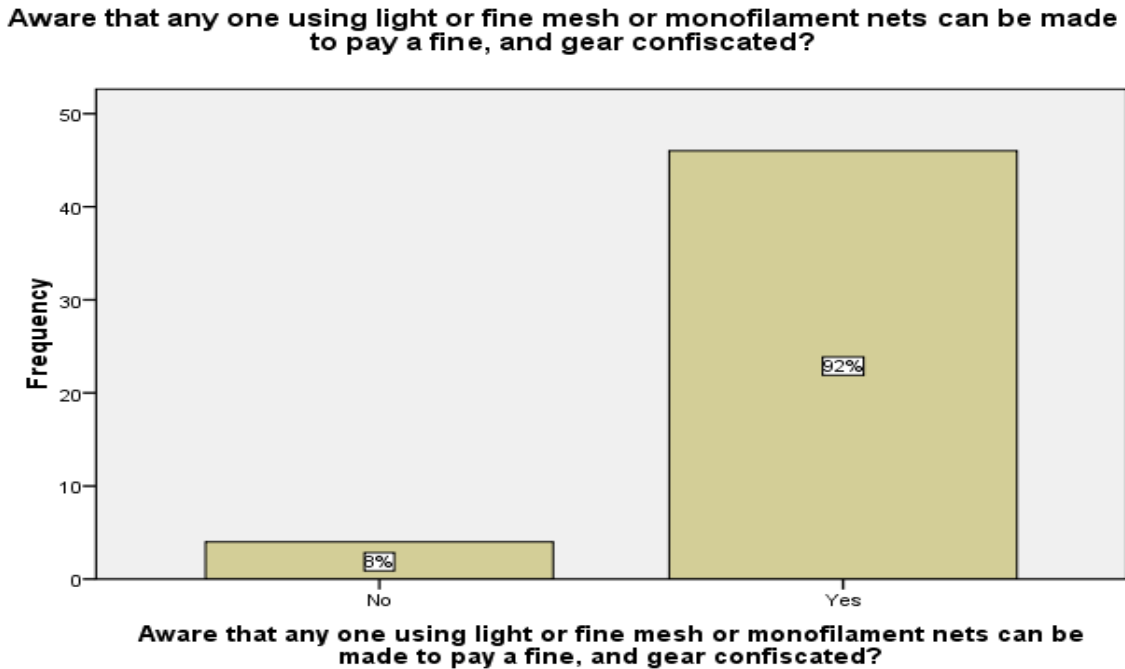


Figure 11 Fishermen awareness on penalties and fines

The above figure 11 show that, 92% of the fishermen were aware using light for fishing and monofilament for fishing was punishable by paying fine or gears being confiscated. 8% of them were not aware penalties and fines.

Fish processors were asked if they were aware of the penalties and fines when got using light for fishing of using monofilament net for fishing. The result is shown in figure 12 below.

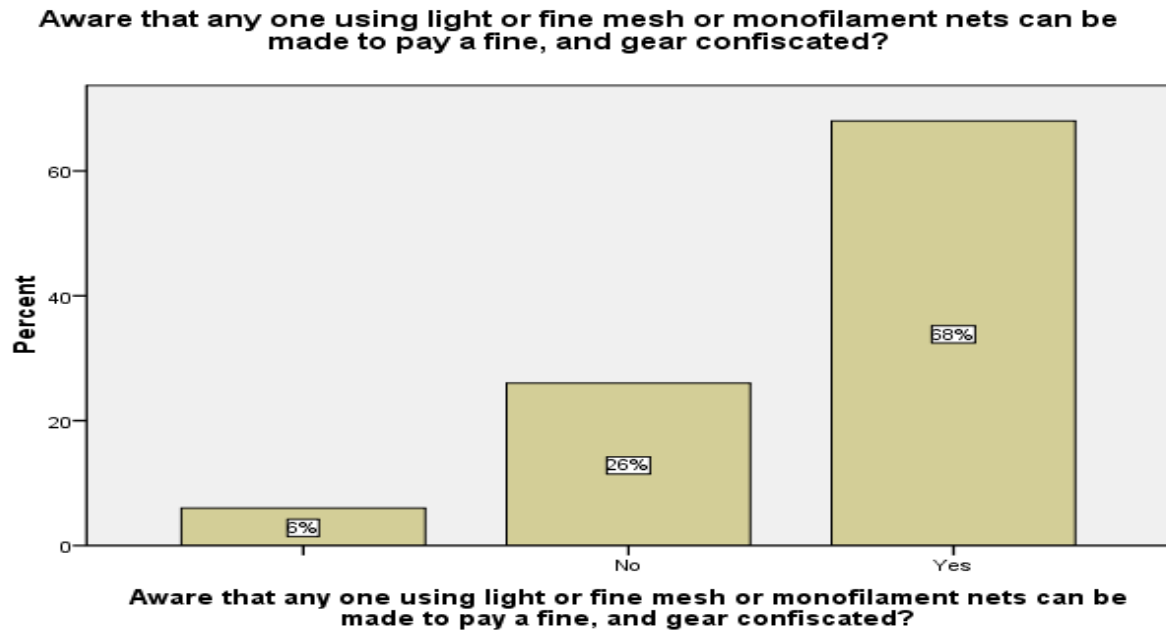


Figure 12 Fish processors awareness on the penalties and fines.

The figure 12 above indicates that, 68% of the fish processors were aware using light for fishing and monofilament for fishing was punishable by paying fine or gears being confiscated, 26% of them were not aware penalties and fines and 6% of the did not responds to the question.

4.2 Investigating social factors affecting compliance.

In order to know if fishermen are concern about their actions, there were asked whose responsibility it was to conserve the marine resources and the result can be seen in figure 13 below.

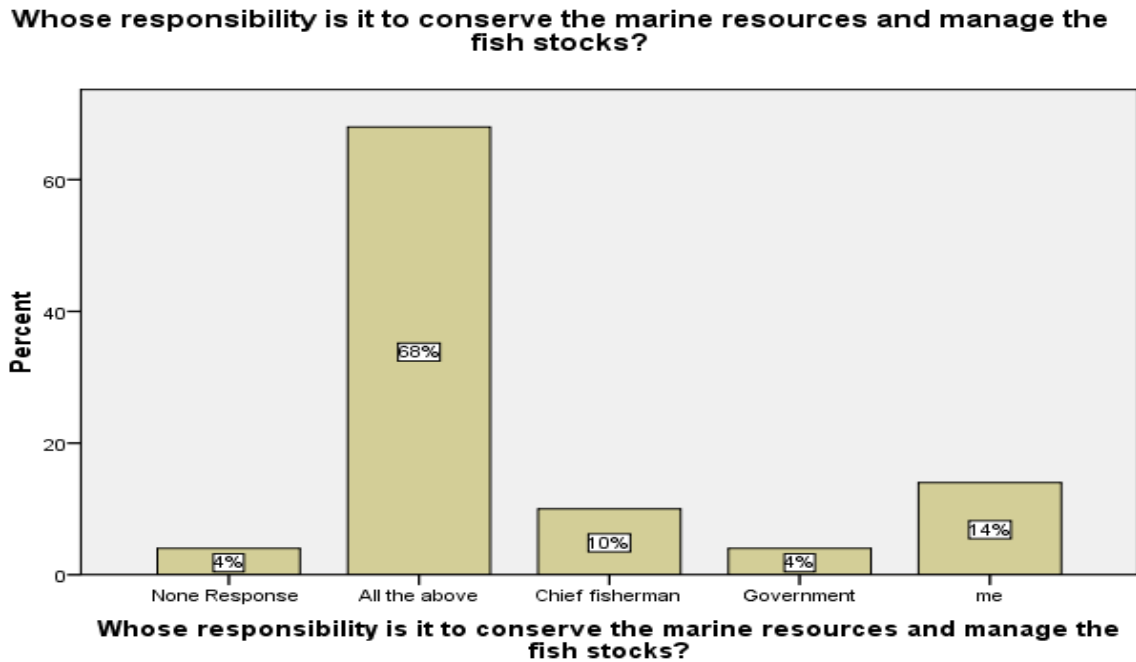


Figure 13 Fishermen's opinion towards responsibility on conservation.

From figure 13 above, 68% of the fishermen said it is the responsibility of chief fisherman, government and themselves, 10% of them said it is the responsibility of chief fisherman, 4% of them said it is the responsibility of government, 14% of the fishermen said it is their responsibility and 4% of them did not respond to the question.

The fish processors were also asked whose responsibility it was to conserve the marine resources and their response is shown in figure 14 below.

Whose responsibility is it to conserve the marine resources and manage the fish stocks?

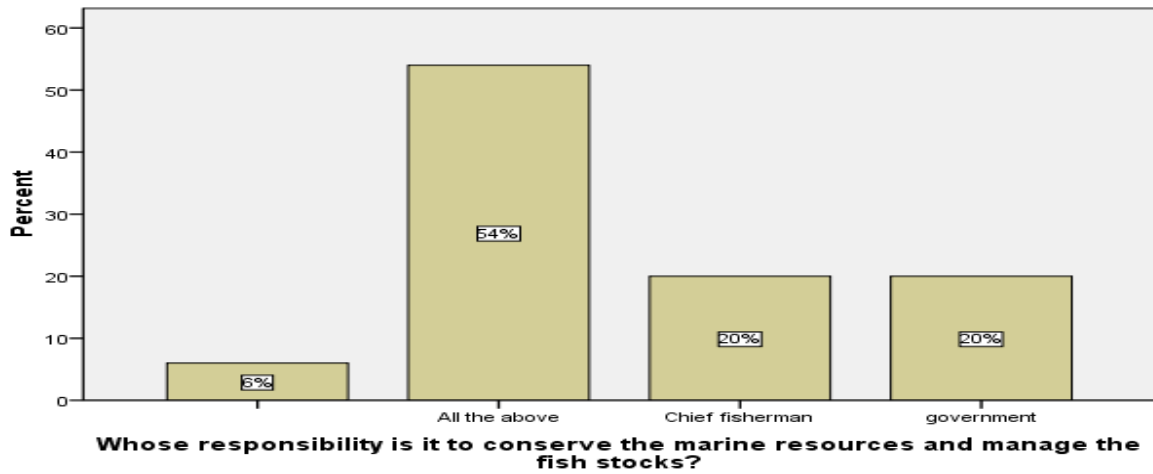


Figure 14 Fish processors opinion towards responsibility on conservation.

From figure 14 above, 54% of the fish processors said it is the responsibility of chief fisherman, government and themselves, 20% of them said it is the responsibility of chief fisherman, 20% of them said it is the responsibility of government and 6% of them did not respond to the question.

The fishermen were asked if they believe the fishing regulations are to protect the fish stocks and their response is shown in figure 15 below.

What extent do you believe the fishing regulations are to protect the fish stock?

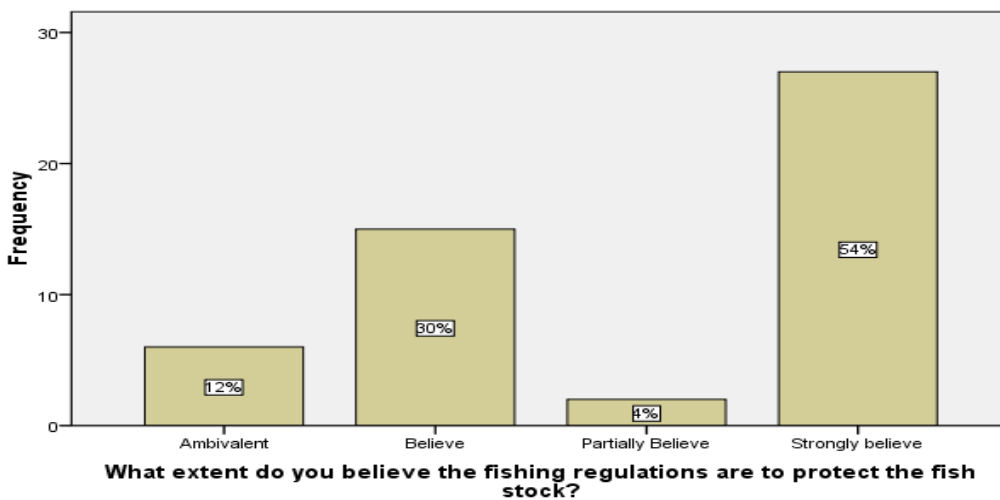


Figure 15 Fishermen level of legitimacy

It is shown in figure 15 above that, 54 percent of the fishermen strongly believed the fishing regulations are to protect the fish stocks, 4 percent of them partially believed, 30 percent of them believed and 12 percent of fishermen were uncontained.

The fish processors were also asked if they believe the fishing regulations are to protect the fish stocks and their response is shown in figure 16 below.

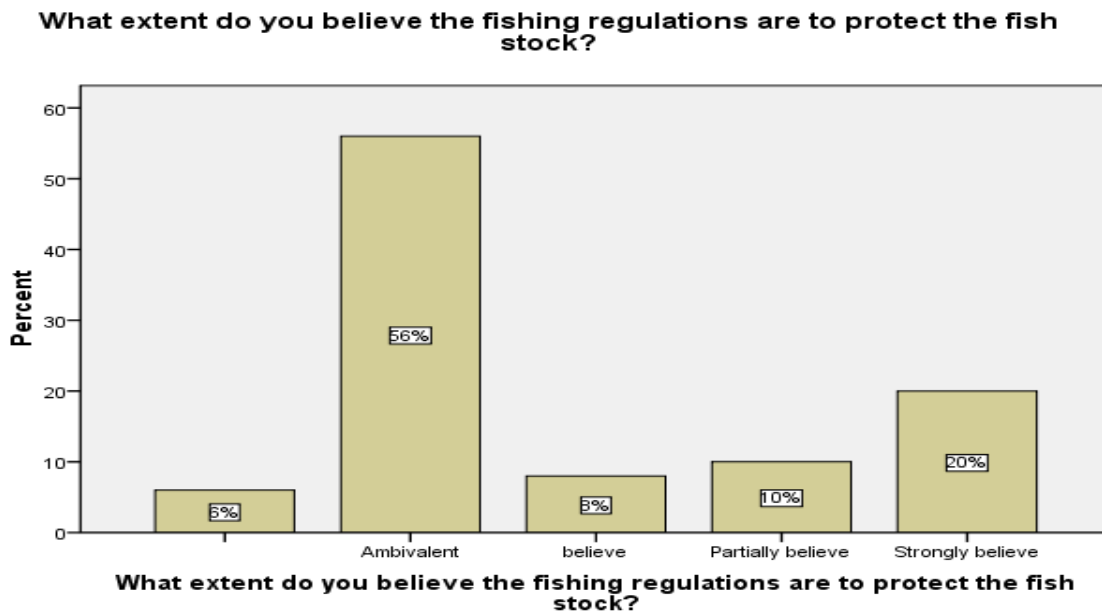


Figure 16 Fish processors level of legitimacy

The above figure 15 shows that, 20 percent of the fish processors strongly believed the fishing regulations are to protect the fish stocks, 10 percent of them partially believed, 3 percent of them believed, 56 percent of fishermen were uncontained and 6 percent did not respond to the question.

The fishermen were asked if they believe illegal fishing methods poses threat to their livelihood. The below figure 17 shows their responds.



Figure 17 Threat to livelihood of fishermen

From figure 17 above, all the fishermen believed that illegal methods of fishing pose threat to their livelihood.

The fish processors were asked if they also believe illegal fishing methods poses threat to their livelihood. Their responds can be seen in figure 18 below.

Do you believe illegal methods of fishing poses a threat to your livelihood

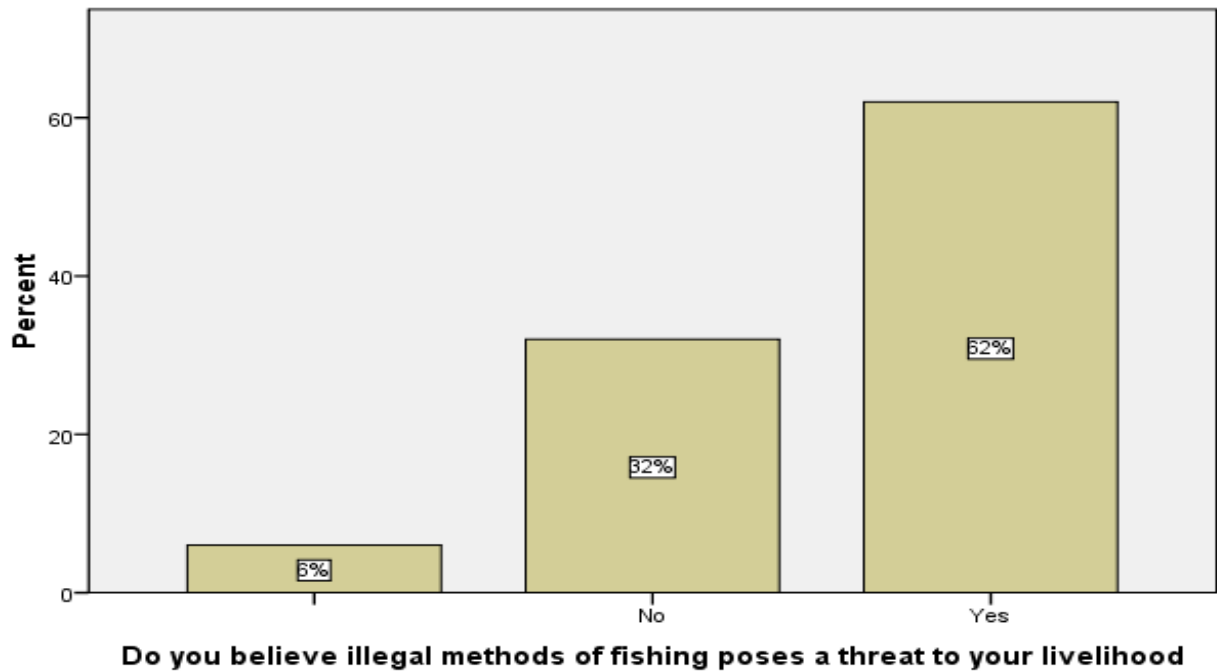


Figure 18 Threat to livelihood of fish processors

From figure 18 above, 52% of the fish processors said they believed that illegal methods of fishing poses threat to their livelihood, 32% of them said they do not believe and 6% of them did not respond to the question.

4.3 Ways forward on how to reduce the risk of policy failure through increased compliance.

The views of the fishermen were asked pertaining to finding solution to illegal fishing methods in the future and their responds can be seen in figure 19 below.

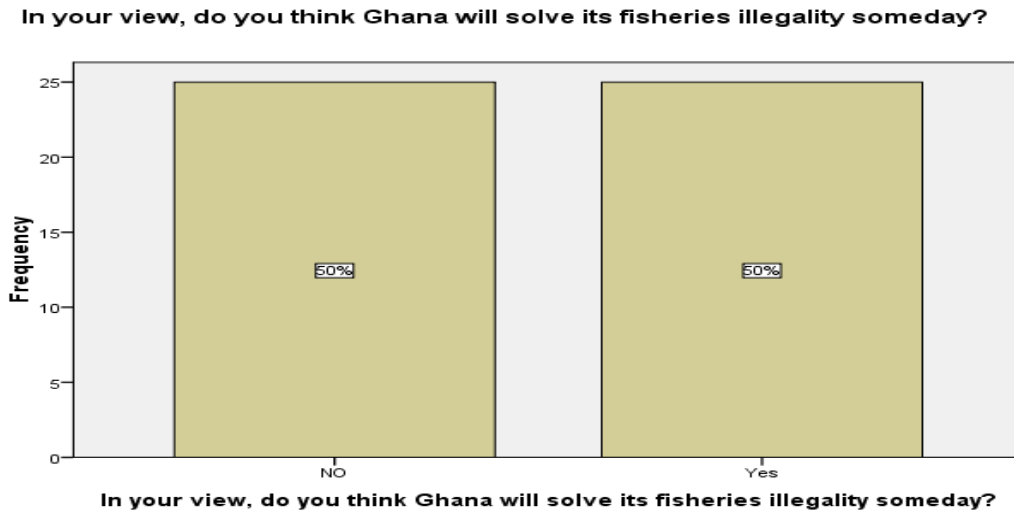


Figure 19 Fishermen's opinion.

The figure 19 above shows that, 50% of the fishermen had the opinion that Ghana can find solution to illegal fishing someday while 50% of them also think there would not be any solution.

The fish processors opinion on the solution of illegal fishing methods in the future was asked and their responds is shown in figure 20 below.

In your view, do you think Ghana will solve its fisheries illegality someday?

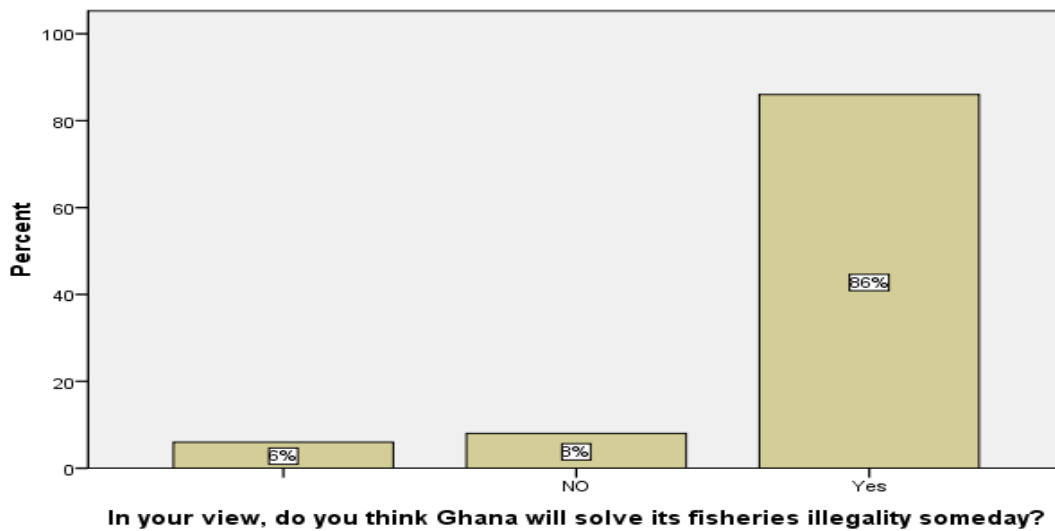


Figure 20 Fish processors opinion.

The figure 20 above shows that, 86% of the fish processors had the opinion that Ghana can find solution to illegal fishing someday, 8% of them also think there would not be any solution and 6% of them did not answer to the question.

5 Discussion

This chapter presents the results of the study with interpretations and discussions. It presents some aspects of regulatory compliance in the fisheries sector in Ghana and why fishermen seem to disregard the laws with particular focus on a practice often too common with fishermen but illegal under the laws of fisheries in Ghana, known as light fishing and the use of monofilament nets. This study also presents what fishers know about and how they perceive the fisheries policies that regulate their activity as a useful tool to assess the effectiveness of rules designed to manage the marine resources and ensure sustainable harvests.

Light fishing and the use of monofilament nets in the fisheries industry of Ghana has been a big issue for the government and most local people in the coastal areas. As we all know, illegal fishing methods poses a huge threat to fish stocks. The non compliance fisher folks in Ghana have not been intensively understood. It was realized from this study, that most fisher folks did not know the fisheries laws and therefore do not feel the responsibility to comply with the regulations. As Hauck (2007) said the influence of power and the imbalance that exist are necessary to understand in the context of fisheries compliance, it is not enough to simply address those who are not complying with laws, but a more in depth understanding is required to focus on the evolution of those laws in the first place. The fisheries Regulations of Ghana 2010, is required to be implemented in all part of the country to restrict and monitor marine resources. However, as confirmed by Grafton et al (2006) it assumed that necessity and desirability of these governance reforms are built on the theory that since fisher folks livelihood depends on the success of fisheries industry they would participate in the process of complying. With focus on small-scale fisheries in developing countries, there is an argument by Grafton et al (2006) which is basing the case for fishery governance reform on the assumed economic incentives for action by fishers requires a broad understanding of the factors that shape those incentives – factors that may be external to the fishery.

Conducting research on the knowledge of 50 fishermen and 50 women fish process, it can be seen in the result that, fishermen had some knowledge on the regulations. Even though most fishermen knew specifically that light fishing and use of monofilament net was illegal, nothing has been done about it. In this research, the major focus on ‘light fishing’ and use of

monofilament net shows that the laws are either over sighted or not well understood. The regulations are meant to be understood and considered legitimate by all parties. On the other hand, the women fish processors in the industry had no knowledge on the 2010 fisheries regulations of Ghana. Through informal conversations with most women they noted that the regulations did not directly concern them and it was not necessary for their business. Even though, some women have heard about light fishing being illegal through NGO advocates but did not know it was written in the regulations as an illegal activity. Since light fishing method is a fish aggregating device and this means its non selective. The economic gains and desperate need to improve catch on each fishing trip has put pressure towards small pelagic fish species in spots where bottom fish are over-exploited. Comparing by Kuperan & Sutinen included variables relating to social influence, behavioral norms and the legitimacy of regulations. They noted that, in practice, the costs of enforcing fisheries regulations resulted in relatively low probabilities of detection, but the penalties were not usually sufficiently high to produce a deterrent effect. Furthermore, several fisher folks expressed their concerns about why they did not need to know the regulations. Majority of them said they had engaged in this trade since their early ages and acquired the necessary skills for the trade and did not need to change or know any regulations to help them in their operations. They mentioned that the law was made by people who had no knowledge about practical fishing. This confirmed what Ali and Abdullah (2010) said about fishermen actively involvement in co-management activities and therefore would increase the tendency of compliance.

Comparing to the deterrence theory that is the higher the probability of detection and the rate of fines imposed, the lower the rate of violations committed. In the case of the research, it was realized that offenders knew about the rate of violations but did not comply with the law. This confirmed that enforcement of the law has been very challenging to the marine policy and other institutions involved. It was agreed by some representative interviewed in the marine police that the enforcement of the penalty has not been effectively implemented. As compared with Berker 1968 model, the more spending on policemen, court personnel, and specialized equipment, the easier it is to discover offenses and convict offenders. From the research, majority of fishermen sampled were aware that anyone using light or monofilament net can be made to pay a fine or can have their fishing equipment and gear confiscated. They described that punishment go from warnings to seizing of equipment or taken to court. Some fishermen also testified that most

illegal fishing case at court has not been attended to and has been politically interfered. Some observations made by women fish processors concerning the arrest of fishermen at landing beaches was the only time they noticed that some fishing equipment were illegal. Most of them testified they had seen the marine police seizing some light fishing equipment's and monofilament nets. In comparison to social learning theory which focused on factors such as social pressure, in shaping individual behaviour and moral values as well as their perception of other fishermen's compliance, from the study this did not affect most fishermen behaviour in Ghana. This could be due to the fact that communities had less control on the situation. Most women processors were further asked why they were not doing anything about the situation. Their explanation given was the inability to influence the men to comply with the laws and also said community shaming which was done in the past to deter violators has been stopped. As stated by Owusu and Nyako 2015, leadership lies in the male groups with the chief fisherman and his council, who are all men, playing a supervisory role. Fishing and its related resource is done by the men while the post-harvest activities including processing and trading are mostly done by the women. This strongly confirms the statement made by SFMP baseline, 2016 that the views of the women being side-lined in the management of the fishery resources. This has implications not only at the community level but also at the national level, making resource management incomplete.

Looking at the large number of fishermen involved in illegal fishing activities in Ghana, it is common to find confusing answers regarding whose responsibility it is to monitor and control the marine resources. Although fishermen agreed they had seen light fishing and the use of monofilament nets, a large number of them from the same community blamed their neighboring communities for indulging in illegal activities. On the contrary most women disagreed with them. As said by Hilborn & et al, 2004 the major problems in fisheries management and conservation stem from improper incentives and institutional structures that fail to control the race for fish leading to overcapacity, over-fishing and economic loss. Once overfishing becomes chronic, the socio-economic and political costs of the tough decisions needed for significant improvement represent a major impediment to change. From the response of fishermen, the conservation of the marine resources and management of fish stock is the responsibility of everyone that is to say government, fishermen, women processors, the community, and its chiefs

must be accountable. Furthermore, fishermen strongly believe that the fisheries regulations are to protect fish stock and therefore they need to comply and obey it to avoid depleting fish stocks which is a threat to their livelihood. Whereas most fish processors did not know the importance of fishing regulation. They went on to add that, if there is no fish in the sea, their livelihood would not be threaten since they also process frozen fish and indulge in other professions such as canoe owner. It has therefore been pointed out by Alayon, 2011 that the necessity of taking in to consideration that “if fisheries are governed responsibly and equitably, the sector has great potential to contribute to poverty reduction, economic growth, biodiversity conservation, sustainable livelihoods and peace.

From the analysis of the research findings, it is evident that most fishermen from the open questions said illegal fishing cannot be solved someday since monitoring and surveillance is very difficult at the landing beaches. This implied that fisher folks were aware of the decline in fish stocks and issue of careful planning and constant monitoring would be challenging for all parties involved. Like most countries, artisanal fishers do not operate by license in practice since it’s an open access although required by law. As written by Hilborn et el 2004 the issue is without careful planning and constant monitoring, we would not learn what went wrong or right and why it happened. If marine reserves are implemented without case by case evaluation and appropriate monitoring programs, there is a risk of unfulfilled expectations, the creation of disincentives, and a loss of credibility of what potentially is a valuable management tool. To able to progress as a country in fisheries management, I agree with Kurien 2007 the clarification of rights, grant legal recognition to community management and exclusive use rights to communities (usually geographically defined), governments must however be prepared to devolve management responsibilities to a community level.

From the analysis of the research in the fishing communities, it is evident that the level of knowledge of fisher’s folks on the content the fishing regulation 2010, Ghana needs to be improved through intensive education. It was realized that most of the fishing communities were practicing illegal fishing methods because there was low community engagement and lack of ownership. Involving fisher folks in decision making and taking into consideration traditional fishing practices to enhance community fisheries management. From participant observation, it

was realized that if co-management is implemented very well illegal fishing practices can drastically reduce.

In as much as this research work looks at the why artisanal fisher folks are selective with compliance of fisheries laws in Ghana, it could not cover all the issues relating to the act towards illegal fishing methods and issues of compliance.

This calls for further investigation in;

- The effect of light fishing on fish biology.
- Effective community based approach on educating fisher folks on new fishing technologies.
- The effective implementation of the 2010 fisheries regulations of Ghana
- Monitoring and evaluating of fish catch within the artisanal fisheries industry of Ghana.
- Closed seasons and livelihoods alternatives in Ghana artisanal fisheries sector

6 Conclusion and Recommendation

It was realized from the study that, although majority of fishermen have some knowledge of the laws, they still violate them. The scarcity of fish and need of minimal livelihood resources seem to be the driving force of fishermen to break the law. Women processors tend to adopt the social learning theory which is focuses on the conditioning effects of the environment (Alayon, 2011). Most women stated that if chief fishermen shame fishermen who use illegal fishing methods and band them in the public they would stop using illegal fishing methods. They would feel disgraced and would bring shame unto their families. They also adopted the deterrence model of compliance in fisheries laws in Ghana saying penalties should be more severe by arresting offenders and banding from fishing for some years. However, fishermen tend to believe in legitimacy model in compliance in fisheries regulation stating they should be consulted during the making of the laws. This would make them obey the laws since they feel they were part of the decision making.

I recommend that

- Fisher folks should be involved in decision making to improve the sense of legitimacy that fishermen seem to lack via co-management
- Implement the deterrent models by criminalizing illegal fishing activities.
- Revising of section (88) 3, by decreasing the amount charged from 25000 dollars to 250 dollars and ensuring enforcement of the regulations
- Engage fisher folks in the reversion/ amendments of the future laws and regulations / fishers Act.
- Consumer education against illegal fishing activities and organizing campaigns to promoting healthy fish purchasing only.
- The need for food security and poverty reduction need to be addressed immediately by providing alternative livelihoods along the coast.

7 Reference

- Akapula, W. (2002). Compliance to mesh size regulations in artisanal marine fishery in Ghana.
- Akers, R. L., Krohn, M. D., Lanza-Kaduce, L., & Radosevich, M. (1979). Social learning and deviant behavior: A specific test of a general theory. *American Sociological Review*, 636-655.
- Akpalu, W. (2011). Determinants of noncompliance with light attraction regulation among inshore fishers in Ghana. *The Journal of Socio-Economics*, 40(2), 172-177.
- Ali, J., & Abdullah, H. (2010). Impact of enforcement and co-management on compliance behavior of fishermen. *International Journal of Economics and Finance*, 2(4), 113.
- Amador, K., Bannerman, P., Quartey, R., & Ashong, R. (2006). Ghana canoe frame survey 2004. Marine Fisheries Research Division, Accra, Technical Paper (34).
- Dottey, R. T. (2005). Effects Of Deforestation On Livelihoods Of Forest Fringed Communities In The Awutueffutu-Senya District (Doctoral dissertation, University of Ghana).
- Eggert, H., & Lokina, R. B. (2010). Regulatory compliance in Lake Victoria fisheries. *Environment and Development Economics*, 15(02), 197-217. Available: http://www.efdinitiative.org/sites/default/files/efd-dp-08-14_1.pdf Assessed: 08/2016
- Falaye, A. E. (2008). Illegal Unreported Unregulated (IUU) Fishing in West Africa (Nigeria & Ghana). Marine Resources Assessment Group Ltd, London.
- FAO (2004), Information on Fisheries Management in the Republic Of Ghana. Available: [Www.Fao.Org/Fi/Oldsite/Fcp/En/Gha/Body.Htm](http://www.fao.org/fi/oldsite/fcp/en/gha/body.htm) Assessed: 26/08/2016
- FAO Fishery Department (1998), Fishery Country profile: The republic of Ghana.
- Fisheries Law, 1991, PNDCL 256

Food and Agriculture Organization, (2004) Information on Fisheries Management in the Republic Of Ghana. Available: <http://www.fao.org/fi/oldsite/FCP/en/gha/body.htm>

Hauck, M. (2008). Rethinking small-scale fisheries compliance. *Marine Policy*, 32(4), 635-642.

Hauge, K. H., Cleeland, B., & Wilson, D. C. (2009). Fisheries depletion and collapse. IRGC report “Risk Governance Deficits: An analysis and illustration of the most common deficits in risk governance”. *International Risk Governance Council Chemin de Balexert*, 9(1219), 21.

King, M., & Hart, P. J. B. (1995). Fisheries Biology, Assessment and Management. *Reviews in Fish Biology and Fisheries*, 5(4), 466-466.

Koranteng, K. A. (1996). The marine artisanal fishery in Ghana: Recent developments and implications for resource evaluation. In *Fisheries Resource Utilization and Policy. Proceedings of the World Fisheries Congress, Theme (Vol. 2, pp. 498-509)*.

Kwadjosse, T. (2009). The law of the sea: impacts on the conservation and management of fisheries resources of developing coastal states—the Ghana case study. *Division for Ocean Affairs and the Law of the Sea. Office of Legal Affairs, the United Nations, New York, 2003*.

Lawson, R. M. (1974). *African entrepreneurship and economic growth: A case study of the fishing industry of Ghana*. Ghana University Press.

Okyere-Nyako, A., & Nsiah, A. (2016). *Baseline Study on Women in Leadership Roles within SFMP Fisheries Stakeholder Groups*. The USAID/Ghana Sustainable Fisheries Management Project (SFMP). Narragansett, RI: Coastal Resources Center, Graduate School of Oceanography, University of Rhode Island and SNV Netherlands Development Organization. GH2014_GEN005_SNV.

Paul, B. & Richmond, Q. (2006). *Report On the Observations of Commercial Light Fishing Operation in Ghana the Marine Fisheries Research Division (MFRD), Tema*

Pomeroy, R. (2016). A research framework for traditional fisheries: Revisited. *Marine Policy*, 70, 153-163.

Sutinen, J. G., & Kuperan, K. (1999). A socio-economic theory of regulatory compliance. *International journal of social economics*, 26(1/2/3), 174-193. Available: https://www.researchgate.net/publication/243461255_A_Socio_Economic_Theory_of_Regulatory_Compliance. Assessed: 23/07/2016

Underwood, D. A. (2011). Evolving institutions in the Ghanaian canoe fishery: Melding traditional and contemporary management.

Viswanathan, K. K., Abdullah, N. M. R., Susilowati, I., Siason, I. M., & Ticao, C. (1997). Enforcement and compliance with fisheries regulations in Malaysia, Indonesia and the Philippines. In *Proceedings of the International Workshop on Fisheries Co-management* (pp. 1-25).

8 Appendix I

SURVEY QUESTIONNAIRE

How many years of fishing experience do you have.....

❖ Assess the level of knowledge of fisher folks on prohibited fisheries methods and its penalty or punishment

1. How much do you know the Fishing Regulation of Ghana?

Very much	somewhat	undecided	Not really	Not at all
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2. What is the most used illegal gear in your opinion. (Rank)second most, 3rd most ...

1. Monofilament nets
2. Light fishing
3. Mesh size less than one inch
4. Use of dynamite,
5. carbide or other obnoxious substances

3. Are you aware that light fishing is illegal?

Yes/No

4. Are you aware monofilament net is illegal?

Yes/No

5. Have you ever seen people using light for fishing before?

Yes/No

If yes, who does it?

1. This community
2. Another community
3. This region
4. Another region
5. This country
6. Another country

6. Have you ever seen people using monofilament for fishing before?

Yes/No

If yes who does it:

1. This community
2. Another community
3. This region
4. Another region

5. This country
 6. Another country
7. Are you aware that anyone using light or fine mesh monofilament nets can be made to pay a fine, and have gear confiscated?
Yes/No
8. Which of these equipment's do you usually see on the canoe at the landing beach?

	Always see	sometimes	Never seen
Portable generator			
Switchboard			
Bulb			
Long Cable			
Monofilament net			
Chemicals			
dynamite			

❖ Investigate factors and social influence affecting compliance to section 11 of the Fisheries Regulation of Ghana. (That is prohibited fishing methods)

1. Whose responsibility is it to conserve the marine resources and manage the fish stocks?
(Sense of ownership) (Choose one)
 1. Me (Fisherman, fish processor, fish monger)
 2. Community
 3. MOFAD
 4. Government
 5. Chief fisherman
 6. Traditional leaders
 7. All the above

2. What extent do you believe the fishing regulations are to protect the fish stock?

Strongly Believe	Believe	Ambivalent	Partially Believe	Disbelieve
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3. Do you believe illegal methods of fishing poses a threat to your livelihood

Yes/No

4. In your view who does the most illegal activities

1. Artisanal/canoes
2. Semi-Industrial
3. Industrial trawlers
4. All the above

5. In your view, which of these groups are involved most in illegal fishing?

1. Ghanaians
2. Foreigners
3. All

6. Why do you think people use illegal methods for fishing? Check all that apply?

1. Due to lack of Knowledge on Laws
2. Due to lack of fish at sea
3. Due to lack of financial incentives to procure approved gear
4. Due to lack of enforcement
5. To catch more fish
6. To make more money
7. Other _____

7. Why do you think fisheries regulations are made?

1. To prevent fishers from fishing the way they want to
2. To protect the stock from depleting
3. To take our livelihood from us
4. To regulate our movement
5. Other _____

❖ To propose ways forward on how to reduce risk of policy failure through increased compliance

1. In your view, do you think Ghana will solve its fisheries illegality someday?
IF No, why.....

IF Yes

2. What should government do to prevent illegal fishing
 1. Involve fishermen and processors in making rules/regulations
 2. Should increase penalties of violators
 3. Invest more in surveillance of all boats /vessels practicing illegal fishing
 4. All the above
3. What do you think chief fishermen or his communities or his council should do to reduce illegal fishing
 1. The chief fisherman and his leaders should be given the power to fine violators and confiscate gear
 2. The community should form watch dog committees
 3. Should create awareness on topics of sustainability on how regulations can increase number of fish in the sea.
 4. All the above
4. What should Nongovernmental organizations do to reduce illegal fishing
 1. They should organize workshops to sensitize the fish folks
 2. Provide financial and social assistance in enforcing policies and stakeholders activities.
 3. All the above