REPORT OF BASELINE STUDY ON LAGOON FISHING IN OGUN STATE:

CASE STUDY OF IWOPIN, AGBALEGIYO, EBUTE-ONI AND MAKUN-OMI COMMUNITIES

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LIST OF ABBREVIATIONS AND ACRONYMS

BIF	Business Innovation Facility
CEO	Chief Operating Officer
CSOs	Civil Society Organisations
DBN	Development Bank of Nigeria
DFID	UK Department for International Development
EIA	Environmental Impact Assessment
FAO	Food and Agriculture Organisation
FGDs	Focused Group Discussions
G	Grammes
GES	Growth Enhancement Schemes
GIS	Geographic Information System
GPS	Global Positioning System
Hp	Horsepower
IDIPR	Ijebu Development Initiative for Poverty Reduction
KAP	Knowledge, Attitude and Practice
KG	Kilogrammes
KII	Key Informant Interviews
LGA	Local Government Area
M	Meters
M4P	Making Markets Work for the Poor
NAEC	National Agriculture Enterprise Curriculum
NAFPP	National Accelerated Fisheries Production Project
NBS	National Bureau of Statistics
NDE	National Directorate of Employment
NGN	Nigerian Naira
NGOs	Non-governmental Organisations
PDF II	Policy Development Facility Phase II
PHCN	Power Holding Company of Nigeria
PIND	Partnership Initiative in the Niger Delta

PMT	Pond Management Training
RC	Results Chain
SMS	Subject Matter Specialist
UK	United Kingdom

EXECUTIVE SUMMARY

This is the report of the study on improving livelihood of fishing folks in Ogun State. The field work spanned through 15 days from 11 – 25 August, 2016 and covered four fishing communities, Iwopin, Oni, Makun-Omi and Agbalegiyo in Ogun Water Side Local Government Area with head quarter at Abigi. The local government is the only area in the state with coastline and well-endowed river networks and a large expanse of exclusive ocean waters for commercial fishing. However, the study shows that the fish value chains within the area are not yet developed to meet international market requirements. The species caught include catfish (*Clarias gariepinus*), tilapias, *korowo* (*Parachanna obscura*), mullets (*Mugil cephalus*) and gymnarchus. Other fish caught were simply identified by local names like *obokun (Chrysichthys nigrodigitatus), eshun (Sphraena piscartorum), shugbon (Elops lacerta)* and *aika (Heterotis niloticus)*.

Objective

The aim of this study is to understand the market system around sea fishing in Ogun State, key constraints and how the livelihoods for poor fisherman could be sustainably improved using an M4P approach

Methodology and Approach

Three key research approaches (participatory, needs assessment and field observations) were combined in gathering both quantitative and qualitative secondary and primary data used in this study. Questionnaires, focused group discussion and key informant interview tools were deployed for the collection of primary data while literature review was employed for secondary data. Data collection lasted for five days. In each community, the consultants and field assistants shared tasks in gathering data using the questionnaires, checklist of questions for FGDs, KIIs, Needs assessment, Site observation as well as the use of GPS data tool.

Description of Study Area

The study was carried out in four fishing communities along Ogun coastline all under Ogun Water Side Local Government Area with head quarter at Abigi 6°29□N 4°24□E6.483°N 4.400°E and population size of 112,802. The coastline and lagoon spans about 15km into the marine after Odi-Omi is predominantly brackish albeit quite proximate to the Atlantic Ocean, Lagoon systems and in particular a myriads of complex network of streams and rivers. The communities are part of the 50 towns and villages that make up the 10 political wards of the Local Government Council.

The area consists largely of illiterate Yoruba speaking people who observe the same customs, uphold the same values and beliefs and respect as other Yorubas. The Ijebus constitute about 70%, with the Ikales, Ilajes, Itsekiris and Urhobos making up the remaining 30%. The dominant religions are Islam, Christianity and Traditional Religion. Ijebu East Local Government bound the area in the west in the north and the east by Ondo State and in the south, by Lagos State and Atlantic Ocean.

It has an area of 1,000 km² fertile land rich in organic matter and well drained deep soil that supports various crop cultivation especially cassava, plantain, maize and rice. Major economic activities include: Farming, Fishing and Lumbering. The major fish caught are tilapia, mullet

There is presence of primary and secondary school in most the communities visited or at least in a reasonable distance. There are fair road network albeit some are at various deplorable states with maintenance work in progress in some areas. There was also a new road being constructed from Lagos passing through Odi-Omin that though yet to be completed but have brought some level of succour to the Odi-Omi people who before were totally disconnected from the rest of the communities resulting in high post harvest lost for the fishermen in that area.

Findings

The study shows that the major constraints are in cold-chains and limited value addition (presently only smoking), which is done with drums by the wives of the fishermen. The resultant effect is that fishes are limited to landing Jetty at Iwopin, which is the only active jetty and sold off for very little amount. The technology employed by fishermen in the study area who are predominantly poor and illiterate with small (often informal) business size, are limited to fishing nets of various sizes, hooks and fish cage traps. The predominant means of transportation to fishing grounds were wooden canoes and paddles. There was only very insignificant number of fishermen (less than 10%) that own and use outboard engines fitted to the wooden canoes for fishing. The drudgery associated with the use of hand pulling canoes not only impact on the health of the fishermen but also result in losses sometimes as they had to return very late occasioned by distance covered during fishing. Given that fish is an extremely perishable foodstuff, these factors significantly constrain livelihoods of fishing folks around the study area.

Despite the huge fishing activities and potentials of the fishing value chain in the area, the fishing value chain was quite undeveloped. Virtually all the goods and services in the value chain apart from the fish are obtained from Lagos. There was no fishing gear wholesale or retail shop or dealer, no outboard engine seller, no outboard engine mechanic except for wooden canoe repairers and net knitters. There was no net weaving factory in the whole of the state neither was there any cold room around the study area. The only cold room sighted was at Kuto in Abeokuta about 1 hour and 45 minutes drive from the jetty in Iwopin and there was no understanding to off-take fish from the local fishermen currently.

The fishermen also suffer low catches during off seasons due to over fishing of the lagoon occasioned by the use of unsustainable fishing gears and methods. Similarly, the undue exploitation of the lagoon fishing ground by foreign fishermen who use trawlers due to poor control of territorial waterways by coast guards and marine police also impede on the catches of the local fishermen.

Generally, there was the challenge of covering of the navigable waterways by water hyacinth and other aquatic weeds that is rapidly resulting in serious ecological change in the area.

The supporting public infrastructure in the area especially road is in fair condition and the study team observed on-going repair works in some terribly deplored parts of the road. Though virtually all the communities within the area were connected to the national grid, regularity of the power supply leaves much to be desired hence the populace resorts to kerosene lamps with insignificant percentage using small generators. The communities rely on wells, lagoon water and private boreholes for their source of water.

The findings also show that government at different levels recognized the place of the study area as well as the potentials it portends for job creation. This is evidenced in the oral interview findings that revealed that there was some intervention efforts from both the federal, state and local government council in the areas of input and technology support. Unfortunately, the interventions were reported to be unsuccessful due to lack of proper diagnosis and unsustainable execution.

The study also reveals that the fishing folks lack access to credit facilities except for corporative lending which is barely enough and takes longer time as access to finance is only granted after several months of collective savings. However, Abigi Micro Finance Bank situated at the local government head quarter is the only financial institution that had granted some micro credit to the fishermen in the past successfully. There is also plan by the Ijebu Development Initiative on Poverty Reduction (IDIPR) to extent their intervention to the artisanal fishing folks in the area of input credit support.

Recommendations

These systemic challenges could be addressed through proper diagnosis and strategic interventions involving the critical stakeholders and fish value chain actors that can catalyse systemic change within the sector. Against the backdrop of the various constraints (systemic and environmental) that impede the productivity and ultimately limit the incomes of the fisher folks, some strategic recommendations include.

Design and develop an inclusive economic growth intervention model tailored towards an improved, efficient and effective market system development.

Develop sustainable alternatives (like fish cage system) that can engage the fishermen during off peak fishing period and ultimately lead to increase in the incomes of the fishing folks.

1 INTRODUCTION

1.1 OVERVIEW AND CONTEXT

This report documents the research and findings of a baseline study of the livelihood conditions offishermen in the lagoon fishing communities of Ogun Waterside Local Government Area (LGA), of Ogun State, Nigeria, with special focus on Iwopin, Agbalegiyo, Oni and Makun-Omi communities. The baseline study, spanned through 15 working days from 11 – 25 August 2016.

Terms of Reference

The Ministry of Finance commissioned the Comprehensive Study of the Market System around the Fishing Communities in Ogun State from Policy Development Facility Phase II (PDF II), a UKAID funded programme.

1.2 BACKGROUND TO THE STUDY

Currently fish products have not only become a major item of the Nigerian diet, it has also attained dominance in Nigerian food importance and overall food security. While production of seafood is growing rapidly in the world, the share of captured fish particularly in developing countries like Nigeria is falling rapidly. From 1995 to 2007 a very large number of small-scale artisanal fishermen who are involved in captured fisheries contributed between 81.4% and 89.6% of the local fish production annually.

During the same period, the industry produced between 4.3% and 9.0% of the total fish production. The total landing from inshore waters (up to 50m depth) by the industrial vessels was only 18,847.782 metric tonnes in 2008 and 22,232.963 metric tonnes in 2009. Production from aquaculture or fish farming (which has a very large potential of fish production) when merged was 20,053.5 tonnes in 2010.

Fish represents a major food source, which is invaluable for the protein they provide and in their use in industrial production as feed ingredient. Economically, fish provides an important food source and income for both men and women and it has an important socio-cultural position in the riverine communities.

The coastline in Nigeria and especially of Ogun Waterside Area of Ogun State is well endowed with the river networks and a large expanse of exclusive ocean waters for commercial fishing. In these areas, the people (i.e. men, women and children) are engaged predominantly or on a part-time basis in one or more activities in the capture fisheries sub-sector. The families (households) livelihood strategy in this area tends to combine various ways of earning a living. The most dynamic livelihood strategies rely on the largest possible range of approaches and available assets, thus reducing risks created by natural or market vagaries. One proven fisheries livelihood strategy is harvesting various fisheries resources with different gears depending in the season. Another is simply doing nothing during the "dead" period (particularly when the climate is harsh) provided enough resources are generated during the active season. Still a third and particularly frequent and solid strategy in the rural areas is to engage in fisheries during the "peak abundance" main season ad to undertake another productive activity the rest of the year. This multiple livelihood source of income often helps to reduce the catastrophic effects fisheries management measures can have where a fishery must be closed or reduced due to the state of resources.

1.3 OBJECTIVES OF THE STUDY

The study aims at identifying the various constraints that impact on the productivity and ultimately limits the incomes of the fisher folks along the Ogun Lagoon with a view to recommending efficient and effective alternatives that will rejuvenate or lead to the maximization of the full potentials of the adequate fisheries infrastructure that is currently showing signs of decline and decay. In particular, the scope of work in line with purpose of this study as stated will seek to understand the Market System around lagoon-fishing in Ogun State, key

constraints and how livelihoods for poor fishermen could sustainably be improved.

The specific terms of the consultancy includes but is not limited to the following:

- Providing a detailed description of the value chain (with population numbers).
- Detail descriptive matrix of value points in the value chain, showing – types and scale of business, actors at each point, input required, equipment required and market size and potential.
- Geo-mapping of the value points and the market size in value and volume.
- Detail description at each value point of operation and regulatory environment.
- Detail list and description of growth constraints and their root causes at each value point. As part of this, a political economy analysis of issues around lagoon fisheries, and how issues there may form the root cause of some persistent constraints.
- Competitive analysis at each value point
- Growth opportunities at each value point and potential size in volume and value.
- Opportunities for improving incomes of women living and working in fishing communities. There will also be specific consideration of excluded groups such as those with disabilities
- Specific analysis of existing technology and the latest technology in the sub-sector.
- Comparative analysis of the benefit and size of the subsector to the state government.
- Economic impact assessment of the sub-sector to the local government and the state.
- Alternative and competitive analysis for consumer choice of protein.
- Environmental impacts assessment of fish farming that will not hinder opportunities that could be leveraged to improve fishermen's livelihoods.

- Whether there are any significant businesses either in the value chain at the moment – or could potentially be linked in the future. This is important because having a sizable business involved in the value-chain gives opportunities for DFID's Business Innovation Facility (BIF) programme to work with the larger business to help adjust their business model to have more developmental impact.
- GIS mapping of the fishing communities to better explain similarities and distinguishing features of the various communities, and to add to the existing mapping of Catfish producers in Ogun State that BIF has already developed.

1.4 ORGANISATION OF THE REPORT

The rest of the report is laid out as follows:

Section 2 outlines the study methodology, including the study design consideration, study approach adopted, methods and tools adapted to the field situation.

Section 3 presents the study findings, which include the socioeconomic situation of actors (respondents) in the fishing communities, their demographic characteristics like sex, age, marital, educational and economic status, household size, estimated monthly income, and membership of associations/cooperatives. This section also include, yield and income data, constraints, access to finance and technology, and the related gender issues associated with lagoon fishing activities.

The last **Section 4** provides conclusions and recommendations based on analysis of the study findings.

1.5 LITERATURE REVIEW

Fishing settlements represent one of the oldest forms of communal living all **over** the world. In these settlements, fishing folks including men, women,

youths and children are involved in activities relating to fishing and engaging in different crafts, skills and technologies for fishing as well as for day to day survival. In Nigeria, the fishing industry dates back to the pre-colonial era where basically small-scale fishing (artisanal) has been a major source of food for the inhabitants of coastal and riverine areas. It also provides employment and economic benefits to those engaged in artisanal fishing activities. These include fish collection in the wild, and fresh fish preservation and marketing (Kareem, et al, 2012). The extent and nature of this involvement in the captured fishing in Nigeria varies by locality, region, level of education and form of fish sales among other factors.

There is a generally agreed position that fisheries development is directed towards three main objectives [10]; a, to bring about improvement in the overall fish production in the country; b, to raise the social status of the fisher-folks; and c, to increase the protein intake in the diet of the general public. In this, major constraints on the development of artisanal fisheries in the major inland water bodies in Nigeria have been identified as;

- Inadequate supply of inputs to the artisanal fisher-folks. Most of the fishing grounds are located far away from the sources of supply for fishing inputs, and added to the extremely high cost of inputs and the non-availability of capital to artisanal fisher-folk, they are unable to equip their units for effective operation.
- The changing nature of the seasonal streams, rivers and pools frequently lead to low productivity of these water bodies and to poor fish catches by the fishermen. This naturally leads to the low-income base and poor living standards for the fisher-folks. This cannot be avoided, particularly along the floodplains of seasonal rivers disturbed by either drought or artificial water control. Under such conditions, full-time fisher-folks have to search for alternative occupations such as floodplain farming with residual soil moisture during dry season.
- Poor management of the water bodies by the government authorities results in low productivity and consequently in low catches by the fishermen. This

is caused by the absence of fisheries edicts in most inland States, and the lack of enforcement of the edicts in the states that have promulgated it. This has led to the use of undesirable fishing gears by some fishermen and the application of very destructive fishing hods.

- There is a shortage of trained manpower at different levels of the profession for effective capture fisheries project implementation, development planning and administration. There is also inadequate dissemination of information on fisheries activities and resource potentials as well as processing, marketing and resource management. In short, extension services are inadequate and need serious re-orientation and strengthening.

Another major constraint is the fact that some fishing communities have no access roads thus rendering marketing and distribution of fish difficult and also creating problems for extension services activities where such are organized. It is also common knowledge that most fishing communities in Nigeria lack basic amenities such as water supply, health facilities and schools for their children.

The most common activities in the capture fisheries subsector has been between those fishing activities carried out from the shore and others carried out from boats or at some distance from the shore. Such observation among the types of labour supply by the fisher folks has become necessary for two reasons. One is the danger posed by the frequency of boat mishaps and the attendant loss of life and properties while prospecting for fish in small boats. The second is as a result of the active involvement of women folk in child rearing.

In the capture fisheries of the coastal and riverine areas in Nigeria, men and women, and even children play diverse roles. Artisanal fishery is composed largely of traditional fishermen who are scattered all over the country, carrying out fishing with the use of traditional dugout or wooden boats (canoes) and other gears (traps, nets, hooks, etc). Their activities are mostly

in shallow continental shelf (coastline), lagoons, creeks, rivers, lakes and reservoirs (Ajao, 2006).

In typical fish settlements (or landing sites), men are predominantly the harvesters of wild fish species (Williams, 1987; Olubanjo, et al, 2007). They are the ones that voyage in lagoons in wooden boats or dugout canoes to catch a variety of fresh species. The fish are sold in their fresh state to local women at fishing ports or landing sites. These are usually direct sales with the farmers' wives acting as intermediaries and dispersion agents.

In Nigeria, within the past three decades, the growing demand for fish has increased domestic fishing efforts and has also resulted in rising fish imports and increased prices (Delgado, et al. 2003). Unlike in many other countries, artisanal fishermen dominate the fishing industry in Nigeria (Williams, 1987; Olubanjo et al 2005).

Ogun State is one of the eight coastal states in Nigeria with about 15 kilometres of Nigeria's coastline, having numerous rivers, streams and inland waterways (freshwater). These support varied fishing activities prevalent among coastal inhabitants. Research reports have however shown that artisanal fisheries is the main economic activity of the coastal population of this study area since there are limitations for alternative sources of livelihood. A good number of studies have been carried out on the socio-economic lives of the fishing communities involved in captured fisheries in Ogun State. Some of the studies also dwelt on the technical efficiency and the allocative efficiency of the various activities.

Olubanjo, et al, 2012 analysed the activities and performance of artisanal fishing households in Ogun waterside area. The study showed that they are mainly men fisher folks whose households reside at least six members and within the ages of 31 to 36 years and were involved predominantly in the marketing of fish catch. The study also showed that they inherited the fishing knowledge from their parents and majority of them have been in

artisanal fishing for more than 30 years. Further, the geographical location, educational status and number in the household helped significantly to influence the fishing activities performed by the household.

Also, the geographical location, the fishing activities performed, size of workers, level of education as well as the manner in which the fish was sold showed significant relationship with the annual income of the fishing households. The study recommended that conventional fishing inputs and fish processing technologies be made available and affordable to the fishing folks in groups or through cooperatives. Also, that credit facilities or opportunity to apply for loans with low interest rates are made relatively easier to help improve purchase of production and processing technologies. Next is improved transportation mode to facilitate timely catch disposal and fresh fish landing as well as that Government should help improve artisanal fisher-folks in curtailing the water hyacinth menace in the lagoons (Idowu, 2010) revealed that activities such as beach seining and laundry activities impacted negatively on fish diversity especially at Iwopin.

The number of fish species observed in the study showed some level of richness in the fish diversity of the study sites. In this study, the physical and chemical parameter values supported the biological life in the lagoon systems and help enhance the fish abundance and distribution. He concluded that human activities needed to be nominated to sustain aquatic life at Iwopin and the surrounding fishing communities.

Earlier studies by Williams (1999) and Ezenwa and Ayinta (1993), observed that Nigeria Coastal brackish waters system in the Delta region (estuaries, lagoons, creeks and wetlands) which stretch approximately 850km distance have witnessed human activities leading to the destruction of critical grounds for nursery and decrease in landing.

Adelabu Ogunbaneru (2012) on the fish catch efficiency of fishing

households in Ogun Waterside of Ogun State, indicated that fishing experiences, capital assets, outboard engine, education and extension contact are significant factors influencing fish catch by households. The study recommended overhauling of the extension delivery system in fisheries, provision of credit for the small-scale fishing input like outboard engines, the provision of market outlets and storage facilities.

In Odulate et al, 2011, the role of women in fisheries in the coastal wetland areas of Ogun State was studied. The study area included Iwopin, Ode-Omi, Makun-Omi and Awodikora-Osa, all within the lagoon and marine fishing communities. The study observed that fish production in these areas has not been able to meet the demand thereby creating a wide gap between demand and supply. Various efforts such as introduction and encouragement of aquaculture have been made to bridge the gap but to no avail. However, recognition of the role and empowerment of women in fisheries will go a long way to reduce poverty, if not bridge the gap. The paper argued that policy makers most often overlooked women participation in making fish production readily available to consumers but recognize that fish contribution from coastal wetlands to overall fish production can be improved through capacity building of women in fisheries. Introduction of new technologies, training, improved transport system and health services can boost fish production and enhance the socio-economic status of the women fisher-folk.

Adewunmi et el (2012) investigated the profitability of Artisanal fishing in Kwara State, in the River Asa in Asa local government. The study showed that an average fisherman makes a gross margin of ₦52, 883.99/fisherman /month. However, like most studies, it identified the problems of artisanal fishing to include; lack of storage facilities, lack of government support and seasonal changes in the volume of the river. The study recommended among others; that fishermen should be given adequate training and the required assistance on modern fishing techniques and use of modern fishing

equipment to ensure sustainability.

There is also the need to organize farmers to into cooperatives to enable them have better access to government programmes and credits. It also encourage the building of mini cold rooms with good storage facilities to help the fisher folks overcome the problem of fish spoilage which reduces the quality of their products.

Recent study by Oruonye (2014) examined the challenges of fisheries management practices in the local communities in Taraba and Douga Tributaries of Benue State in the face of declining fisheries resources, increasing degradation and climate change among others. It provided information that will guide scale fisheries management in the face of social economic and environmental changes and allow for more adaptive response to new circumstances and opportunities

A comprehensive report by the Partnership Initiative in the Niger Delta (PIND 2011) analysed in details the value chain in captured fisheries and aquaculture. This study identified the value chain functions to be inclusive of production, harvesting, consolidation and marketing. The production activities include fish capture, fish feed production and storage.

Odebiyi et al (2013) evaluated the coastal fisheries value chain (CFVC) of Ogun State Waterside local Government Area. The study found that there is no significant association between the constraints faced by the fishermen and their revenue. There were three major marketing nodes along the coastal areas - these were the fishermen, fish process and fish marketers. It concluded that poor transportation network, high cost of fishing inputs, inadequate funding and poor storage facilities were major constraints to CFVC development and that the fish-marketers stage was profitable compared to other stages in the CFVC.

Abiodun Cheke (2014) observed that Marketers of fish and fish products in Nigeria commences from the harvesting stage to the end of the Value Chain, the key challenges for fish distribution include Seasonality, post-harvest losses and inadequate power supply and distribution logistics. The high cost of fish preservation and storage were identified as key problems of the fish value chain and marketing. Lack of easy access to credit is one of the key factors hindering many youth from participating in the value chain opportunities. Specifically the following were identified;

- Lack of suitable shore-based fish handling, collection storage, marketing and distribution facilities.
- Deficiencies in marketing and distribution facilities.
- Poor communications which make it difficult to operate efficient fish collection and distribution system and thus leads to establishing of inadequate fish market information systems.
- Inadequate or misdirected government intervention and assistance scheme due to lack of understanding of the prevalent socio-economic conditions in small-scale/ Artisanal fisheries.

Adeleke et al (2015) in a recent study observed that the strategies for Value chain in fish production include the fortification of fishing gears, changing the time of fishing (early morning and night), 67% of the fisher folks had no form of fish preservation while the rest 33% preserve their fish traditionally. It was found that the market suffers from several constraints, especially the high cost and variable supply of products, poor market price of fish and fish products. This study recommended that the concept of value chain be incorporated with the fish production at the artisanal level to avoid fish spoilage and wastage. This will increase profitability, food security and sustainability. Government should intensify the right support in terms of aids and infrastructures and give localized informal training to fisher folks on the ways of improving contributions of the chain actors for sustainable fisheries. Commercialization of the processing and the marketing segments of the value chain and technologically upgrading of the processing segment is paramount.

2 STUDY DESIGN AND METHODOLOGY

2.1 STUDY AREA

The area of study is Ogun Waterside Local Government Area in the Ijebu Division of Ogun State. It is located in the eastern part of Ogun state sharing boundaries with Ondo state in the north, Lagos state in the south and Ijebu east local government in the west. About half to three quarter of the length of the local government is surrounded by water extending from Lagos state to Ondo state, this peculiar feature gave birth to the name waterside. The area comprises over 50 towns and villages with headquarter at Abigi at 6°29°N 4°24□E/6.483°N 4.4°E, while the main town in this area are Iwopin, Omi, Ibiade, Abigi, Efire, Ilushin, Makun-omi, Ode-omi and Lomiro, the area consists largely of Yoruba-speaking people of which, the Ijebus comprise about 70 percent, with the Ikales, Ilajes, Itsekiris and Urhobos making up the remaining 30 percent. It has an area of 1,000 km² and a population of 72,935 at the 2006 census. This area is also blessed with a large expanse of fertile land (soil) rich in organic matter, well drained and deep which makes it support various crop cultivation especially plantation crops such as oil palm and coconut. The major occupations are Farming and Fishing. The major agricultural products are Garri, Fish, Rubber, Rice and Maize. Major natural resources are Timber, wild Oil Palm Trees, and Vast manila forest.

2.2 OVERALL APPROACH

The study adopted a mix of quantitative and qualitative research methods. These included literature review, face-to-face interviews using survey questionnaires, key informant interviews (KII), focus group discussions (FGDs), field observation – i.e. visits to fish landing platforms and processing sites, and the use of Global Positioning System (GPS) data gathering tool.

The study was conducted with a wide range of actors in the fisheries sector, including fishermen, fish smokers, wooden canoe fabricators and Subject Matter

Specialists (SMS). **Annex 2** presents a list of stakeholders that were engaged during the study.

A five-member team undertook the study in the four communities covered during the survey. This comprised the Principal consultant with expertise in development and economic analysis, and four other consultants with expertise in economic analysis in fisheries and aquaculture; development and economic research; social impact assessment and intervention; data analysis and Geographic Information System (GIS). The Principal consultant also worked with ad hoc field assistants recruited from the surveyed communities to assist in data collection.

While the team had oversight responsibility for the FGDs and key informant interviews, the field assistants assisted in communicating in the local Yoruba language with some of the participants who had difficulties in understanding spoken English. As a data quality assurance measure, the consultants crosschecked completed forms in the field for data consistency before leaving the survey villages/clusters.

Data collection lasted for five days. In each community, the consultants and field assistants shared tasks in gathering data using the questionnaires, checklist of questions for FGDs, KIIs, Needs assessment, Site observation as well as the use of GPS data tool.

Data from questionnaires were entered into Microsoft Excel Spread sheets for data analysis and generation of summary statistics. Data from the GPS tool were used to produce the distribution of the fish landing and smoking points

2.3 RECONNAISSANCE VISIT AND DESIGN OF SURVEY TOOLS

In preparation for the study, the consultant visited the fishing communities selected for the study, as well as Abeokuta, the State Capital of Ogun State, and

Ijebu-Ode Local Government Area (LGA) for a reconnaissance exercise between the 5th to the 7th of August 2016. During the visit critical stakeholders were engaged and scheduling of Focus Group Discussions (FGDs) and Key Informant Interviews (KIIs) with fisheries sector actors was initiated. This prior visit to the field enabled the consultant to gain an understanding of the situation and how best to adapt the data collection method to the field situation. The familiarization visit also provided an opportunity for hiring field assistants with local language capabilities.

The consultant held brief meeting with Mr. Marcus A. Adeniyi, the Chief Operating Officer (CEO) of the Ijebu Development Initiatives on Poverty Reduction (IDIPR), in the Palace of Paramount Ruler of Ijebuland, Oba Dr. Sikiru Kayode Adetona,to introduce the project and explain the objective of the research as well as elicit information on the activities of IDIPR in the fisheries sector.

Three field assistants comprising of two females and one male from the four fishing settlements were recruited, trained and inducted in readiness for the taking off of the study with the rest of the team who arrived on 9th August, 2016. With the aid of the field assistants, the consultant identified fisheries sector value chain actors with whom FGD and KII will be held during the field visit. A brief meeting with the actors will enable the consultant agree some schedules of FGDs, KIIs and interviews using questionnaire. Some key Subject Matter Specialist (SMS) were identified and engaged to elicit additional primary data on the study topic. These experts were from the Ogun State Ministry of Agriculture, Department of Fisheries and the Federal University of Agriculture, Fisheries Department, Abeokuta. Also, the fisheries office in Ijebu-Ode that was responsible for the management of the National Accelerated Fisheries Production Project (NAFPP) in Iwopin was visited.

In addition, in preparation for the fieldwork, the consultant designed data collection tools for review by the DFID/PDF II team. The tools were revised based on comments and suggestions provided by the DFID/PDF II team. These include

four research instruments that were developed based on the requirements of the study and are appended to this report (See **Annex 4**).

2.4 *SAMPLING TECHNIQUES*

A multi sampling technique was adopted for this baseline study. The DFID/PDF II team proposed Ogun State for the survey. The state was selected based on its lagoon stretch that runs in an East-West direction. A number of settlements along the lagoon system engage in fishing activities. From the state, Ogun Waterside LGA was purposively selected for involvement in the study because of the clusters of fishing settlements in the lagoon system.

The sample for questionnaire interviews comprised fisherfolks and fish smokers from the communities of Iwopin, Agbalegiyo, Oni, and Makun-Omi. In total, 80 one-on-one interviews and eight focus group discussions were undertaken across the four communities sampled for the study. **Table 1** below presents the quota for the social survey, FGD, key informant interviews and field visits.

Table 1: The number of respondents interviewed from the study area

Data Collection Method/Tool	**Ogun State**				**Total**
	Iwopin	**Oni**	**Makun-Omi**	**Agbalegiyo**	
Questionnaire	20 respondents	20 respondents	20 respondents	20 respondents	80
Focus group discussions	2 FGDs	2 FGDs	2 FGDs	2 FGDs	8
Key Informant	3 key informants	3 key informants	3 key informants	3 key informants	12

Table 2: Brief Description of the Sampled Clusters

Study Location	Brief Profile
Iwopin	Iwopin settlement is a medium-sized brackish water fishing settlement located on the Ogun Lagoon. It was one of the centres for National Accelerated Fisheries Production Project (NAFPP). NAFPP was launched in 1973.The programme involved providing a package of improved practices and inputs to selected fishermen, first in four pilot states and, later, in the whole country, In implementing the programme, the following facilities were put in place in Iwopin: a landing jetty, cold room, net loft and a power generating plant. These facilities have since gone moribund. Iwopin has two major landing sites, one is a concrete pavement, and the other is a muddy riverbank. Fishing activities are on all year round.
Agbalegiyo	Agbalegiyo is an extension of Iwopin. It is a vibrant fishing settlement predominantly inhabited by fishermen and women. No permanent, concrete building structures exist in the whole community. The settlement has no concrete landing site.
Ebute-Oni	Ebute-Oni is a fishing settlement that is almost deserted because of the invasion of water hyacinth on lagoon waters. In the last 15 years, the steady and unrestrained encroachment of water hyacinth on the lagoon waters near the river bank has almost led to a complete shutdown of fishing operations in the community.
Makun-Omi	Makun-Omi is the most popular waterside market in the whole of Ijebuland. The market runs on a nine day cycle. Both marine and lagoon water fish can be sourced from the Makun-Omi waterside market. In Makun-Omi, trade by barter is still being practiced, with the exchange of fresh fish for foodstuffs like garri, plantain, snails etc.

Annex 4-1: Survey questionnaire;

Annex 4-2: Checklist of topics and questions for FGD with women

Annex 4-3: Checklist of topics and questions for group interview/FGD with men and;

Annex 4-4: Checklist of topics and questions for key informant interviews with women and men

2.5 STUDY METHODS AND DATA COLLECTION TOOLS

The specific methods employed during the study are outlined below:

Literature Review

The literature review focused on the wild capture fisheries sub-sector in Nigeria and its relevance to poverty reduction among rural/fishing communities. A review of the different value chains in the sub-sector and the different roles played by men, women and children in its harvesting, preservation, processing and marketing were also undertaken. The technologies employed by artisanal fishermen and the prevalent methods of value addition to fish and fish products were also examined. A review of the constraints associated with a lack of social infrastructure in fishing settlements and the coping strategies adopted by fishing communities to ensure livelihood support and economic sustainability were also reviewed. Related needs assessment reports of fishing and fish smoking communities in Nigeria, and the socioeconomics aspects of overall relevant Environmental Impact Assessment Reports of the region.

Questionnaire Method

Survey questionnaires were used to elicit sensitive information such as demographics and income data that need to be gathered privately. A total of 80 fishermen and fisherwomen were interviewed using questionnaires. **Annex 3-1** presents the survey questionnaire that guided interviews with participants.

Key Informant Interviews

The team conducted key informant interviews with a total of 12participants – (i.e. eight men and four women). Interviewing both female and male participants provided an opportunity for garnering the perspectives of women and men. . **Annex 3-4, 3-5, 3-6 and 3-7** presents a checklist of questions that guided the key informant interviews.

Focus Group Discussions

A total of eight (two in each of the communities) FGDs were held with fisher folks in the four communities. **Annex 3-2** and **Annex 3-3** presents a checklist of questions for the FGD that guided the discussion with the various actors in the smoked fish value chain sector.

Site Visit and Observation

In order to observe occupational segregation by sex, the team visited four fishing settlements in Ogun Waterside LGA. A detail description of the sites visited can be seen in Table 2.

Global Positioning System

This study involved the use of digitization of the base map of the area. This is used to produce a GIS map with the use of ArcGIS 10.0 and global positioning system (GPS 76CSx) to obtain fish landing and smoking points. These coordinate points were plotted and superimposed on the digitized base maps to show spatial pattern of fish landing and smoking points in the area. See coordinate points in the appendix.

2.6 *FIELD OBSERVATION AND CONSTRAINTS*

The field assistants noted the following field observations and constraints:

Respondents' reception, perception, and attitude

Respondents in the survey were generally warm and welcoming, in all the study centres. However respondents in Agbalegiyo, recalled a previous encounter with a team of researchers, who came with a promise of providing the needed fishing material resources like outboard engines and nets for the fisher folks in the community, and never did, but only for a radio broadcast to be heard stating that inhabitants of Agbalegiyo were listed among the beneficiaries of the community-wide government support for wild fish capture sub-sector. Since then, the community has remained hostile to researchers' especially government-backed researchers. However, the team had to convince them, that they were not a government agency-sponsored initiative. It was only then that they became very cooperative.

Income data collection

A large percentage of respondents could not recall the exact amount of income earned in previous months. This occurrence, was however to be expected given that a majority of the respondents were yet to acquire any education beyond the secondary school level that led to poor record keeping.

2.7 GPS LOCATION OF THE FISHING ACTIVITIES IN THE COMMUNITIES

Figure 1: Spatial Distribution of Fish Landing Points

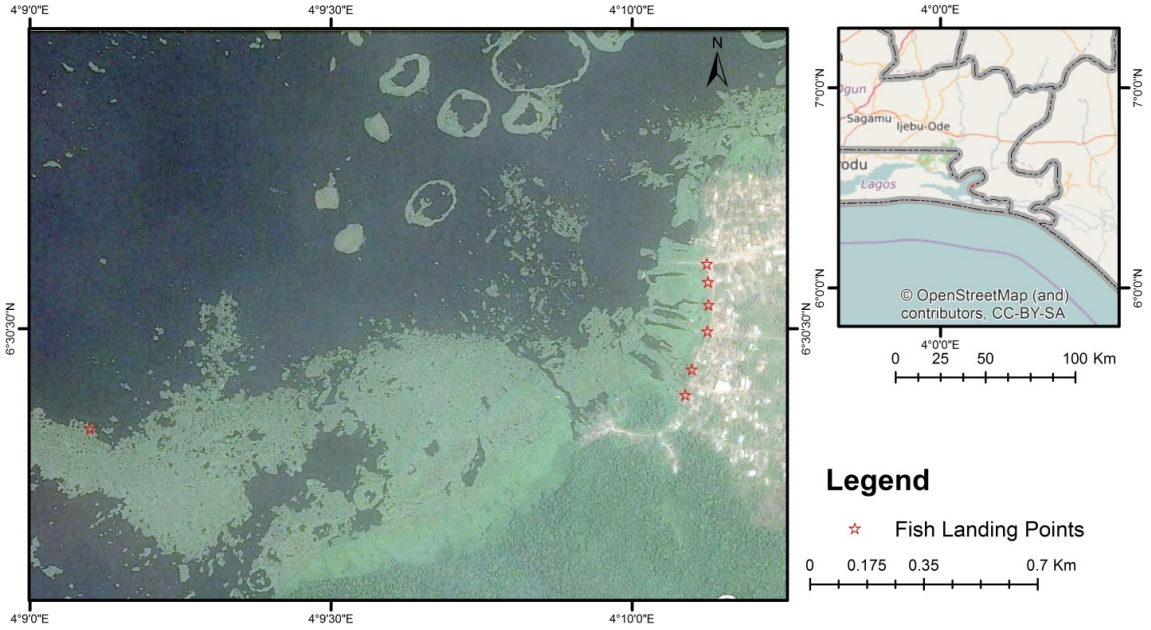

Figure 1 above shows the fish landing points in the area, with varying number of 50 to 100 women per point waiting for fishermen to buy fish. The women buy in basket to dry and resell to buyers from Lagos, Ondo and Edo States. The drying process takes a lot of resources like firewood, labour and time. These resources were valued as part of the incurred expenses for the production of the final product called dried fish. Business at the landing point is dependent on time of the fishermen arrival.

Figure 2: Spatial Distribution of Fish Smoking Points

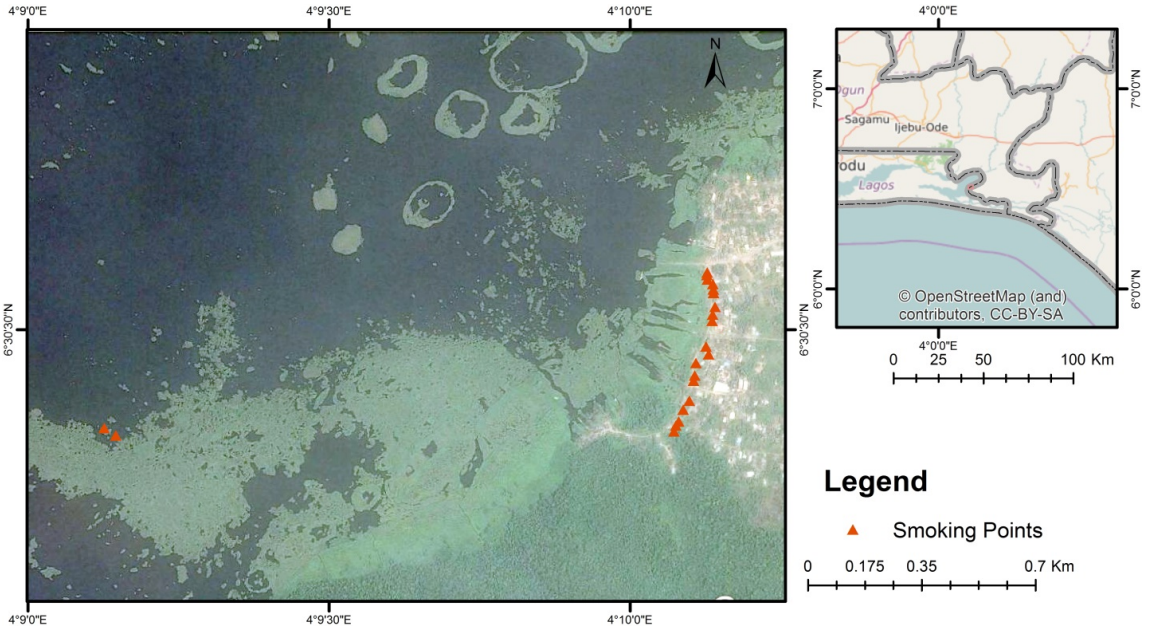

Figure 2 shows the smoking points in the area, where the women smoke or dry their fish before resell to the dry fish dealers. The smoking points are close to each other such that the women leverage benefits of closeness in terms of pricing drying methods. The smoking points are individually owned.

Figure 3: Spatial Distribution of Fish Landing Points Relative to Smoking Points

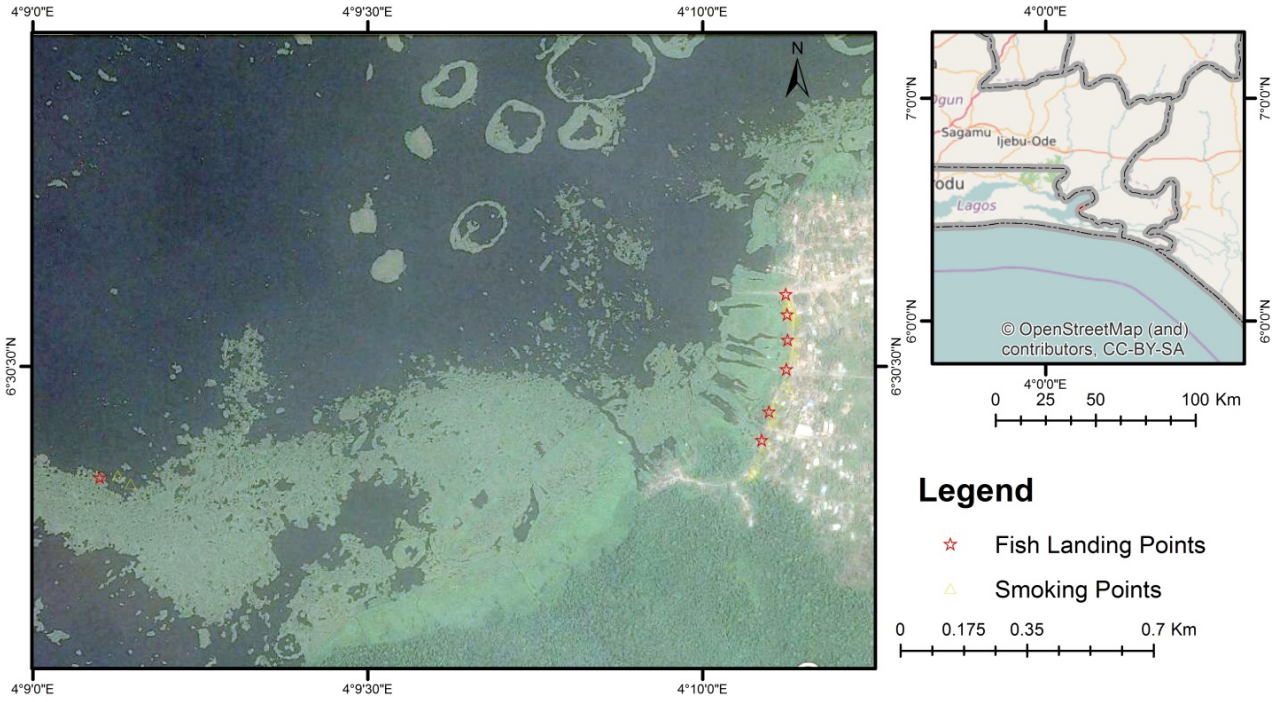

Figure 3 shows fish landing points relative to smoking points, these points are very close in that it takes no time to travel from landing to smoking points. In the relationship, landing and smoking points only exist in the area. The market for the product is usually from the nearby states.

Figure 4: Feed mill and Processing Centers

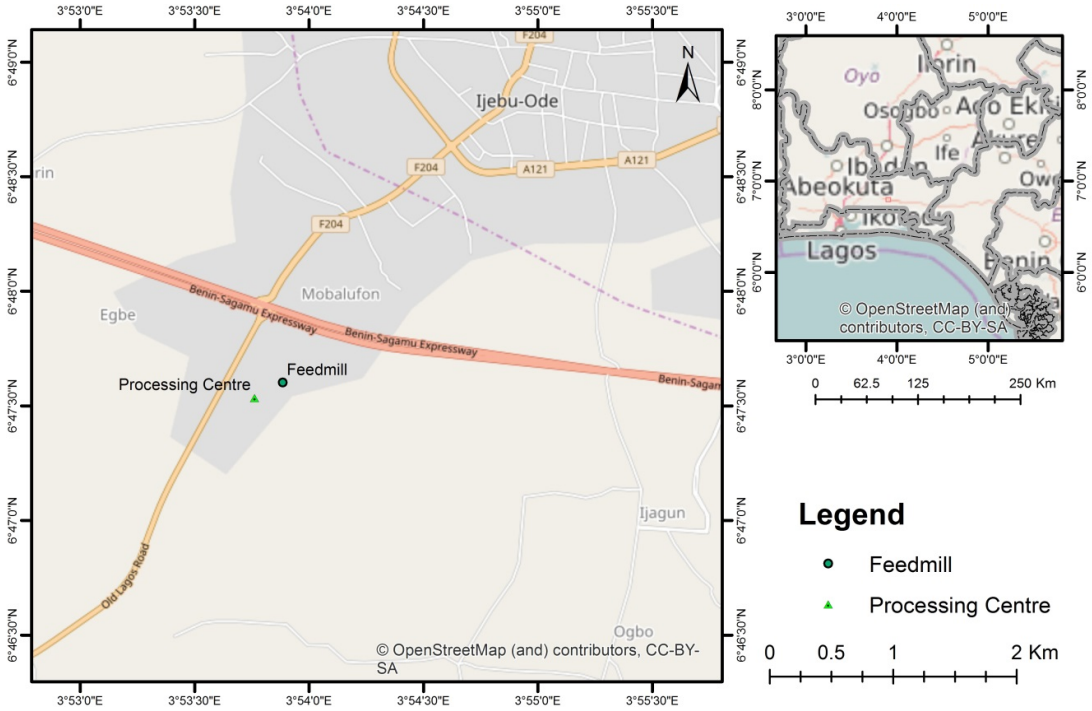

Figure 4 shows the fish processing and feed mill centers at Ijebu-Ode. These service centers are located far away from the fish landing and smoking communities. This makes it difficult for the fish dealers from communities to patronize the centers. The Ijebu Development Initiative on Poverty Reduction owns the feed mill. The processing center is privately owned for fish processing for entrepreneurs.

3 SUMMARY OF KEY FINDINGS/RESULTS

3.1 SOCIOECONOMIC CONDITION

3.1.1 Study Population

Fisheries sector actors in the four communities of Iwopin, Agbalegiyo, Oni, and Makun-Omi in Ogun Waterside LGA constituted the target population for the baseline study from which the sample was drawn as reported in Section 2.3 above. As noted earlier, a sample of 80 (60% of who were men) were sampled for the field survey. A breakdown of the sample size is presented in sub-section 4.1.2. Table 2 below presents summary of the sub-sample from each community.

Table 3: Sample Size disaggregated by Gender

State	Female	Male	Total
Iwopin	8	12	20
Agbalegiyo	8	12	20
Oni	8	12	20
Makun- Omi	8	12	20
Total	32	48	80

Age distribution

Table 4 below shows that all the respondents interviewed across the four communities were between the 20 and 60 years age bracket. This implies that the respondents were still within the productive and economic active age, and could be expected to increase catch and improve family livelihood.

Table 4: Brief Demographic Profile of Respondents from the study area

Household size (by class interval)	Freq.	%		Age cohorts	Freq	%
1-5	36	45%		21-30	28	35%
6-10	44	55%		31-40	28	35%
				41-50	10	12.5%
				51-60	14	17.5%
Total	80	100%		Total	80	100%
Marital status	Freq.	%		Educational status	Freq.	%
Married	72	90%		No formal education	8	10%
Single	8	10%		Uncompleted Primary education	4	5%
				Full Primary School	13	16%
				Full Secondary School	47	59%
				Uncompleted Tertiary	8	10%
Total	80	100%		Total	80	100%
Tribe						
Ijebu	45	56.25%				
Ilaje	20	25%				
Yoruba	10	12.5%				
Ijaw	3	3.75%				
Others	2	2.5%				
Total	80	100%				

Household Size

Fifty-five percent (55%) of the respondents in the four communities indicated their household size to be between 6 – 10 members, and 44% of the respondents belonged to smaller households having 1-5 members. This implied that labour for captured fisheries and related value chain activities can be sourced from the family unit.

Marital status

About 90% of the 80 respondents were married, with only 10% as single. The above statistic is indicative of the value chain's potential for benefiting other household members as reflected in the average house size described in Table 3 below.

Educational characteristics

The study established a rather high literacy rate as only 10% of respondents sampled had no formal education. Up to 69% of those that indicated their educational status had completed either secondary or post-secondary qualifications, thereby enhancing communication. The implication is that the respondents can be relied upon to accept innovations and adopt new technologies.

3.1.2 Overview of Economic Activities

As clarified earlier, the study focused on actors in the wild capture sub-sector of the fisheries value chain. Fishing was the fulltime occupation for 84.5% of the respondents (see Table 4 or 5 below).

In terms of the fishing experience of the respondents, majority (83%) of the respondents had been operating in the artisanal fishing sub-sector for more than 15 years. Only 17% of the respondents have less than 10 years' experience in artisanal fishing. Thus, the respondents in the study area can be described as being of sizeable knowledge in the artisanal fishing operations of the lagoon system of Ogun Waterside Area.

About 69% of the respondents inherited the artisanal fishing knowledge within the family as opposed to undergoing training outside the home. As such, artisanal fishing households serve adequately in facilitating the informal transfer of fishing knowledge from one generation to another in the study area. However, 31% of the respondents engaged in artisanal fishing being the only occupation at their disposal in the community.

Table 4 also provides a classification of the study respondents in terms of tribe. A majority of the respondents were Ijebus (56.25%), closely followed by Ilaje's (25%) and Yoruba (12.5%). Most of the respondents said they had fished in Epe River, the Ogun and Lagos lagoons. Other rivers fished in were the Tongei and Okun rivers from Yewa and Ijebu areas respectively. The range of hours spent in any given fishing expedition according to most respondents was 6-10 hours. The distances covered at the lagoon by 49% of the respondents were between 2to 4km; however51% of the respondents admitted to have covered a distance of more than 4 km in a single fishing adventure. According to one KII respondent, the fishermen engaged in what was called *community fishing*, that is, a minimum of two and a maximum of four fishermen going out to the lagoon as a group for fishing activities. The species caught include catfish (*Clarias gariepinus*), tilapias, *korowo* (*Parachanna obscura*), mullets (*Mugil cephalus*) and gymnarchus. Other fish caught were simply identified by local names like *obokun (Chrysichthys nigrodigitatus), eshun (Sphraena piscartorum), shugbon (Elops lacerta)* and *aika (Heterotis niloticus)*. The current fish catch is less than it was two years ago as attested to by 90% of the respondents. Some of the reasons given for the decrease in catch were:

- Invasion of the lagoon waters by aquatic floating plants especially water hyacinth (*Eichonia crassipes*).
- Lack of modern fishing equipment and gears.
- Overfishing within nearby coastal waters through the use of dragnets especially from Ghanaian natives who operate *'Fatiko' (Small mesh size drag net and Beach seines*.

In terms of membership of fisher cooperative association, majority of the respondents (55%) were members of association of fisher folks; while 45% were not members of any such association. Incidentally all the respondents in Ebute-Oni indicated that no fisher association existed, partly because water hyacinth and other aquatic weeds have seriously impacted the fishing points in Ebute–Oni. This was also the case in Makun-Omi here the fishing activities in the two area has declined drastically.

In Iwopin, names of fisher associations include, All Fishers Cooperative, Iwopin Fishing Association, and Water fishing union, Ijebu waterside; while in Agbalegiyo, the only named fishing association was Owodini Agbalegiyo fishing cooperative.

Market for Fish Product

Majority of the respondents (68.75%) said there was always a ready market for their fish catch, while 31.25% said there were no ready markets. In Iwopin, a daily market was kept at the waterside with buyers from Lagos and some neighbouring states like Ondo and Edo states patronising fish merchants at the waterside every day for fresh fish purchase. The most popular market in Ijebuland according to some respondents was the Makun-Omi fish market. This market, which runs on a nine-day cycle, received buyers from neighbouring states, including Edo and Delta States. Trading by hand and barter dominated the mode of sale in the markets.

Demand for Fish and Fish products

A majority of respondents (75%) said they didn't meet their client's demand for fish, the reasons adduced were:

- Fewer catch
- Increasing demand for fish and fish products as evidenced by an increased number of buyers
- Lack of fishing gears like nets

- Encroachment of fishing jetties, ports by water hyacinths and other aquatic weeds.

On how they intended to meet this demand in the future, the respondents proffered the following solutions:

- Acquiring more fishing gears
- Clearing the fishing ports of water hyacinth
- Provision of modern fishing facilities like landing sites
- Support and assistance in the form of inputs from government and donor agencies in acquiring better fishing equipment

Evidences from Needs Assessment conducted in Iwopin and Agbalegiyo communities indicated the *Most Important and Urgent* needs of the communities to include the following:

i. Fishing nets.
ii. Support repayment for any of the material inputs received.
iii. Support repayment for any of the credit facilities received

Ranking items ii and iii above as *Most Important and Urgent* needs suggest that respondents will support any repayment plan for material inputs received and/or credit facilities extended to them by government, donor agencies or financial institutions. Respondents expressed that the above listed *Most Important and Urgent* needs were a prerequisite for increased fish harvest and profitability.

Also listed as *Very Important and Urgent* needs were:

i. Outboard engines for boats
ii. Smoking kilns with complete processing building
iii. Fibre or wooden canoes
iv. Clearing of water hyacinths from fishing ports
v. Provision of regular public power supply to aid preservation of catch.

Additionally, the following were ranked, as *Important and Urgent* needs.

i. Hooks

ii. Cold rooms

iii. Micro credit

iv. Road maintenance

v. Establishment of outboard engine and fishing gears sale

A large percentage of respondents (91.67%) stated that they incurred losses in the fisheries business due to post-harvest losses. In preventing losses, three strategies were adopted

- Use of Iced block to reduce spoilage
- Smoking more fresh fish for value addition
- Consumption

More information about income is presented in Section 3.7. Table 5 below details the economic characteristics of the respondents interviewed.

Table 5: Economic Characteristics of Fisheries Value chain actors

Fishing Fulltime	***Freq.***	***%***		***Mode of Sale***	***Freq.***	***%***
Yes	*60*	*84.5%*		*Dozen*	*20*	*25%*
No	*11*	*15.5%*		*Hand*	*35*	*43.75%*
				Kilo	*25*	*31.23%*
Total	***71***	***100%***		***Total***	***80***	***100%***
Primary Occupation	***Freq***	***%***		***Duration in fishing years***	***Freq.***	***%***
Fishing	*64*	*80%*		*Less than 10 years*	*13*	*16.25%*
Farming	*8*	*10%*		*10 to 2 5 years*	*47*	*58.75%*
Trading	*8*	*10%*		*Greater than 25 years*	*20*	*25%*
Total	***80***	***100%***		***Total***	***80***	***100%***
Form of Fish Sale	***Freq***	***%***		***Ready Market***	***Freq***	***%***
Fresh	*40*	*50%*		*Available*	*55*	*68.75%*
Fresh and Smoked	*40*	*50%*		*Unavailable*	*25*	*31.25%*

Fishing Fulltime	Freq.	%		Mode of Sale	Freq.	%
Total	**80**	**100%**		**Total**	**80**	**100%**
Types of Fishing craft used	**Freq.**	**%**		**Types of Canoe used**	**Freq**	**%**
Boats with engine	35	43.75 %		Wooden and dugout canoes	15	18.75 %
Boats without engine	45	56.25 %		Wooden canoes	65	81.25 %
Total	**80**	**100%**		**Total**	**80**	**100%**
Common gears used	**Freq**	**%**		**Fishing Gear Maintenance**	**Freq**	**%**
Hooks and lines, nets	12	15%		Further	7	8.75%
Hooks and lines, nets, traps and cages	21	26.25 %		Locally	73	91.25 %
Nets	47	58.75 %				
Total	**80**	**100%**		**Total**	**80**	**100%**

Existing Lagoon Fishing Technologies

Due to the prohibitive cost of fishing inputs like outboard engines, majority of the respondents (56.25%) embark on their fishing expedition in nearby waters with boats without engines. This however reduces their catch. All the respondents interviewed used wooden canoes, with paddles. There were no modern fiber reinforced boats sited in any of the landing sites.

Preservation Strategies used to Prevent Losses

Because of the unavailability of regular public power supply, most of the respondents (76.47%) interviewed preserved their catch and fish harvest by a combination of smoking, and the use of iced blocks. The use of freezers and cold

room were the two other preservation strategies adopted by a few of the respondents.

3.2 GENDER AND HEALTH ISSUES

Women play important role in fisheries and in maintaining households and communities. Although fish production is traditionally considered as masculine enterprise, women's role in fisheries is complementary and crucial. (Odulate et al 2011).

One of the most important commodities handled by women is fish (Akpaniteaku *et.al*; 2005). In coastal wetland communities, women are deeply involved in artisanal fisheries activities. These activities include unloading of fish from landing canoes, fish marketing and processing (Cochrane et. al; 2009); which basically form the link between production and consumption.

In all the communities sampled, the value chain activities were divided along gender lines; the men were usually the suppliers of fresh fish from the inland rivers, lagoon and seas, the women smoked and marketed fish products. There were however isolated cases of women involvement as fisherwomen in communities sampled.

In terms of the entry requirements/barriers for women involvement in the fish value chain, the FGD participants in the four communities expressed that there were no barriers to entry by women into any section of the value chain. Women were free to engage themselves even as fisherwomen/folks as long as they had relevant fishing gears and the resources to hire labour. However, societal expectations, coupled with traditional roles for women and men imposed certain jobs on women and others on men. Women were found more as smokers and traders of smoked fish products, and the men were usually the fishers and smoking kiln fabricators.

3.3 PRIMARY OCCUPATION AND MONTHLY REVENUE ESTIMATES

The primary occupation for the majority of respondents in the study (80%) was fishing. This was followed by farming (10%) and trading (10%).

Monthly Revenue Estimates

In terms of total monthly revenue, the estimates ranged from below NGN 10,000 to above NGN150, 000.The total revenue showed that many of the respondents (37.6%) earned a total of NGN30, 000 – NGN59,000 while just 8.75% earned above ₦150,000. Table 6 below gives the monthly revenue estimates.

Table 6: Total Monthly Revenue of Respondents from the Study Area

Revenue bracket	*Frequency*	*%*
Less than NGN 10,000	*8*	*10%*
Less than NGN 20,000	*17*	*21.25%*
Between NGN 30,000 and 59,000	*29*	*36.25%*
Between NGN 60,000 and 89,000	*10*	*12.5*
Between NGN 90,000 and 119,000	*9*	*11.25%*
Above NGN 150,000	*7*	*8.75%*
Total	***80***	***100%***

Sources of Business Assistance and Capital

When respondents were asked if they received any form of assistance, majority (77.5%) answered in the negative, with just 22.5% affirming that they had previously received assistance to enhance their fishing business. The type of assistance received was stated as both material and financial. Material assistance was in the form of fishing gears and nets, while financial was in the form of loans. Financial institutions provided the loans received by respondents. Some respondents said they had received up to NGN 200,000 in the past. Table 7 below gives a breakdown of the sources of business capital.

Table 7: Sources of Business Capital

Sources of Capital	*Frequency*	*%*
Borrowed	*6*	*7.5%*
Family Sources	*16*	*20%*
Loans	*51*	*63.75%*
Others (Personal savings)	*7*	*8.75%*
Total	***80***	***100%***

Although all the communities sampled were connected to the national grid, electricity supply was almost non-existent. Table 8 below gives a breakdown of the power supply sources of the respondents.

Table 8: Power supply sources of the respondents from the study area

Sources of Power	*Frequency*	*%*
Generator	*48*	*60%*
Lantern/Candle	*18*	*22.5%*
PHCN	*14*	*17.5%*
Total	***80***	***100%***

3.4 CONSTRAINTS AND CHALLENGES IN THE FISHERIES SECTOR

The major constraints faced by lagoon fishermen according to the respondents were:

- High cost of fishing inputs like outboard engine. The average cost of 15hp, 25hp and 40hp outboard engines according to over 70% of the respondents and over 80% of the key informants were NGN400, 000. NGN600, 000 and NGN800, 000 respectively. Sellers of outboard engines were located in Epe, Lagos State, about 35km from Ijebu-Ode.
- High cost of nets, since there are no local manufacturers.
- Lack of funds to procure fishing gears
- Invasion of lagoon waters by aquatic floating plants especially water hyacinth (*Eichonia crassipes*).
- Lack of credit facilities to acquire fishing gears
- Lack of cold storage facility
- Use of crude methods of catching fish
- Low catches at certain periods of the year
- Poor electricity power supply
- Inadequate pricing due to sales without proper measurement
- No record keeping on the part of the fishermen on quantity caught and sold

3.5 ENVIRONMENTAL IMPACT OF FISH FARMING

Description of the value chain with population numbers

The dominant value chain in the study area is the fish smoking. The smoking value chain is predominantly women activities. Most of the women interviewed confirmed to be smoking fish caught by their husband. The predominant smoking technology in the area was the drum smoking with firewood.

Descriptive matrix of value points in the value chain, showing – types and scale of business, actors at each point, input required, equipment required and market size and potential

Table 9: Description of value point operating and regulatory environment

Value Chain	Types & Scale of Business	Business Actors	Input Required	Equipment Required	Market Size/ Potential
Fish Smoking	Small scale	Women	Fire wood /charcoal	Smoking kiln	Large
Cold Storage	Micro	Women	Ice block	Freezer	Medium
Canning	X	X	Cans, fish	Canning Machine	Large
Canoes repair and building	Very Micro	Only 3 youths	Wood	Chisels, nails, nuts and bolts	Medium
Fibre boats sales and	X	X	Fibre glass	Fibre cutters bolts, nuts	Large
Net sales	X	X	X	Treads and factory	Very Large
Net repairs	Small	Men	Tread, floater, ledge	Weaver	Large
Sales of hooks and other fishing gears	X	X	Finance	Store, transport	Large
Fishing	Large	99% men	Bate, floaters, fuel	Nets, floater outboard engine,	Large
Wholesales of fresh fish	Large	Fishermen	X	Basket	Large
Retail of	Large	Women	Ice Block	Basins or	Large

Value Chain	Types & Scale of Business	Business Actors	Input Required	Equipment Required	Market Size/ Potential
fresh fish				basket	
Sales of dried fish	Large	Women	Purpose built market for fish	Fish baskets, shelves storage	Very Large

The operating and regulatory environment for the value points identified in this study is between the study area, the state capital and Lagos State. The only value point within the operating environment is the fish-landing jetty at Iwopin and the smokers. There was no evidence or records of any form of regulations.

Table 10: Description of growth constraints and their root causes at each value point.

S/N	Value Chain	Description of Growth Constraints	The root Causes
1	Fish processing	• Smokers use drums only • Only family are involved in smoking • No cold Room/canning technology	➢ Lack of finance/knowledge of improved kiln ➢ Lack understanding of business of scale ➢ Limited knowledge of other value chain
2	Fishing	• Fishermen use mostly wooden canoe • Only few has outboard engine • Fishing is limited to nearby fishing ground	➢ High cost of fibre boats ➢ High cost of out-board engine ➢ No credit facilities ➢ Fishermen cannot access far fishing ground with paddle

S/N	Value Chain	Description of Growth Constraints	The root Causes
		• Low catch • Fishing man hour lost due to outboard engine breakdown • No fishing gear to go for fishing	➢ Lack of proper gear and training on sustainable fishing ➢ No outboard engine mechanic ➢ High cost of fishing gear/ lack of access to credit
3	Fish sales	• Fishermen sell fish at low cost • Fishermen sell fish at loss • Fishermen cannot meet demand • Fishermen record post harvest loss • Poor pricing of fish by buyers	➢ Selling fish without scale ➢ No record of sales ➢ No record of net catch ➢ Low catch ➢ low demand/lack of storage /electricity ➢ lack of proper value addition

A political economy analysis of issues around lagoon fisheries

One of the dominant political economy issues around the lagoon fisheries revealed in this study was the issue of little to no control of the territorial waterways. Foreigners' especially Ghanaian fishermen with improved fishing technology were found to be competing in the same fishing ground with the locals who use only small canoes. This revelation was particularly sensitive as the foreigners do not only use their improved technologies to enjoy better catch but also sell the fish to the local women for huge profit. The survey reveals that there is presence of coast guards and the Nigerian Marine police headquarters of Ogun State is situated in Iwopin but has not deterred penetration of the area by foreign

fishermen. The study revealed the lack of adequate and appropriate security equipment to carry out effective patrol within the lagoon.

Evaluation of opportunities for improving incomes of women living and working in fishing communities

The study reveals that there are great opportunities to improve the incomes of women living and working in the fishing communities exists. The women indulge in fish smoking which is the only value addition in existence in the community. The capacity of the women can be strengthened and the market system challenges addressed.

Consideration of excluded groups such as those with disabilities

There are no prohibitions for the participation of any group in the fishing communities sampled. Every member of the community has equal opportunity to participate in the fishing activity. The main systemic challenge to participation is the lack of start-up funds. Likewise there is no special consideration for particular individuals with disabilities to participate in the activities.

Analysis of existing and the latest technology in the sub-sector

The study revealed that every aspect of the value chain is obsolete. 100% of the fishermen use canoe except that 10% of the population had outboard engine attached to the canoe. Whereas the foreign counterparts use trawlers and other bigger wooden boat with outboard engine, over 80% of the fishermen in the study area use smaller canoe. The predominant fishing gear in use is dragnets, hooks and cage.

Comparative analysis of the benefit and size of the subsector to the state government

The fishery subsector contributes over 52.5% of wild capture fish in Ogun State. The sector creates full and part time employment for Ogun State and contributes to Gross Domestic Products of the State, contributes to food security in the State,

as fish is the dominant protein consumed around the study area. The sector puts the state in map of tourist states in Nigeria. Generate revenue for the state.

Economic impact assessment of the sub-sector to the Local Government and the State

The sector is of great economic importance to the Ogun Water Side Local Government. The local government name was derived from the presence of the lagoon and the associated fishing activities in the area. It is a tourist attraction for the local government and a major source of revenue generation even though this is yet to be properly harnessed.

Environmental impacts of Fish Farming and Opportunities that could be leveraged to improve Fishermen's Livelihoods.

Fish farming like any other project impacts the environment both positively and negatively. However the positive impacts of fish farming outweighs the negative impacts, which are minimal and easily mitigated by adhering to the right practices. One major impact of fish farming especially when concrete tank is used is stench from spent pond water though this is also a source of organic manure and could be harnessed to generate income too. With constant change of water the impact is mitigated. Fish farming is an opportunity that can be leveraged to improve fishermen's livelihoods especially the Cage Culture Aquaculture. Cage culture occurs when fishes at juvenile stage are raised in cages that are lowered into a body of water. For successful cage culture, a suitable site as well as species of fish native to the water body of choice should be considered. The lagoon is most suitable especially because the shelter is not to be exposed to wind or currents from the sea. This will be handy to address the issue of over fishing of the lagoon provided that the coast guards will control the foreigners.

Evaluation of significant businesses in the value chain

There is no significant business in the value chain at the moment. The value chain is very short. The fishermen land the fish at the jetty with ready market women waiting to take up the catch. The catch is either sold fresh or smoked by the

women and the big fish is retained alive in a controlled part of the lagoon for better pricing. However, the smokers' cooperative and fishing cooperatives show some potential for growth and development.

4 CONCLUSIONS AND RECOMMENDATIONS

4.1 CONCLUSION

The Comprehensive Study of the Market System around Fishing in Ogun State sought to understand the market system around lagoon fishing in Ogun State, key constraints and how the livelihoods for poor fisherman could sustainably be improved. The following conclusions can therefore be drawn from the study:

- Most of the fisher folks were males (60%) and their age is within the economic active range of 20 to 60 years, which favoured the adoption of fishing development.
- Most of the fisher folks were married (90%) and highly experienced in fishing because of families' inheritance.
- Majority engaged in fishing because it was a family business and to augment income from other sources.
- The non- membership of fishery cooperative societies, no steady public power supply, inadequate fishing technologies, water hyacinth, and a lack of access to credit facilities were some of the major constraints in the fisheries sub-sector.
- The demand for fish products is not met by a majority of the respondents (75%), due to fewer catch and an increasing human population.
- The artisanal fishing was moderately profitable in the study area.
- The cost of fishing inputs like outboard engines and nets were prohibitive.

4.2 RECOMMENDATIONS

These systemic challenges is believed could be addressed through proper diagnosis involving the critical stakeholders and fish value chain actors and strategic and appropriate interventions with great capacity to ensure systemic change within the sector. Against the backdrop of the various constraints (systemic and environmental) that impede the productivity and ultimately limit the incomes of the fisher folks, it is critical to consider the following strategic recommendation:

- Design and develop an inclusive economic growth intervention model tailored towards an improved, efficient, effective and functional market system development.
- Develop sustainable alternatives (like fish cage aquaculture) that can engage the fishermen during off peak fishing period, reduce over fishing, introduce sustainable fishing and ultimately lead to increase in the incomes of the fishing folks.
- Leverage the Ijebu Initiative on Poverty Reduction (IDIPR) and or some of the bulk buyers of fish to provide of fishing inputs like outboard engines and nets on credits. This can also be achieved by stimulating the market actors and the financial institutions to see the potentials in investing in this area.
- Either study to improve on the current smoking kiln or develop a pilot modern smoking kiln demonstration to stimulate appetite of the market actors to adapt the new kiln. There is also the option of leveraging the smoking centre at IDIPR cluster farm at Ijebu Ode by mitigating the issue of appropriate transportation system.

There is urgent need to deploy group dynamics training and organisational capacity training for the existing cooperatives while encouraging the other fisher folks (fishermen and fish smokers) in fishing communities to pool their resources together to form cooperatives that are government recognised. This is to afford them the opportunity to access funds from government- financed agro-allied lending institutions and donor agencies to improve their business and ameliorate the constraints imposed by lack of or inadequate finance.

- Leverage and strengthen the capacity of existing extension services from the state ministry of Agriculture to provide regular sensitization and trainings to fisher folks on sustainable fishing, modern methods of fish harvesting, proper fish handling techniques, and proper smoking practices. Enlightenment and training/workshops on fisheries may further enhance the operations and fortune of the fishermen.

- Commission further study on the workings as well as the environmental impact of the Ibute Ilamu fish conservation and aggregation techniques (local fish cage aquaculture) vis-à-vis the deep cage aquaculture with a view to adapting same as alternative fishing practice for off peak fishing season.
- Stimulate the local government and the fishing cooperatives to advocate through the Oba of Ijebu for the IDIPC success in conventional cluster farming to be extended to the Ogun Waterside local government. This will involve the introduction of the conventional Pond Management Trainings (PMT) and Entrepreneur Development (e.g. The Nigerian Agriculture Enterprise Curriculum, (NAEC)) training that will lead to the establishment catfish and tilapia farms as a way of reducing the overdependence on wild capture and meeting the local demand for fish products.

- The local and State government should intensify more effort on water hyacinth control programme to boost fish production and easy water transport services.

- The federal and states government should work in synergy to provide adequate infrastructure such as motor able roads, electricity and equipment for resources preservation should be provided in the rural fishing villages.

- Design strategic capacity and advocacy intervention to strengthen the capacity of the Abigi Micro Finance bank and other FIs as well as to improve the business capacity and acumen of the Fisher folks (fishermen and smoked fish actors) to access and manage credit facilities. Access to more funds will enable more captured fisheries as value chain actors acquire better fishing gears, inputs and improved smoking kilns, thereby resulting in more efficient fish business operations and ultimately lead to increase in income.

- The government and donor organisations should design awareness creation, advocacy or incentive oriented intervention targeted at stimulating interest of the few existing cold value chain actors in the area to extend their business to the wild capture fish storage. The interventions could be targeted at mitigating transportation challenge by supporting a pilot cold storage actor to acquire a mobile cold room to off take catches from the fishermen. This however, will also require a detailed study of the volume of the catch as well as the existing supply chain system.

The State government should support the coast guard and marine mobile police force in the area with adequate tools required to protect and guard the lagoon against unauthorised fishing.

BIBLIOGRAPHY

1. Abbott, V., *Traditional fish smoking in western Kenya.* Boiling Point, 1988(15).

2. Adelabu Ogunbameru (2012): Catch Level and Technical Efficiency in Coastal Fisheries of Ogun State. JORIND 10(3), December 2012.

3. Adegbite, D. A. and E. O. Oluwak, 2004: Revolving Loan Scheme as a Poverty Alleviation Strategy: A Case Study of Women Groups in UNAAB Extension Village. FAMAN Journal, Vol. 7(2), 2004, Pp. 18 – 28.

4. Adegbite, D. A. and A. O. Oloruntoba and O. J. Olaoye, 2008: Performance Assessment of Ogun State Agricultural and Multi-Purpose Credit Agency (OSAMCA) in Credit Delivery and Operation (2004 – 2006). Journal of Sustainable Development in Africa, Vol. 10, No. 3, Pp. 127 – 153.

5. Adeogun, O. (2010): Economic Efficiency of Fish Farming Techniques in Lagos State, Nigeria. An Unpublished Ph.D. Thesis, Department of Agricultural Economics. Obafemi Awolowo University, Ile Ife, Osun State, Nigeria. Pp 25 – 40.

6. Akpaniteaku, R. C., Weimin, M. And Xinhua, Y. 2005. Evaluation of the contribution of fisheries and aquaculture to food security in developing countries. Naga, World fish Center, 28 (1 & 2), pp. 28 – 32

7. Ashton, I.P., *Understanding lipid oxidation in fish*, in *Safety and quality issues in fish processing*, H.A. Bremmer, Editor. 2002, Woodhead Publishing Limited: Cambridge, England. p. 254-285.

8. Cochrane, K.; De Young, C.; Soto, D.; Bahri, T. 2009. Climate change implications for fisheries and aquaculture: Overview of current scientific knowledge, FAO Fisheries and Aquaculture Technical Paper No. 530. Rome, FAO. 2009. 212pp.

9. Fadayemi, N. O. (1987): Report of the World Bank Meeusen. Nigeria Fisheries Sector Review Study prepared for Federal Department of Fisheries, FMA, Lagos.

10. FOA. Corporate Document Repository; Inland Fisheries Resources of Nigeria, Fisheries and Aquaculture Depem\nd. Italy, August 1990.

11. FAO. Securing regional supply in aquatic products: prospects from the FAO postharvest loss assessment case studies. in Committee for Inland Fisheries and Aquaculture of Africa, Fifteenth Session. 2008. Lusaka, Zambia; December 9-11.

12. FAO. Post-harvest losses in small-scale fisheries: Case studies in five sub-Saharan African countries. Fisheries and Aquaculture Technical paper 550, Rome 2010

13. Fraser, O.P. and S. Sumar, *Compositional changes and spoilage in fish (Part II) - Microbiological induced deterioration.* Nutrition and food science, 1998. **98**(6): p. 325-329.

14. Idowu, A. A.(2010): Effect of Some Socio-Economic Activities on Fish Diversity of Lagoon Systems in Ogun Waterside Local Government of Ogun state, Nigeria. ***International Journal of Biological and Chemical Science.***4 (1):88-99. Published by the Department of Biochemistry, Dchang University, Cameroun. Available online at (http://www.ajol.info)

15. Kereem, R. O., Idowu, E. O., Ayinde, I. A and Badmus, M. A. 2012. Economic Efficiency of Freshwater Artisanal Fisheries in Ijebu Waterside of Ogun State, Nigeria. Global Journal of Science Frontier Research. Vol. 12, Issue 11, Version 1.0 2012.

16. Mabawonen, A. F. (1986): Fisheries in the Nigerian Economy "The Challenges Ahead." Journal of West African Fisheries, Vol. 11, No. 1.

17. Odulate, D. O., George, F.O. A., and **Idowu, A. A** (2011): Role of Women in Fisheries in Coastal Wetland Areas of Ogun State, Southwest Nigeria. Paper

Presented at the Proceedings of the Environmental Management Conference, Federal University of Agriculture, Abeokuta, Nigeria, 2011.

18. Odulate, D. O., George, F.O. A., and **Idowu, A. A** (2012): Role of Women in Fisheries in Coastal Wetland Areas of Ogun State, Southwest Nigeria. ***Journal of Agricultural Science and Environment*** 12(1): 74 – 82. Published by Federal University of Agriculture, Abeokuta, Nigeria.

19. Olaoye, O. J., D. J. Idowu, A. A. Omoyinmi and G. A. K. Akintayo (2012): Social Economic Analysis of Artisanal Fisherfolks in Ogun State Waterside Local Governments of Ogun State, Nigeria. Global Journal of Science Frontier Research Agriculture and Biology. Vol. 12. Issue 4 Versions 1.0, April 2012.

20. Olubanjo, O. O., Akinleye, S. O. and Adekoya, M. I. (2012): Social Economics of Fisherfolks in the Capture Fisheries of the Ogun Waterside Area, Nigeria.

ANNEXES

IMPROVING LIVELIHOOD OF SEA FISHERMEN IN OGUN STATE.

HOUSEHOLD/BUSINESS SURVEY QUESTIONNAIRE

Policy Development Facility Phase II (DPFII) in partnership with the Ministry of Finance, Ogun State is undertaking a study in Ogun State aimed at improving the livelihood of fishermen and the fishing settlements along the coastline.

The study will seek to understand the market system around sea fishing in Ogun State, key constraints and how the livelihood for the poor fisherman could sustainably be improved.

The interview will take between 15 to 25 minutes to complete and elicited information will be treated with strict confidence. Participation in the interview is voluntary and you may choose not to answer some or all of the questions. Your views are very important and we hope you will fully participate.

Serial Number	**State**
Name of Cluster	**Date...../8/2016**
Name of Respondent:	
Interview start time:	**Interview end time:**
Address of Respondent: Village/Town: Ward: LGA: State: **Telephone no:**	**Name of Interviewer:** Telephone No: Signature:

Name of Supervisor:	
Name of Data Entry Clerk:	**Date of Data Entry:**

1.	Sex	☐ Male ☐ Female
2.	Age (years)	<20 ☐ 21– ☐ 30 31–40 ☐ 41–50 ☐ 51– ☐ 60 61 &> ☐
3.	Marital Status	Single ☐ Married ☐ Widowed ☐ Divorced ☐ Separated ☐
4.	How many persons in your household?	1–5 ☐ 6– ☐ 10
5.	What Tribe do you belong to?	Ijebu ☐ Ijaw ☐ Igbo ☐ Ikale ☐ Ilaje ☐ Yoruba Others ☐
6.	What level of education have you attained?	☐ None ☐ Full Primary ☐ Uncompleted Primary ☐ Full Secondary ☐ Uncompleted Secondary ☐ Full Tertiary ☐ Uncompleted Tertiary
7.	Are you a full time fisherman?	No ☐ ☐ Yes
8.	Why did you choose fishing as a major occupation?	1= Family Business; 2= Occupation at disposal; 3= Hobby
9.	If yes to question 7 above, how long have you been fishing?	
10.	If No, What is your primary occupation?	Farming ☐ Trading ☐ Others (Specify) ☐

11.	In which other rivers do you fish apart from rivers in this axis?	
12.	How long does your fishing operation take?	1-5h ☐ 6- ☐ 10hrs Above ☐ 10hrs
13.	What distance do you normally go for fishing activities (KM)?	☐ 1Km ☐ ☐ 2km 3km ☐ 4km Over ☐ 4km
14.	What fish species have you harvested?	Tilapia ☐ Cat fish & Tilapia ☐ Cat fish, Tilapia & Korow ☐ Catfish, Tilapia, Korowo & Gymnartus ☐ Others ☐ (Specify)
15	What is your average level of fish catch?	**Per day** / **Per week** / **Per month**
16.	Is your current catch more than two years ago>	No ☐ ☐ Yes
17.	If yes, what do you think is responsible for the increase?	
18.	If no, what do think is responsible for the decrease?	
19.	What is your source of labour?	☐ Families ☐ Hired Labour ☐ Others (specify)
20.	Do you belong to any fishing cooperative society?	No ☐ ☐ Yes
21.	What is the name of the cooperative society you belong to?	

22.	Do you have a ready market?	Available Unavailable	
23.	What is your mode of sales?	☐ Kilo Hand ☐ ☐ Dozen Others (Specify) ☐	
24.	What form of fish sales do you adopt?	☐ Fresh ☐ Smoked ☐ Fresh and Smoked	
25.	Do you always meet the demand for fish supply?	No ☐ ☐ Yes	
26.	If no, why don't you meet the demand?		
27.	How do you intend to improve your chances of meeting the demand?		
28.	If yes, how were you able to meet the demand?		
29.	Could you please estimate your average earning per month from fishing activities?		**Peak months**
		No. of months	
		Earning per month	
30.	Do you encounter any losses in the fishing business?	No ☐ ☐ Yes	
31.	When do these losses occur?	After I catch the ☐ fish Peak period in fish ☐ harvest	
32.	What prevention measures have you adopted to avoid losses?		
33.	What quantity/percentage of the fresh fish spoils before selling?		

34.	What quantity of fish do you eventually sell per month?	
35.	How much do you sell the fresh fish?	
36.	What type of fishing craft do you use?	Boats with ☐ engineBoats without ☐ engine
37.	What types of canoes do you use?	Dugout ☐ Canoes ☐ Wooden canoes ☐ ☐ Wooden and Dugout Canoes Others (Specify)
38.	What common gears do you use?	☐ ☐ Hooks & ☐ lines Nets ☐ Traps & Cages Others
39	Where are the fishing gears maintained/repaired	☐ Locally ☐ Further
40.	What is your total monthly revenue? (NAIRA)	30,000 – ☐ 59,000 60,000 – 89,000 ☐ ☐ ☐ 90,000 – 119,000 120,000 – 149,000 Above 150,000 ☐
41.	What are your source(s) of capital?	Family ☐ ☐ Loan ☐ Borrowed Family & ☐ Loan Others ☐ (Specify)
42.	Do you receive any form of assistance?	No ☐ ☐ Yes
43.	If yes to question 40 above, what form of assistance?	Finance ☐ Material ☐ Extension Support Services ☐
44.	If yes to question 40 above, from who?	☐ Government Financial ☐ Institutions NGOs Others (specify)

45.	If financial assistance (question 42 above), how much in naira, do you get?	☐ ☐ 25,000-50,000 ☐ 51,000- ☐ 100,000 101,000-200,000 Above 200,000
46.	If Finance in question 41, what form of financial support did you receive?	☐ Loan Grant ☐ ☐ ☐ Cooperative Support Family
47.	If Material in question 41, what form of financial support did you receive?	☐ Canoes Fishing ☐ Gears ☐ Training Others ☐ (specify)
49.	What is your source of power?	☐ PHCN ☐ Generator Solar ☐ ☐ Lantern/Cadle
50.	How do you preserve your catch?	☐ ☐ Smoked ☐ ☐ /Dry Coldroom Iceblock Freezer
51.	If smoking/dry, what type of technology	☐ Choco/Drum ☐ Smoking/Kiln/Oven Others ☐ (specify)
52.	What fuel type do you use in fish smoking?	☐ ☐ Firewood/chacoal Gas/Stove Others (specify) ☐
53.	If coldroom, who owns it?	☐ Personal ☐ ☐ Cooperative Private
54.	Whose role is it to smoke or dry fish?	Men ☐ ☐ Women
55.	Where do you sell your fish?	☐ Waterfront Fish ☐ brokers/Middlemen
56.	What environmental issues have you experience?	☐ Flooding ☐ Pollution ☐ Others (specify)
57.	How do you dispose your decayed fish? (pls	

	explain)	

IMPROVING THE LIVELIHOOD OF FISHERMEN IN OGUN WATERSIDE LGA

NEEDS ASSESSMENT FORM

Name of Respondent:……

M/F:……

Community:……

Date:……

S/N	NEED	RANKING
1.	Out board engine for boat	(1) (2) (3) (4) (5)
2.	Fishing Nets	(1) (2) (3) (4) (5)
3.	Hooks	(1) (2) (3) (4) (5)
4.	Cold room	(1) (2) (3) (4) (5)
5.	Smoking Kiln with complete processing building	(1) (2) (3) (4) (5)
6.	Extension Services	(1) (2) (3) (4) (5)
7.	Micro Credit	(1) (2) (3) (4) (5)
8.	Fiber or wooden canoe	(1) (2) (3) (4) (5)
9.	Out board engine repair Centre with trained personnel	(1) (2) (3) (4) (5)
10.	Clearing of water hyacinth and other marine weed	(1) (2) (3) (4) (5)
11.	Marine cage aquaculture to supplement wild catch during off pick and to allow for fingerlings to mature	(1) (2) (3) (4) (5)
12.	Electricity	(1) (2) (3) (4) (5)
13.	Road maintenance	(1) (2) (3) (4) (5)
14.	Establishment of outboard engine and fishing gears sale	(1) (2) (3) (4) (5)
15.	Do you support repayment for any of the material support received	1) (2) (3) (4) (5)
16.	Do you support repayment for any credit facility received with interest	1) (2) (3) (4) (5)

Note:

1 = Not Important

2 = Fairly Important but not urgent

3 = Important and urgent

4 = Very important and urgent

5 = Most Important and urgent

ANNEX 3-3A – CHECKLIST OF QUESTIONS FOR THE KEY INFORMANT INTERVIEW WITH FISHER FOLKS

2 KIIs should be undertaken

Name :	
Phone :	
Location:	
LGA	**State:**

The following questions are to serve as prompts to help develop the conversation. Additional questions may come up from the answers given by the informant. Probe the answers as much as possible.

Opening

Topics/question	*Process note*
1. Tell me about how you came into the fishing trade?	This question is less threatening and is intended to establish rapport.
2. What kind of equipment do you use for fishing?	
3. What is the peak season for fish harvest here?	Please indicate the begin and end period using the months of the year
4. What is the lean period for fish harvest here?	Please indicate the begin and end period using the months of the year
5. What maximum volume/quantity of fish can you catch with this equipment?	Please explore catch for both peak and lean seasons
6. What percentage of your catch do you sell as fresh fish, and what percentage do you smoke?	You may wish to use the ten-seed technique. Pick 10 stones for the exercise. Ask the respondent to divide

	the 10 stones into two sets, one representing the volume sold fresh and the other the proportion smoked.
7. What are the factors responsible for the loss of fish after harvest?	Apart from encouraging the respondent to identity the factors, they could also tell you preventive measures as well
8. What preventive measures are adopted by fisherfolks to avoid losses?	
9. What is the current level of post-harvest losses per quantity of harvest experienced by an average fisherman?	You may wish to use the ten-seed technique. Pick 10 stones for the exercise. Ask the respondent to divide the 10 stones into two sets, one representing losses and the other the proportion in good state before smoking or sale.
10. How have you been preserving your fish both off and on shore? What technologies (including indigenous ones) are utilized by you or other fisher folks for this purpose?	

Entry barriers, Technology and Constraints

1. Are there entry challenges/barriers faced by prospective/new fisherfolks. What could these constraints be? What were your experiences when you were a new entrant?
2. What types of fishing equipment are available in your community for fishing?
3. What levels of awareness of the new and improved fishing technologies exist amongst the fisher folk?
4. What can cause a fisherfolk to lose his harvest?

5. Are they any environmental issues that impact the volume of fish harvested in any given season? If yes, what are these issues, and how do they impact they harvest positively or negatively?

Income, Yield Potential and Challenges

1. How profitable/lucrative is the fishing business compared to other occupational engagements (any example)?
2. In your opinion, what opportunities for economic/business growth exist in the fishing business?
3. (i)In which months (Peak months) do you catch fish the most? And why?(ii) What volume/quantity of fish do you catch in these months? (iii)What is the average monthly income you make in these months?
4. (i) In which months (Lean months) do you catch fish the least? And why?(ii) What volume/quantity of fish do you catch in these months? (iii)What is the average monthly income you make in these months?
5. What preservation strategies do you adopt to keep your fish harvest from getting bad?
6. How long do you keep/preserve your catch fishbefore you sell it? Where do you fisherfolks in this community sell their fish? Do the markets hold daily or weekly?
7. What are the greatest obstacles and challenges that you encounter as a fisherfolk?
8. What suggestions do you have that can help resolve the problems? What kind of support do fisherfolks need to improve their earning potential in thee business?

Organization and Cohesion

1. How are fisherfolks organized in general?
2. Do the women and men belong to separate fishing associations? If yes, why?
3. What requirements are needed for membership of any fisherfolk association?
4. Is registration with a fisherfolk association necessary before operating in the industry?
5. Are there any advantages or disadvantages of belonging to an association of fishermen/women? If so, what are they?

6. Please state the names of any fisherfolks organization or association you know in your community, and how they operate.
7. Are there entry barriers for prospective fisherfolks in your cluster in terms of joining an association? What was your experience when you joined one?

Gender and Health Issues

1. Between men and women, which sex is more dominant in fishing industry, and why?
2. Are women subject to violent attack and intimidation by men because of their economic empowerment through fishing activities?
3. What are the domestic roles of fishermen and their spouses (traditional roles)
4. Does involvement in fish smoking generate feelings of inadequacy in male spouses resulting in domestic violence?
5. Do fishermen/women report health issues arising from fishing activities?
6. How are fisherfolks generally perceived by the society?

Annex 3-3B – CHECKLIST OF QUESTIONS FOR THE KEY INFORMANT INTERVIEW WITH FISH SMOKERS

1 KII should be undertaken

Name :
Phone :
Location:
LGA **State:**

The following questions are to serve as prompts to help develop the conversation. Additional questions may come up from the answers given by the informant. Probe the answers as much as possible.

Opening

1. Tell me about how you came into the smoked fish business?
2. What kinds of smoking equipment are available in your cluster? Which one do you use for fish processing? How much do you spend on inputs for this equipment – firewood, kerosene, etc. what kinds of wood do you use for smoking?
3. How long (in minutes/hours) does it take to smoke say 10kg, 20kg or 100kg of fish? What is the largest volume/quantity of fish you have smoked, and how long did it take for you to smoke that volume/quantity?
4. What is the capacity of your smoking equipment? That is, what quantity/volume of fish can your smoking equipment handle at once? How much fuel wood do you use at any given time?
5. What improved smoking kiln technology is available in your community? What are the benefits of using the improved technology? For example, time saving? Cheaper fees? What else?

6. What level of awareness of these new and improved smoking kiln do you have as a fish smoker?

Income, Yield Potential and Challenges

1. How profitable/lucrative is the smoked fish business compared to other occupational engagements (any example)?
2. In your opinion, what opportunities for economic/business growth exist in the smoked fish business?
3. (i)In which months (Peak months) do you smoke fish the most? And why?(ii) What volume/quantity of fish do you smoke in these months? (iii)What is the average monthly income you make in these months?
4. (i) In which months (Lean months) do you smoke fish the least? And why?(ii) What volume/quantity of fish do you smoke in these months? (iii)What is the average monthly income you make in these months?
5. What preservation strategies do you adopt to keep your smoked fish from getting bad?
6. How long can a properly kept smoked fish last before it starts getting bad?
7. What are the greatest obstacles and challenges that you encounter as a fish smoker?
8. What suggestions do you have that can help resolve the problems? What kind of support do smoked fish actors need to improve their earning potential in the business?

Organization and cohesion

1. How are smoked fish actors oorganized in general?
2. Do the women and men belong to separate smoked fish associations? If yes, why?
3. What requirements are needed for membership of any fish smoker association?
4. Is registration with a fish smoker association necessary before operating in the industry?
5. Are there any advantages or disadvantages of belonging to an association of fish smokers? If so, what are they?

6. Please state the names of any fish smoker's organisation or association you know in your community, and how they operate.
7. Are there entry barriers for prospective smokers in your cluster in terms of joining an association? What was your experience when you joined one?

Gender and Health Issues

1. Between men and women, which sex is more dominant in fish smoking business, and why?
2. Are women subject to violent attack and intimidation by men because of their economic empowerment through fish smoking?
3. What are the domestic roles of fish smokers and their spouses (traditional roles).
4. Does involvement in fish smoking generate feelings of inadequacy in male spouses resulting in domestic violence?
5. Do fish smokers report health issues arising from smoking fish?
6. How are fish smokers (men and women) and smoking business generally perceived by the society?

ANNEX 3-3C – CHECKLIST OF QUESTIONS FOR KII WITH INPUT SUPPLIERS-NET MAKERS, CANOE/BOAT BUILDERS ETC

1 KII should be undertaken

Name :
Phone :
Location:
LGA **State:**

Opening

1. Tell me about how you came into making nets/ boats for fishing?
2. What kinds of fishing equipment are available in your cluster? Which one do you sell/supply/manufacture? How much do you spend on inputs for manufacturing this equipment – wood, ropes, etc. what kinds of wood do you use for making the canoe/boat?
3. How long (in hours) does it take to manufacture a small/medium size canoe/boat? What is the largest canoe/boat you have manufactured, and how long did it take for you to manufacture it?
4. What are the ranges of capacities of canoe/boat that you manufacture? That is, what quantity/volume of fish can it carry at once?
5. What improved fishing technology is available in your community? What are the benefits of using the improved technology? For example, time saving? Larger catch? What else?
6. What level of awareness of these new and improved fishing technology do you have as a canoe/boat manufacturer?

Income, Yield Potential and challenges

1. How profitable/lucrative is your engagement in canoe/boat making business compared to other occupational engagements?
2. What do you think account for so much women involvement in smoked fish processing?
3. What kind of support do you need to improve your earning potential in the business?
4. In your opinion, what opportunities for economic/business advancement exist in the canoe/boat making business?
5. (i)In which months (Peak months) do you make canoe/boat smoke the most? And why?(ii)What volume/quantity of canoe/boat do you make in these months? (iii)What is the average monthly income you make in these months?
6. (i) In which months (Lean months) do you make canoe/boats the least? And why?(ii)What volume/quantity of canoe/boats do you make in these months? (iii)What is the average monthly income you make in these months?
7. What are the greatest obstacles and challenges that you encounter as a canoe/boat maker?
8. What suggestions do you have that can help resolve the problems? What kind of support do canoe/boat makers need to improve their earning potential in the business?

FOCUS GROUP DISCUSSION WITH WOMEN

Number of Participants:		
Smoked Fish Value chain	**Actors Represented**	**Tick**
	Fish smokers	
	Input Makers –Net/ Canoe/Boat makers	
	Fisherfolks	
	Commercial smokers	
	Fisher folks	
Location:		
LGA	**State:**	

CHECKLIST OF QUESTIONS FOR FOCUS GROUP DISCUSSION

Choose Focused Group Discussion Participants Carefully

Selecting participants for focus group discussions should be done with care. The participants need to be people with knowledge or experience in the smoked fish value chain. Besure to have a mix of people -- people of different ages, educational level, and vocations in the fisheries sector value chain –fisherfolks, fish smokers, input suppliers, commercial smokers etc.

Topic/question	**Process note**
1. Is there any barrier/requirement for entry by women into fishing, and other value chain activities in the fisheries sector in this community?	Please consider introducing an exercise called Road Blocks (see Tools Together Now)
2. On the average, what percentage of fish harvest do fisher folk sell as fresh, and what percentage do they smoke?	Please use the ten seed technique

Topic/question	Process note
3. Are there incidences of loss of harvest due to inadequate cold storage facilities/insufficient smoking facilities? If yes, what can be done/what is currently done to mitigate these losses?	
4. What is the current level of post-harvest losses per quantity of harvest experienced by an average fisherman?	Please use the ten seed technique
5. What is the average number of commercial smoking kiln service providers in your community?	
6. What are the weakness and strengths of fish smokers in your community?	
7. What are the opportunities and threats available to fish smoker in your community?	
8. (i)What new and improved fishing technologies are in existence in your communities? (ii)How prevalent (extent of adoption) is this improved technology in your community/cluster? (iii) What level of awareness exists amongst fisherfolks of these new fishing technologies?	
9. Are they any issues limiting women and men from full participation in any aspect of the fisheries value chain, either as smokers, fisher folks, commercial kiln service providers or net/canoe builders? How could these issues be addressed in a positive and	

Topic/question	Process note
progressive manner?	
10. What months do you consider very favourable for fishing, and why? What volume of fish do you catch during these months? What are the units of measurement for fishes in this community? What are the selling prices for each unit during this period? What is your average monthly income within these months?	
11. What months do you consider least favourable for fishing, and why? What volume of fish do you catch within these months? What are the units of measurement for fishes in this community? What are the selling prices for each unit during this period? What is your average monthly income within these months?	
12. Are they any associations of fisheries sector value chain actors? What benefits do members derive from the association, if any?	
13. Which communities in the state are fishing activities most developed?What makes the communities favorable for fishing business?	
14. Which months do you have the highest	

Topic/question	Process note
demand for fish product? Which months do you have the lowest demand for fish product? What percentage of the demand do you meet?	
15. Where are commercial smokers located in this community? What kinds of equipment do they use?What types of smoked fish are prominent in this community?	

FOCUS GROUP DISCUSSION WITH MEN

FOCUS GROUP DISCUSSION WITH WOMEN

Number of Participants:		
Smoked Fish Value chain	**Actors Represented**	**Tick**
	Fish smokers	
	Input Makers –Net/ Canoe/Boat makers	
	Fisherfolks	
	Commercial smokers	
	Fisher folks	
Location:		
LGA	**State:**	

CHECKLIST OF QUESTIONS FOR FOCUS GROUP DISCUSSION

Choose Focused Group Discussion Participants Carefully

Selecting participants for focus group discussions should be done with care. The participants need to be people with knowledge or experience in the smoked fish value chain. Besure to have a mix of people -- people of different ages, educational level, and vocations in the smoked fish value chain - small scale smokers, smoking mammies, fisher folks, smoking kiln service providers and smoking kiln fabricators.

Topic/question	**Process note**
1. Is there any barrier/requirement for entry by women into fishing, and other valuechain activities in the fisheries sector in this community?	Please consider introducing an exercise called Road Blocks (see Tools Together Now)
2. On the average, what percentage of fish harvest do fisher folk sell as fresh, and what percentage do they smoke?	Please use the ten seed technique
3. Are there incidences of loss of harvest due to inadequate cold storage facilities/insufficient smoking facilities? If yes, what can be done/what is currently done to mitigate these losses?	
4. What is the current level of post-harvest losses per quantity of harvest experienced by an average fisherman?	Please use the ten seed technique
5. What is the average number of commercial smoking kiln service providers in your community?	
6. What are the weakness and strengths of fish smokers in your community?	
7. What are the opportunities and threats available to fish smoker in your community?	
8. (i)What new and improved fishing technologies are in existence in your	

Topic/question	Process note
communities? (ii)How prevalent (extent of adoption) is this improved technology in your community/cluster? (iii) What level of awareness exists amongst fisherfolks of these new fishing technologies?	
9. Are they any issues limiting women and men from full participation in any aspect of the fisheries value chain, either as smokers, fisher folks, commercial kiln service providers or net/canoe builders? How could these issues be addressed in a positive and progressive manner?	
10. What months do you consider very favourable for fishing, and why? What volume of fish do you catch during these months? What are the units of measurement for fishes in this community? What are the selling prices for each unit during this period? What is your average monthly income within these months?	
11. What months do you consider least favourable for fishing, and why? What volume of fish do you catch within these months? What are the units of measurement for fishes in this community? What are the selling prices for each unit during this period? What is your average monthly income within	

Topic/question	Process note
these months?	
12. Are they any associations of fisheries sector value chain actors? What benefits do members derive from the association, if any?	
13. Which communities in the state are fishing activities most developed?What makes the communities favorable for fishing business?	
14. Which months do you have the highest demand for fish product? Which months do you have the lowest demand for fish product?What percentage of the demand do you meet?	
15. Where are commercial smokers located in this community? What kinds of equipment do they use?What types of smoked fish are prominent in this community?	

ANNEX 5-1

GPS Coordinates of Fish Landing Points and Smoking Points in the Study Area

Northings	Eastings	Remark
629237.8	719748.6	Fish Landing Point
629244	719692.5	Fish Smoking Point
629300.4	719642	Fish Smoking Point
629249.2	719617	Fish Smoking Point
629248.5	719562.8	Fish Landing Point
629289.4	719549.7	Fish Smoking Point
629236	719526.1	Fish Smoking Point
629233.2	719492.5	Fish Smoking Point
629211.1	719465.2	Fish Landing Point
629246.3	719474.8	Fish Smoking Point
629216.9	719429.9	Fish Smoking Point
629227.1	719410.3	Fish Smoking Point
629232.6	719392.8	Fish Landing Point
629220.1	719368.7	Fish Smoking Point
629177	719364.4	Fish Smoking

		Point
629215.3	719344.4	Fish Smoking Point
629222.2	719314.2	Fish Landing Point
629164.2	719325.2	Fish Smoking Point
629205	719304.9	Fish Smoking Point
629166.9	719260.5	Fish Landing Point
629177.1	719228.3	Fish Smoking Point
629132	719239.4	Fish Smoking Point
629165.6	719209.1	Fish Smoking Point
629272.8	719421.6	Fish Smoking Point
629236.8	719375.6	Fish Smoking Point
629271.9	719608.8	Fish Smoking Point
629257.8	719544.9	Fish Smoking Point
631174.5	720551.3	Fish Landing Point
599239	750991.5	Feedmill
598893	751066.6	Processing Centre

Source: Author's Fieldwork, 2016