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## Examining how Ghana's co-management policy could tackle IUU fishing in the artisanal fisheries sector

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WORLD MARITIME UNIVERSITY

Malmö, Sweden

EXAMINING HOW GHANA'S FISHERIES CO-MANAGEMENT POLICY COULD  
TACKLE IUU FISHING IN THE ARTISANAL FISHERIES SECTOR

By

AMBROSE YANKEY

A dissertation submitted to the World Maritime University in partial fulfilment of the  
requirement for the award of the degree of

MASTER OF SCIENCE  
IN  
MARITIME AFFAIRS

(OCEAN SUSTAINABILITY, GOVERNANCE, AND MANAGEMENT)

2022

## Declaration

I certify that all the material in this dissertation that is not my own work has been identified, and that no material is included for which a degree has previously been conferred on me.

The contents of this dissertation reflect my own personal views, and are not necessarily endorsed by the University.

(Signature): .....

(Date): .....

Supervised by: Professor Francis Neat

Supervisor's affiliation: Head of Specialization, OCEAN SUSTAINABILITY,  
GOVERNANCE, AND MANAGEMENT

## Acknowledgements

"I can do all things through Christ who strengthens me." Philippians 3:13 (Holy Bible, King James Version).

I thank God Almighty, the author and finisher of my faith, for keeping me and my family safe and sound during the period of my studies. I also wish to thank the members of the WMU Christian Fellowship who provided me with spiritual refuge.

I am grateful to my wife, Patricia, whose unwavering support and prayers were crucial to the successful completion of this program. To my sponsors, Oriens Fond, I wish to thank you most sincerely for giving me this great opportunity.

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## Abstract

Title Of Dissertation: Examining How Ghana's Fisheries Co-Management Policy Could Tackle IUU Fishing in The Artisanal Fisheries Sector.

Degree: Master of Science

This dissertation examined how co-management principles could be applied to effectively combat IUU fishing in the artisanal fisheries sector of Ghana. In this study, five themes that were considered fundamental to the concepts of fisheries co-management were examined to determine which ones needed to be improved or harnessed to make the fishery successful in tackling IUU fishing in the industry.

Semi-structured interviews with selected state officials, fisheries officers, and chief fishers at some fishing communities were conducted using open-ended questions. The interview questions were based on the five themes, which are inherent in Ostrom's eight principles. The experiences and roles of the chief fishers and state officials, their relationships with each other with respect to co-management, and their perceptions of IUU fishing were established to form the basis of the discussions.

The results revealed that although there appeared to be good stakeholder participation and cooperation over certain management issues, the fishers generally felt that their opinions and ideas are usually not taken into consideration. Additionally, it was also apparent that little trust existed between local resource users and state officials, which has exacerbated the problem of IUU fishing. There was consensus that compliance with fisheries regulations was poor because punitive measures were not stringent.

A formal policy to decentralize power and responsibility from authorities to local resource users, as well as the need to build trust among stakeholders and improve compliance levels through enforcement, were identified as key areas to focus on, if the co-management program is to effectively combat IUU fishing.

**KEYWORDS:** IUU Fishing, Co-management, Artisanal Fishers, Power sharing, Compliance, Stakeholder, Education and Awareness.

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## List of Abbreviations

FAO	Food and Agriculture Organization
IUU	Illegal, Unregulated, Unreported Fishing
SDG	Sustainable Development Goals
EEZ	Exclusive Economic Zone
FC	Fisheries Commission
MoFAD	Ministry of Fisheries and Aquaculture Development
FAD	Fish aggregating Device
GPHA	Ghana Ports and Harbour Authority
GMA	Ghana Maritime Authority
MOC	Maritime Operations Centre
GNCFC	Ghana National Canoe Fishermen Council
CBFMC	Community-Based fisheries Management Committee
FEU	Fisheries Enforcement Unit
NAFPTA	National Fish Processors and Traders Association
MMDA	Metropolitan, Municipal and District Assemblies
IGO	Inter-Governmental Organization
NGO	Non-Governmental Organization

## 1.0 Introduction

### 1.1 Background

Globally, fish and fishery products remain the most traded food commodity and are essential to the economies of nations (FAO, 2014). Not only does the fish trade provide a significant source of foreign exchange revenues to developing nations, it also creates employment and ensures food security (de Coning & Witbooi, 2015).

Illegal Unregulated Unreported (IUU) fishing is responsible for much of the world's overfishing and depletion of fish stock. The Sustainable Development Goal (SDG) 14.4 highlights the need to end IUU fishing and overfishing, and many countries have acknowledged the need to combat IUU fishing. Continued IUU fishing will not only deplete fish stocks and destroy habitats, but also threaten species extinction, disrupt marine food webs, increase food security risks, and disrupt coastal communities' social cohesion (Widjaja et al., 2020).

Globally, IUU catches are estimated to reach 26 million tonnes per year, or one in every five wild-caught fish, with a net yearly cost of \$10 to \$23 billion (Agnew et al., 2009; Pew Trusts, 2018). Faced with these glaring figures, regional bodies, intergovernmental organizations, NGOs, and individual nations see the elimination of IUU fishing as critical to ensuring sustainable fishery resources (Cabral et al., 2018; Erceg, 2006; Flothmann et al., 2010). IUU fishing is also associated with organized crimes, including child labour, piracy, widespread fraud, and drugs, arms and human trafficking (Mackay et al., 2020).

Ghana is a coastal nation located in West Africa with a population of about 30 million and a land area of 240,330 sq.km. Her 550 km of coastline has a relatively narrow and shallow continental shelf, studded with unique ecosystems such as estuaries, mangroves, marshes, lagoons, etc., and hence has rich biodiversity (deGraft-Johnson et al., 2010). It is estimated that about 40% of the population dwells in coastal areas due to rural-urban migration (Lawson et al., 2012). The high population density in coastal areas, coupled with increasing shipping activities, oil and gas production, and

other anthropogenic activities, can potentially impact negatively on Ghana's marine fisheries.

The marine fishing industry in Ghana comprises the small-scale or artisanal, semi-industrial, and industrial sub-sectors (Nunoo et al., 2015). With about 10% of the population relying solely on fisheries resources for a living, the industry is crucial to the Ghanaian economy, accounting for approximately 1.5 percent of the national GDP (MoFAD, 2014). Furthermore, the sector is estimated to generate more than \$1 billion in revenue each year through various fishing agreements, permits, and exports (MoFAD, 2015). Fish is also the preferred and relatively cheap source of protein for the populace, playing an essential role in the nation's nutrition and food security. The sector also contributes to women's empowerment in line with the UN SDGs.

However, like many developing coastal nations, IUU fishing is widespread in Ghana. The European Commission of the European Union has warned Ghana twice within the last decade (MoFAD, 2018) with a yellow card, which indicates that a country's attempts to prevent and deter IUU fishing are insufficient. Scientific data has shown that marine fisheries are in crisis because of the decline in fish landings over the last decade (Adom, Sekyere, & Yarney, 2019). As a result, Ghana has become a net importer of about 40% of the nation's fish requirements, which is likely to increase in the subsequent years due to the growing population (MOFAD, 2015). Combating IUU fishing is therefore imperative if the fisheries resource is to be sustainable, considering the potential challenges of climate change on food security.

The government of Ghana has recognised the need to create and manage marine protected areas (MPAs) to not only meet the 10% Aichi target 11 (objectives set by the Convention on Biological Diversity in an attempt to preserve and protect the biodiversity that supports global food security, health, and clean water), but also to protect fish nursery areas and spawning grounds as a strategic measure to sustainably develop its declining fisheries resources as outlined in the National Fisheries Management Plan (MoFAD, 2015).

## 1.2 Artisanal Fishing Industry

Artisanal fishers in Ghana employ traditional fishing techniques and small traditional fishing boats for both commercial and subsistence reasons. The canoes used are either motorized or non-motorized, with fishing gear such as purse seines, gillnets, beach seines, set nets, and hook and line. The major species landed by these fishers include sardinellas, anchovies, herrings, mackerels, and other species of important economic value (Asiedu et al., 2021). There are an estimated 13,000 canoes in operation in the exclusive economic zone (EEZ) of Ghana (Akyempon et al., 2013).

The total annual catch of the canoe fleet was estimated at 254,000 metric tonnes in 2014 (MoFAD, 2015), but has seen a downward trend due to negative impact on fish spawning and breeding arising from increased fishing effort and a rise in IUU fishing activities (Mutimukuru-Maravanyika et al., 2013).

About 180 coastal villages are situated along the stretch of the Ghanaian coast mainly characterized by a relatively high rate of unemployment, poverty, illiteracy, and population density. The absence of alternative sources of income has potentially increased the rate of exploitation of the fisheries resources. Over the years, the average annual income per artisanal canoe has dropped by as much as 40% (MoFAD, 2015). Previously, artisanal fishing was deemed sustainable and non-destructive to the fisheries resources and marine ecosystem because the fishers used simple traditional fishing techniques to exploit fisheries resources for mainly subsistence purposes. Legislative instruments and enforcement efforts therefore did not largely target this sector. For instance, the artisanal fleet has not been effectively licensed to date, although required by law, giving them unrestricted access to fishery resources (MoFAD, 2016).

Open access to the fisheries resources, high unemployment rate, rivalry between artisanal fishers and the growing industrial fleet, increased demand for fish protein, and lack of alternative livelihood options constitute the main drivers of IUU fishing in the artisanal industry. Some artisanal fishers use undersized nets, explosives, chemicals such as DDT, and unapproved fish aggregating devices (FADs) to attract, immobilize, or kill fish (including fingerlings) for easy capture (Afoakwah et al.,

2018). These practices do not only render fish dangerous for human consumption but also lead to the depletion of the fish stock and the degradation of the marine ecosystem (Nunoo et al., 2009).

Additionally, artisanal fisheries are habitually underreported because, unlike industrial fisheries, landing sites are widely dispersed, vessels are small and numerous, and their catches are not frequently included in national stock assessment and management approaches (Duggan & Kochen, 2016; Quetglas et al., 2016). Furthermore, the sector has generally been excluded from reporting obligations, either due to a lack of state ability or capacity to enumerate these fisheries (Govan, 2014).

### 1.3 Fisheries Management in Ghana

#### 1.3.1 Fisheries Legal Framework

The government of Ghana has the responsibility of managing the fisheries industry through the Ministry of Fisheries and Aquaculture Development (MoFAD) and the Fisheries Commission (FC). The management style has been a top-down approach, with limited engagement of the local resource users in decision-making. Ghana has fisheries acts and regulations which serve to govern the activities of the fishing industry. The fisheries legislation is a blend of customary regulations and statutory enactments in accordance with Article 11 of the 1992 Constitution.

The Fisheries Act of 2002 (Act 625) outlines the legal framework within which fisheries are to be managed and provides comprehensive directives for the sustainable management of the fisheries. The Fisheries Regulations 2010 (L.I. 1968) supplement the Act by providing detailed guidelines on prohibited fishing as well as licensing of fishing vessels, importation of fish, fishing in foreign waters, marks on fishing gear, and many other topics (Yamoah, 2012).

Over the last decade, the MoFAD has worked to enhance inter-agency cooperation to improve enforcement of fisheries laws by establishing a marine police unit, a fisheries enforcement unit with personnel drawn from the Ghana Navy and the FC, and retooling the FC with monitoring, control, and surveillance capacity. Despite the successes of these traditional regulatory mechanisms, the problem of IUU persists.

### 1.3.2 Inter-Agency and Stakeholder Collaborations

Collaboration among stakeholders has shown to be critical for policy implementation, and strengthening ocean governance (Weiland et al., 2021). Since the establishment of the Ghana Navy in 1959, there have been collaborations between it and other maritime stakeholder institutions such as the Ghana Maritime Authority (GMA), Ghana Ports and Harbour Authority (GPHA) amongst others (Kontoh et al., 2019). These collaborations, mostly information sharing and technical cooperation, have ensured a relatively safe maritime domain to promote not only national economic growth but also the UN SDGs 2030. For example, the FC partners with the Ghana Navy to conduct fisheries patrols within the nation's EEZ.

Furthermore, there is good technical cooperation and information sharing through the Navy's Maritime Operations Centres (MOCs) and the Monitoring Control and Surveillance division of the FC and the GMA to identify and sweep hot spot areas of Illegal Unreported Unregulated (IUU) fishing and smuggling of narcotics using fishing vessels (Wirth C, 2012). A special Marine Police Unit was inaugurated in June 2013 within the Ghana Police Service to augment fisheries law enforcement efforts.

Several fishers associations also contribute to fishery management. The National Fisheries Association of Ghana is the principal representative organisation for artisanal fishermen and is represented on the Fisheries Committee. The Canoe and Fishing Gear Owners Association of Ghana, the National Canoe Fishermen Council (NCFC), the Ghana Marine Fishing Officers Association, and the National Fisheries Association of Ghana are all represented on the Fisheries Committee. There are additional nongovernmental organizations (NGOs), such as the Environmental Justice Foundation, Hen Mpo Ano (our own shores), and the Fisheries Alliance among others.

### 1.3.3 Permits/ Licenses

Most traditional regulatory efforts include issuance of permits or license in Ghana's fisheries management have largely targeted semi-industrial and industrial fishing. This is partly because artisanal fishing was deemed sustainable and seen as a livelihood and heritage for coastal dwellers. However, as the dynamics of artisanal fishing have shifted from sustenance to aggressive attempts to generate profit by investing in

modern gear and motorised vessels, there is a need to regulate the sector by restricting access to the fisheries resources. Also, the numerous canoes littered across the widely dispersed landing sites along the coast of the nation, coupled with inadequate staffing of the FC has made regulation of the sector ineffective. Furthermore, artisanal fishermen have been ardent in their opposition to any new regulations that might restrict access to the fisheries resources since their livelihood is dependent on it.

Introducing permits and licences is a crucial step towards effective management and regulation of the sector. However, because poverty, which is strongly linked to IUU fishing, has not been effectively addressed in most coastal communities through provision of alternative livelihood and other government interventions, previous governments have avoided taking this critical step to restrict access to the fisheries. This lack of political will to issue permits/license as an effort to clean up the sector has further aggravated the challenge of IUU fishing.

#### 1.3.4 Co-management Approach

Many literatures support the claim that IUU fishing is a lead cause of decline in fish stock worldwide while co-management approaches especially in artisanal fisheries management has proven to effectively combat IUU fishing in the sector. The FAO and Pomeroy defines co-management as "a partnership arrangement between government and the local community of resource users, sometimes also connected with agents such as NGOs, research institutions, and other resource stakeholders, to share the responsibility and authority for management of a resource". This governance approach is particularly useful for artisanal fisheries as it provides the basis for more localized management and strengthens the pillars of fisheries sustainability (Cavallé et al., 2020), and it has been largely successful in other parts of the world.

Like many West African coastal nations, the government of Ghana has been unable to successfully manage fisheries resources through the traditional regulatory approach, resulting in over-exploitation and IUU fishing. Although, environmental changes such as climate change and ocean acidification could potentially impact negatively on the fisheries, experts recognize that the primary focus of fisheries management should be

on the resource users and not the resource itself, since the main causes of IUU fishing and over-exploitation are usually of socio-economic, institutional, and political origin (Pomeroy, R.S. & Williams, M.J., 1994).

This inspired the adoption of a co-management approach, promoted by the FC in the form of Community-Based Fisheries Management Committees (CBFMCs) implemented in 1997 and early 2000s. The CBFMC brought together government-supported community-based groups including local resource users, some key stakeholders in the fisheries sector, IGOs, NGOs, the academia, among others to collectively manage the fisheries. The CBFMCs chalked some success and were a significant step toward integrated community-based resource management.

However, the concept failed to meet its objectives due to challenges including lack of a clear legislative framework and definition of authority or jurisdiction; lack of administrative clarity to attract the interest of key stakeholders. including MMDAs in coastal areas; inadequate capacity development; and inadequate technical and logistical resources (MoFAD, 2020).

#### 1.4 Essential Elements of Co-Management

After Elinor Ostrom discredited the popular “Tragedy of the Common” theory, which implies that privatization is the only means to protect finite resources from depletion or ruin as conceptualized by William Forster Lloyd in 1833, Ostrom’s principles for managing common pool resources including fisheries resources have been well validated both in literature and case studies (Cavallé et al., 2020). Based on her comprehensive work, eight principles for a sustainable and equitable governance of fisheries resources were established. They include the following:

Define clear group boundaries: this involves delegation of power to groups on what specific resource and area they are entitled to manage.

Match rules governing the use of common goods to local needs and conditions: which indicates that regulations should be dictated by the local people and fit their peculiar need. Thus, rules should not be a one-size-fits-all approach.



Ensure that those affected by the rules can participate in modifying the rules: this implies that stakeholders engagement and participation in decision making must be encouraged to improve compliance.

Make sure the rule-making rights of community members are respected by outside authorities: this involves having a system in place to check for compliance of the rules. Develop a system, carried out by community members, for monitoring members' behaviour: thus empowering the local resource users to run an effective monitoring and control of the resources.

Use graduated sanctions for rule violators: there should be an adaptive system of warnings and fines to correct offenders without breeding resentment.

Provide an accessible, low-cost means for dispute resolution: implies the availability of a cost effective mediation and resolution of disputes amongst resource users.

Build responsibility for governing the common resource into nested tiers: this implies devolution of power and decentralization of decision making.

However, as fisheries management has evolved, and experience has grown, new ideas have been introduced to make co-management systems more successful. These other elements include fisher empowerment, strong leadership, incentivization, enforcement, decentralization, and devolution of authority (Cavallé et al., 2020).

### 1.5 Objective of Study

The aim of this study was to investigate how some elements, which are inherent in Ostrom's principles for managing common pool resources for sustainable and equitable fisheries governance could be harnessed and or improved in the new Ghana fisheries co-management policy to effectively tackle the menace of IUU fishing in the artisanal sector. To this end, I sought to assess which of the five chosen elements could be harnessed and or improved to make the co-management model effective in tackling IUU fishing?

## 2.0 Methodology

### 2.1 Data collection: Desk Study

A desk review of relevant literature on fisheries management, IUU fishing, and artisanal fisheries management was conducted throughout the research. The review included thesis, reports, and peer reviewed journal articles, as well as the Ghana co-management policy for the fisheries sector. This provided the background and context of IUU fishing in the artisanal industry, as well as the essential elements of co-management that have been accepted worldwide.

### 2.2 Data collection: Interviews

The interview questions were based on five themes identified as important for sustainable and equitable fisheries governance, which could be harnessed and/or improved in the new Ghana fisheries co-management policy to effectively tackle the menace of IUU fishing in the artisanal sector. The experiences and roles of the chief fishers and state officials, their relationships with each other with respect to co-management, and their perceptions of IUU fishing were established. The interview questions are attached as Appendix 1.

Semi-structured interviews were conducted using open-ended questions which were verbally read to strategically selected state officials, fisheries officers, and chief fishers at selected fishing communities in English, and when necessary, translated into a local language that both the interviewer and respondent could understand.

### 2.3 Choice of Respondents

A list of the respondents and their designation is provided as Appendix 2. The respondents were mainly chief fishers who had vast experience and years of fishing. State officials with various appointments at the FC, the apex institution at the operational level of fisheries management in Ghana, were also interviewed. A director at the MoFAD as well as the acting president of the GNCFC were also interviewed. This helped to gain first-hand information and to understand the perspective of both fishers and state officials on the issues of IUU fishing and co-management approaches. Although, involving other stakeholders such as NGOs and university scientist would

have enriched the study, the most essential feature of co-management in many literatures is the vertical link between fishers (local resource users) and state officials (government). This informed the choice of respondents.

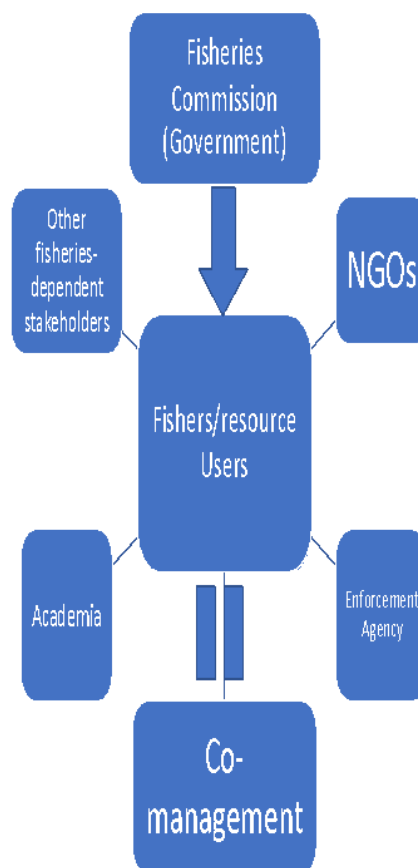
Some of the interviews were conducted via virtual means (Zoom and WhatsApp) to remove the barrier of distance, while others were conducted in direct contact with the respondents. Two individuals were recruited to assist in the data collection. One of them interviewed the local chief fishers directly while the other helped with the translation of the recorded audio from the local dialect into English. Each interview was audio recorded with the express approval of the respondents. These recordings were subsequently transcribed and formed the basis of my data analysis. Overall, twelve people were interviewed, which included state agents at the strategic, and operational levels of the fisheries sector, and local resource users (fishers). All participants gave their consent to be part of the study, and the study was approved by the World Maritime University ethics review committee.

#### 2.4 Inter-rater reliability

Two individuals were recruited to help with my data collection, and because semi-structured interviews allow for greater flexibility, I ensured that a high measure of consistency was achieved. The two individuals were recruited not only for their availability but also for their background and interest in fisheries management. One has a bachelor's degree in fisheries science, while the other has a bachelor's degree in biological sciences. They were given some orientation and education on fisheries co-management to get them on the same page, as well as guidelines on how much freedom they had to ask follow-up questions, and on how to conduct the interviews to reflect the objectives of my research. There was therefore a high degree of agreement amongst the three of us with respect to the data collection.

Figure 1.

A co-management stakeholder diagram showing the vertical link between local resource users and government



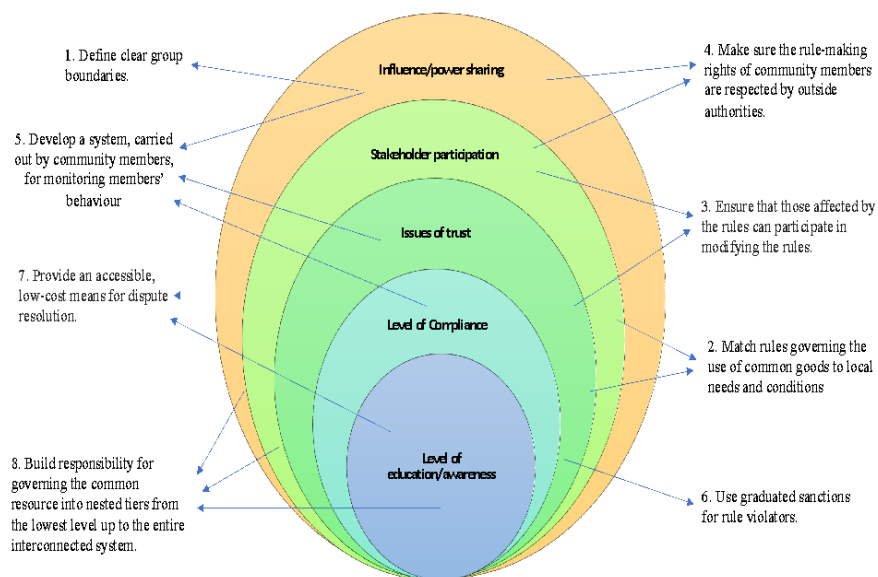
### 3.0 Results

The findings presented under this section as shown in Table.1 focuses on the main objectives of the study that aimed at evaluating how some essential elements of co-management could be harnessed and or improved to combat IUU fishing in the artisanal sector. Five essential themes which are inherent in Ostrom’s eight principles for sustainable and equitable management of common pool resources as shown in figure 1 were coined out with special reference to the peculiarity of the Ghana artisanal fisheries sector. They include the following:

1. Influence/power sharing in the co-management arrangement.
2. Stakeholder participation.
3. Issues of trust between resource users and state officials.
4. Level of compliance.
5. Level of education/awareness with respect to IUU fishing and co-management.

Figure 2.

A diagram showing how the five themes relate to the eight Ostrom principles.



### Influence/ Power sharing

The fishers indicated that they were not treated fairly or with sufficient respect by the government authorities (Table 1, Quote 1). Six out of six chief fishers interviewed expressed that they were only invited to participate in workshops and normally receive instructions and directives from state officials. Although there appeared to be cooperation over certain management issues such as the implementation of closed seasons (Table 1, quote 2), the fishers generally felt that their opinions and ideas are usually not taken into consideration (Table 1, quote 3). The fishers implied that the government wields all power. Interestingly, however, state officials claimed that fishers have well-organized associations with significant influence in fisheries management and do have a say and a share in responsibility (Table 1, quote 4).

### Stakeholder Participation

From the interviews, all state officials acknowledged that stakeholder engagement had not been adequate in the past, but currently stakeholder involvement or participation was broad and adequate (Table 1, quote 5). Notably the inclusion of women in the fisheries supply chain are now acknowledged and included (Table 1, quote 5). This view was also expressed by 5 out of 6 chief fishers. Despite good stakeholder representation, there were views that the relay of information to and from grass-root fishers was sometimes a challenge, preventing them from effective participation.

### Issues of Trust

From the interviews conducted, there appears to be little trust between local resource users and state officials. The fishers indicated that the authorities had allowed foreign owned vessels to overfish (table 1, quote 7) and thereby lost faith in the government to act in their interest. While the local fishers do not trust that the state officials have their interests in mind, the state officials, however, were of the view that the level of trust is satisfactory and that their attempts to engage and communicate with the fishers had been successful (Table 1, quote 8). There was also a positive view from one

official who intimated that the level of trust is gradually increasing under the new political administration (Table 1, quote 9).

#### Level of Compliance

Most respondents believed that IUU fishing persists because punitive measures are not harsh enough (Table 1, quote 10). All respondents were of the view that additional enforcement was required to improve compliance (Table 1, quote 11). Financial constraints and inadequate enforcement personnel, according to all state officials, pose a challenge to effective enforcement (Table1, quote 12).

#### Level of Education/Awareness

From the interviews, the local fishers appeared very knowledgeable on the consequences of IUU. They recognised it as a leading factor in the decline of the fisheries (Table 1, quote 13). It was also established that IUU fishing was prevalent on the western shores than on the eastern shores of Ghana (Table1, quotes 18). Some went on to state health implications of consuming fish that is caught using explosives and chemicals (Table 1, quote 14). Also, the benefits of co-management have been widely communicated to the local resource users through workshops, festivals, games, and other community-based social marketing methods (Table 1, quote 15&16). The fishers therefore anticipate more authority and leverage in the co-management policy for the management of the fisheries (Table 1, quote 17).

Table 1. Results from the interviews

Theme	Examples of supporting quotes
Influence/ Power sharing	<ol style="list-style-type: none"> <li>1. <i>“They see we fishermen as third class citizens, they do not regard us much” B1</i></li> <li>2. <i>“We worked together to agree on the closed season regime” A2</i></li> </ol>

	<p>3. <i>“There is some level of engagement with fishers, but it is one thing being consulted and another having your views acted upon” B1</i></p> <p>4. <i>“Fishermen are well organized at the national, regional and district level. They were able to prevent the closed season from being rolled out in 2018.” A1</i></p>
Stakeholder Participation	<p>5. <i>“We based on failed past experiences to include more stakeholders in the co-management arrangement. For instance, women were included in the current structure” A2 &amp; A5</i></p> <p>6. <i>“After attending workshops, some of the chief fishers are not able to organise their local fishers to relay information” B1</i></p>
Issues of Trust	<p>7. <i>“Under their watch, the Chinese are invading our fisheries in broad daylight. We have lost faith in the system” B1</i></p> <p>8. <i>“The artisanal fishers think we are not being fair to them. We are gradually building the trust” A3</i></p> <p>9. <i>“We trust the local fishers to do the right thing. We continue to engage them in discussions on how best to manage the fisheries resources” A2</i></p>
Level of Compliance	<p>10. <i>“The fines given to culprits must be harsh enough to deter them and others from engaging in IUU” A2</i></p> <p>11. <i>“If a police post is established at the landing sites, compliance would improve” B3 &amp; B4</i></p> <p>12. <i>“Budgetary constraint has made monitoring, control and surveillance ineffective” A2, A3 &amp; A4</i></p>
Level of education/Awareness	<p>13. <i>“We used to have plenty catch with little effort before than now” B2</i></p> <p>14. <i>“Catching fish with chemicals can cause cancer in the consumers” B3 &amp; B4</i></p> <p>15. <i>“About 70-80% are aware of the benefits of Co-management.” A2</i></p> <p>16. <i>“The fishers are very aware of the benefits of co-management, only that they only think of what they can get today and not tomorrow” A3</i></p> <p>17. <i>“In fact, they (fishers) are calling for the implementation of the co-management and wish to be given enough authority to effect arrest of culprits of IUU fishing” A1</i></p> <p>18. <i>“IUU fishing occurs more at the western shores than here in Tema” B3</i></p>



## 4.0 Discussion

Effective co-management can help achieve sustainable fisheries and stamp out IUU fishing. But for co-management to be effective it must be built on certain principles which are globally accepted the standards for sustainable and equitable management of common pool resources. In this study I used insight from key stakeholders on five essential principles to evaluate if Ghana's small scale fisheries are on a pathway to effective co-management and the reduction of IUU fishing.

### 4.1 Influence/Power Sharing

The definition of co-management forms the premise that people who rely on a natural resource should be central to decisions about how that resource is used and managed (Raicevich et al., 2018). Additionally, the presence of a vertical link between the local resource users (fishers) and the government (state officials), including formal arrangements for sharing responsibilities and authority based on collaboration among themselves and with other stakeholders is another important element of co-management (Borrini-Feyerabend et al., 2009). Thus, if the local resource users are not empowered, then there is no co-management. Therefore, there should exist, a mechanism which gives local resource users a chance to influence the management of the fisheries (Nielsen et al., 2004).

From the results, there is a disconnect in the issues of influence and power sharing. While the fishers are convinced that they are not empowered enough, the state officials think that the fishers wield significant power in decision making for the management of the fisheries. For example, the research revealed that fisher groups from the district to the national level were able to mobilize and successfully resisted the closed season measures introduced in 2018. The findings revealed that it took the intervention of the fisher to fisher (F2F) dialogue (an NGO initiative, which trained some selected fishers to retrain other fishes) to effectively convince most local fishers to accept the closed season as an effective measure to halt the decline of the fish stock. Meanwhile, many local fishers hold the view that they are seen by the government authorities as third-

class citizens. Such concerns and misunderstandings need to be addressed if the new policy on co-management is to succeed.

#### 4.2 Stakeholder Participation

A stakeholder may be defined as any group or individual who has direct or indirect interest in the fisheries resources. It includes people who would potentially be affected whether negatively or positively by how the fisheries resources are managed (Walton et al., 2013). The MoFAD, FC, GMA, Ghana Navy, NGOs, local coastal communities, organized fisher groups and other marine resource management organizations are all examples of stakeholders considered.

Identifying stakeholders is an essential first step which requires analysis and mapping, to classify stakeholders according to their levels of involvement, interest, and influence in the co-management project (Reed et al., 2009), and choose how best to involve and engage with each of them as shown in fig 1. Understanding who the decision-makers and key players are, as well as recognizing the people who have little power but are interested in the project's success will help identify which stakeholder to focus on and engage more closely. (Walton et al., 2013).

For an effective co-management, a participatory engagement of stakeholders is needed through workshops and seminars. Drawing lessons from the CMFMC, the new co-management policy ensured that stakeholder participation was broad and adequate. The office of the Attorney-General and Ministry of Justice, academia, the National Fish Processors and Traders Association (NAFPTA), cold store operators, and gear importers were included in the new policy. Indeed, all respondents alluded to the fact that stakeholder participation was adequate.

Figure.3 Showing Stakeholder Identification/Analysis Framework



Source: Mendelow, A.L. (1981). Environmental Scanning-The Impact of the Stakeholder Concept. ICIS.

#### 4.3 Issues of Trust

Transparency and accountability are essential to the success of co-management. Building trust usually takes time and require dedicated effort by partners. Fishers usually have a low level of trust with government (Pomeroy et al., 1998). To improve trust, stakeholders must be well informed through effective communication channels to understand their contribution to the larger objectives of the co-management policy. Information should be easily accessible to not only empower them to make better decisions and stronger contributions, but also to avert any resentment. Frequent meetings to build consensus and discuss common solutions are also very important to build trust.

The research reveals that there is little trust between the fishers and state officials. The fishers strongly feel that their interest is not protected by the government. Some chief fishers were of the view that some artisanal fishermen engage in IUU fishing because the Chinese trawlers violate the fishing laws by fishing in the 30-meter zone with no punitive actions against them. One state official confirmed that indeed the level of trust was low and must be improved.

Conversely, other state officials were of the view that the level of trust was satisfactory. Speaking to the issues of Chinese trawlers fishing in the 30-meter zone, an official said that it is not true that industrial trawlers have been fishing in the 30-meter zone. He intimated that industrial fleet are well managed because of their small numbers, and regular gear audit is conducted on the industrial fleet with support from the Norwegian government. This disconnect on the issues of trust must be diffused through transparency and effective communication. The new co-management policy must therefore seek to build and improve on trust to not only increase the sense of co-responsibility, but also improve compliance and encourage responsible fishing by the artisanal fishers.

#### 4.4 Level of Compliance

The new co-management program would fail to achieve the desired outcomes if compliance to fisheries laws and regulations was low or non-existent. In the literature, co-management have been shown to potentially improve compliance in the long term, however enforcement of the regulations, whether by the authorities or jointly is necessary to achieve high level of compliance in the short term. However, in many cases, stringent enforcement usually results in poor relations and conflict between authorities and local resource users (Hauck & Sowman, 2001, Evans et al., 2011).

From the results, all the respondents, both fishers and state officials, agreed that additional enforcement was required to improve compliance. According to some informants, establishing a police post at landing sites would improve compliance. Another issue raised by some officials was that punitive measures are insufficient to deter perpetrators of IUU fishing. Increasing fines or penalties for violations could be

one way of rectifying this issue. Since IUU is a low-risk but high-gain activity, governments can impose stringent sanctions to reduce the gains and make the activity less attractive to perpetrators (Widjaja et al., 2020).

The research revealed that unlike the western shore, fishers at the eastern coast of Ghana had good compliance especially with respect to fishing with high powered bulbs and lighting accessories which are used as fish aggregating device. This is due to well defined and regulated fishing harbour at the east as compared with the numerous undefined and poorly regulated landing sites at the west coast.

It is expected that IUU fishing activities will be better regulated at the local level with the involvement of trained community-based committees and fisheries associations in collaboration with the Fisheries Enforcement Unit (FEU) of the FC as stipulated in the new co-management policy. Therefore, policy could harness the high unemployed youth population by giving them the necessary training and deployed back into the communities as fisheries task force to not only augment the inadequate enforcement personnel but also mitigate the high rate of unemployment in the local fishing communities.

#### 4.5 Level of Education/Awareness

Education and capacity building can enhance people's attitudes and understanding of co-management. Education programs can address specific resource management issues, help achieve management objectives, and promote other essential services such as research, monitoring, and enforcement (Lucrezi et al., 2019). Under this theme, the study sought to find out whether local fishermen were aware of the consequences of IUU and if they had a good understanding on the benefits of co-management, because it is one thing to act unknowingly and another to act with understanding.

The study revealed that most fishers are aware of the implications of IUU fishing and affirmed that it was a lead cause of decline in the fish stock. Some went on to state some health implications of consuming fish that is caught using explosives and chemicals as shown in the results table. Most of the respondents agreed that the benefits of co-management have been widely publicized through workshops, festivals

games, radio programs and other community-based social marketing methods. Because of the strong understanding of the benefits of co-management, it was recorded that fishermen are eagerly looking forward to the implementation of the new policy and anticipate greater influence and authority in the management of the fisheries. However, there was a consensus that education and awareness creation must continue since the artisanal fisheries sector in Ghana is extremely dynamic and there are yet some remote fishing villages where education and capacity building efforts are yet to reach.

#### 4.6 Unexpected Finding

While some state officials alluded to the fact that there was some form of co-management arrangements in Ghana fisheries management, others intimated that the co-management policy is yet to be implemented. Thus, what is perceived as the existing co-management model does not seem to satisfy the ideal elements of co-management. More education and capacity building are therefore needed not only for the fishers, but also for the fisheries managers to understand the intricacies of co-management and its potential benefits for better implementation and subsequent evaluation.

#### 4.7 Limitation of Study

This study focused only on fishers and state officials, with the rationale that although other stakeholders are important for effective co-management, the most essential feature of co-management is the vertical link between fishers (local resource users) and state officials (government). The views of other stakeholders were therefore missing on the themes selected for the study. Furthermore, the five themes discussed are not exhaustive with respect to the elements of effective co-management. These are areas that future research could explore to enrich discussions on how co-management could effectively tackle IUU fishing in Ghana's artisanal fishing sector.

## 5.0 Conclusion

In this study, five themes considered essential to the principles of fisheries co-management were explored with respect to the artisanal fisheries sector of Ghana to ascertain which needed to be harnessed or improved to make the fishery sustainable and effective in combating IUU fishing in the sector. A literature review including the review of the Ghana co-management policy for the fisheries sector, and a semi structured interview of key stakeholders were conducted. It can be concluded that to help policymakers decide which areas to focus on to achieve an effective co-management program, the following should be considered.

Co-management should include a formal policy for the devolution of both power and responsibility from the authorities to the stakeholders. Fishery-dependent stakeholders should be part of the decision-making process and vested with the necessary powers to implement those decisions. Much greater attention needs to be paid to garnering trust amongst stakeholders as this is essential if the outcomes of the co-management policy are to be achieved. It is also imperative to improve the level of compliance with the set laws and regulations governing the fisheries. Finally, the value of education and awareness-building cannot be overstated, as they empower stakeholders and foster mutual respect between managers and resource users.

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## Appendices

### Appendix 1. Interview Questions

#### **A. For Chief Fishers**

1. Kindly introduce yourself (name, age, position).
2. How long have you worked in the fishing industry?
3. What is your experience of IUU fishing in the artisanal sector?
  - a. Please provide some examples of what you consider IUU fishing in the sector
  - b. What do you think are consequences of IUU fishing?
4. How well are fishers informed about the consequences of IUU fishing?
5. What is your role in the existing co-management structure in Ghana?
6. How well informed have you been about the benefits of co-management?
7. Do you consider the current co-management arrangement effective in tackling IUU in the sector?
8. What are the challenges in the current co-management structure?
9. Do you think the current co-management structure gives equal influence to the government and stakeholders?
10. What role did you play in the consultation and engagement in adopting the current regulations?
11. Are there stakeholders that were overlooked?
12. How would you describe the level of trust in the current co-management arrangements?
13. Do you think more awareness-creation and education are needed to improve the efficiency of co-management governance?
14. What can be done to improve compliance of existing regulations?

**B. For State Officials**

1. Kindly introduce yourself (name, age, position).
2. How long have you worked in the fishing industry?
3. How directly do you work with artisanal fishers?
4. How well are fishers informed about the consequences of IUU fishing?
5. What is your role in the existing co-management structure in Ghana?
6. Do you consider the current co-management arrangement effective in tackling IUU in the sector?
7. What are the challenges in the current co-management structure?
8. Do you think the current co-management structure gives equal influence to the government and stakeholders?
9. How were stakeholders identified? Are there stakeholders that were overlooked?
10. How would you describe the level of trust in the current co-management arrangements?
11. Do you think there is duplicity of functions between agencies (for example enforcement) in the existing co-management arrangement?
12. How well informed are other stakeholders about the benefits of co-management?
13. Do you think more awareness-creation and education are needed to improve the efficiency of co-management governance?
14. Do you think there is a lack of capacity or information to achieve effective co-management governance?
15. What can be done to improve compliance of existing regulations?

Appendix 2. Table showing respondents and their designation

Serial	Institution	Designation	Work experience (No. of years)	Code
1.	MoFAD	Deputy-Director (Research, Statistics, and Information Management)	8 years	A1
2.	GNCFC	Acting President	35 years	B1
3.	Fisheries Commission	Fisheries manager, (Monitoring, Control and Surveillance Division)	9 years	A2
4.	Fisheries Commission	Regional Director, Western North Region	14 years	A3
5.	Fisheries Commission	Assistant Manager, Fish health, post-harvest, and extension (FPE)	9 years	A4
6.	Fisheries Commission	Senior Fisheries manager, (Zonal Level)	11 years	A5
7.	Fisher	Chief Fisherman Elmina, Centra Region	16 years	B2
8.	Fisher	Chief Fisherman, Tema Newtown	21 years	B3
9.	Fisher	Canoe owner/Fisherman	16 years	B4
10.	Fisher	Canoe owner/Fisherman	17 years	B5
11.	Fisher	Canoe owner/ Fisherman	17 years	B6
12.	Fisheries Commission	Fisheries Manager, Marine Division	10 years	A6