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**UNIVERSITY OF  
CAPE COAST**

## **USAID/UCC FISHERIES AND COASTAL MANAGEMENT CAPACITY BUILDING SUPPORT PROJECT**



**POLICY AND RESEARCH DIALOGUES ON  
SUSTAINABLE FISHERIES AND COASTAL  
MANAGEMENT IN GHANA**

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# **TECHNICAL REPORT**

DEPARTMENT OF FISHERIES AND AQUATIC SCIENCES  
UNIVERSITY OF CAPE COAST

**YEAR ONE**

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**Cover Photo:**

Policy and research dialogue session at the Mensvic Hotel in Accra, Ghana.

## **EXECUTIVE SUMMARY**

Ghana has a very fragile ecosystem well-endowed with natural resources which are exploited by different sectors of the economy. This relatively small coast houses 25% of the nation's population and about 80% of the industrial establishments in Ghana thereby increasing the environmental pressure on the environment. Aside the environmental challenges, Ghana's fisheries sector is plagued with massive overcapacity, resulting in excess competition over the limited fish resources, declining productivity, economic inefficiency, and depressed fisher incomes. The traditional and political fisheries management arrangements and institutions have also, in recent times, failed to successfully manage the growing challenges in the fisheries sector. It is in the light of these environmental and fisheries management challenges that University of Cape Coast through the Fisheries and Coastal Management Capacity Building Support Project, conducted these research dialogues to facilitate the sustainable management of fisheries and the coastal zone of Ghana.

A team of researchers spent time interacting with stakeholders in the four coastal regions of Ghana. The overall finding of this Policy and Research Dialogue is the general acceptance that illegal fishing methods is causing a decline in the catch, and the willingness and unanimous agreement by all stakeholders that change is needed. Also, stakeholders are unanimous that change has to be from the bottom: instigated and implemented by fishermen and fishmongers and supported by the local district assemblies, traditional authorities and the police. That is, existing fisheries and environmental laws and regulations can be enforced by these local stakeholders in order to attain the national fisheries management objectives.

As part of this capacity building objective of this project, the Department of Fisheries and Aquatic Sciences (DFAS) of the University of Cape Coast should in the next years, among others, work with the Ministry of Fisheries and Aquaculture Development to initiate and facilitate the drafting, acceptance and implementation of fisheries and coastal environmental bylaws in the various district assemblies.

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## LIST OF ACRONYMS

CCM	Centre for Coastal Management
CCRF	Code of Conduct for Responsible Fisheries
DFAS	Department of Fisheries and Aquatic Sciences
EPA	Environmental Protection Agency
FEU	Fisheries Enforcement Unit
MCS	Monitoring, Control and Surveillance unit
MMDA	Metropolitan, Municipal and District Assemblies
MOFAD	Ministry of Fisheries and Aquaculture Development
NEAP	National Environmental Action Plan
SNV	Netherlands Development Organisation
UCC	University of Cape Coast
USAID	United States Agency for International Development

## I INTRODUCTION

The marine and coastal resources of Ghana exist within a very fragile ecosystem well-endowed with natural resources which are exploited by different sectors of the economy. Landward, the area includes major landforms and ecosystems such as lagoons, marshes, estuarine swamps. Seaward, the boundary is determined as the limit of Exclusive Economic Zone (200 nautical miles). The primary activity of the zone is fishing, contributing about 1.7% to the country's gross domestic product. Other activities of economic importance that occur in the zone are agriculture, transportation, salt production, oil and gas exploration, sand and stone winning, recreational and industrial developments. The zone is also known to be important internationally, as feeding, roosting and nesting sites for thousands of birds, especially migratory species.

Ghana's coastal zone represents about 6.5% of the land area of the country, yet houses 25% of the nation's population. This small strip of land now hosts about 80% of the industrial establishments in Ghana. The primary sources of land-based pollution of the marine environment come from industries and human settlements along the coast and these wastes tend not to be treated. The country's coastal zone, especially estuaries and lagoons, is therefore highly degraded and used for the disposal of industrial and municipal wastes, an activity that is being given urgent attention. On the other hand, the primary sources of sea-based pollution of the marine environment are discharges of untreated wastes from ships and other vessels and oil from oil tankers. Environmental degradation of coastal areas has therefore been identified as a key issue in Ghana's Environmental Action Plan.

Aside the environmental challenges, Ghana's fisheries sector is plagued with massive overcapacity of fleet, resulting in excess competition over the limited fish resources, declining productivity, economic inefficiency and depressed fisher incomes. According to the World Bank and the Food and Agriculture Organization of the United Nations, ***“by improving governance of marine fisheries, society could capture a substantial part of this \$50 billion annual economic loss. Through comprehensive reform, the fisheries sector could become a basis for economic growth and the creation of alternative livelihoods in many countries. At the same time, a nation's natural capital in the form of fish stocks could be greatly increased and the negative impacts of the fisheries on the marine environment reduced.”*** Fisheries management draws on fisheries science in order to find ways to protect fishery resources to ensure sustainable exploitation. Modern fisheries management is often

referred to as a governmental system of appropriate management rules based on defined objectives and a mix of management means to implement the rules, which are put in place by a system of monitoring control and surveillance. The sustainable use and conservation of marine living resources is encouraged through legislation, regulations, education and awareness creation programmes as well as the enforcement of existing regulations and legislation. According to the Food and Agriculture Organization of the United Nations, fisheries management should be based explicitly on political objectives, ideally with transparent priorities. Typical political objectives when exploiting a fish resource are to:

- maximize sustainable biomass yield
- maximize sustainable economic yield
- secure and increase employment
- secure protein production and food supplies
- increase export income

Such political goals can also be a weak part of fisheries management, since the objectives can conflict with each other. In Ghana for example, traditional fisheries management arrangements have in some places, worked better than political arrangements. Failures of political fisheries management and institutional shortcomings have, sometimes, been covered up by traditional fisheries management arrangements or institutions. However, these institutions (political and traditional) have also, in recent times, failed to successfully manage the growing challenges in the fisheries sector.

It is in the light of these environmental and fisheries management challenges that University of Cape Coast (UCC) and the United States Agency for International Development (USAID), through the Fisheries and Coastal Management Capacity Building Support Project, are calling for policy and research dialogues to facilitate the sustainable management of fisheries and coastal zones of Ghana.

### **1.1 Specific Tasks:**

- Conduct assessment of relevant fisheries and coastal management issues for policy and research dialogues at the district, regional and national levels;
- Facilitate round table meetings with policy makers for discussions on the above issues;
- Develop policy briefs on fisheries & coastal issues and best practices emanating from the meetings;



- Facilitate a conference of researchers to discuss sustainable fisheries and coastal management issues in Ghana;
- Facilitate linkages among personnel in relevant government agencies and researchers in Ghana; and
- Document and share with stakeholders, examples of best practices in fisheries and coastal management in Africa.



**Figure 1. Sardines spread out on trays to dry before they are smoked**

## **2 OVERVIEW OF FISHERIES AND ENVIRONMENTAL MANAGEMENT IN GHANA**

The fishery sector is valuable and its importance is related to employment, livelihood support, poverty reduction, food security as well as foreign exchange earnings. The fishery sector employs both men and women; the men are normally engaged in the key fishing activities, whilst women are engaged in the on-shore post-harvest activities such as processing, storage and trading (Larbi, 2015). In Ghana, the developed landing sites serve industrial, inshore and artisanal vessels. Tema Fishing Harbour and Albert Bosomtwe Fishing Harbour are the major landing sites for industrial and inshore vessels. Important landing sites for the artisanal sector are Teshie, Jamestown, Chorkor, Shama, Axim, Elmina, Winneba, Mumford, Akplabonya, Adina, Atiteti, Abutiakope and Moree.

The marine fisheries cover over 300 different species of commercially important fish (Ofori Adu, 1988). Most domestic marine fish supplies are the sardinellas, chub-mackerels and anchovies and large pelagic species such as tunas. There are also fisheries for demersal species of the families Sparidae, Mullidae, Pomadasyidae, Serranidae and Penaeidae (Quaatey, 1997). The type of vessels used is mostly made up of 30-200hp diesel engines, and large steel-hulled foreign built vessels. They operate in Ghanaian waters and are restricted to between 50-75m deep, but frequently stray into shallow waters. They either purse seine or use the pole and line with live bait (anchovy) to land tunas (skipjack, yellow fin and big eye) (Bank of Ghana, 2008).

The fishing craft for the artisanal sector is the dug-out canoe. The canoes range in size between 3 and 18m long and from 0.5 to 1.8m wide depending on the type of fishery that it is used for. The canoe is propelled by an outboard motor of up to 40hp, or sail and oars depending upon the fishing operation that it is used for (Amador et al., 2006). The gears used in artisanal fishing are purse seines, beach seines, trawl nets, gillnets and entangling nets (including set and drifting gillnets; trammel nets), traps (including pots, stow or bag nets, fixed traps) and hooks and lines.

The semi-industrial or inshore fleet consists of locally built, wooden-hulled vessels between 8 and 22m long and powered by inboard engines between 90 and 400hp. They are used for purse seining during the upwelling seasons for sardinella, and trawling is done during the off-season (Bank of Ghana, 2008). They operate from seven coastal landing centres, namely: Tema, Apam, Mumford, Elmina, Sekondi, Takoradi and Axim.

## **2.1 Fisheries Management in Ghana**

In Ghana, there are independent management systems for marine fisheries and lake fisheries. Together, the two management plans attempt to respond to ecological, socio-economic and institutional issues related to the development of the national fishery. To conform to the global policy environment, the national fisheries management plans draw heavily on the Code of Conduct for Responsible Fisheries (CCRF).

The existing regime for the regulation of the fisheries industry is a mixture of customary rules and statutory enactments in consonance with Article 11 of the 1992 Constitution. The fisheries industry in Ghana is regulated by the Fisheries Act of 2002, Fisheries Regulation 2010 (LI 1968), Fisheries (Amendment) Act 880 (2014), Fisheries (Amendment) Regulation (2014) and all other Acts, Decrees, Laws, Legislative Instruments (and other subsidiary/subordinate legislation) on or relating to the sector that are still in force and not inconsistent with the Constitution (the Existing Law). The purpose of the Fisheries Act is to amalgamate with amendments of the laws on fisheries; to provide for the regulation and management of fisheries; to provide for the development of the fishing industry and the sustainable exploitation of fishery resources; and to provide for connected matters.

Alongside this formal fisheries management regime is a traditional fisheries management regime that operates and varies from one ethnic group to the other. At each landing beach, there is an elected chief fisherman who is the administrative head and chief arbiter in all disputes related to the landing site. In recent times, the position of a chief fishmonger (Konkohemaa) has evolved to play a similar role as that of the chief fisherman.

## **2.2 The National Environmental Action Plan**

Ghana has a National Environmental Action Plan (NEAP) which defines a set of policy actions, related investments and institutional strengthening activities to make Ghana's development strategy more environmentally sustainable and to improve the surroundings, living conditions and the quality of life for all generations of Ghanaians. Degradation of the coastal environment is one of the key issues identified in Ghana's Environmental Plan. Some of the specific issues are fisheries degradation, industrial pollution of water resources in the coastal zone, coastal erosion, and biodiversity loss.

The Environmental Protection Agency (EPA) by law is therefore the leading public institution for protecting and improving the environment in Ghana. It performs these functions with the following guiding principles: partnerships, pollution prevention and control, ecosystem management, environmental justice, environmental education,

compliance and enforcement. It is supposed to provide standards and guidelines in relation to air, water and other forms of environmental pollution. It also has authority to ensure that developers of commercial entities comply with environmental impact assessments. At the local level, metropolitan/municipal/district assemblies are responsible for sanitation and are required to promote aggressively the construction and use of domestic latrines, and enforce by-laws on the provision of sanitation facilities by landlords and public latrines to be restricted to public places.

### **2.3 Challenges of Fisheries and the Coastal Environment**

In most countries, fisheries production from wild harvests has reached maximum sustainable levels or declined. Contributing factors to the latter are overfishing, poor management, the open access nature of the resources, loss of critical habitats, coastal sand winning, exploitation of immature fish, and the use of destructive fishing techniques such as bomb fishing and fish poisoning. Open access and the resulting tragedy of the commons has been a universal feature of fisheries. This has led to overcapitalization, hence application excess effort, degraded habitats, and depleted resources worldwide. New approaches to management involve secure access privileges, community-designated fishing areas, zoning, national access agreements, licenses and permits, and other forms of use rights or tenure.

Weak governance and the implications of open access policies are widely acknowledged as some of the largest and most common problems within the sector. Factors characterizing weak governance in the fisheries include corruption, inadequate management resources (physical, human, and financial), poor enforcement of regulations, illegal fishing, inability to trace the origin of catches, lack of stakeholder participation in decision-making, and user conflicts. The inclusion of fishers in management can strengthen governance structure by creating responsible economic incentives for conservation, engender behavioural change and reduce the need for extramural enforcement. A stronger, corruption-free institutional framework will allow for capture of economic rent and reinvestment in management.

According to Mensah (1997), sand mining is a type of open-cast mining that provides material for the construction sector in Ghana. The construction sector in the coastal areas of Ghana relies heavily on coastal sand and pebbles in the building of houses, bridges and roads. No sand is cheaper and easier to obtain for the construction of buildings in the coastal zone than beach sand (Pilkey et al., 2004). This makes the industry very attractive especially for those who do not want to work within the confines of the law.

Coastline retreat is a major threat to human beings (Xue et al., 2009). During the last decades, coastline erosion has increased in many locations as a consequence of human activity (Sanjaume and Pardo-Pascual, 2005). Coastal erosion has been identified to be a global problem with at least 70% of sandy beaches around the world receding (Bird, 1985). Coastal erosion is not alien to the 550 km long Ghanaian coastline. It has been a serious problem dating back to the 1970s (Dei, 1972), and continues to threaten many historical sites, tourism facilities, communities and important social infrastructure. The government has over the years spent huge sums of monies in engineering ventures targeted at protecting coastal communities from inundation and the threat of the sea e.g. in Keta and Ningo-Prampram areas.

There is also loss of coastal vegetation such as mangroves, cacti, raffia palm and coconut trees. Coastal erosion, sand mining and the Cape Saint Paul wilt disease have contributed to 80% decline of coconut and other vegetation over the last 40 years (Biney et al., 1993). The clearing of vegetation on the beaches to create pathways for trucks is a common practice by sand miners which destroys many species of vegetation and associated animals.

Another challenge is marine pollution by oil spills, untreated sewage, heavy siltation, eutrophication (nutrient enrichment), invasive species, persistent organic pollutants, and heavy metals from mining activities. Pollution by plastics is also widespread and on the increase with fatal consequences for countless sea creatures.





**Figure 2. A beach scene in Apam**



**Figure 3. Canoe building section of the landing beach at Prampram**

### **3 POLICY AND RESEARCH DIALOGUE STRATEGY**

To achieve the objectives of this activity, discussions were held at landing beaches concerning the following:

1. Species of fish caught, catch trends and preferred species
2. Fishing methods
3. Storage of the catch at sea, the condition of the fish when landed, and suggested adaptations to storage challenges
4. Concerns about the fish stocks (species and general)
5. Fisheries management issues
6. Impact of the following on fisheries development:
  - a. Issues of subsidies on fishing inputs
    - i. premix fuel;
    - ii. outboard motors
    - iii. fishing nets
  - b. Control of the number of fishing vessels and fishing areas through
    - i. licensing
    - ii. zoning
  - c. Introduction of protected areas, closed seasons and reduction in capacity/boat numbers
7. Marketing challenges and suggestions
8. Processing and preservation methods, the processes, problems and suggestions for improvement
9. Sources and preferences of fuelwood for smoking of fish
10. Losses incurred in the different fish processing techniques?
11. Market chain: packaging, transport, major markets, customers, customer relations, and losses in the chain
12. Coastal environmental challenges such as salt panning, sanitation, mangrove cutting, sand mining, and erosion with respect to trends, gender dimensions, and management practices
13. Occurrence of conservation areas in the community for bird and turtles, and management practices
14. Research, financial support, training needs
15. Conflicts and conflict issues, trends, dimensions among users of coastal resources and other stakeholders.

Subsequently, regional and national policy and research dialogues were held with the relevant stakeholders to synthesize and agree on a bottom-up, simple and effective fisheries and coastal environmental management in Ghana. The information was gathered through breakout and in plenary sessions.





**Figure 4. Fishmongers describing their routine and challenges in fish processing, storage and marketing at some of the landing beaches surveyed**





**Figure 5. Data gathering scenes in Half Assini**

## **4 CAPTURE FISHERIES AND COASTAL ENVIRONMENTAL MANAGEMENT IN GHANA**

### **4.1 Jomoro**

#### **4.1.1 The Fishery**

Jomoro District had 28 landing beaches and 208 canoes in 2014. These have increased and the numbers of fishermen have also increased.

Major fish species landed here are burrito, barracuda, cassava fish, bumper, herrings and silverfish. The price of the fish is set through haggling and bargaining with the Konkohemaa (queen fishmonger) who relays the cost to prospective buyers. The Ewe fishermen do not spend long periods at sea so their catch is relatively fresh and the most preferred by fishmongers and consumers. Fishermen from other ethnic groups stay longer and allegedly use chemicals hence their landings are often deteriorated. When the catch is low, the person who pre-financed the expedition has the first right of purchase.

Postharvest losses are usually higher during bumper harvests because of lack of storage facilities but the losses are being incurred at this time when there are low catches because of the use of chemicals to catch the fish. This is easily detected as fish caught with chemicals have a reddish coloration, deteriorate faster and breakup easily during smoking.

The chorkor smoker is used in smoking of the fish. “Alokoba” and “baya” (forest hardwood species) are two most popular hardwood used for smoking fish. The smoked fish is packaged in large aluminium pans and transported to Agona, Tikobo, Anyinase, Elubo, Sowudadiem, Warf, Kumasi and Accra and other market destinations, usually, on Mondays, Tuesdays, Fridays and Saturdays.

There is increasing interest by fishermen in fish culture. Fisheries officers should be trained to assist interested fishermen to go into this venture. Also there is the need to train the Fisheries Commission staff at the landing beaches in fish identification. In addition, more personnel should be recruited and provided with basic equipment to facilitate data collection for proper management of the fisheries sector in Jomoro. Thursdays are fishing holidays at in the Jomoro area.



#### **4.1.2 Environmental and fisheries issues**

There are underhand dealings in sale of premix fuel. Fuel is first sold to middlemen who then add their margins before selling. Many of the middlemen do not even own canoes/boats. There is therefore frequent shortage or hoarding of premix fuel and fishermen have to supplement with commercial fuels. There is also a strong political bias in the setup and operations of the Landing Beach Committee. This increases the cost of the fishing.

There is a complaint that the FEU is not visible. The fishermen wondered how ordinary fishermen could manage to outwit such professionals. The Jomoro Chief Fisherman was specifically mentioned and praised by President Kuffour for stopping illegalities. It is believed that the FEU has informants within it who warn some of the trawlers in advance before it sets out on operations.

The Fante fishermen engage in light and chemical fishing when purse seining while the Ewe fishermen do beach seining. Because of the general low catches in the fishery the Ewe fishermen have also gone into light fishing. This practice had been discussed at the district assembly but it still continues. The Fante fishermen said if they stop light fishing, fishermen from Axim will come and do it in Half Assini waters.

According to the fishermen, light on the oil rig attracts all the fish and also brings skin diseases to the people of the area. Seaweeds also often invade the area thus worsening the situation. Fishmongers incur losses because after they have bought the fish, the men continue to pick fish from the bowl. Also, the women have often complained about the bad quality of the fish. Sometimes when it is very bad, the price is reduced.

Sanitation on the beach is maintained at the individual level. There are community efforts but some individuals keep breaking the law. Although there is a public latrine some of the people do not patronize it. Relatively, more men defecate on the beach than women do. It was reported that the beach was once a turtle nesting area.

## **4.2 Esiama**

### **4.2.1 The Fishery**

About 25 canoes operate at the main landing beach at Esiama but none of these boats is registered. Some of the fishermen go out to sea overnight and others go and return within the day. The gears used here are ali net, tenga, adaliboa and set nets. The distance travelled to the fishing grounds depends on the type of gear being used. Some fishermen go as far as Benin or Cote d'Ivoire to fish and when they lose their bearings as happens sometimes they

seek help from crew of other vessels or the stars are used as a guide. Fishermen who travel farther from their base carry ice chests on board their vessel. The ice is produced and sold by women.

When going out to sea, one has to have sim cards of all the mobile phone networks and change to the appropriate sim card as and when needed. The mobile phones are used at sea for communication with family, other crew and colleagues at the landing beaches.

Fishes landed at Esiamaa include the African moonfish, bone fish, redfish and cassava fish. The Konkohemaa negotiates and arrives at the final price. In times of scarcity the fish is shared among all interested fishmongers. The fish is either smoked or frozen. The chorkor smoker is the commonest oven used for smoking fish in Esiamaa. There are communal ovens (Morrison's oven) built by the Netherlands Development Organisation (SNV) which requires smokers to provide their own fuelwood. However, the smoking process is slow so the chorkor smoker is preferred. Dead coconut trees and coconut shells are used for fish smoking. Fish that is deteriorated are salted and dried on palm fronds on raised platforms.

Destination markets for fish from this town are Agona Nkwanta, Half Assini, Anyinase, and Dormasi. When there is a bumper harvest, it is announced on the local radio station (Westend FM) to inform prospective buyers. Unsold fish is kept in warehouse cold store till the next market day. In case of an accident, the truck owner pays a third of the cost of damage.

The beach was usually cleaned by communal labour until Zoomlion Company (ZOIL) took over the job. However, individuals see to maintenance of clean working areas. Defecation on the beach in this area is strictly prohibited.

#### **4.2.2 Environmental and fisheries issues**

One of the major sources of conflicts in the fishing industry is the crossing of fishing nets belonging to different crews. Such disputes are usually settled at sea but they sometimes result in a fight at sea. When reported, the dispute is settled by the chief fisherman and the offending party is made to pay two thirds of the cost of damage.

At night, some trawl vessels switch off their lights and move into inshore areas to fish thus competing with artisanal fishers. In addition, they pose a danger to canoes which sometimes run into the trawl vessels and also destroy gill nets set by canoe fishermen.

The authority of the chief fisherman at Esiamaa is no longer recognised by users of the landing beaches including the non-fishing folk. There is evidence that the beach area is being eroded steadily with sand mining taking place along the beaches. There are no public latrines

close to the beach so persons working at the beach have to find an alternate place of convenience.



**Figure 6. A communal oven in Esiamia**



**Figure 7. Unsanitary conditions at a landing beach in Ghana.**

### **4.3 Axim**

#### **4.3.1 The Fishery**

Except on Tuesdays, fishing is practiced 24 hours daily all-year-round at Axim. Bumper harvests were common place in this community in the 1980s but this has not been the case

for some time. Currently the number of canoes is four to five times greater and the low fish catches has led to the use of various unapproved fishing methods, however destructive. These fishing methods include the use of light, chemicals, calcium carbide, dynamite and purse seine nets with smaller mesh sizes including mosquito nets. Trawling in unapproved zones and 'saiko' fishing are further degrading the fishery.

The major gears used are 'watsa' (dominant) 'ali-poli-watsa', set net, drift net, and hook and line. Drift gill nets are used for skipjack tuna fishing in July/August. Purse seining is the dominant fishing method for the capture of round sardines and flat sardines from June to September. Fishermen embark on fishing expeditions with ice. When ice is in short supply, fishing is terminated. Spoilage can occur when the fish have full stomachs. Also when the fish hull is full, the rest of the fish which are left on deck often deteriorate.

Fishmonger associations exist in the area. They educate members about illegal fishing methods. Members of the association indicated that they would welcome equipment that tests fish caught using an illegal. In this community the Konkohemaa plays a neutral role in bargaining when the fish is landed, but sometimes this fails due to harassment from the fishermen. There are times the fishmongers cheat the fishermen and vice versa. The former situation occurs when the catch is poor, and the latter during bumper harvests.

The 'chorkor' smoker is the dominant stove used in the area. The Morrison stove has been introduced but smoking takes a longer period to complete; it also occupies a lot of space and is about five times the cost of a 'chorkor' smoker. Wood for fish smoking comes from the rubber, guava, "alokoba", "prumin", (forest hardwood species) and mangrove plants. Sugarcane chaff stocks are used to improve the colour of fish for the domestic market. Blue shark is not smoked, but only salted and dried. The hammerhead shark is smoked. Chub mackerel is the most profitable fish when smoked.

Major markets for fish from Axim are Agona Nkwanta, Kumasi, Bogoso, Prestea, Accra and Sefwi Bekwai. The fish is packaged in large, tagged aluminium pans and transported to the market. The transport cost is paid in cash or on credit. The fishmonger usually stays in the market town till the fish is sold. The fish can also be stored in a warehouse at the market town, and is sold to known customers. The price of the fish may go down if the quality reduces due storage. If the fish consignment is unaccompanied by the fishmonger it is sold by a contact person and the proceeds sent to the owner via mobile money transfer.

There is only one Fisheries Technical Assistant at Axim who is being supported by National Service personnel. These personnel need training in the area of gears, species identification,

types of canoes and inshore fishing vessels, seawater physicochemical measurement, data keeping and interviewing skills.

#### **4.3.2 Environmental and fisheries issues**

The FEU is located too far away (Sekondi Naval Base) and it takes a long time for them to respond to distress calls. Because Ghana is a member of World Trade Organisation, foreigners are allowed to do business in Ghana but those who come into the fisheries business do not abide by the fisheries laws of Ghana. The big boats they operate though licensed to catch specific species in specific zones infringe upon these restrictions and rather engage in illegal fishing. Unfortunately, the FEU does not enforce the law.

In Cote d'Ivoire Ghanaian crew and gear are insured and fishermen pay taxes on their catch, which is not the case in Ghana. For example, there are about 500 vessels operating from Axim area, but only 300 are registered. The landing beaches in Ghana are open access but there is only one entry/check point in Cote d'Ivoire which makes law enforcement easier.

The fishermen observe that February to April is the breeding period of most fish therefore light fishing which is widespread during this period harvests of both spawning fish and juveniles.

The distribution and sale of the premix fuel involves many middle men, and hoarding and corruption are challenges in the sale and management of the commodity. It is recommended that premix should be sold in the open market like other vehicle fuel. Some of the smoked fish is lost as a result of mutilation during transportation to markets in cane baskets instead of metal pans.

Because of the monetary induced relationship between Tullow Oil's Fisheries/Community Relations Officers and the communities, meetings called by the traditional government Fisheries Officers are not honoured. Sea weeds drift to the shores between December and January. Fishing is difficult during this season because the weeds clog the outboard motors and nets.

Sanitation issues are common at the landing beaches in the area. The beaches are cleaned every Tuesday before the fish is landed. However, there is the need to place trash bins at vantage points, construct public latrines, provide information vans to educate the population, and enforce the law. Waste management at the landing beaches used to be managed by the Zoomlion Company but this has stopped. Sand used to be mined at the landing beaches but this activity has been relocated elsewhere.





**Figure 8. Fish being smoked with a chokor smoker built of mud**

#### **4.4 Shama**

##### **4.4.1 The Fishery**

During a fishing expedition that may last up to three days, the fishermen take along an ice chest to store their catch. They fortified by prayers and anointing oil before setting out to the fishing grounds. The nets are set in the morning and retrieved in the evening and the fish kept on ice. A fishing expedition can be arranged between a fisherman and wife or with any other person. When the fish is landed, the group expenses are deducted and the profit is saved. At the end of a year or two, the profit is shared among the shareholders. Every fisherman on the boat or canoe has a share of the fish that can be taken home or sold.

When the fish is landed, it is spread on a plastic sheet on the beach and sorted into the various grades. The person who pre-financed the expedition has the right of purchase. Surpluses are sold to other interested buyers or sent to the market at Sekondi. Fish of bad quality are bought at half price and processed into “momoni” (stink fish). Prior to salting the fish, it is descaled and for some species the skin is removed. Removal of the skin makes it

dry faster and prevents flies laying eggs underneath the skin. The mouth of the fish is blocked to prevent flies from entering it to lay eggs. After cleaning the fish, it is placed in basin with salt crystals for three days and sundried for four to five days. The fish is packed in a jute bag and stored in a cool dry place for up to two months.

Sometimes the fish from the local landing beaches is insufficient for the fishmongers and have to be supplemented by fish bought from Sekondi, Elmina, and Dixcove. The processed fish is sold at Agona Nkwanta, Takoradi, Kumasi and other markets.

#### **4.4.2 Environmental and fisheries issues**

Light fishing is practised in this area. The fishermen set off in the evening and return the next morning. Fishermen who use chemicals usually deliver the fish caught to their wives or the pre-financiers. Such fish is of bad quality; it is commonly smoked and sold in villages and the hinterland where the quality cannot be easily ascertained.

Pre-mix fuel issues are common place in the Shama area. There are middle men who buy in bulk and sell at a higher price. In many cases, the commodity is not available. Because of the shortage of fuel, many boats have relocated to Cote d'Ivoire.

To fish in Cote d'Ivoire waters, a fisherman must have a Ghana ID card, a Cote d'Ivoire ID card and insurance cover. The fish caught can either be sold in Cote d'Ivoire or sent to Ghana. Some fishermen stay about three to four months or up to one year in Cote d'Ivoire. The FEU in Ghana are reportedly corrupt and usually inform fishermen who do not comply with the fishery regulations ahead of time about their enforcement activities unlike the enforcement units in Cote d'Ivoire.

Mangrove wood for fish smoking in Shama has reduced significantly. So mangrove cutting has ceased and fuel wood is now obtained from cutting of forest hardwoods from the hinterland.



**Figure 9. Empty containers at Shama awaiting supply of premix fuel**

## **4.5 Elmina**

### **4.5.1 The Fishery**

About eighty percent of fish landed at Elmina is smoked and the remainder salted and dried. The 'chorkor' smoker is used for smoking. Major wood used in fish smoking in this area are cocoa, Celtis species and "yayah" (forest hardwood species). Also waste wood from boat and canoe builders is used but Celtis is the most preferred. Mangrove wood is not used perhaps because of the already degraded nature of the nearby mangrove stands. The favourite fishes for salting and drying are burrito, bumper, Spanish markerel and the bigeye tuna.

The major market for the smoked fish is Kumasi, Praso, Fumso, Mankessim, Agona and Endo near Assin Fosu. The fish is packaged in aluminium pans rather than cane baskets which easily rot when wet and losses could occur during transportation. The fish is either sent by the fishmonger to the market or unaccompanied to a designated customer. A tag is placed on the container to facilitate the identification of individual products. At the bus



terminal, push cart owners are able to identify each person and their tag and therefore are able to distribute the containers to their respective customers. Occasionally a fish monger forgets to tag the fish container or the tag may be lost in transit.

Smoked fish can be stored and later sold when the price goes up. When smoked, the duration of storage depends on the species and fat content. Fishes with high fat content such as the tunas and tuna-like species do not store for long. Smoked sardines can be stored for relatively longer periods. Fishes caught in August are usually fatty so extra paper wrappers are required during storage.

In times of bumper harvest, the excess fish can be frozen for later smoking. However, such fish does not taste as good as freshly smoked. Fish frozen prior to smoking or drying is also brittle and difficult to package and transport. For these reasons, fish from “saiko” operations are not bought during bumper harvests.

#### **4.5.2 Environmental and fisheries issues**

Light fishing, ‘saiko” and “tainga” all unapproved fishing practices are done alongside the use of chemicals such as DDT and detergents, and bomb fishing. After several fruitless fishing trips fishermen are unable to pay off their debts and that compels them to use light. Fish caught using chemicals easily deteriorate. However, they are difficult to identify when in the fresh condition.

Premix fuel is available in the community but its sale and distribution are riddled with corruption. Owners of the bigger vessels who are wealthy buy the commodity in bulk and retail it to less endowed fishermen.

Fish starts to deteriorate when the fishermen stay too long at sea. When it is spoilt, it can only be used for animal feed and the price for such fish is very low. Other forms of postharvest losses occur when dogs, cats or pigs tamper with unattended fish landed on the beach. There is no loss of fish through stealing.

Sand mining takes place in many locations along the beach. Although the police have been arresting culprits, the practice still continues especially at night.



**Figure 10. Salted fish parts being dried at Apam**

## **4.6 Apam**

### **4.6.1 The Fishery**

When fish is landed by the husband, the wife or the woman who pre-financed the expedition has the first right to buy it. When it is the wife who pre-financed the fishing trip there is more trust and security because in cases when there is no catch, there can be conflicts. The catch is usually divided into 3 - among the financier, workers and boat owner. In case of bad harvest, the financier has to re-finance other expeditions to recoup the investment made in the previous expedition. Sometimes the crew avoid payment by landing the catch at another beach. The portion of the catch for unmarried fishermen is sometimes used for dating or sexual advances (fish-for-sex).

Fish prices are negotiated daily by the Konkohemaa. Sometimes the uncompromising boat owners are ignored when negotiation stalls and will only compromise when their fishes start decomposing. When the daily price per bowl is arrived at, all fishmongers buy at that price. The price of 'saiko' fish is already determined at sea.

The 'chorkor' smoker is the dominant technology for smoking fish. In recent times, instead of clay, cement blocks are used in the construction of ovens. There is the need to use high quality wire mesh to construct smoking racks for durability. Different types of smokers have been introduced for trials in this community but do not compare with the chorkor smoker

in terms of efficiency. The main fuelwood used for smoking fish is “Bejewoba”, *Essa (Celtis)*, *Emire (Terminalia)*, and *Kuntun (Phagara)*. Mangrove wood is not used in the area. The wood comes mainly from Akim Oda in the Eastern Region and Pomadze in the Central Region.

Major markets for fish from this area are Agbogbloshie, Techiman, Kumasi, Swedru and Mankessim. Elmina and Sekondi are popular destinations for salted fish. The fish is either transported to these markets by the fish monger or transported to the customer at the destination market. Unpurchased fish is kept in stores/sheds in the market at a price for safe keeping. To store in these market places, the fish must be well dried. The most popular fish market days are Mondays and Thursdays to give ample time to prepare for the beginning of the week or the end of the week.

Fishes processed by the different methods have about the same profit margins. However, smoking has a faster turnover. In times of bumper harvest, the fish is processed and stored until the lean season when the value appreciates. When smoked, the fish wrapped in a black polythene sheet and stored in an oven. It is heated once in a while to reduce the humidity. When the fish is well smoked, it can be stored for up to a year or more.

No fish goes to waste; only the price may change depending on its quality. Fish that are going bad are either salted or dried. Fresh fish are smoked or sold fresh. Therefore, postharvest losses here are due to change in quality when landed. But the fishmongers buy all and process them accordingly. Salted and dried fish are lost to cats and dogs.

The fisheries industry is based on credit. To finance the activities, loans are usually acquired. Opportunity International is the most popular institution. The risk of giving credit to fishermen is their refusal to pay or failure to catch fish. The banks therefore usually ask for collateral before loans are contracted. The ‘Susu’ credit system is therefore what works best in the community. The money is saved in a rural bank and withdrawn in times of need. There are also the fishermen or fishmongers’ association dues that members draw from in times of need.

#### **4.6.2 Environmental and fisheries issues**

Illegal gear is used in fishing in this community. Light and chemicals are used so most of the catch comprises juvenile fishes. As much as possible, the illegal gear and dynamite are hidden from the woman who finances the fishing expedition.

There are middlemen in the distribution and sale premix fuel. The fuel is sold to a middleman in bulk and therefore it is difficult to obtain fuel directly from the designated points of sale.

There are so many issues in the fishing industry that make it difficult for people in the sector to make profits:

- Sometimes when there is bumper harvest, fishmongers do not have money to buy the fish and have to secure loans from various institutions to buy the fish. Some people take advantage of this need to swindle fishermen/fishmongers. Swindlers ask that groups make an in-kind contribution for a grant. When these contributions are received, they bolt away with the money.
- Also in times of bumper harvest, the glut leads to fish and revenue losses.
- These days, because of low catches fishermen stay longer at sea. Under such circumstances, they run out of ice and by the time the fish is landed, it has already started deteriorating.
- Most cold stores are not functioning either due to the high cost or shortage of electricity. Cold stores are needed to keep the fish from spoilage but not to freeze the fish as frozen fish is difficult to smoke.
- There can also be fish scarcity and the only places that one can get fish in times of scarcity are Tema, Elmina, Sekondi, and the Aby Lagoon near Half Assini.
- When fish is bought from Cote d'Ivoire there are exchange rate losses that the fishmonger incurs. The major fishes bought by fishmongers from Cote d'Ivoire are Tilapia, Sardinella, Tuna and Mackerels. Light fishing is banned in Ivorian waters which are more protected than that of Ghana. Fishes caught in Ivorian waters are also bigger.
- While some fish mongers refuse to buy fish caught using light, others will buy such fish thus making it difficult to isolate offenders. However, in Apam, fish caught using DDT is completely shunned. That fish usually appears reddish. If one pre-finances an expedition and it turns out that the fish was caught using chemicals, the price can go as low as a third as such fish deteriorate faster. Some fishes naturally deteriorate faster even when smoked (e.g. horse mackerel). These are usually salted and dried.
- Fishermen in the 'saiko' business refuse to attend meetings of other regular fishermen.

## **4.7 Bortianor**

### **4.7.1 The Fishery**

Almost all fish landed is smoked using the 'chorkor' smoker. The Morrison stove is less patronized because of its slow smoking capacity. Wood used for smoking is from cola, "oshia", "begyewoba" (forest hardwood species). Mangrove wood is not used because it is not efficient as the above listed wood.

Fish is sent to major markets like Mamprobi, Techiman, Agbogbloshie, and Denu. The fish is packaged in an aluminium basin and either sent through the vehicle driver to the customer or sent to market by the fishmonger. When in baskets, losses occur when it rains as the basket gets weak, rot easily and the fish easily break into pieces. The fish are packaged in baskets and covered in black polythene sheets.

There is high incidence of poverty within fishing communities. Therefore, a major challenge is how to raise money to fund fishing expeditions. Women make contributions into a savings account. During the bumper season, the money is withdrawn and shared among the contributors. Loans are contracted by the associations. That way there is guaranteed retrieval of borrowed money. Soft loans have up to a maximum of 100 to 120% interest and are serviced in bits. The loans should reach the fishing communities before July at the beginning of the major fishing season.

### **4.7.2 Environmental and fisheries issues**

A major concern of the fishermen is that, Ghana Government grants licenses to foreigners but fails to control them and rather local fishermen are chased out of the sea. It is also alleged that many of the so called foreign vessels are owned by Ghanaian middlemen. This encourages the illegalities in the fisheries sector in Ghana. Trawlers must be stopped from fishing in inshore areas. Because the trawlers fish in the zone of the artisanal fishermen, artisanal fishermen have to increase their efficiency (such as the use of fish aggregating devices) and effort (many canoes and longer time at sea) to be able to survive.

The major illegal activity in the artisanal fisheries is light fishing. The fishermen in this community accuse the Fantes for doing most of the illegal fishing like use of light and chemicals. In their opinion if light fishing is stopped all other illegal fishing activities will cease.

It should be possible for fishmongers not to buy fish caught by illegal means, and arrest any chief fisherman whose landing beach is used for illegalities. Currently when a catch or gear is seized, it is difficult to prove that the person used chemicals. So there are always conflicts



among fishermen and also with the chief fisherman in trying to stop chemical fishing. The people here are in support of acquiring an instrument for testing fish for chemicals. Apart from the landing beaches, these test kits should also be used at the market places so that the law is enforced everywhere.

Another effect of light fishing is that it removes the seasonality of fish catch. Therefore, prices are affected and the fishermen who use legal and regular fishing methods run at a loss.

There were complaints about operations of the FEU which is accused of non-performance. If ordinary fisherman can stop illegal fishing, The FEU stationed in Tema is unable to stop illegal fishing activities even in Tema.

It is the opinion of members of the community that municipal assemblies should help with cleaning the landing beaches.



**Figure 11. Buyers waiting for the boats to bring fish on one of the unsanitary landing beaches**

## **4.8 Ningo Prampram**

### **4.8.1 The Fishery**

Light fishing is the major problem in the area. This was banned in Lower Prampram landing beach about 10 years ago but other beaches are not enforcing it at their landing sites. So when a fisherman is arrested, it becomes a problem. Whilst light and chemical fishing are not practiced here, the women buy fish caught by this process. However, such fish is sold outside the community and not in Prampram market. The fish caught using chemicals deteriorates faster and has to be processed fast. Pair trawling by Chinese fishing vessels (“china china”) still takes place in the area. The Ministry keeps promising enforcement but is never fulfilled. Carving canoes out of wood is a cumbersome process. According to the locals, Government has sold all our timber to foreigners while boat/canoe builders in Ghana buy wood from foreigners.

The challenges of the fisheries sector prevail because fishermen have been politicized. Politicians campaign and after they win, nothing is done about the problems of the fisheries sector. They fail to stop pair trawling and even instead are rather participating in this bad practice.

Another reaction was that it is impossible to reduce the number of canoes as a management measure because that would increase unemployment.

The solution to all the illegalities is to arrest any chief fisherman who allows an illegality in their landing beaches, and also arrest people who patronise illegalities in the fisheries value chain. Also, about 80% of women in the Prampram area are involved in the fisheries value chain. Therefore, one can easily ban illegal fishing through the use of fishmongers by motivating them to reject fish caught using illegal methods.

The dominant fish caught by the fishermen in this area is the Frigate Mackerel (*Auxis thazard*). About 70% of fish landed in Prampram is smoked for sale in Accra, Kumasi and as far as Techiman.

## **4.9 Keta**

### **4.9.1 The fishery and coastal environment**

In this area ali-poli-watsa, beach seine, winching nets (nifa nifa) are the main fishing gears. These are used to catch anchovies, herrings, round and flat sardines, horse mackerel, and tuna species. The use of monofilament net is the main fishing problem in the area.

Stakeholders in this community support cessation of importation of this gear which must be stopped and consignments on sale should be seized and destroyed. The law should be enforced at the national level, and at the local level the chief fisherman should be given legal backing to enforce fisheries regulations; fishermen, the police and judiciary should be educated on the fisheries law and more personnel from the FEU should be deployed to enforce the law.

The fishermen are of the view that there should not be a closed season or reduction of fleet because there is no alternative occupation for fishermen.

Conflicts in the fishing sector are associated with entanglement of nets belonging to different crews. An arbitration committee settles all fisheries related conflicts in the area. In times of fish scarcity, fish mongers quarrel among themselves especially during bargaining to buy fish that has been landed by the fishermen. Some women pre-finance the fishing expedition but some of the men are not trustworthy and sometimes divert the fish to another fishmonger. In the markets, conflicts arise from customer retention and loyalty. That is when a colleague fish monger tries to snatch a colleague's customer.

Fishermen in this area believe that the fish usually migrate from the west to the east. At the time of this interaction they were of the view that the fish was being caught in the Western, Central and Greater Accra Regions with light and chemicals preventing the fish to reach the Volta Region.

On financial assistance they prefer it be provided in the form of fishing inputs for it to be paid in instalment over time. Members of the fishmongers' association do not patronize illegally caught fish and their own fishing gears or sponsor fishing expeditions.

The bulk of the fish landed in the area is smoked using the 'chorkor' smoker. During the bumper season, anchovies are dried. Mangrove wood is mostly used followed by wood from the neem and "hɛhɛ" (hardwood species brought from the Ho area) because they are believed to give the smoked fish a better appearance and taste.

Fish caught with chemicals are difficult to process. Losses also occur when there is a bumper harvest but this is reduced by storage. Fish is mainly smoked or dried and stored. Smoked fish is stored in baskets lined with brown paper and stored in a cool dry room. In this state, it can last for three months.

Fish is mainly sold in Keta, Denu and in Togo. Fish is bought and sold through haggling over prices which may result in profits or losses.



The following suggestions were made for improving the fishing trade in the area. First, there is the need to improve the quality of the wire mesh for the smoking racks used to smoke the fish and the current material tends to rust quickly. Also, cost of aluminium pans is too high. There is need to provide training to fishermen and fishmongers in modern methods of fish processing and storage. To improve premix fuel distribution and sale, allocation should be made according to the number of registered boats at the landing beach and type of fishery practiced. The price should also be reduced when that of other fuels goes down. People in the area should be trained in mariculture. This will help a lot of the people in the area because the Keta Lagoon is salty. Also the lagoon should be connected to the sea by breaching the sand bar to allow entry of marine fish to increase fish biodiversity and biomass.

Traditional fishing holidays in the area are Tuesdays, Wednesdays, and Sundays depending on the landing beach.

#### **4.10 Adina**

##### **4.10.1 The Fishery**

Fishermen and fish mongers in this community have associations formed to promote unity, welfare of members, train members in fish processing, and work towards the future development of the industry. Members can make withdrawals from a revolving fund contributed by members. In times of good harvests, extra fish is bought by the association using the revolving fund. There are male fishmongers and traders belonging to the predominantly female groups.

Species landed are sardines, anchovies, horse mackerel, king fish, and cassava fish. Anchovies and round sardines form the dominant catch. Round sardines are most preferred because they are easier to process, look attractive and can be preserved longest. Barracuda and tuna deteriorate fastest.

About 70% of the fish landed here is smoked. The rest is dried or salted. All the small sized fishes are smoked. Mackerel is smoked and some are salted.

The 'chorkor' smoker is used to smoke fish. The fuelwood used is predominantly mangrove which is now getting scarce. "Hehe" is now the major wood for smoking. It is a hardwood and gives the fish a good colour similar to that from mangrove wood smoked fish.

The smoked fish is packaged in cane baskets lined with brown paper and draped with a net. The baskets are woven in Dzozie and Akatsi. The fish is first packaged to make them airtight by covering the basket with large polythene sheets. The smoked fish are stored in special windowless rooms with the doors kept closed; the rooms are therefore permanently dark. The smoked fish can be stored in this way for 3-4 months. Major markets for selling the fish are Ho, Denu, and Togo.

Adina has a communal dump site around the lagoon. Sand mining in the area is prohibited. Sand for building construction is bought from inland areas.

There are no public latrines along the beach. Latrines therefore need to be built and a fine imposed on anyone caught defecating in the open.

#### **4.10.2 Environmental and fisheries issues**

July-September is the major fishing season. The fish migrate from the west coast towards the east coast. However, because the fishermen at the western coast use light and chemical fishing they reduce what is available for all. Government has failed to stop the light fishing practice. Seizing generators of offenders is not punitive enough but it should include seizure of the outboard motor of canoes that contravene the ban.

Other challenges of fisher folk in the area are lack of money to purchase fish during bumper harvests and use of monofilament nets by some fishermen.



**Figure 12. Fish smoking wood for sale at Adina**

#### **4.11 Examples of best practices from Cote d'Ivoire**

Fisheries practices and management in Cote d'Ivoire has been widely praised by the fishermen. Many of them have fished several times in Ivorian waters and therefore shared their experiences as captured below:

- Every Ghanaian fisherman interested in fishing in Ivorian waters is supposed to present a valid Ghanaian identity card. When you arrive there, the first step is to procure a temporal Ivorian ID that permits you to fish in Ivorian waters.
- Register your vessel at the nearest landing beach.
- Obtain a valid insurance (for gear and crew) to be able to go out to sea.
- The gear will be inspected by Ivorian fisheries officials to ensure they meet the required standards.
- The use of chemicals, light or wrong mesh sized nets in Ivorian waters is prohibited. When caught the fisherman is prosecuted and goes to jail. Bribes are not accepted.
- There is always premix fuel at these landing beaches controlled by the chief fisherman.
- When you return from the fishing expedition, the same officials inspect the catch and the gear. If you have violated the law, you are arrested for prosecution right away. They officials don't receive bribes.
- The fish is weighed and the appropriate taxes are paid. One can then decide to sell the catch in Cote d'Ivoire or take it away.
- We only sell in Cote d'Ivoire if we are staying there for long; else we bring it to Ghana. Ivoirians are not fish eaters like Ghanaians so the prices are lower there.
- The fishes caught in in Ivorian waters are relatively bigger.

## **5 CONCLUSIONS FROM THE REGIONAL AND NATIONAL POLICY AND RESEARCH DIALOGUES**

### **5.1 Western Regional Dialogue (24<sup>th</sup> August, 2015)**

#### **5.1.1 Fisheries management**

- Use of dynamite fishing should not be allowed and government should regulate the sales of dynamite to only authorize agencies;
- Fisheries laws and regulations as well as local by-laws should be made available to the Police;
- Government should enforce the laws on light fishing and ensure that both trawlers and canoes users abide by the laws;
- The police must be current with the fisheries laws and by-laws of the local assemblies;
- Government should regulate fishing by instituting closed and open seasons;
- Government should regulate fishing in the country by enforcing at least a three-month grace period;
- Government should not interfere with arrests of fisheries offenders;
- Fisheries Enforcement Unit should always be on the alert and respond quickly to calls;
- Chief fishermen should understand sanitation programs;
- Logistics (including heavy duty tracks) must be made available to the Fisheries Enforcement Unit;
- Fisheries Enforcement Unit, Police, Navy must be adequately resourced example vehicle and other tools to support the work;
- Premix must be managed by the chief fisherman. Government must not interfere the distribution of the product;

#### **5.1.2 Environmental management**

- A voluntary sanitation committee should be formed and chaired by the chief fisherman within the community to handle sanitation issues and because it is voluntary, fishermen can contribute to the committee's welfare by donating fish from their catch;

- By-laws on sanitation must be formulated and enforced by the committee after being gazetted by the assembly;
- Chief fishermen must help with the sanitation issues instead of waiting for officials. They should be able to unite the fisheries officers to help;
- As a society, the use of all forms of rubber product at the beaches should be abolished as this contributes to low fish catch envisaged. This should be backed by the Metropolitan/Municipal/District Assemblies;
- Provision of litter bins by the district assembly should be positioned at easily accessible points within the community;
- The community should form coast guards to patrol the beaches and ensure that the beach is clean at all times. Leadership to be provided by existing community leaders such as chief fishermen and Konkohemaas and cleaning must be done on weekly basis (rest days- Tuesdays and Thursdays);
- Community should undertake weekly cleaning of the beach and defaulters should pay GH¢ 10.00 and this fee should be applied to those who defecate at the beaches as well;
- Fish mongers should be educated to process fish in a more hygienic way;
- Assemblies expedite actions on re-introduction of “Town Council officers” in the community;
- Government should introduce an award for communities with clean landing beaches (e.g. on National Farmers Day);
- Use of unapproved nets and the importation of unauthorized nets must not be allowed;
- Government should dissolve the existing committee on premix fuel and hand over its management to the chief fishermen for efficiency;
- Transshipment should not be tolerated. The government should stop Saiko activities at all landing beaches;
- District assembly by-laws must recognize chief fishermen in order to empower them. Copies of by-laws to be handed over to local police for collaboration and culprits must be arrested and prosecuted;
- All malfunctioning and dysfunctional canoes should be evacuated from the beaches after a month’s notice. Failure to comply with this should result in the destruction of the canoes by the district assemblies together with the Chief Fisherman.



**Figure 13. Break-out session during the Western Regional Dialogue**

## **5.2 Central Regional Dialogue (26<sup>th</sup> August, 2015)**

### **5.2.1 Fisheries management**

- Community led actions should be used to enforce the law on light fishing and the FEU must do their jobs without fear or favour. Also, fish marketers should reject fish caught by light and chemicals;
- The chief fishermen must lead in the enforcement process and must be supported by their traditional leaders;
- Each Chief Fisherman holds meetings with fishermen to set by-laws for communities (on all illegal / IUU fishing activities). They then meet to synchronize at district level, present to the district assembly to accept and next, present to the Attorney-General's department to gazette;
- The Government should empower the chief fishermen, the marine police and other agencies responsible for the enforcement of the fisheries law;
- Community members should be empowered to report all illegal activities to law enforcers and the reporters should be protected. Also the public should be educated on illegal fishing activities;
- The Government must also enforce the law and monitor fish landed. The law must be enforced without any political consideration;
- Pair trawling should be stopped and that will in turn cause Saiko fishing to stop;
- Fishing activities should be regulated to ensure that the appropriate mesh sizes are used for fishing;



- The Government should enforce the law barring fishing on Tuesdays;
- The distribution of premix fuel to fishers should be monitored. It should be given to fishermen directly and not members of any political party;
- Premix fuel should be sold publicly at fuel stations for availability to all. Fuels should not be kept at home and the public should be educated on this; and
- Inaugurate the National Premix Committee immediately to monitor the various Landing Beach Premix Committees.



**Figure 14. Participant making a contribution during the Central Regional Dialogue**

### **5.2.2 Environmental management**

- There should be people who should monitor and ensure regular cleaning of our beaches. The assembly should re-introduce the sanitations enforcement agents (e.g. as run by the Town Council some years ago). Also, establish a coastal sanitation committee chaired by chief fishermen to oversee the sanitation issues at the beach. There should be people who should monitor regular cleaning of our beaches;
- Zoomlion Beach Cleaning Services (ZOIL) should be reintroduced he help clean the beaches and be periodically supported by volunteers to clean the shores;
- Also profits made from the sale of pre-mix fuel can be used to pay people to clean the beach on regular basis;
- Refuse dump sites should be sited on the shores and the disposal of waste products in the water should be prohibited;
- Dumping of waste on beaches is bad for the coastal environment. Bye-laws should be enacted to regulate the disposal of waste materials along the coast of Ghana;

- Defecating on the beach is bad for the coastal environment. There must be toilet facilities close to the beaches (both mobile [for occasions] and non-mobile) so that people can easily use them and stop open defecation at the beach;
- The refuse should be properly disposed off after sweeping the beaches. Most often it is left unattended to. Provision of dust bins at the beaches or the mobile vans is ideal;
- People must be educated not to litter plastic waste at the beaches and talk to fishermen who dump their plastics into the sea when they go fishing; waste bins should be provided on vessels and emptied after fishing;
- The manufacturers of the plastics should be made to pay a small fee for cleaning the beaches;
- Sand wining leads to flooding and loss of landing sites, therefore public education should be reinforced and offenders prosecuted using effective laws;
- Tree planting exercises should be encouraged, especially trees such as acacia to reforest the beach areas; and
- Government and interested stakeholders should facilitate research into development and provision of better smokers to reduce fuel cost and minimize deforestation.

### **5.3 Greater Accra Regional Dialogue (28<sup>th</sup> August 2015)**

#### **5.3.1 Fisheries management**

- Fishes landed should be inspected and destroyed if they were harvested illegally;
- The government should inspect the work of the marine police to prevent them from being bias;
- The chief fishermen should be empowered to implement the fisheries law. They should also be supervised and their work, inspected to ensure they are working as they should. Chief fishermen who accept bribes and condone wrong doings should be fished out and arrested;
- The police should support and aid the chief fishermen in implementing the law governing fisheries activities;
- The Government should pass and enforce a law to stop the use of light and chemicals in fishing activities. These should come with sanctions for people who violate this law;
- Outboard motors of people undertaking light and chemical fishing should be seized. This is because that is the main tool that can stop the fisherman, not the net or generator;
- The government must ensure that fishermen put a stop to using rubber nets and turn to rope nets, and discourage the sale of rubber nets;



- The Government and local authorities should ensure that some particular nets are used only during some particular seasons, such as the poli nets that are used to harvest anchovies;
- Premises should be made available and the distribution should be effective;
- Unannounced inspections should be conducted regularly on the sea by Navy officials to ensure that lights and chemicals are not used; and
- The FEU must ensure that trawling activities should not be undertaken close to the shores.

### **5.3.2 Environmental management**

- There should be continuous education on the effects of defecating at the beaches;
- There should be a spot fine on anyone found defecating at the beach;
- MMDAs should increase the public toilets along the beaches;
- Task forces should be formed to guard the beaches. It may comprise of police personnel, chief fisherman and 5 other persons within the community;
- MMDAs should provide dust bins at vantage areas to help collect polythene materials as well as other waste materials;
- Most waste materials at the shore are transported by rain water and into the sea. Therefore, District Sanitation Units should enforce the district by-laws to prevent people from dumping their wastes into the drains;
- People should desist from pouring waste into public drains, especially when it rains since these are washed onto the shore in the long run;
- Every community located around the shores should dedicate a day within each month to clean up the beaches;
- There should be monthly clean up exercises; and
- All food vendors must have waste bins where they are selling.



**Figure 15. Participant presenting the results of their break-out group work during the Greater Accra Regional Dialogue**

#### **5.4 Volta Regional Dialogue (31<sup>st</sup> August, 2015)**

##### **5.4.1 Fisheries management**

- Unapproved nets should not be used in marine fisheries sector and the importation of unapproved nets should be discouraged or prevented;
- The government should see to the destruction of all mono filament nets being imported or in stores and users of this net should be prosecuted;
- For the trawlers, their activities are mostly covered making it difficult to identify people who engage in it. A trawling boat should be reported to the chief fisherman for onward reporting to the FEU for the necessary action to be taken;
- There should be constant sensitization on the use of light and chemicals;
- When seen doing the wrong practice, should be reported to the chief fisherman for arrest;
- The fisheries management laws and regulations should be distributed to all the necessary institutions and stakeholders such as the assemblies and assemblymen/women, police, court etc.;

- Establishment of landing beaches should follow the laid down guidelines by the Landing Beach Committee and the number of landing beach should be controlled;
- Selling of premix fuel should be solely done by the chief fishermen, their secretaries and pumping attendants appointed by the chief fisherman from the Community Based Fisheries Management Committee (i.e. no involvement or interference by Police, Chiefs, Assembly members, District Chief Executives, Pastors, Political representatives etc.)

#### **5.4.2 Environment management**

- We should form task force which would be a nine-member committee including the police for the law enforcement: e.g. 2 net owners, one fish processor, 2 fishermen, 1 traditional ruler and chief fisherman being the chairman and assembly man or a 7-member committee consisting of 4 men and 3 women to oversee all sanitation issues;
- Toilet facilities should be constructed at beaches by stakeholders to avoid indiscriminate defecation along the beaches. Afterwards, defecation at the beaches should attract a fine to deter others;
- Sanitation by-laws should be developed and enforced by community based fisheries management committee;
- Each landing beach should set a date for communal labour (non-fishing days) by chief fishermen;
- There should be re-establishment of the ZOIL to clean up the landing beaches and also, refuse containers should be placed at vantage points and re-instituting sanitation inspectors;
- Recreational areas should be established by the government and assemblies at the beach sites to curb dumping of refuse at the beaches;
- Educate market women and fish mongers on how to keep their selling place clean;
- There should be frequent meetings held between the chief fishermen and all community based fisheries management committees to report on all activities on the landing beaches.



**Figure 16. Break-out session during the Volta Regional Dialogue**

## **5.5 National Dialogue (17<sup>th</sup> December, 2015)**

### **5.5.1 Stakeholders' concerns and initiatives for the artisanal fisheries Sector in Ghana**

The National Dialogue was a gathering of chief fishermen and fishmongers and their leadership, fisheries administrators and policy makers, academics, local government officials and representatives from environmental and legal services of Ghana (Appendix 8.1). The Dialogue was opened by Prof John Blay, Coordinator, Centre for Coastal Management, UCC. Participants were reminded of the earlier dialogues at the landing beaches and the regional level. He thanked them for making the time to meet to contribute to managing a resource that is of importance to all.

Dr. Denis Worlanyo Aheto (Project Manager) then gave the general project overview (Appendix 8.2) and emphasised that this was a continuous engagement with all the necessary stakeholders. Whilst capacities were being built at the various academic and non-academic institutions to manage the fisheries, the project will ensure that the capacities of fishermen are also built to sustainably manage the resources.

Justice Odoi, Environmental Specialist, USAID emphasised the importance the people of the United States through the USAID place on sustainably managing our resources to feed the

future. The USAID was happy to partner with the UCC to build capacities to meet this objective.

The Dialogue was graced by Hon. Shirley Aryeetey Minister, Ministry of Fisheries & Aquaculture Development who was very happy about such an initiated. She mentioned the significant role fisheries place in the national economy in GDP and employment. The ministry was therefore very committed to improving artisanal fisheries. The distribution of outboard motors was to help modernise the gear. In the coming years, more will be done to make fishing a much more profitable business.

The Ministers speech was then supported by Dr. Raymond Babanawo, Fisheries Commission on MOFAD's plan for the artisanal fisheries sector in Ghana (Appendix 8.3) and Paul Bannerman, Deputy Director, Fisheries Scientific Survey Department, MOFAD who presented an overview of Ghana's Fisheries Management Plan 2015-2019 (Marine Sector) (Appendix 8.4).



**Figure 17. The setting of the National Fisheries Dialogue at Mensvic Hotel, Accra**





















**Figure 18. Some scenes at the National Fisheries Dialogue**



### **5.5.2 Agreement on guiding principles to support fisheries and coastal environment**

- Government should ensure that illegal fishing should stop completely
- The chief fishermen should enforce the laws on fisheries backed by government and those who are found culpable or flouting the rules should be punished
- Fine people who break the laws, and those who don't pay their gear should be seized. Publish violations and people who break the laws should be prosecuted and jailed. No political interference. No protocol.
- Those who break laws e.g. use of light fishing should be punished
- Seize the gear of those practicing bad fishing methods as a way of reducing the fishing effort.
- Women should reject fish caught through illegal means
- Management of premix should be decentralized so that each community should be given the opportunity to manage it and, give the premix to fuel stations so that we go and buy like how vehicles do
- Women are now boat owners and should be given share of the premix
- Government should support communities that are affected by the invasion of the sea weeds, *Enteromorpha*
- Develop by-laws on sanitation at the district assembly levels to complement the fisheries laws
- The new laws should abolish the use of polythene bags for packaging
- Laws must be enacted to prevent defecation on beaches
- When we enact the by-laws there must be punishments accompanying them
- Introduction of waste bins and waste collection points instead of throwing filth into the sea
- Non-point sources of pollution from municipalities affect the landing beaches and not just a problem caused by fishermen alone
- The beaches are dirtied by the communities themselves, so communities should clean the beaches themselves.

- Zoil should be re-established to support the cleaning of beaches.

### **5.5.3 Way forward**

At the end of deliberations, participants agreed that, the products of both the regional and national dialogues be synthesized into a list of principles to guide activities in the various landing beaches. These should be presented to all stakeholders and a date be agreed upon to implement the agreements nationally.

## **5.6 GENERAL CONCLUSIONS**

The following conclusions are drawn from the policy and research dialogues:

- i) Illegal fishing methods such as the use of small meshed nets, light, dynamite, calcium carbide and detergents are being used in varying intensity among the fishermen in Ghana;
- ii) The landing beaches are littered with waste directly from beach users and indirectly from deposition from the sea.
- iii) The traditional gender roles in the fishing industry are being breached; for example, women own boats and finance fishing expeditions, there are male fishmongers and fish traders.
- iv) There is willingness and unanimous agreement among all stakeholders that a change is needed in the utilization and management of the coastal fisheries resources and environment;
- v) The change must be from the bottom. That is, it should be instigated and implemented by fishermen and fishmongers and supported by the district assemblies, traditional authorities and the police. In other words, existing fisheries and environmental laws and regulations should be enforced by local stakeholders if the objective of ensuring sustainable utilization of fisheries resources and environment is to be achieved.

## **6 RECOMMENDATIONS**

### **6.1 Department of Fisheries and Aquatic Sciences**

The policy and research dialogue process brought up some general conclusions and responsibilities of the local stakeholders to fisheries and environmental management.

- i) The Department of Fisheries and Aquatic Sciences, UCC should collaborate with the Ministry of Fisheries and Aquaculture Development to initiate and facilitate the drafting, acceptance and implementation of fisheries and coastal environmental management bylaws for the district assemblies.
- ii) DFAS should facilitate the institutionalization of a “Best Landing Beach Award” as part of the National Farmers’ Day celebrations to motivate coastal communities to keep their beaches clean. Evidence of beach cleanliness should be published in a quarterly photo album.
- iii) DFAS should provide an effective extension service using local radio stations and to dialogue with community based fisheries management groups.
- iv) DFAS should organize annual forums of landing beach chiefs and fish mongers for information sharing and sustain commitment to good fishing practices and maintenance of healthy environments in their respective areas. Companies and other stakeholders could be tasked to fund the organization of the annual forums and take advantage to advertise their products.
- v) To improve on research dialogues, the DFAS should develop and publish a biannual newsletter or bulletin of aquatic sciences for sharing research findings among scientists and other stakeholders in the fishing industry.
- vi) The policy and research dialogues have generated a substantial amount of primary data and research questions. The data and others generated from research should be used by DFAS for quarterly briefs targeting the different sectors of the fisheries industry and value chain.
- vii) DFAS relays these quarterly briefs with a Breakfast-with-the-Minister meeting to foster dialogue between research and policy makers.
- viii) The research issues will form the initial pool of demand driven research initiatives to be updated through the radio programmes, news bulletins, conferences and other stakeholder initiatives being carried out by DFAS.

- ix) A coordinated undergraduate, graduate and faculty research among universities will seek to meet these demand driven research objectives.
- x) This Policy and Research Dialogue was coordinated by fisheries officers at the zonal and district level. These officers work under trying condition to collect data for fisheries management. Also, the academic background of many of these officers is in general agriculture. To facilitate the work of fisheries officers at the zonal and district level, DFAS should organize periodic training for such personnel in aquaculture, fish identification, fish data collection, gear identification and technology and fisheries data processing and data management.

## **6.2 Ministry of Fisheries and Aquaculture Development, Metropolitan/Municipal/ District Assemblies, NGOs etc.**

- Many stakeholders in the fisheries sector agree that the formula for the sale and distribution of premix is good. However, there is the need to remove bottlenecks and eradicate middlemen and corrupt practices.
- Most of the fish landed is processed and sold or stored in the smoked, salted or dried form. Freezing of fish landed is virtually not practiced. Also, due to decreasing stocks, fishermen tend to stay longer at sea leading to the increasing demand for ice to keep their catch in the fresh state. Therefore, new cold stores should focus more on ice production with very little capacity for fish freezing;
- Construct darkrooms for bulk storage of smoked fish for individuals and fishmonger associations;
- Encourage the use of aluminium pans for transporting fish to reduce postharvest losses;
- Promote the construction of platforms at a minimum height of 1m for fish drying as a way of reducing contamination of the fish.
- Develop and introduce technologies to identify fish caught using chemicals as a means of stopping chemical fishing with light. These technologies should be deployed at the various landing beaches and market places;
- Provide latrines near the beaches of fishing communities to reduce the incidence of defecation on the beaches;

- Initiate formation of sanitation committees at all the landing beaches to be headed by the chief fisherman and assisted by the “konkohemaa”. Some of the proceeds from the sale of premix fuel could be used to facilitate the work of this committee;

### **6.3 Issues for Research**

- What triggers the occurrence of mats of seaweeds in Ghanaian waters and how can it be controlled? Does this weed have any economic value that can be utilized by the coastal communities?
- What are the species, energy content and efficiency of wood used in smoking fish in Ghana? What are the cultural underpinnings to the use of these species? What is the relationship between wood type, smoking method, smoker type and polycyclic aromatic hydrocarbon (PAH) and histamine concentration?
- Assess the spatial and temporal roles and interests of women in fisheries and coastal zone management. Explore the changing gender roles and dynamics in fisheries and coastal zone management
- Assess the spatial and cultural differences, gender roles and dynamics in sanitation among coastal communities
- Assess the potential for mariculture as an alternative to capture fisheries.
- Determine sustainable means of financing fisheries activities in Ghana and assess fish storage practices among the coastal communities of Ghana.
- Document the barter trade being practiced in the fishing communities (e.g. fish for food stuff as practiced in Elmina; Fish for Sex....)
- Assess and develop a market matrix of the fish trade in Ghana.
- How to address political interference in the supply and sale of premix fuel
- Assess and quantify postharvest losses in the fishing industry



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PARTICIPANT LIST

**USAID/UCC FISHERIES AND COASTAL MANAGEMENT CAPACITY BUILDING SUPPORT PROJECT**











NATIONAL POLICY DIALOGUE

MENSVIC HOTEL, EAST LEGON, ACCRA

17<sup>TH</sup> DECEMBER, 2015

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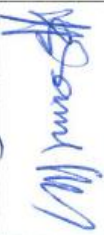


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**USAID/UCC FISHERIES AND COASTAL MANAGEMENT CAPACITY BUILDING SUPPORT PROJECT**

NATIONAL POLICY DIALOGUE

MENSVIC HOTEL, EAST LEGON, ACCRA

17<sup>TH</sup> DECEMBER, 2015

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20	Stephen Kentem	Proj. Coordinator	Second S-1 Makre	0205663032	M	
21	Yan Omsiluxaa	WESTERN REGIONAL SEC. NAPTA	S.T.M.A	0506411414 0271885616	F	
22	Emmanuel Annon	TEWA	TWA	0244680203	M	
23	Daniel Atyei-Boats	Kumasi	Fisheries Dept. KNUST	0243248590	M	
24	ADDEY THAWA	Co. ACCRA	TWA	024461 8602	M	
25	PETER LINFORD ADJEI	G. ACCRA	Dome Kumasi	0261464481	M	
26	Promise Gaka	F. C	Keta / VR	0247232458	M	



PARTICIPANT LIST

USAID/DOCC FISHERIES AND COASTAL MANAGEMENT CAPACITY BUILDING SUPPORT PROJECT

NATIONAL POLICY DIALOGUE





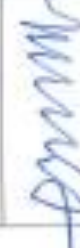
MENS/VC HOTEL, EAST LEGON, ACCRA

17<sup>TH</sup> DECEMBER, 2015


No.	NAME	DESIGNATION	DISTRICT OR METRO	TELEPHONE NO.	GENDER (M/F)	SIGNATURE
1	Dr (Mrs) Ruth Asimah	HEAD FISHERIES AND AQUACULTURE DIVISION	ACCRA METROPOLIS	0205424161	F	
2	Majin Lazar	SFMP	Accra	0266031831	M	
3	Prof. Edward Ofori DFAS	DFAS	NCC	0244055253	M	
4	Prof. P.K. Ofori-Dankwa	University of Ghana	Legon	0208351477	M	
5	Emelia Akpanaka	NAFPFA	Axim   N/R	0208823370	F	
6	Algora Kpalamad	Fish manager	Half Assini   N/R		F	
7	Margaret Graham	NAFPFA	Axim - W/R	0208188778	F	

No.	NAME	DESIGNATION	DISTRICT OR METRO	TELEPHONE NO.	GENDER (M/F)	SIGNATURE
8	Elizabeth Graham	NAEPPTA <del>Assistant</del>	Arum - W/R	020818799	F	Elizabeth
9	Patricia Mulya	Asst. Mayor	Chokony	0266137831	F	Patricia
10	Aku Ake	Asst. Mayor NAEPPTA	Ashevi		F	Aku Ake
11	Victoria Appal	(Sist) National Treasurer	Serya - Barale	0540578109	F	Victoria
12	Rebecca Eshun	National Treasurer	More - Central	0246694613	F	Rebecca
13	Grifty Amosah Nwulu	Vice President Apur & W	Cape Coast	0553557804	F	Grifty Amosah Nwulu
14	Grace Baidie	President	Arum	09201893078	F	Grace
15	Kwabena Bryony		Cape Coast	0240444077	M	KB
16	Nana Abdul Mustafa	Chief Justice	Arum	0243469259	M	Nana Abdul Mustafa
17	Nana Giko	Chief Justice	Arum	055308377	M	Nana Giko




No.	NAME	DESIGNATION	DISTRICT OR METRO	TELEPHONE NO.	GENDER (M/F)	SIGNATURE
18	Maryi Mami Kesako	Chuygama	Umuwe	0207355152	M	
19	MAMA OGBANU MAMM III MIKE ABAKA - EDU representing Mama Kojie Kendaak	SEC. GNCFC AXIM CWAFF-PSFA	GENERAL FETTER (CA) NIZEMA EAST MUNICIPAL ASSEMBLY	0543-390930	M	
20	Barekhe Kisiek	UTER, Sunyani	Sunyani	024489966	M	
22	Faizwek Danson	UTER Sunyani	Sunyani	0208776972	M	
23	Kofi Ayibogah Odakyi	Wan Wpnan	Takoradi	0266031882	M	

7.2 Presentation by Dr Denis Aheto, Project Manager



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DEPARTMENT OF FISHERIES  
AND AQUATIC SCIENCES  
SCHOOL OF BIOLOGICAL SCIENCES



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CENTRE FOR COASTAL  
MANAGEMENT





## Project Finance

Five Years (2014-2019)

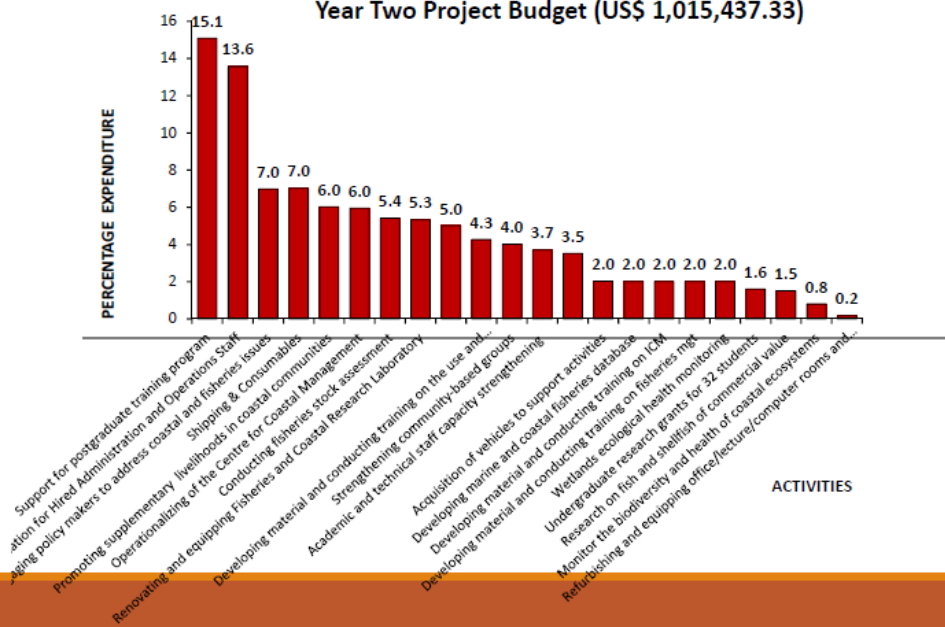
**USAID Funding:**  
\$5,500,000.00

**UCC Cost Share:**  
\$1,800,000.00

PROJECT IMPLEMENTATION LETTER  
NO. 641-A18-FY14-IL#007

## Project Finance

Year Two Project Budget (US\$ 1,015,437.33)



## Intermediate Result Areas

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1. Capacity Building for fisheries and coastal management
  2. Improved information systems and science-informed decision-making
  3. Increased constituencies that provide the political will and public support
  4. Public Private Partnerships
- 



### Activity 1: Renovating and Equipping the Fisheries and Coastal Research Laboratory

#### Expected Results

- Laboratory re-designed and refurbished
- Relevant laboratory equipment acquired and installed

#### YR 2:

- **Accreditation with GSB**
  - **ISO Certification**
- 





## Activity 2: Academic and Technical Staff Capacity Strengthening

### Expected Results

- Capacity assessment needs completed
- First group of three DFAS academic staff would have updated their skills in fisheries and coastal management in the USA.
- Training in stock assessment & fisheries management



### YR 2:

- **Three technical and academic staff are sufficiently trained to use newly acquired field, laboratory and office equipment**

## Activity 3: Operationalization of the Centre for Coastal Management

### Expected Results

- Coastal management specialist engaged
- A functional management structure established for the Centre
- Strategic plan for the Centre reviewed
- Business plan developed
- Collaboration with other Centers initiated



Prof. John Blay, Coordinator of the Centre for Coastal Management introducing Prof. Rick Burroughs at the Lecture

### YR 2:

- **Policy & Research Dialogues**
- **Private-sector partnerships**
- **Climate change adaptation course**

## Activity 4: Support for Postgraduate Training Program

### Expected Results

- 20 M.Phil and 10 PhD students their programs.



Second year USAID funded MPhil Students of DFAS

### Yr 2:

- **New 5 M.Phil students**
- **5 PhD. Candidates**
- **Inter-University Research Collaboration?**

 <p>Alchete Naa Kwiteh Cietey PhD Candidate (Fisheries Science) MPhil Fisheries Science University of Ghana</p>	 <p>Rebecca Esamuah PhD Candidate (Integrated Coastal Zone Management) MPhil Oceanography University of Ghana</p>	 <p>Lawrence Ahiash PhD Candidate (Aquaculture) MPhil Aquaculture University of Cape Coast</p>
 <p>Jemimah Eboam Kessah PhD Candidate (Fisheries Science) MSc: Sustainable Coastal Development (Norwegian University of Science and Technology in Trondheim, Norway)</p>	 <p>Margaret Fata Dzogreku PhD Candidate (Oceanography &amp; Limnology) MPhil Oceanography &amp; Limnology University of Cape Coast</p>	

## Activity 5: Undergraduate Research Grants

### Expected Results

- B.Sc undergraduate students would have been funded to undertake research work for their undergraduate dissertations.

### Yr2:

- **31 students supported**



Five of the seven undergraduate recipients of research grants



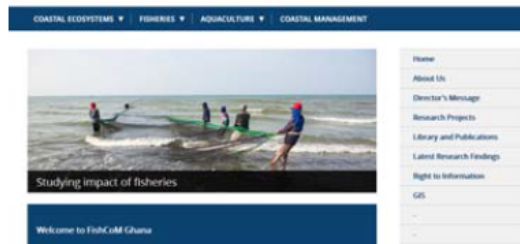
## Activity 6: Developing Marine and Coastal Fisheries Database

### Expected Results

- Equipment for gathering and managing data on marine and coastal fisheries procured
- Contacts with relevant data sources and hosts established
- Data gathering mechanisms established.

### YR 2:

- **Fishcom Ghana**
- **Copyright**
- **Intellectual property**
- **Privileged access, etc**



## Activity 7: Building Institutional Partnerships and Collaborations

### Expected Results

- Memorandum of Understanding (MOU) with partner institutions initiated
- Researcher and stakeholder conference organized
- Public relations plan and strategy to improve visibility of project developed
- Links with personnel in relevant government agencies & a network of researchers in Ghana and elsewhere initiated
- Ministry of Fisheries and Aquaculture Development (MoFAD)
- University of Rhode Island (URI)
- University in Ghana
- Florida Gulf-Coast University
- ACDI/VOCA in Ghana
- Coastal Implementing Partners (IP)

### YR 2:

- **Private sector partnerships**
- **Policy and research dialogues**



## Activity 8: Research and Assessment of Marine Resources

- *Conducting Fisheries Stock Assessment*
- *Research & Assessment on Marine Fisheries Governance Issues*
- *Research on the Culture of Fish and Shellfish of commercial value*
- *Analysis of Value Chains of Fish Trade*
- *Monitor the Biodiversity and Health of Coastal Ecosystems*



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## ACKNOWLEDGEMENTS

- United States Agency for International Development (USAID)
- Ministry of Fisheries & Aquaculture Development (MoFAD)
- University of Cape Coast/ DFAS/ CCM
- USAID Sustainable Management Fisheries Project
- Stakeholders – Fishermen, Processors, etc.
- Technical Experts from KNUST, UG



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### 7.3 Presentation by Dr Raymond Babanawo, Fisheries Commission

**MOFAD's Plan for the artisanal fisheries Sector in Ghana**

The Ministry of Fisheries and Aquaculture Development is committed to developing, promoting and coordinating policies and programs that ensure profitability and sustainability of the fisheries sector



- Ensuring sustainability of the fisheries resources
- Capacity building and awareness creation
- Livelihood Diversification Social Support
- Improving Environmental and Hygiene conditions of Fishers

**MOFAD's Plan for the artisanal fisheries Sector in Ghana (Ensuring sustainability of the fisheries resources)**




- implementation of Marine Protected Areas
- Implementation of closed seasons
- Fish Stock Assessment
- Adequate laws and regulations
- Promotion of responsible fishing methods and practices
- Fishing gear control and regulation
- Enhanced Monitoring, Control and surveillance (MCS)
- Effort control; registration and regulation of number of canoes



## MOFAD's Plan for the artisanal fisheries Sector in Ghana (Capacity building and awareness creation)



- Funding and organizational arrangements necessary to make the Fisheries Commission effective and efficient towards implementation of the FASDP
- Adequate Staffing arrangements
- Relevant training programs
- Improvements in infrastructure and logistics
- Intensification of communication & awareness creation to precipitate responsible fishing practices
- Capacity building related to implementation of co-management



## MOFAD's Plan for the artisanal fisheries Sector in Ghana (Livelihood Diversification)



- Proposal for livelihood diversification
- One Coconut (Palm) can produce on average 60 fruits/annum
- Farm gate price for coconut is @ 80 pesewas
- Revenue per tree = GH¢ 48
- 200 Coconut trees/palms/ha
- Revenue/ha = GH¢ 9,600
- 11,000 fishermen along the coast
- Every fisherman cultivates one hectare of coconut plantation
- Total Revenue = GH¢ 105.6m

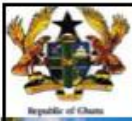




## MOFAD's Plan for the artisanal fisheries Sector in Ghana (**Livelihood Diversification and Social Support**)



- Provision of premix fuel at subsidized price
- Retention of proportion of profit for community development
- Procurement and distribution of outboard motors at subsidized price



## MOFAD's Plan for the artisanal fisheries Sector in Ghana (**Improving Environmental and Hygiene conditions of Fishers**)



- Promotion of hygiene and proper waste disposal within fishing communities
- Value addition to landed fish and increased revenue
- Reduction of waste in fish landed
- Improved monitoring of activities of fishers and data collection
- Participation in local tourism industry






MOFAD's Plan for the artisanal fisheries Sector in Ghana



## 7.4 Presentation by Paul Bannerman, Deputy Director, Fisheries Scientific Survey Department, MOFAD

OVERVIEW OF  
Ghana Fisheries Management Plan  
(Marine Sector)

*A National Policy for the Sustainable Management of Ghana's Fisheries Resources*

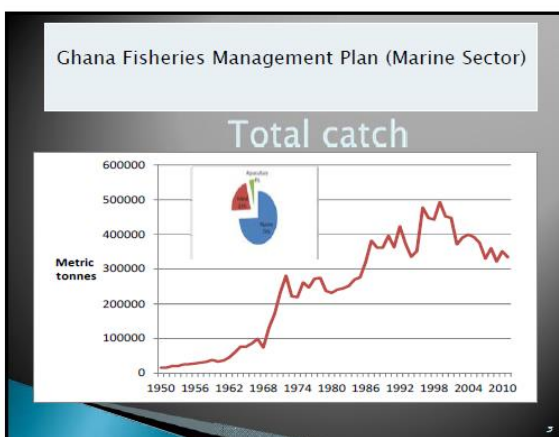
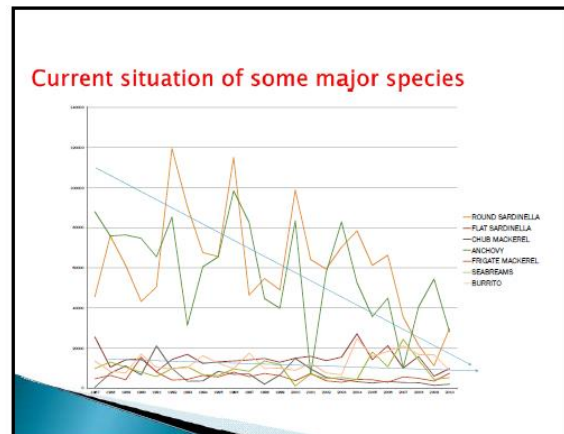


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- ▶ THE TOTAL MARINE FISHERIES RESOURCES OF GHANA OVER THE DECADES HAVE BEEN FLUCTUATING SHOWING A GENERAL DECLINE IN CATCHES AND MEAN SIZES OF FISH DUE TO :
  - ENVIRONMENTAL FACTORS
    - UPWELLINGS AND UNEXPECTED INTERACTIONS
  - MANMADE ACTIVITIES
    - OVERCAPACITY
    - OVERFISHING
    - USE OF ILLEGAL METHODS AND GEARS
    - WASTEFUL FISHING PRACTICES LEADING TO POST HARVEST LOSSES

### Fisheries sector

- ▶ The Fisheries sector accounts for about 5% of the country's Agricultural Gross Domestic Product (AGDP). Fish contributes 60% of annual protein intake of Ghanaians.
- ▶ In addition to food security, the marine fisheries sector is estimated to generate approximately US \$1 billion in total revenue each year. The latest figures indicate that the sector represents around 2.6% of Ghana's GDP (Fisheries and Aquaculture Development Plan 2011-2016 – *IGOG 2011*)





Summary of sustainable levels in relation to current fleet numbers from computations based of catch and effort data from the fishery –"Shaeffers" model MSY

	No of units in 2014	MSY mt	Units required to sustain fishery
Artisanal	>12000	239,913	9,095
Inshore	403	13,713	272
Industrial	107	30,637	48

In summary the key issues are:

- ▶ Excessive fishing effort exerted in all fisheries
- ▶ Inadequate information on Fisheries Biology and Stocks.
- ▶ Weak enforcement of Fisheries Regulations
- ▶ Low levels of protection of marine Biodiversity

### KEY ISSUES

▶ Ghanaian fisheries management is confronted with the following:

Key issues	Description
Inadequate information on Fisheries Biology and Stocks.	Insufficient scientific information known about the biology and current biomass levels of the main commercial species. Available information suggests that most fish stocks are overexploited and require rebuilding strategies.
Excessive fishing effort exerted in all fisheries	Excessive fishing capacity, especially in the trawl sector, requires effort reduction to more sustainable levels. The exact extent of the overcapacity in the canoe sector is not currently known. The overcapacity translates into levels of fishing effort above the MSY level of effort representing both economic and biological overfishing. Urgent reduction of fishing effort by management action is required.

- ▶ TO ADDRESS THE DECLINES AND MAN-MADE ACTIVITIES HAVING A NEGATIVE EFFECT ON FISH RESOURCES, THE GOVT AS ENSHRINED IN THE ACT SECTION 42 MUST COME UP WITH A MANAGEMENT PLAN TO REVERSE AND IMPROVE ISSUES THREATENING FOOD SECURITY, LIVELIHOODS AND ALSO TO MEET INTERNATIONAL OBLIGATIONS
- ▶ THE GOVT THEN DEVELOPED A NATIONAL PLAN (2015–2019) TO STOP OVERFISHING AND REBUILD DEPLETED STOCKS TO IMPROVE PEOPLE'S LIVELIHOODS

### KEY ISSUES

▶ Ghanaian fisheries management is confronted with the following:

Key issues	Description
Weak enforcement of Fisheries Regulations	There is weak enforcement of the fisheries laws and regulations due to inadequate resources (both human and financial) and adequate conflict resolution mechanisms. More strategic use of existing resources to support new conservation actions should be applied.
Low levels of protection of marine Biodiversity	There is inadequate protection of specific marine ecosystems. Better protection of sensitive ecosystems is required to ensure replenishment of biomass, particularly of coastal areas which are known nursery areas of various commercial species. Closure of known spawning and nursery areas is required.
Inappropriate procedures in certifying fish for export	Catch monitoring and catch certification are key processes to ensure informed management decisions. There are no clear cut guidelines on verification of fish and fishery product for export often leading to rejects.

National Management Plan of Ghana (Marine Fisheries Sector)



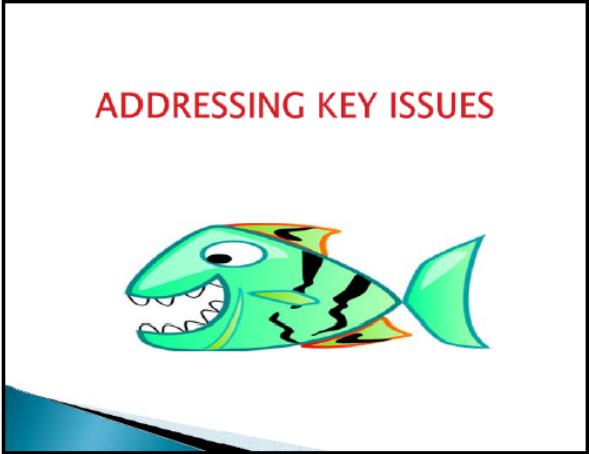
Fisheries Management Plan of Ghana  
(Marine Fisheries Sector)  
13/02/2015  
(3<sup>rd</sup> Version)

2015 – 2019



- ▶ THIS PLAN HAS COME TO THIS STAGE (GAZETTED) DUE TO VARIOUS INTERACTIONS WITH STAKEHOLDERS NAFAG (GNCFC, GITA, GIFA, GTA), REGIONAL CONSULTATIONS WITH FISHERMEN ALONG THE COAST, FEEDBACKS FROM VARIOUS MDA'S INCLUDING THE EPA, AG-OFFICE, INTERIOR-MARINE POLICE, UNIVERSITIES NGO'S ETC
- ▶ FINAL NATIONAL STAKEHOLDER WORKSHOP WAS HELD AT THE ALISA HOTEL ON THE 24<sup>TH</sup> MARCH 2015.
- ▶ DIALOGUE AT CAPECOAST 3-5 SEPTEMBER 2015

- ▶ Increase the traditional one day per week fishing holiday to 2 days per week. ©
- ▶ Enact periodic closures to all fleet depending on clear scientific research (a)
- ▶ Control of new entrants to the fishery by encouraging alternative livelihoods ©
- ▶ Facilitation of co-management systems especially in the artisanal sector ©
- ▶ Strict adherence to current ICCAT capacity limits allocated to Ghana etc (tuna)



- Inadequate information on Fisheries Biology and Stocks**
- ▶ Develop a Data Collection Regulation aimed at gathering fisheries data thru' recruitment and training and deployment of personnel; 40 new staff recruited and deployed
  - ▶ Continuous capacity building programmes for technical and scientific staff in data collection
  - ▶ Develop research plan and undertake assessments of key commercial fish stocks:

- Reducing excessive fishing effort exerted in all fisheries**
- Some actions to be taken in the plan:
- 50% reduction in fishing days for trawlers (scaled annually).(t)
  - Control the number and capacity of vessels(t)
  - Deletion of inactive boats (t)
  - Cancellation of licences for violators of fisheries laws and regulations amendment 880 of 2014 (a).
  - Replacement scheme for registered vessels (t)

- Improving information on fish biology, stock assessment to support rebuilding harvest strategy.
- ▶ Improve the implementation and use of data collection schemes for all fisheries including e-formats for logbooks and web-based applications such as tablets etc in the short-medium term
  - ▶ Collaboration with universities and research institutions in specific areas eg benthic ecology, mpa's, demersal assemblages etc
  - ▶ Organise at least one annual meeting to promote the sharing of experiences among stakeholders;

TIMELINES FOR HIGH MEDIUM AND LOW PRIORITY ACTIONS TO IMPLEMENT

Strategic Action areas (2015-2019)	2015		2016		2017		2018		2019	
	m1-6	m7-12	m1-6	m7-12	m1-6	m7-12	m1-6	m7-12	m1-6	m7-12
1. Control the current levels of fishing effort and fishing capacity: HP *T.1.1, 1.2, 1.8, *C1.1, 1.2, 1.8, and *TF 1.1, 1.2	*HP	*HP	*HP	*HP	*HP	*HP	MP	*HP	MP	*HP
MP C1.4, 1.5, 1.6, 1.7	LP	LP	MP	MP	MP	MP	MP	MP	MP	MP
2. Improving information on fisheries biology and stock assessment to support a stock rebuilding harvest strategy: *2.1	*HP	*HP	*HP	*HP	MP	MP	MP	MP	MP	MP
2.2, 2.3	LP	LP	MP	MP	MP	MP	MP	MP	MP	MP
3. Effective enforcement of fish legislation: *3.1	*HP	*HP	*HP	*HP	*HP	*HP	MP	MP	MP	MP
3.2, 3.3	LP	*HP	*HP	MP	MP	MP	MP	MP	MP	MP
4. Protecting marine habitat to conserve biodiversity; and *4.1, *4.2	*HP	*HP	*HP	*HP	MP	MP	MP	MP	MP	MP
5. Product certification and reducing post-harvest losses. *5.1, 5.2	*HP	*HP	MP	MP	MP	MP	MP	MP	MP	MP
5.3	LP	LP	MP	MP	MP	MP	MP	MP	MP	MP

### Low levels of protection of marine Biodiversity

- ▶ Designate and create marine habitat protection areas, through research along the coast to protect nursery areas and spawning grounds, mainly in estuaries and mangrove areas;
- ▶ Actively collaboration with Govt-(MDA), Research institutes, Universities NGO's etc in protecting the marine resources

### Weak enforcement of Fisheries Regulations

- ▶ Maintain and upgrade vessel monitoring system (VMS),
- ▶ Enforce strictly provisions in Act to eliminate IUU fishing
- ▶ Collaborate effectively with regional bodies on MCS strategies to combat IUU fishing;

### Reducing post-harvest losses and improvement of livelihoods

- ▶ Promoting community group involvement in post-harvest and facilitating business opportunities thru improving landing facilities to increase food safety and hygiene;

Facilitate the creation of and traders associations to access micro-credit financial schemes to enhance fish production and marketing;

Improved social interventions thru' the implementation of insurance and pension schemes for fishermen

- ▶ Enforcement presence through increasing the number of surveillance hours per month from 144 hrs to 240 hrs by year 3;
- ▶ Improving the efficiency of prosecution through training of prosecutors, judges and creation of fisheries tribunal and establishment of dispute resolution mechanisms;
- ▶ Adequate resourcing of the Fisheries Enforcement Unit in conjunction with capacity building of staff;

### In conclusion

- ▶ a Management Operational Committee will be formed to implement the FMP,
- ▶ the FMP will be reviewed annually with the collaboration with all key stakeholders,
- ▶ The FMP will be backed with a financial plan.

*The onus lies on all stakeholders to play their part in the interest of the fishery and posterity.*





▶ *We are grateful to all stakeholders most especially our fishermen and mummies for their thought and support for this plan which if implemented judiciously would be beneficial to all of us and would enable us get good quality affordable fish of our choice every day on our tables.*

▶ *Thank you*