

SUTAINABLE FISHERIES LIVELIHOODS PROGRAMME

SFLP/DFID-FAO

**CONTRIBUTION OF FISHERIES RESEARCH TO THE IMPROVEMENT OF
LIVELIHOODS IN WEST AFRICAN FISHERIES COMMUNITIES**

CASE STUDY: NIGERIA

March 2002

EXECUTIVE SUMMARY

This study was sponsored by the Sustainable Fisheries Livelihood Programme (SFLP) to ascertain the contribution of research to improvement in sustainable livelihoods of both coastal and inland fishing communities in Nigeria. The thrust of the study is on key livelihood groups using fisheries resources, research providers, policies, institutions and processes in relation to research. In conducting the study, literature search was combined with interaction with fisher-folk in selected fishing communities and key informants using Participatory Rural Appraisal (PRA) techniques. The study was carried out by an inter-disciplinary team comprising fisheries experts, economists and rural sociologists for each of the ecological areas.

The key groups whose livelihoods are linked to fisheries resources in Nigeria are similar for both inland and coastal States. In the inland fishing communities, there are six key livelihood groups, namely, fishers, fish monger / processors, fish wholesalers, fish retailers, fish gear dealers and boat builders while in the coastal communities, the six groups are fishers, fish processors, fish marketers / mongers, boat builders, net fabricators and outboard engine mechanics. These livelihood groups depend largely on fisheries resources, with fisheries accounting for 70 – 90% of the annual income generated by them. They invariably combine fisheries activities with other livelihood endeavours such as farming, animal husbandry, petty trading, artisanship, etc., with the entire activities playing complementary or supplementary roles in stabilizing the economy of the fishing communities. However, the fisher-folk living under harsh conditions in the mangrove swamp has little or no land for cultivation.

Over 95% of fishers are men, comprising indigenous and migrant populations, including some non-Nigerians, mainly Ghanaians in the south and Malians, Chadians and Cameroonians in inland States. They are usually very skilled with long time involvement spanning several generations in which skills are passed over informally. Only few women are engaged in fishing, usually in rivers, pools and creeks. The common fishing craft in the communities is either dug out or plank canoes and not more than 20% are motorized. They use mainly a variety of simple fishing gears and their catch varies with the gear in use. Their catch, which always includes a good proportion of juveniles, is sold to appointed dealers or relations. Their income is rather low and can hardly sustain them and their family.

Fish processing is the exclusive preserve of women, except in some inland fishing communities where men participate actively especially in the Chad Basin. Similarly, fish marketing is dominated by women, except wholesale and distant trade that is dominated by men in inland communities. The other livelihood groups (fish gear dealers, boat builders, out board engine mechanics and net fabricators) are few in each community and are usually men and the demand for their services depends on fishing intensity.

Fishers are vulnerable due to depleting stock arising from over-fishing and excessive pressure on available resources; environmental degradation due to flooding, deforestation and menace of water hyacinth and industrial activities including oil spillage, dredging, canalization, construction of hydro-electric dams, high post-harvest losses due to poor processing methods and lack of refrigeration facilities, adoption of obnoxious fishing methods such as chemicals and explosives, poor rural infrastructures, particularly accessibility, health, water and sanitation facilities, relative poverty and high illiteracy among fishing communities, communal conflict, unfavorable macro-economic policies resulting in high cost of fishing inputs, inadequate marketing information and data on available fish resources, and ineffective grass-root organizations.

All or most of the factors that impinge on the fishers affect the demand for products and services of the other livelihood groups. Specific constraints include health hazards (e.g. effect of smoke on eyes) and non-availability or erratic electricity for marketers and forest depletion and scarcity of wood affecting processors and boat builders.

Generally, poverty in the fishing communities is pervasive. The fisher-folk live in isolated and often remote villages and housing in most communities is poor. They tend to spend most of their income on food and thereafter can ill afford to pay for capital items, the education of their children, medical services, clothing, transportation and other items. Availability of credit is quite restricted and is derived from small personal savings, loans from friends, relations and on special instances, money lenders.

Awareness of these problems and the need for proper management, control and sustainable exploitation of artisanal fisheries resources prompted the articulation and implementation of several projects in the past, including the establishment of two fisheries research institutes in 1975, *the National Institute for Freshwater Fisheries Research (NIFFR), New Bussa* and *the Nigerian Institute for Oceanography and Marine Research (NIOMR), Lagos*. In addition, a number of Nigerian Universities are also undertaking fisheries research.

The work of these institutes has led to a better understanding of the conditions in fishing communities and improved technologies aimed at promoting sustainable fisheries livelihood. Nevertheless, their impact is constrained by a number of factors, namely, inadequate and erratic funding; poor infrastructures; inconsistent and inappropriate policies; inadequate number of skilled manpower, especially skills in socio-economic research and extension; ineffective research-extension-farmer linkage; ineffective community based organization and inability of the fisher-folk to develop effective lobbying power; and weak linkage with other service providers such as rural financial institutions.

Efforts made by the research institutes to introduce improved technologies and forge partnership with fishing communities recorded mixed results. Generally, there is a low adoption rate of improved technologies because of inappropriate extension methods, or because the introduced methods have incremental cost implications which the fisher-folk cannot afford. Partnerships were also constrained by inadequate fund and insufficient enlightenment and sensitization of the fisher-folk.

The constraints at fisher-folk and research provider levels form the thrust of the priority research goals for artisanal fisheries articulated by the National Agricultural Research Strategy Plan (NARSP), 1996 – 2010, which include:

- Assessment of fisheries resources in the coastal, marine and inland freshwater bodies
- Development of fisheries management strategies for optimal harvests, and fishing gear selectivity to prevent over-exploitation, particularly in the inland water bodies
- Control of aquatic pollution and degradation to attain sustainable fisheries production, particularly in the coastal fishing communities
- Development of efficient fish processing and preservation technology to minimize post-harvest losses
- Assessment of bottlenecks in transfer of fisheries technologies and improvement in training of extension staff

- Determination of impact of tariff (on fishing inputs) on fish production and evaluation of possibility and benefits of increasing credit facilities to fisher-folk
- Improvement in the quality of life of rural fishing communities through promoting diversity in livelihood options

This study also highlighted that policies and processes are inconsistent resulting in instability in the capacity of research institutes to carry out relevant research; that there has been insufficient synergy between the research institutes and other institutions involved in fisheries research and other service providers; and that the principle of demand-driven research and the use of participatory methods have not been well established.

Furthermore, the contribution of fisheries research to policies and processes is limited as policy making in Nigeria is often over-centralized with government administrators rather than key fisheries researchers as main actors. This also means policies tend to alienate the views of the local people, especially as local institutional structures are incapable of influencing policy decisions on their own. Planning is predominantly top down, supply driven and compartmentalized. There is need for a framework that will be more responsive and relevant to socio-economic priorities of fishing communities.

It is concluded that improvement in policy formulation and implementation can come through:

- Encouragement of formation of viable village level associations or organizations such as Community Based Fisheries Management Committees (CBFMC) to serve as a platform for linkage between research providers, fisher-folk and administrators- *involvement of the fisher-folk and community-based organizations is essential because legislation or policy decisions from top down are not as effective as community action and control measures*
- Decentralization of policy making process to involve a greater number of stakeholders in fisheries, for example, involving financial institutions in planning and administration of credit schemes
- Increased training of research scientists in the area of Participatory Rural Appraisal (PRA) tools to facilitate demand-driven research delivery to the fishing communities
- Adequate research funding (from public and private sources) is required to enhance participatory mechanisms for the identification of needs and preferences of fisher-folk
- Additionally, as in Ghana, the following are also relevant points of intervention in PIPs:
 - Creation of a national forum for holistic planning of future of the artisanal fishers
 - Preparation and execution of a national campaign to promote the value of artisanal fisheries to the nation in financial, economic and social terms
 - Development of a national strategy for promotion of alternative livelihood strategies for fishing communities to maximize use of human and natural capital and
 - Review of the existing fisheries policy

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1. INTRODUCTION

Nigeria is endowed with a long coastline of about 960km, a large area of inshore waters, and a vast inland system comprising natural and man-made lakes, rivers, creeks, lagoons and wetlands all of which support a good variety of fisheries. Thus, artisanal fisheries occupy a very significant position in the Nigerian economy providing employment for over 400,000 people and supplying about 90% of the total local production of about 300,000 metric tons (FDF, 1997). It impacts on the quality of lives of various groups through supplying 58% of per capita animal protein intake and engagement in fishing and allied occupations as primary or secondary source of income (IFAD, 1997).

This study was funded by DFID, through the Sustainable Fisheries Livelihood Programme (SFLP) and coordinated by FAO. SFLP is seeking to reduce poverty in coastal and inland fishing communities in Nigeria by improving the livelihoods of people dependent on fisheries and aquatic resources through:

- Development of social and human capital in fisheries dependent communities
- Enhancement of the natural assets of these communities
- Development of appropriate fisheries policy and institutional environment

The focus of the present study is on the contribution of research to sustainable fisheries livelihoods. The thrust of the study is on four themes, which include:

- Identifying diversity, assets and livelihood strategies of fishing communities and livelihood groups using fisheries resources
- Evaluating fisheries research potential and contribution to sustainable livelihoods
- Bringing out the key lessons learnt and identify small scale activities or initiatives to improve the contribution of fisheries research to the reduction of poverty among those using fisheries resources
- Reviewing policies, institutions and processes in relation to research focusing on effects on sustainable livelihoods and the effect of fisheries on policies and processes, including examining linkages between different organizations involved in poverty alleviation in the artisanal fisheries sector.

This will facilitate the identification of the most appropriate entry points for policy and strategies that would improve livelihoods and their sustainability in the sector. The report is in three parts. The first part covers the coastal States of Akwa-Ibom, Bayelsa, Cross River, Delta, Lagos, Ogun, Ondo and Rivers, the second part covers the inland fishing communities of major rivers and lake basins in the middle and northern States of the country, while the third part is on Policies, Institutions and Processes (PIPs).

2. METHODOLOGY

In conducting this study, considerable time was devoted to secondary information gathering. This was supplemented by ground-truth from interactions with fisher-folk in selected communities and interviews of key informants in Research Institutes, government agencies and Non-Governmental Organizations (NGOs) using participatory appraisal techniques. Rapid Rural Appraisal (RRA) technique using questionnaires organized in a Semi Structured Interview (SSI) format were used for data collection in fishing communities. Data were collected on household size, ethnic/gender composition, fishing gear composition, fish marketing, occupation, livelihood strategies, alternative sources of income, profiles of fisheries research providers and partnerships involving research providers and artisanal fisher folk.

I. KEY LIVELIHOOD GROUPS INVOLVED IN ARTISANAL FISHERIES IN COASTAL COMMUNITIES AND THEIR LIVELIHOOD STRATEGIES

1. INTRODUCTION

Fisheries resources represent the foci of the livelihood activities of most coastal communities. About 300,000 indigenous people and migrant fishermen, mostly Ghanaians, depend on fisheries resources as the main source of sustenance, assets and investment capital. Fishing supply 75% of their animal protein intake, and more than 98% of the population of the fishing communities is dependent on fishing and fishery related activities. Over 80% are engaged primarily in fishing as the main source of livelihood while about 95% are engaged directly or indirectly in the fishing industry. Some communities date back to the 18th century when the original settlers first arrived (e.g. Orimedu, Lagos State).

Six major livelihood groups that depend largely on fisheries and aquatic resources are small-scale fisher, fish processors, fish mongers / marketers, net fabricators, boat builders and out board engine mechanics. To these livelihood groups, the acquisition of assets, such as shelter, boats, nets, engines, fishing gears, is mainly through fishing, fish processing, marketing and other fish related activities. Similarly, their financial requirements for investment, food consumption, education, health and other family needs depend on fishery.

The vulnerability of each livelihood is relative to the percentage of dependence of each livelihood on the fisheries resources / activities. It is hinged on the state of the resource / stock exploitation, growth rate, emigration, local knowledge, varieties of technologies in use and policy.

2. DESCRIPTION AND VULNERABILITY OF THE LIVELIHOOD GROUPS

2.1. Artisanal Fishers

2.1.1. Key Characteristics

This livelihood group is mainly men made of indigenous people and migrant fishermen from Ghana. Women mainly fish in the swamps, creeks and rivers. Few women from the communities participate in high sea fishing by employing labour for fishing activities. The Ghanaians constitute the main source of hired labour. The core assets used include outboard engines, canoes (various sizes), boats (Ghana type), line baits and gear of different types. Only about 20% of the wooden canoes are motorized. There is no clear demarcation between the rich and the poor, gender, religion and caste but the livelihood group can be categorized based on the type and size of canoe / boat used in their operations, and may be full time or labourers employed in fishing activities.

Fishers organize themselves into self-help associations in most coastal communities, e.g. the “Aiyekunikanse” in Orimedu and “Omoowowere” in Ogheye. The Aiyekunikanse is the major forum for all the identified livelihood groups including the service providers. Members meet twice weekly for economic and social reasons and they contribute to the purse of the organization. Members individual needs are met from the purse and they have had no external assistance. Fishing operation is on individual basis.

Though fishing is as old as most coastal communities it has not developed to expected standard. Some of the coastal fishing communities are permanent while others are not. Housing in most of the communities is poor. The majority of the homes are temporary or semi-permanent structures – walls and roof of huts made of bamboo and thatch. On the whole, the vast majority of the fishermen live in appalling conditions in remote and isolated areas, with only one fifth of rural housing physically sound.

In financing their activities, the fishermen depend on their personal savings from fishing and funds from self-help groups, relatives and friends, which due to high cost of inputs, were always insufficient for their investment requirements. The infrastructures for fishing activities are inadequate. The high cost of fishing inputs has caused adverse effect on investment and thus sustainability. Prospective potential fishermen have migrated to the cities in search of white collar jobs. Generally, intervention is required in the form of credit, input supply, rural infrastructure and enabling environment.

2.1.2. Vulnerability of Fishers

The vulnerability of this livelihood group in the coastal fishing communities is in terms of:

- Environmental shock e.g. erosion in the Benin River System destroying nursery grounds of the fisheries resources; accretion on the Lagos East; mud flat in the Mahin coastline, and the resultant drudgery in landing of boat.
- Population presents a formidable challenge to food security and employment opportunities. In the coastal communities, population densities per habitable area are high as the wetland ecology of the region restricts habitation to the relatively small are of higher elevation. This therefore translates to higher pressure on the fisheries resources that is the bedrock of these coastal communities livelihood.
- Resource base – changes in abundance due to recruitment failure or environmental impact resulting in poor catches.
- Multiple user conflict – trawler menace, destroying nets due to trawling in non-trawling zone of the coastal waters.
- Communal conflict – e.g. Bakasi are in Akwa-Ibom compelling fishermen to abandon fishing and going into motor bike transportation business in the cities.
- Changes in macro-economic policies – removal of subsidy on fishing inputs, non-preferential interest rate on fishery loans (interest rate on loan determined by free market strategy)
- Funds – difficulty accessing credit facility
- High rate of inflation – increased cost of inputs, resulting in difficulty in input replacement, continuous use of input beyond designed life span, incessant breakdown and irregular fishing trips and low catches.
- Risk of losing life at sea.

2.1.3. Cost of Vulnerability of the fishers livelihood group

Vulnerability due to trawler menace estimated using cost of asset and loss of income of the group is in the order of N18,495,000 for asset and N34,524,000 – 46,032,000 for income.** Trawler menace is one of the most serious problems confronting coastal artisanal fishers.

2.2. Fish Processors

2.2.1. Key Characteristics

Women play vital roles in processing and preservation of fisheries products. Fish processing in these communities are predominantly women activities. The women are largely the wives or relatives of the fishermen. In Ita-Absi, Akwa-Ibom State, some men are found in this group even though at very low percentage.

The asset used in their occupational operation is the traditional smoking kiln “Agodo” – a clay type oven or drum oven. The ovens are of random sizes and shapes (circular or rectangular), fish houses with open fire smoking kilns. Major energy source is wood, which is increasingly in short supply. Fish processing is time consuming and arduous.

This group is organized into economic organizations and most cases members could belong to an umbrella producers organization comprising mainly fishers and they also belong to a wholly processing group made up mainly of women. This is the case in Orimedu in Lagos State where apart from belonging to Aiyejunikanse, they also belong to the “Egbe Elegu” forum. This is also the case in Ogheye in Delta State where the women belong to both “Omowowere” and the “Better Life” organizations. The aim of these women’s group is self-help through savings mobilization and credit and price control.

The womenfolk depend on fish processing and marketing for their livelihood. They contribute substantially to the up keep of the usually large family maintained by the fishermen in the provision of cloths, food and even education of their children. As most of the fishermen tend to have more than one wife, each one caters for her children.

A substantial part of their proceeds goes into the construction of fish houses and smoking kilns. The input cost of a fish processor in Ogheye, for example was approximately N150,000 for a fish house and smoking kilns. This, however, varies from community to community and the financial capability of the processor. The cost of input could range from as low as N5,000 for a one-oven processor to N200,000 for a processor with several ovens. They depend essentially on proceeds from their processing activities for their livelihood and livelihood assets. Most of them are unable to meet the input costs of these assets or access any form of credit.

2.2.2. Vulnerability of Fish Processors

This group is affected by the following factors:

- All or most of the factors that impinge on fishers
- Environmental – erosion destroying swamp forest resulting in scarcity of fuel wood required for processing
- Development – clearing of forest for developmental purposes also resulting in scarcity of fuel wood.
- Health hazard – on eye sight from smoke while processing.
- Inadequacy or lack of electricity and refrigeration facilities

2.3. Fish Marketers / Mongers

2.3.1. Key Characteristics

This livelihood group is made up of mostly women. Within the group are those who deal with fresh / wet fish (mostly wives of fisher) and those that deal with smoked fish (predominantly middlemen / women from neighbouring States). Wet fish sellers market their products in the neighbourhood communities and urban centers while smoked fish dealers sometimes export products outside the shores of Nigeria. The principal asset of the fresh / wet fish dealer is deep freezer located at neighbouring markets. However, this is often lacking. Generally, fish preservation is done through icing and drying.

Products transportation is by public transport and such activities are carried out either daily or weekly. In most of the fishing communities, access is primarily by boat, usually multipurpose passenger-speed boats fitted with outboard engines. Services are not regular, expensive and risky. This makes the movement of goods and people difficult with concomitant implications for marketing, cost of inputs, access to health services and other social services. For example, at times, fishermen are forced to sell their catch to avoid preservation problems.

With the inefficient transport system, the market is dominated by a relatively few traders. Their influence is enhanced by the remoteness of the villages and the perishable nature of the product. Nevertheless, these traders are providing services that are essential to the economic life of the communities and they seem to have monopoly over price setting.

Beyond price setting, this group lacks organization. Marketers sometimes meet under the auspices of “fish sellers” where price control is generally the aim. In some situation, they organize themselves for self-help activities. However, their organizations are too weak to deal effectively with factors such as high transport costs and inappropriate storage facilities which conspire to reduce their opportunities. In the urban area, this livelihood group is more cohesive when compared to their rural area counterparts. Reasons for this include differential awareness and access to information and infrastructural facilities.

The place of fisheries in the livelihood of this group and contribution to livelihood assets are similar to what obtains for the fish processors.

2.3.2. Vulnerability of Fish Marketers

This group is vulnerable in terms of :

- All or most of the factors that impinge on the livelihood chances of the fishers and processors, especially those affecting availability of fishery product or reduction or fluctuation in quantity of product
- Infrastructure – such as roads for ease of product transportation, deep freezer and electricity for preservation of fresh wet products.

2.4. Boat Builders

2.4.1. Key Characteristics

The boat builders are predominantly men. They are few in number in each of the communities. Area of skill acquisition is carpentry, and they combine boat construction and maintenance with other carpentry work. Their main assets are chisel, handsaw and hammer.

2.4.2. Vulnerability of Boat Builders

- All or most of the factors that impinge on livelihood chances of fisher affect the demand for the product and services of this livelihood group
- Resource base – factors impacting resources base, thereby affecting intensity of fishing reflect on this livelihood group as it will determine the need for construction of new boats
- Environmental factors impacting on forest resources and reducing the availability of wood, an essential material used by boat builders

2.5. Net Fabricators

2.5.1. Key Characteristics

This livelihood group is few in number. Gear design and fabrication are mainly men activities but some women and youth are involved in maintenance and repairs. Fisheries also have important place in their livelihoods and livelihood assets acquisition. About 70% of the income of this group comes from fishery related activities while 30% may be derived from other economic activities. Fishery, therefore, contributes substantially to their acquisition of assets such as houses, tools and equipment and in meeting basic family needs. Their livelihood is dependent on the need for new nets or mending of old ones and this also varies with fishing intensity. During peak seasons, they are occupied with several requests for net but during the slack season, they are occupied in other activities. Operational assets include netting materials, floats, sinkers and needle (mainly wooden). The fishers provide the materials for the fabricator and prices paid to the fabricator are in relation to type of gear and materials. The fabricator sometimes engages in fishing and / or crop or livestock production to make ends meet.

2.5.2. Vulnerability of Net Fabricators

- All or most of the factors that impinge on livelihood chances of fishers affect the demand for the product and services of this livelihood group.
- Resource base – factors impacting resource base, thereby affecting intensity of fishing reflect on this livelihood group as it will determine the need for increase or reduction in number of nets needed.

2.6. Outboard Engine Mechanic

2.6.1. Key Characteristics

In most of the communities, they are usually not more than one or two outboard engine mechanics who carry out repair and maintenance work for the fishers. They generally lack or have limited tools for their operations. For instance, essential tools such as gear puller, shaft and window bearing puller are lacking. Other constraints include high cost and non-availability of spare parts. Livelihood strategies are similar to that of boat builders and net fabricators.

2.6.2. Vulnerability of the Outboard Engine Mechanics

- All or most of the factors impacting on the fishers affect demand for products and services of this livelihood group.

3. ORGANIZATIONS AND INSTITUTIONS LINKED WITH RESOURCE USERS

Organizations and institutions that directly impact resource users can be grouped into formal and informal.

3.1. Formal Organizations

Under this umbrella are Fisheries Society of Nigeria (FISON), and Nigerian Union of Fishermen and Sea Food Dealers (NUFSD). Brief profiles of the organizations are stated below:

FISON – This organization was established in 1976 to serve as a platform for all stakeholders in fisheries – Research Institutes, Universities, Federal and State Department of Fisheries, Non-Governmental Organizations, Private Fishermen and Fish Farmers. The over 500 members which covers the whole Federation cut across all the strata of the society. It is dominated largely by men. One of the primary objective was to be a mouth piece for members by influencing macro-economic policies that affects all stakeholders.

NUFSD – This is a relatively organized group with branches in all the thirty-six States of the Federation and the Federal Capital Territory, Abuja. The aims of the group are to act as a pressure group towards the formulation of appropriate fisheries policies and provision of credit facilities to members.

3.2. Informal Groups

Several community based organizations are in existence for the management of fisheries in one way or the other. Such are the traditional institutions like the community head, head fishermen, self-help groups, producers organizations like “Aijejunikanse” in Orimedu, with membership of over a hundred. This organization is an umbrella organization for almost all the livelihood groups in this community. The main thrust of the organization is self-help. In Ogheye, the “Omoowowere” is an older co-operative society established in 1984 with the sole aim of positioning its members to take advantage of any help that could come from the government. The membership of this society is 25. the “Better Life” society comprising only women is the fish processing counterpart of the Omoowowere with membership number 15 and it was also established in 1984.

4. GENERAL GENDER ISSUES

Among fishing communities the most common gender division of labour has been between activities carried out from the shore and those carried out from the boats at some distance from the shore. This division has typically evolved in part because of the dangers and frequent loss of life involved in going out in small boats and because of women’s direct responsibilities for children.

In the Nigerian coastal fishing communities, women are dominant in preserving, processing and marketing of fish. They are also involved in net making and mending. The domain of the men on the other hand is boat building, constituting 100% in the Nigerian coastal fishing communities. Another livelihood group with 100% dominance by men in the Nigerian coastal fishing communities is the outboard engine mechanic.

Both genders are involved in fishing, while the men fish in the rivers and sea, the women mainly fish the rivers, estuaries or back waters. This has economic implication as it is an established fact that high sea fishing has higher capital outlay and corresponding higher income margin compared to back waters fishing. The percentage of men involved in fishing is higher than women, it is in the ratio of about 4:1.

In marine and river fisheries, women often engage in subsistence fishing for family or local use, in collection of shellfish, in ownership, financing and outfitting of fishing enterprise, in making and repair of net, traps and post harvest activities such as fish processing, transport and marketing. While fish processing is regarded as the exclusive domain of women, men are also involved in processing in some coastal communities (e.g. Ita-Abasi in Akwa-Ibom State). The type and extent of involvement of men and women in the various activities varied from one community to another. In some of the communities, it is a taboo for the women to enter or even step in the marine water. They are only allowed to fish in the backwaters.

5. SIGNIFICANT FACTORS LINKED TO POLICIES, INSTITUTIONS AND PROCESSES THAT DIRECTLY TOUCH OR CONDITION THE LIVELIHOODS OF RESOURCE USER GROUPS

5.1. Credit Administration

Credit administration for fisheries should be made effective to address the needs of the fisher-folk through greater involvement of financial institutions and Non-Governmental Organizations. The IFAD Artisanal Fisheries Development Project in three of the coastal States showed that improvement in the delivery of credit and the dissemination of technologies produced positive results for the fisher-folk (APMEU, 1997).

5.2. Fishing Zones

Due to over fishing, NIOMR recommended expansion beyond 13 nautical miles the area exclusive for artisanal fishing and policy excluding fishing in some areas for certain periods so as to allow juveniles grow. Implementation of this and its enforcement is central to sustainable livelihoods for the various groups.

5.3. High Cost of Inputs

Macro economic policies are required to address issues of subsidy on fishing inputs and liberalization of importation of essential crafts and gears, e.g. 2-stroke outboard engine.

5.4 Non-enforcement of laws and regulations

NIOMR was a partner in the promulgation of the Sea Fishery Decree which makes it an offence for any person to operate any fishing boat within Nigeria's territorial waters, unless it is licensed and the catch is subject to inspection. However, this has not been implemented and trawler menace is the order of the day. Enforcement of laws and regulations needs to be given sufficient priority attention.

5.4. Community-Based Approach to Law Enforcement

There is need to place emphasis on community-based approach to implementation of laws and regulations. There seems to be more involvement of traditional institutions in fisheries management in inland than in the coastal areas, although there are exceptions in the estuaries and rivers. Marine resources are often shared between various countries so management efforts can be jeopardized without similar efforts in the other countries. Moreover, some fisheries are sequential, therefore different operators fish the same species at different stages of maturity, which is a source of potential conflict. This is a common issue between estuarine and coastal shrimp fisheries operators. Furthermore, the migrant pattern characteristic of several fishing communities weakens feeling of responsibility as far as sustainability of the resource is concerned. Other reasons are ill-defined boundaries in marine fisheries; high number of users – artisanal, industrial, nationals, foreigners, many fishing techniques, active and passive gears, less control over inputs and outputs in marine fisheries. These factors need to be looked at closely.

6. ADDRESSING VULNERABILITY FACTORS THROUGH RESEARCH

- Environmental Shock: Monitoring of vulnerability factors, e.g. coastal erosion, building of T-Groin, determination of right sand grain size for beach replenishment
- Resources Base: Promulgating the use of right mesh size for resource exploitation, advocating close season and area, education on the detriment of use of obnoxious fishing methods
- Conflict: Communal education for multiple users on conflict resolution and management and community involvement in planning and contributing resources for development projects
- Risk to Life: Education on precautionary measures
- Health Hazard: Promotion of use of improved smoking kiln (e.g. NIOMR's Magbon-Alade), use of different energy source e.g. charcoal
- Macro-Economic Policy Changes: Advancing advice to policy-makers based on findings from field.

7. MAJOR CHARACTERISTICS OF THE DIFFERENT LIVELIHOOD GROUPS

Livelihood Groups	Defining Characteristics	Key Gender Differences	Main Livelihood Strategies	Constraints Regarding Key Capitals	Place of Fisheries to Livelihood	Source of Funds and Financial Profitable	Vulnerability
Fishers	<p>-Mostly men.</p> <p>-Some women participate in high sea fishing by employing labour.</p> <p>-Indigenous people and migrant Ghanaians.</p> <p>-Average length of time over two decades.</p> <p>-Over five generations in some communities. Ghanaians constitute labour force.</p> <p>-Skill acquisition is generational and informal.</p>	<p>-Percentage: *80/20 male/female in high sea fishing communities.</p> <p>*could be as much as 50- 50 in back waters fishing communities.</p> <p>-Cultural norms in some communities prevent women from fishing in high sea.</p>	<p>-High level organisation observed.</p> <p>-Highly mobile in response to movement of the fish stock along the coastal waters.</p> <p>-None motorised to motorised.</p> <p>-Fishing could be all year round but different gears are employed according to fishing season.</p> <p>-Individualistic operation, but enjoys and often belong to social and economic associations and apex organisation.</p>	<p>-High cost of inputs.</p> <p>-Difficulty in accessing credit.</p> <p>Emigration of youth from livelihood.</p> <p>-Very little access to training on profession.</p> <p>-Inadequate access to formal education.</p> <p>-Inadequate access to modern health and social facilities.</p>	<p>-Major assets in meeting basic family needs (education of wards, feeding and clothing.</p> <p>-Source of tools and equipment.</p>	<p>-Personal and assistance from friends and relations.</p> <p>-Without OBE, Cost of Recovery Ratio (CRR) up to 200%; ROCE up to 150%; Profitability rate up to 40%.</p> <p>-With 25HP OBE, CRR is up to 140% (bonga); ROCE up to 66%.</p> <p>-Profitability rate up to 25%. Economic and financial indicators vary with the type of fisheries and season.</p>	<p>-Environmental shock:</p> <p>*Erosion leading to nursery grounds destruction.</p> <p>*Accretion and mud flats-drudgery in boat landing.</p> <p>*Rough weather during rainy season limits fishing trips.</p> <p>-Resource base:</p> <p>*Changes in abundance due to recruitment failure or environmental impacts.</p> <p>*Multiple user conflict:</p> <p>*Trawler menace.</p> <p>-Communal conflict</p> <p>*Destruction of assets.</p> <p>-Macro-economic policy changes:</p> <p>*Removal of input subsidy.</p> <p>*Non preferential interest for fisheries loans</p> <p>-High inflation:</p> <p>*Inputs replacement difficult-resulting in usage of inputs longer than designed life span, therefore, incessant breakdown, irregular fishing trips and low catch.</p> <p>-Risk of life loss.</p>

Fish Processors	<p>-Mostly women *Largely wives/relatives of fishers. -Indigenous people. -Average of 15 years. -Over 5 generations in some communities. -Skill acquisition is mainly generational and partially formal skill not accepted.</p>	<p>-Percentage *98 & 2% female to male in some communities. *Most communities 100% female.</p>	<p>-Use of oven. *Very rudimentary to improve smoking kilns. -Mobility is not a livelihood strategy. -Forms economic organisation and also belongs to fishers' umbrella organisation.</p>	<p>-Inadequate financial capital for required livelihood assets. -Scarcity of fuel wood for processing. -Traditional smoking kiln not enough to arrest glut in peak season.</p>	<p>-Major assets in meeting family basic needs(education of wards, feeding & clothing).</p>	<p>-Personal sources and assistance from husbands. -Cost Recovery Ratio(CRR) up to 100%; ROCE up to 150%; Profitability Rate up to 40%.</p>	<p>-Environmental *Swamp forest erosion destruction results in fuel wood scarcity. -Development. *Forest clearing results in fuel wood scarcity. -Conflicts *Communal and multiple users result in low quantity products. -Health hazards *Eye sight impairment from smoke. -Macroeconomic Policy impacting on fishing.</p>
Fish Marketers	<p>-Mostly women. -Two distinct groups: *Wet/Fresh fish dealers-mostly wives of fishers. *Processed and preserved product dealers. *Predominantly middle men/women from neighbouring states. *Fresh product disposed off in the locality. *Processed and preserved product taken further a-field. • Skill acquisition not formal and could be generational.</p>	<p>-Percentage *90 to 10% female to male in most communities. *Could be in the range of 8:2 in the urban areas.</p>	<p>-Mobility *Major livelihood strategies involves use of canoes, huge house boats, (see annex III). Cars and buses. *Purchase is done for fishing communities either daily or weekly. In communities where processors doubles as marketers product stock pile and taken to markets weekly. *Degree of organisation in rural communities not very cohesive compared to urban fish marketers.</p>	<p>-Infrastructure: Lack of roads to most fishing communities due to the remote nature and when roads are present may not be motorable. *Lack of cold room/freezer to absorb glut in peak seasons.</p>	<p>-Major assets in meeting family basic needs (education of wards, feeding and clothing).</p>	<p>-Personal sources -Cost Recovery Ratio(CRR) up to 100%; ROCE up to 150% and Profitability Rate up to 40%.</p>	<p>-Infrastructure *Unstable power supply. -Resource base *Change in abundance due to recruitment failure or environmental impacts translating in availability of product quantity.</p>

OBE Mechanics	<ul style="list-style-type: none"> -Indigenous people -Very few in each community (1 or 2). -Usually less than two decades in the profession. -Skill acquisition by apprenticeship (5 to 6 years). 	<ul style="list-style-type: none"> -Percentage. *100% male. 	<ul style="list-style-type: none"> -Mobility not a livelihood strategy. -Apprenticeship in mechanic. -No professional organisation due to number. -Sometimes joins fishers' organisation. 	<ul style="list-style-type: none"> -Inadequate tools due to lack of financial capital. -High cost of inputs. -Non-availability of spare parts. -Lack of human capital. 	<ul style="list-style-type: none"> -Major assets in meeting basic family needs (education of wards, feeding and clothing). 	<ul style="list-style-type: none"> -Personal sources and assistance from friends and relations. -As high as 100% profit. 	<ul style="list-style-type: none"> -Resource base determines fishing intensity, therefore, volume of work translates in income.
Boat Builders	<ul style="list-style-type: none"> -Indigenous people and migrant Ghanaians. -Very few in each community not more than four. -Generational skill acquisition in carpentry by apprenticeship. 	<ul style="list-style-type: none"> -Percentage 100% male. 	<ul style="list-style-type: none"> -Mobility not a livelihood strategy. -Apprenticeship in carpentry. -Engages in other carpentry works in the community. -Indigenous people are also fishers as they own boats. -No professional organisation but joins the fishers' group. 	<ul style="list-style-type: none"> -High input cost translating to replacement difficulty. -Lack of credit facilities. 	<ul style="list-style-type: none"> -Major assets in meeting basic family need (education of wards, feeding and clothing). 	<ul style="list-style-type: none"> -Personal As high as 100% profit. 	<ul style="list-style-type: none"> -Environmental factors impacting on forests reduce raw material availability. -Resource base determines fishing intensity.
Net Fabricators	<ul style="list-style-type: none"> -Indigenous and Ghanaians. -Very few in each community. -Less than two decades in the profession. 	<ul style="list-style-type: none"> -Percentage *100% male in some communities. *8:2 male to female in other communities. 	<ul style="list-style-type: none"> -Mobility is a livelihood strategy among the indigenous people. -Engage in agriculture among the indigenous group. -No professional organisation but may join the fishers'. -Members in some communities have benefited skill enhancement from research training workshops. 	<ul style="list-style-type: none"> -None identified 	<ul style="list-style-type: none"> -Major assets in meeting basic family need (education of wards, feeding and clothing). 	<ul style="list-style-type: none"> -Personal sources. -As high as 100% profit. 	<ul style="list-style-type: none"> -Macroeconomic changes reduce number of net fabricators. -Resource base determines fishing intensity, therefore number of nets required.

****Costing Fishers' Vulnerability**

Trawler menace

Cost of asset

An average of 3 nets are destroyed per fishing season in a community
Average cost of a net is ₦45,000 as at year 2000
Thus : $3 * 45,000 = \text{₦} 135,000$
Therefore vulnerability of the fishermen per community per fishing season is ₦ 135,000 due to trawler menace.
Given the number of fishing settlements on the coast (i.e. river mouths and coastline) to be 137 (Ajayi et. al. 1996) that are susceptible to trawler menace, a total of ₦ 18,495,000 could be lost annually due to trawler menace alone by the fishermen.

Loss of income

The average catch per trip per net is ₦ 7,000 – 8,000 (peak season).
There are an average of 12 –14 good fishing days in a month (Ajayi et. al. 1996), with the average catch of ~~₦~~ 7 – 8,000 / trip / net , therefore in a month a total of ₦ 84,000 – ₦ 112,000 could be lost. On the assumption of 3 nets per community per fishing season, the fishermen are liable to loss as much as ~~₦~~ 252,000 – ₦ 336,000 per month in the peak fishing season. On the total coast wide scale, the loss would be between ₦ 34,524,000 – ₦ 46,032,000

II FISHERIES RESEARCH ORGANIZATIONS: POTENTIAL AND CONTRIBUTION TO SUSTAINABLE LIVELIHOOD

1. ANALYSIS OF KEY FACTORS INFLUENCING THE PERFORMANCE OF RESEARCH PROVIDERS

The important factors influencing the performance of research providers include:

- **Funding Resources**
- **Infrastructure / Networking**
- **Agricultural Policy**
- **Human Resources**
- **Capacity to analyze socio-economic research**

1.1 Funding Resource

Most of the funding to Research Institutes comes from Budget allocation with little from loans and grants. Most research institutes witness funding instability on both capital and recurrent accounts. Capital budget allocation to research institutes has tended to be more unstable than recurrent budget allocation. Release of approved budget funds to the institute encounters unduly long delays. Though budget funds are supposed to be released at the beginning of each quarter, delays of up to three to five months are not uncommon. This creates uncertainty in research programming, disrupts research activities and distorts results of research trial and experiments that are related to season and consequently impacts performance negatively. For example, there is insufficient fund for on-farm adaptive research.

1.2 Infrastructure / Networking

One of the major factors affecting the performance of research provider is weak research infrastructure as evident before the advent of National Agricultural Research Project (NARP) in 1994. There are large stocks of unserviceable laboratory equipment, vehicle, research vessels, field equipment and workshop machinery. Electricity supplies are irregular and telecommunication facilities to link results users and extension personnel remained poor. The situation is similar for library facilities. Lack of internet connectivity constitutes another major bottleneck. Following the intervention of NARP, the situation improved and a lot of improvements were recorded in the areas of infrastructure, mobility and field equipment. With the closure of NARP, it is like back to square one.

1.3 Agricultural Policy

A National Agricultural Policy was prepared in 1992 but not promulgated, thus creating a fertile ground for ad hoc programmes and paradigm shifts depending on the preferences of successive government. The situation provided room for many research institutes to operate agricultural research programmes as if they are not derived from or guided by an explicitly formulated national policy.

1.4 Human Resources

The Institute has inadequate number of qualified human resources. The staff cut across several disciplines because of the multi-disciplinary nature of the mandate – fisheries, oceanography and geology. The staff inadequacy problem is compounded by exit of highly qualified and experienced researchers. The erosion or inadequate growth of high-caliber research staff in research institutes could have been dealt with if there had been adequate political will and commitment. Also inadequate resources and incentives in terms of capacity building/upgrading opportunities access to information network and professionals constitute a major impediment to the performance of researchers.

1.5 Capacity to analyze socio-economic factors

The quest for socio-economic studies necessitated the establishment of the Fisheries Economics and Statistics Section in the Institute. With the creation of the section, a number of socio-economic studies have been executed. However, much more would have been done if the necessary tools and equipment for data bank is in place.

2. CONSTRAINTS TO ACCESSING RESEARCH OUTPUTS AND RESULTS AND USE OF TECHNOLOGIES:

2.1 Poor infrastructural base

The major constraints to artisanal fisheries include poor rural infrastructure, particularly accessibility, education, electricity, health, water and sanitation facilities. Indeed, poverty in the fishing communities as in other rural Nigeria may be said to be due to the constraints of lack of basic infrastructure as this inhibits efficiency, reduces the quality of their products and puts enormous strains on their living conditions. It also makes it too easy for diseases to infest them and upset their fragile income-earning capacity.

2.2 Weak Research-Extension Linkage and inadequate technological support

Extension message tends not to be of much tangible impact. In some of the communities, such as Orimedu, some fisher-folk have benefited from training by extension, e.g. in design, construction and maintenance provided by the Nigerian Institute for Oceanography and Marine Research. Other successfully introduced innovations include chorkor oven, the cage culture and the long tail engine (IFAD, 1997). Generally, extension contact with the fisher-folk is not regular, and some of them claimed that they have never been visited by extension. Because of this, there is lack of training and understanding of the new technology and the fisher-folk tend to give preference to its own technology that may be less efficient.

2.3 Lack of investment capital

This is a major factor influencing the adoption of improved technology in the fishing communities. Only a few fisher-folk are known to have benefited from formal lending or credit institutions. They rely on their personal lean savings and on traditional sources of credit (relatives, friends, money lenders, etc) for investment capital. The funds available at this level are limited and cannot meet the capital requirement of improved technology. This implies that the people have to be supported financially to facilitate adoption of innovations that requires capital investment. Virtually all the fisher-folk interviewed mentioned lack of investment fund as their most important constraint. Credit Administration for fisheries should be effectively directed and made sufficient for fisher folk so as to meet their input needs. The IFAD project in three of the coastal States showed that the delivery of credit and the dissemination of technologies produced positive results for the fisher-folk (APMEU, 1997).

2.4 High cost of inputs

Macro economic policies have put the cost of fishing inputs beyond the reach of the fisher-folk, particularly outboard engines and nets. Policy adjustment is required to address issues of subsidy on fishing inputs and liberalization of importation of essential craft and gears, e.g. 2-stroke outboard engine.

2.5 Ineffective community-based organizations

Most of the community-based organizations are weak and ineffective in demanding and access services of government and other organizations. There is need to place emphasis on capacity building of community organizations to make them effective instrument for fisheries development.

2.6 Other constraints include frequent communal clashes, invasion of artisanal fishing area by fishing trawlers and destruction of nets of artisanal fisher-folk, population factor, and pervasive poverty.

3. KEY FACTORS THAT INFLUENCE THE PERFORMANCE OF TRAINING AND CAPACITY BUILDING OF USERS

3.1 Illiteracy

Majorities of the livelihood groups are illiterate without formal education. This makes it difficult for them to understand new technologies made available to them by the research – extension system.

3.2 Accessibility to fishing settlement

Almost all the fishing settlements in the coastal areas are not accessible by roads. The only viable means of transportation include canoes, and boats. The terrain (creeks and estuaries) are difficult to reach by research providers, thus alienating many of the livelihood groups from capacity building and identification of felt needs. Lack of proper assessment of fishing/fishers environment by the research provider constitutes a major obstacle to provision of training to users. Consequently, many of the services provided are either ad hoc which are not based on research findings or demand driven. Where assessments are carried out, ranking of priorities are not done in collaboration with users.

3.3 Cultural beliefs and norms

Fishers generally find it difficult to accept change because of the culture and norm existing within their society (e.g. beliefs such as covering fish with sand).

3.4 Lack of fund

Funding is generally a constraint to most research institutes. As stated earlier, inadequate funding of research is one of the key factors influencing the performance of research providers. Many research institutes can not carry out on-farm adaptive research because of fund constraints.

4. DESCRIPTION OF THE MANDATED RESEARCH INSTITUTE AND ANALYSIS OF ITS CURRENT SITUATION AND EVOLUTION

Organization	<p>Nigerian Institute for Oceanography and Marine Research Established in 1975.</p> <p>Mandate: Conduct research into the resources and physical characteristics of the Nigerian territorial waters and high sea beyond. Specific mandates are as follows:</p> <ul style="list-style-type: none"> (a) Genetic improvement of marine and brackish water fisheries. (b) Abundance, distribution and biological characteristics of fisheries and other aquatic resources in our brackish and marine water. (c) Socio-economic study of exploitation and utilization of our marine and brackish water aquatic resources. (d) Aquaculture. (e) Preservation and utilization of fishes, and other aquatic products. (f) Design and fabrication of simple fisheries implements and equipment. (g) Any other matters related to fisheries and oceanography. (h) Physical characteristics of Nigerian territorial waters, the high seas and beyond. (i) Effects of pollution on Nigerian's coastal waters and their prevention. (j) Marine environment including weather forecasting, topography of the sea and deposit on, or under the sea bed; Geophysical phenomenon of the Nigerian continental margin and the contiguous land mass. <p>Extension Research and Liaison Services with relevant Federal and State Ministries, Primary producers, industries and other users of Research results, on matters of fisheries and other aquatic resources, physical oceanography.</p>
Coverage	The eight (8) states in the coastal areas of Nigeria, every strata of the population in fishing communities including migrant fishermen and women.
Type Of Organization	National Research Institute
Type Of Fisheries Covered And Key Research Themes	Coastal Fisheries comprising of marine and brackish waters. Key research themes include: biological Characteristics of fisheries and other aquatic resources in our brackish and marine resources; Socio-economics of exploitation and utilization of these resources; Preservation and utilization of fishes, and other aquatic products; Physical characteristics of Nigerian territorial waters, the high seas and beyond.
Finance	Budgetary Allocation from Federal Government NARP JICA
No. Research Staff	(See ***)
Contribution To Policy In Fisheries Section	<p>Designed and fabricated Turtle Excluder Device (TED) in 1998 for the trawl fishery resulting in the accreditation of Nigeria to export shrimp products by the USA</p> <p>- NIOMR recommends the minimum total length of fish to be caught during the year taking into consideration (a) 5% retention length of the legal cod-</p>

	<p>end mesh (b) fish demand and supply situation (c) health of the resource.</p> <ul style="list-style-type: none"> - NIOMR designs and extend mesh sizes required for fishing the different fish species <p>In collaboration with FDF, NIOMR enforces the restriction order on fishing trawlers not to fish within the first thirteen nautical miles of the Nigerian continental shelf waters.</p>
Contribution To Strengthening Capacity Of Fisher Folk And Their Organization	<ul style="list-style-type: none"> - Dissemination of validated research findings is one of the mandates of the Institute. - Artisanal fisher-folk within the purview of the mandate areas had been benefited in the time past from some of these findings. - Capacity building have been carried out in <ul style="list-style-type: none"> • Gear design, construction and maintenance • Boat / canoe maintenance • Maintenance of outboard engine • Fish smoking, processing as preservation technologies using NIOMR smoking kilns and • Use of by-catches and trash fish in producing value added fish products. <p>In terms of organization, NIOMR has been able to organize some fisher folk into different cooperative groups for the purpose of registration and taking the advantage of credit facilities e.g. linking of Aiyekunikanse of Orimedu to First Bank of Nigeria is currently in progress.</p>
Contribution / Place Of Social Science Research	<p>NIOMR accorded high priority to social science research with the establishment of Fisheries Economics and Statistics Section with the mandate to study socio-economic problems of rational exploitation and utilization of marine and brackish water aquatic resources. To this end, quite a number of socio-economic studies had been carried out in the coastal states.</p>
Capacity For Development – Oriented Research	<p>NIOMR has capacity for development-oriented research, however, incentives, training and experience for researchers in participatory methods is still inadequate.</p>
Partnership With Other Organization/ Groups Of Producers/Decentralized Local Authorities	<p>In carrying out its mandate, NIOMR collaborate with all other relevant Research Institutes, Organizations (e.g. Shell Petroleum Development Company) and local authorities e.g. the Yorkori Community Project for smoking kiln installation in collaboration with Shell in 2001.</p>

Approach And Intervention Strategy	<p>NIOMR approach and intervention strategies with users of research results include:</p> <ul style="list-style-type: none"> - On-farm Adaptive Research (OFAR) - Village Adoption Concept - Thematic Survey - Monthly Technology Review Meetings - Publication of research results in local languages - Training workshops and organization of open day to show case NIOMR technologies.
Constraints, Limit And Opportunities	<ul style="list-style-type: none"> - One of the major constraints is funding of research and dissemination of research findings - In terms of opportunities, NIOMR has quite a number of human resources that cut across fisheries, aquaculture, oceanography, geology and socio-economics. With the necessary wherewithal the Institute is capable of performing much better.
Key Research Results Available On Fisher Folk Livelihoods	<p>Post harvest utilization of fish include:</p> <ul style="list-style-type: none"> - Production of fish crackers from cassava and under-utilized fish species. - Production of fish cake from shrimp by-catch and fish cake burger for entrepreneurial development. - Production of fish fingers from under-utilized fish species. - Production of packaged smoked-dried sawa "<i>Sardinella maderensis</i>" <p>Fishing Technology</p> <ul style="list-style-type: none"> - Monofilament gillnet to replace multifilament gill net webbing in pelagic fishery - Refined brush park fishing. - Treatment of wooden canoes to prevent infestation by borers.

***NO. OF RESEARCH STAFF BY DISCIPLINE

DISCIPLINE	NO.
Fisheries / Aquaculture	26
Geology / Geophysics	3
Oceanography	3
Zoology	4
Socio-economics	3
Extension	1
Mass Communication	1
Biology	2
Micro-biology	2
Nutrition	3
Geography	2
Land Surveying	1
Food Technology	9
Applied Chemistry	2
Vet. Medicine	1
Engineering	3

III EXPERIENCES OF COLLABORATION BETWEEN FISHERIES RESEARCH PROVIDERS AND ARTISANAL FISHER-FOLK INCLUDING IDENTIFICATION OF AREAS OF IMPROVEMENT

1. PROMOTION OF IMPROVED FISH SMOKING KILN “MAGBON-ALADE”

Title of case study of partnership	Promotion of improved fish smoking kiln “Magbon-Alade”
1. Types of Actors involved	Research Scientists, Extensionists, Community Leaders and Fish Processors (mainly women)
2. Origins of collaboration	Communities and Nigerian Institute for Oceanography and Marine Research
3. Principal objectives of the partnership	<ul style="list-style-type: none"> - To combat glut experienced during the peak fishing season - Increase batch capacity enabling large quantity of fish to be processed per unit time. - Elimination of drudgeries normally associated with traditional fish smoking in rural areas, thus creating more time for women to attend to their house chores. - Elimination to the barest minimum, the laborious rotation of fish to achieve even drying - Reduce health hazard of fish smoking. - Reduction of batch processing time, 3 – 4 hours as against 24 – 36 hours by traditional methods. - Improved quality of the end product. - Promotion of environmentally friendly smoking kiln.
4. Other partners involved	African Regional Centre for Technology (ARCT), Dakar and International Development Research Corporation (IDRC), Canada.
5. Key activities in Partnership	<ul style="list-style-type: none"> - Preliminary study of traditional fish processing practices. - Assessment of fish losses during glut, estimated at over 40%. - Identification of constraints. - Design and construction of prototype smoking kiln. - On-station trials. - Field trials in collaboration with the community (Magbon-Alade). - Identification of constraints in improved smoking kiln. - Modification of improved kiln taking cognizance of identified constraints - Mass Adoption.
6. Process	<ul style="list-style-type: none"> - Surveys - Participatory approach in trials.
7. Roles of fisher folks in the process	<ul style="list-style-type: none"> - Problem identification - Participation in the field trials.
8. Results and impacts	<p>Low Adoption</p> <p>The impact of the improved smoking kiln has not been felt due to the following reasons:</p> <ul style="list-style-type: none"> - Non-adaptability to local conditions - High cost of acquisition - Non-involvement of the stakeholders in the design of the equipment.
9. Sustainability and replicability of the partnership	The process is sustainable and replicable if there is wherewithal and constant participation of stakeholders in all stages of the partnership.
10. Key lessons	The need to adopt participatory approach from conception through design to implementation and evaluation.
11. Ideas for activities and initiatives to encourage partnership	<ul style="list-style-type: none"> - Promotion of environmentally friendly smoking kiln based on different ecological zones and socio-economic practices - Enhance the marketing, distribution and price intelligence strategies of the finished products arising from the improved technology in order to improve the living conditions of the livelihoods groups

“Magbon-Alade”: The improved smoking kiln derived its name Magbon-Alade, from the community where the field trials were conducted.

2. PROMOTIONAL OF IMPROVED GEAR FOR ARTISANAL FISHERIES MONOFILAMENT GILL NET AND BEACH SEINE:

Title of case study of Partnership	Promotion of improved gear for artisanal fisheries (Monofilament gill net and Beach seine)
1. Types of Actors involved	Research Scientists, Extensionists, Community Leaders, Net makers and fishermen.
2. Origins of collaboration	Communities and Nigerian Institute for Oceanography and Marine Research
3. Principal objectives of the partnership	<ul style="list-style-type: none"> - Conservation of the fisheries resources - Increase fish production - Increase gear efficiency and life span - Local sourcing of netting materials - Improvisation of net accessories
4. Other partners involved	Lagos State Ministry of Agriculture
5. Key activities in Partnership	<ul style="list-style-type: none"> - Inventory of exiting gear - Evaluation of existing gear performance - Design and Construction of improved fear - On-Station trials using flume tank for models - Field trials of prototypes in collaboration with communities (Orimedu, Agbelegiyo) - Design and construction in field with community participation.
6. Process	<ul style="list-style-type: none"> - Survey / inventory - Participatory approach in trials of nets with fishermen and design and construction with net makers.
7. Roles of fisher folks in the process	<ul style="list-style-type: none"> - Design and construction of improved gear - Participation in field trials - Empowerment of other fishers within the neighbouring communities for replicability purpose by adopted fishers.
8. Results and impacts	<ul style="list-style-type: none"> - Adoption very high in some communities (e.g. Badagry); 50% in other communities (Orimedu) - Impact - Increased fish production up to 20% for gillnet and 75% for Beach seine. Best fishermen award for 1986 in Lagos State won by a fisherman that adopted the improved beach seine net in Ibese. - Improved sizes of fish in landed catch - Increased gear life span.
9. Sustainability and Replicability of the partnership	<ul style="list-style-type: none"> - The process is sustainable and replicable in any fishing communities in the coastal States if there is wherewithal for constant monitoring.
10. Key lessons	<ul style="list-style-type: none"> - There is a need for the production of locally adaptable netting materials at a reduced cost.
11. Ideas for activities and initiatives to encourage partnership	<ul style="list-style-type: none"> - Promotion of efficient environmentally friendly fishing gears and socio-economic practices.

3. PROMOTION OF A MULTI-PURPOSE 13-METRE (LENGTH OVER-ALL) SHALLOW DRAFT VESSEL

Title of case study of partnership	Promotion of a multi-purpose 13-metre (length over-all) shallow draft vessel
1. Types of Actors involved	Research Scientists, Extensionists, Community Leaders, and fishermen.
2. Origins of collaboration	Communities and Nigerian Institute for Oceanography and Marine Research
3. Principal objectives of the partnership	<ul style="list-style-type: none"> - Accessibility of fishing grounds hitherto inaccessible to the artisanal fisherman due to sand bars at river mouths - Promotion of the shallow draft vessel, that prevent accidents arising from mass turbulent of foaming water from waves breaking over the sand bars at river mouths - Training to upgrade fishermen to operate at a higher level than canoe fishermen.
4. Other partners involved	Food and Agricultural Organization (FAO) and Norwegian Government International Aid Agency (NORAD).
5. Key activities in Partnership	<ul style="list-style-type: none"> - Field trials of prototypes in collaboration with community (Uta-Ewa)
6. Process	<ul style="list-style-type: none"> - Participatory approach in trials of prototype with fishermen
7. Roles of fisher folks in the process	<ul style="list-style-type: none"> - Participation in field trials
8. Results and impacts	<ul style="list-style-type: none"> - Increased fish catch - Increased commercial activities - Overcome sand bars and turbulent waters - Access to inaccessible fishing ground - Participation high and impact was high.
9. Sustainability and Replicability of the partnership	<ul style="list-style-type: none"> - The process is sustainable and replicable if there is cooperative group by the fishers to take advantage of credit facilities - Loanable funds available and with low interest rate.
10. Key lessons	<ul style="list-style-type: none"> - Fund constraint hinder mass adoption - There is need for domestication - Encourage participation
11. Ideas for activities and initiatives to encourage partnership	<ul style="list-style-type: none"> - Production of economically adaptable shallow draft vessel - Empowerment of women group on fish product development (value added) - Monitoring and evaluation of activities to assess impact of the program of the livelihood group.

I. KEY LIVELIHOOD GROUPS INVOLVED IN THE ARTISANAL FISHERIES OF NIGERIA'S INLAND WATERS

1. INTRODUCTION

Fisheries provide full or partial employment for over 100, 000 (indigenous and non-indigenous population) in the inland states of Nigeria (Neiland et al, 1998). Key groups whose livelihoods are linked to the fisheries resources of Nigerian inland waters include among others: fishers, primary fish mongers/processors, fish wholesalers, fish retailers, fish gear dealers and boat builders. Their characteristics and the vulnerability under which they operate are described below.

2. Description And Vulnerability Of Key Livelihood Groups

2.1 Artisanal Fishers

2.1.1 Key characteristics

Fisheries account for about 90% and 95% of the activities of fishers in the rural fishing communities in Lakes Kainji/Jebba and Chad basins, respectively. Fisheries also account for 74% and 90% of annual income generated by this group (SFLP survey ; Ovie, *et al*, 2000). The situation is similar for this group in other major inland fishing areas of the country (e.g. the Niger/Benue river confluence at Lokoja). Fishers generally combine fishing with other rural livelihood activities such as farming and animal husbandry.

Over 95% of fishers are men. Fishing is not the traditional occupation of women although few are engaged in it with their children in shallow pools/creeks.

Fishers are of different ethnic origins comprising indigenous and non-indigenous groups. Non nationals, especially Malians, Chadians and Cameroonians are also involved. In the Chad and Kainji/Jebba Lake Basins in Northern Nigeria in addition to the Niger/Benue confluence at Lokoja (middle of Nigeria), migrant fishers from the coastal region of the country are numerous. Fishers have long time involvement, spanning several generations in which parents pass on fishing skills to their children. Informal fisher's organisations exist in most of the communities but they are very weak structurally in terms of membership and operation.

2.1.2 Vulnerability of fishers

Fishers are vulnerable to depleting fish stock (due to over-fishing and environmental degradation); unfavourable macro-economic policy outcomes (e.g. inflation, removal of subsidy or tax holiday for fishing inputs); market forces (fishers are described as mere price takers for lack of competitive negotiating power for the price of their fresh fish with the fish mongers (the latter grant them soft loans for input procurement and other emergency expenditures). Additionally, fishers lack market information because of their rural setting, and poor physical capital (e.g. roads) which preclude them from taking their fish to distant markets where prices are better. Lack of refrigerating facilities makes some fishers sell their catches at give-away prices. There is little or no access to formal sources of credit. Their main sources of investment capital are their own meagre savings, borrowing from friends

and relatives. This is quite limited and can hardly meet the capital requirement of improved technology, implying that this group may have to be supported financially to facilitate adoption of innovations that requires substantial financial investment.

2.2 Primary Fish mongers/processors

2.2.1 Key Characteristics

The fish mongers/processors represent the first segment of the fish market chain buying fresh fish directly from fishers as the latter land the fish at the shores in boats or canoes. The fish could be sold fresh thereafter, or processed by smoking, sun-drying or charring- rarely by refrigeration for lack of electricity in the fishing villages. The fish mongers/processors depend almost entirely on this activity for their livelihood but sometimes combine it with petty trading. It is a profitable livelihood activity involving de-gutting, cutting and washing before smoking, sun-drying or charring - a typical domestic chore of women in rural Africa.

Over 85% of primary fish mongers/processors are women, except in the Chad basin where men dominate, constituting over 90%. The women are mainly of different ethnic groups but dominated by the non-indigenous groups or strangers as Islam precludes Muslim women from active trade outside their homes.

Processed fish is usually sold in bulk to wholesalers. This group usually engages in this livelihood activity for several generations but as the income generated is invested in children's education, their offspring tend to move to occupations outside the fisheries sector. Household maintenance constitutes major goals. Fairly strong informal organisations with clear-cut membership exist for the group. A fisher would rarely break his allegiance to a fish monger to whom he is affiliated (especially if the latter had provided soft loan/credit) even if the former would get higher prices elsewhere. As part of livelihoods strategy, this group may engage in petty trading and farming as subsidiary occupations.

2.2.2 Vulnerability of Primary fish mongers/processors

As with fishers, this group is vulnerable to depleting fish stock, market forces (but less so than the fishers as they are better organised), poor physical assets (lack of refrigerating facilities, roads, electricity etc) and political crises/conflicts which sometimes preclude the lifting of processed fish to distant markets for sale. They are rarely affected by inflation as fish is sold with respect to cost price. Fuel wood for fish processing is a major constraint to this group especially in the Chad Basin.

2.3 Fish wholesalers

2.3.1 Key characteristics

Fish wholesalers form a very important livelihood group in the lakes Kainji, Jebba and Chad basins where they are involved in weekly transportation of processed and smoked fish to distant Southern Nigerian markets of Lagos, Onitsha, Enugu and Ibadan. These markets receive over 70% of the fish products from the Lake Chad Basin (Ladu *et al.* 2000). It is a lucrative trade and highly sustaining in view of financial asset accruing from the activity.

The activity is dominated by men (about 80-85% in Chad Basin and about 50-60% in the Kainji lake basin). The few women involved in the trade are of Southern Nigeria origin as the northern rural women are constrained by Islamic religion from participating in open and distant trading.

Different ethnic groups (indigenous to non-indigenous) and even foreign nationals from Mali, Chad and Cameroon Republics are involved in the trade. Access to the activity is therefore, not restricted. In the Chad Basin, the wholesale fish market is well organised with a strong union that is registered with the local market authority. It is a major business for which actors are involved over a long period of time and sometimes passing on the business to their descendants. The fish wholesalers represent a very vital link between the primary fish mongers/processors and the retailers and may represent sole livelihood activity.

2.3.2 Vulnerability of the group

This group is vulnerable to macro and micro-economic policies, depleting fish stock, seasonal shocks arising from fluctuation in fish availability, political, religious and ethnic crises/conflicts. Like the fish mongers/processors, this group is rarely vulnerable to market forces, as they tend to largely regulate prices of smoked and dried fish in general.

2.4 Fish retailers

2.4.1 Key Characteristics

The fish retail marketers represent the far end of the fish marketing chain (seller/consumer interface). This activity is very important in the livelihood of this group especially in S. Nigeria where smoked/dried freshwater fish is cherished. Fish retailers depend exclusively on this activity for their financial capital asset and livelihoods. It is a lucrative business which may be lifetime or sole activity or complemented with petty trading and/or farming.

The retail fish market is almost exclusively the activity of women (>95%) (Ladu *et al.*, 2000). In the north, however, some men are involved. Although various ethnic groups are involved, the business is dominated by indigenes of the area where the fish markets are situated. Access to retail fish marketing

is not restricted, but entrepreneurs must belong to any of the existing local informal associations (unions) set up to protect their interest and to facilitate their dealing with the wholesalers. Fish retailers are involved over a long period of time and like the primary fish mongers/processors, they hardly pass on the activity to their children.

2.4.2 Vulnerability of the Group

Fish retailers share similar risks as primary fish- mongers/processors, in addition to the problem of spoilage caused by insect infestation. Retailers also have to contend with sudden influx and lower prices of imported frozen fish. There is little or no credit available and so members rely mainly on their unions or some other forms of social networks for limited support in time of need. Physical infrastructures such as electricity and properly lock-up stalls for keeping unsold products are generally lacking.

2.5 Fishing Gear Dealers

2.5.1 Key Characteristics

Traditional fishing gears marketed include mainly gill net materials of various filaments and mesh sizes, cast nets, hook-line, cane traps (ndurutu) and Malian traps (goura). For the first three gears which are largely imported, the livelihoods of the dealers depend solely on these as it is the major activity and source of income for the group. The more traditional gears (Cane and Malian traps) are usually the activities of members of the local fishing communities who combine this specialised work with other activities for their livelihoods.

This is mainly the activity of men because of the mode of procurement (distant travels and capital intensive nature). Women are rarely involved except when they assist their husbands in sales in local depots or market.

Different ethnic groups are involved in major markets close to fishing communities. Dealers usually initiate their children into it early to enable them master the trade. This livelihoods group is usually small in rural communities and so does not operate any cohesive organisation but has effective informal contacts to fix prices based on market forces. In bigger commercial cities of Onitsha, Lagos, Port-Harcourt etc, a formidable association with strong membership and operating under rules and regulations exists for its members. The village level gear dealers are highly vulnerable to the wholesale dealers as the latter control the gear marketing system in terms of price.

2.5.2 Vulnerability of the Group

Dealers of imported fishing net materials are highly vulnerable to macro-economic policies as earlier described. They lack access to credit facilities. Increased deforestation has constrained cane trap markers from easy access to their raw materials.

2.6 Boat builders

2.6.1 Key Characteristics

Very few people are involved and in the time past it was an important livelihood source. It is however, no longer lucrative as depleting fish stock especially in the major inland water bodies have drastically reduced the demand for fishing boats. Boat builders are however, able to switch to other carpentry duties such as furniture construction as an alternative livelihood source. Boat building is the exclusive preserve of men as it is labour intensive and requires special skills.

Diverse ethnic groups are involved but indigenes from the Southern part of the country predominate even in fishing communities in the North. Boat building is a professional activity, with carpentry as a major and necessary skill. Actors have long association with the art and usually pass it on to their children. Because of the very few and scattered individuals that are engaged in the activity, they rarely form themselves into any specific organisation except join other livelihood groups such as fishers and carpenters.

2.3.1 Vulnerability of the group

The group is vulnerable to:

- i) Macro-economic policies of deregulation, removal of input subsidy and tax holidays have affected the demand for boats by fishers who are increasingly unable to cope with the high cost of fishing inputs.
- ii) Depleting fish stock leading to low demand for boats by fishers)
- iii) Scarcity of timber especially in the Northern part of the country where artisanal fisheries predominate

3. ORGANISATIONS AND INSTITUTIONS LINKED WITH RESOURCE USERS

Informal and formal organisations that directly impact on fisheries resource users (local unions or associations) exist for the protection of individual livelihoods groups at the micro (local) level, although these are generally weak structurally and unable to influence policy at the macro (national) level for the benefit of their members. However, some formal professional organisations exist for the purpose of linkages with and influencing policy on behalf of fisheries resource users.

3.1 Informal Voluntary Organisations

Informal voluntary organisations exist at village levels in major fishing communities of Lakes Kainji/Jebba and Chad basins, the confluence of the Niger/Benue, the Nguru-Gashua wetlands etc. (Ladu et al, 2000). These village level associations or institutions have as their major goals the enhancement of social capital (eg reciprocal activity and assistance to the needy). Such organisations operate through long standing customary rules/laws, norms and taboos.

In addition, Village Heads or *Sarkin Ruwas* (Head Fishermen) usually preside and exercise some level of regulatory powers with respect to access to the fisheries. They act as link persons between the rural community and village level formal institutions such as the local representative of the Federal Department of Fisheries if present. In the Kainji and Lake Chad Basin Areas, this leadership system comprises mainly men as women are rarely involved in local administration in these areas.

They have no apparent or firm advocacy/lobbying powers at the national (macro) or middle (meso) levels but are vital at the local government levels where they are able to influence access to the fisheries. The successful implementation of the Community-Based Fisheries Management Plan for the Kainji Lake was made possible through the mutual co-operation between NIFFR, The German Technical partners and this informal association at the local community level.

3.2 Formal Organisations

3.2.1 Fisheries Society of Nigeria (FISON)

Established in 1976, the society forms a platform for major fisheries stakeholders in fisheries research institutes, Federal and State Departments of Fisheries, Universities, the private sector, NGOs and some multi-national oil companies. It is generally elitist. It has over 500 members drawn from both inland coastal/marine and fisheries sectors. Women constitute about 20% of membership. Because of its elitist nature, it represents a strong lobby/advocacy group for influencing fisheries policy at the macro level for the benefit of all stakeholders in both inland water and coastal/marine fisheries.

3.2.2 The Nigerian Union of Fishermen and Seafood Dealers (NUFSD)

This is an umbrella registered organisation of fishermen, fish traders and seafood dealers. It has its Headquarters in the Federal Capital Territory, Abuja. It is a large organisation with branches in the 36 States of the Federation in addition to the Federal Capital Territory, Abuja. Women account for about 10-15% of membership especially in the area of fish processing and marketing.

It is relatively well organised, providing limited credits and loans to members. Fish production and marketing in addition to export and import (but mainly the latter with respect to frozen fish) are the major focus of the union. It represents an emerging pressure (advocacy/lobby) group on FISON for government policies affecting the interest and wellbeing of their members.

3.2.3 National Association of Fish Farmers and Aquaculturists (NAFFA)

Like NUFSD, NAFFA is involved in organising fishermen but with major emphasis on stimulating the interest of fishermen and others in aquaculture in both rural and urban communities. It is a relatively well organised with a national president, a national secretariat and three national vice-presidents representing the three main geo-political zones of the country. Each of the 36 States of the federation has a State Chapter with a chairman and secretary. It has a national headquarters in Minna, Niger State but is currently relocating to Abuja. Its membership is over 3000 spread across the entire country. Women are relatively few (about 10%).

Its major goals include fostering closer relationship among fish farmers for the improvement of their livelihoods, organisation of relevant training for members, dissemination of information on fisheries related matters, supply of fertilizers and water pumps at subsidised rates etc. It has become a strong lobby group and its national President, Dr. Ikoyo-Eweto was appointed the chairman, Drafting Committee on Fisheries Policy in Agriculture. The organisation is also now a member of the newly established Livestock and Fisheries Development and Marketing Company set up by the Federal Government for the disbursement of loans and credits.

3.2.4 Nigerian Chamber of Commerce, Industry, Manufacturing and Agriculture (NACCIMA)

This organisation has significant link with policies affecting fisheries communities. It has branches in all the 36 states and is represented in the national Council on Agriculture, the apex policy and decision-making body on agriculture.

4. GENERAL GENDER ISSUES

The predominance of a gender (men or women) in a livelihood group was generally a function of the type and scope/skill required for a livelihood activity and existing religious and cultural norms. While fishers, boat builders and gear/craft trade are dominated by men, fish marketing, especially at the level of the primary fish mongers/processors and retailers, is dominated by women. Religious or cultural norms, however, restrict women (especially child-bearing Muslim women) in the North from active participation in fish commerce. Women from the southern part of the country, therefore dominate the trade. Men are actively involved, especially where religious or cultural values prevent women from doing so.

Restriction of access to the various livelihoods groups or to resources is not apparent as skills and financial capability (to commence a livelihood activity or to procure physical asset for an activity) are the major requirements.

Every livelihood group at the local level lack any reasonable lobbying capacities as they have very little or no interactions with formal (macro-level) institutions involved in fisheries policy development.

5. SIGNIFICANT FACTORS LINKED TO POLICIES, INSTITUTIONS AND PROCESSES (PIPs) AND RESOURCE USER GROUPS

Policies and the institutions making them, in addition to the processes of policy-making and implementation have implications for livelihood groups utilising fisheries resources.

- Government macro-economic policies of deregulation or structural adjustment programmes in addition to micro-economic policies (fiscal measures) all affect the vulnerability of livelihood groups or resource users in one way or another.
- Inflation, caused by macro-and-micro-economic policies (deregulation and SAP) diminishes the capacities of livelihood groups to procure necessary inputs for their activities.
- Prevailing weak currency requires a huge amount of starter-funds (financial capital) to commence fish trade and considering the fact that this is a livelihood group dominated by women, there is the need to empower them financially by providing access to credit/loans.
- Fisheries policy-making in Nigeria is over centralised, as local level institutions are rarely involved in the process. The need to consult and include local fishing community members about policies that directly impact on their livelihood is vital if such policies are to be beneficial and sustainable. Local fishers and other livelihood groups should be part of a process to articulate their needs and preferences.

6. SUMMARY OF MAJOR CHARACTERISTICS OF THE DIFFERENT LIVELIHOOD GROUPS

Livelihood Groups	Defining characteristics	Key gender difference	Main l/hood strategies	Constraints regarding key capitals	Financial profitability of activities	Vulnerability /key risks
FISHERS	Indigenous. & non indigenous ethnic groups (Hausas, Kanuris, Urhobos Ijaws); foreign nationals (Maliens, Chadians Cameroonians); several decades of fishing; highly skilled.	No gender restriction but 95% are men; Women rarely engage in activity except in pools/creeks.	well-off fishers use outboard engines; combine fishing with farming and livestock keeping; fisher's organisations exist; some migrate to more productive areas;	Depleting fish stock; lack of access to loans and credit for input procurement and replacement	Generally profitable with adequate input	Macro/micro economic policies; high cost of inputs; Seasonality of stock; loss of life on lake; lack infrastructure – schools, health and sanitation facilities, etc.; theft of gears
PRIMARY FISH MONGERS/PROCESSORS	Mainly non-indigenous women (Urhobos, Ijaws, Yorubas); long time association with the business; hardly migrates	Over 85% women; Men rarely involved except in the Chad Basin	Rarely migrate (mostly married women); may combine activity with petty trading; Better organised than fishers	Dwindling natural capital; (fish-stock); lack of access to initial financial capital to start trade; little/no access to formal sources of credit/loans	Generally profitable and earning more than fishers in the Kainji/jebba lake basins	Poor physical assets (roads, electricity for refrigeration.; processing infrastructure); Seasonality in quality/quantity
FISH WHOLE-SALERS	Different. Ethnic nationalities (Maliens and Chadians involved in the Chad Basin) strong union; almost lifetime activity; may own warehouse	Activity dominated by men (over 80-85%); the few women involved in lakes kainji Jebba and Chad are non-Muslims from Southern Nigeria.	Use trucks for transportation; highly organised esp. in the Chad Basin (about N45m or US\$ 0.45m weekly volume of smoked fish); may represent sole l/hood activity;	Macro-economic policies; Low fish volume due to over-exploitation; high cost of transportation; high energy cost; inadequate access to credit and loans	Highly profitable; operates like a cartel	Political and religious crises may preclude lifting of fish to Southern Nigeria markets; high cost of transportation

Livelihood Groups	Defining characteristics	Key gender difference	Main strategies	Constraints regarding key capitals	Financial profitability of activities	Vulnerability /key risks
FISH RETAILERS	Situated at far end of fish market chain; different ethnic groups but dominated by indigenes of where markets are located; retailers organised into strong informal union; almost a lifetime and sole activity for actors	Retail market dominated by women (over 90% especially in Southern Nigeria. Few individuals involved in fish retailing in Northern Nigeria are men	Well organised informal group; rarely combines trade with other activities as supply is usually assured every week from wholesalers.	Low fish volume.; high price of fish due to high transport cost; inadequate storage and preservation facilities;	Very profitable as women sustain themselves and children on activity	Same as wholesalers
FISHING GEAR DEALERS	Different ethnic groups and some foreign nationals but wholesale trade dominated by Yorubas and Ibos; mostly sole activity even at the retail level	Activity is almost the exclusive preserve of men, except when women assist their husbands in sales.	No very strong union as actors are widely separated from one another; mainly an import trade at the wholesale level; actors usually very few and restricted to major towns around fishing communities	Depleting fish stock reduces demand for gears; macro-economic policies e.g. removal of import subsidy increase cost of input.	Highly profitable especially at the wholesale level	High cost of imports due to unfavourable macro/micro economic policies; removal of import tax holiday; lack of subsidy
FISHING BOAT BUILDERS	Dominated by people from mostly South coastal region (Ijaws, and Urhobos); special skill in carpentry; long time profession; parents usually pass on skill to interested sons	Exclusively a man's trade	Actors usually migrate to major fishing areas; major skill is carpentry; combines activity with other livelihoods portfolios; actors few and not well organised	Low demand due to depleting fish stock; lack of timber especially in the North	Not profitable any more except when combined with other carpentry duties such as furniture-making	Scarcity of timber and lack of money and food

II. INLAND FISHERIES RESEARCH ORGANISATIONS: POTENTIAL AND CONTRIBUTION TO SUSTAINABLE LIVELIHOODS IN INLAND FISHING COMMUNITIES

1. Introduction

The inland water resources of Nigeria (approximately 149,919 km², Ita, 1994) comprising major lakes, rivers, ponds and floodplains, have enormous fisheries resources that provide food, income and jobs to a large number of rural dwellers. The management, control and sustainable exploitation of these inland water fisheries resources are major mandates and focus of the National Institute for Freshwater Fisheries Research (NIFFR), New Bussa, Niger State, Nigeria. In addition to NIFFR, some International organisations and a number of Nigerian Universities are also undertaking fisheries research at various levels.

The following report is a brief characterisation of NIFFR as a major inland water fisheries research provider in addition to the Kainji Lake Fisheries Promotion Project (KLFPP or GTZ, a Nigeria/German bilateral technical co-operation and the Department of Fisheries, federal University of Technology, Minna Niger State.

The report is basically in two parts:

- Analysis of factors influencing the contribution of fisheries research to the livelihoods of artisanal fisher-folk and
- Profiles of the fisheries research providers

2. Analysis Of Key Factors Influencing The Contribution Of Research To The Livelihoods Of Artisanal Fisherfolks

The three fisheries research providers profiled below have contributed, albeit at different scales to the development of fisheries and fishing communities in Nigeria. A number of factors, however, constrain the contribution of these research providers to the livelihoods of artisanal fisher-folks in the country. Some of these factors include:

2.1 Unenforceable Policy/changes in Policy-making Institutions

The NIFFR and the Universities are most affected by this constraint. Government fisheries policy-making in Nigeria is often over-centralised, with government administrators who do not understand the fundamental importance of scientific research in developing new technologies, being major actors.

Policy-making, therefore, tends to alienate not only the local people but also institutional structures for fisheries research. This makes enforcement of fisheries laws and regulation difficult if not impossible. An example is the 3" mesh size that was recommended by NIFFR and entrenched in the fisheries decree of 1992. A good number of fisher-folks still contravene this by using lower mesh sizes as they had little or no input into the contents of the fisheries laws and regulation. The frequent movement of NIFFR from one federal ministry to another has often jeopardised fisheries policy implementation by NIFFR. For example the Institute has variously been moved from the Federal Ministry of Science and Technology to Education and Water Resources.

2.2 Funding

Inadequate and untimely release of funds is a major problem confronting fisheries research and capacity to contribute to the livelihoods of the fisher-folks. In most cases, release is less than 1% of the request and also often less than 50% of final allocation. If and when releases are made, bureaucratic procedures often delay receipt. These processes are unduly long and affect adversely, efforts at carrying out village level field research aimed primarily at the local artisanal fisher-folks. The GTZ, perhaps by virtue of being an International organisation, is less constrained, as it has adequate funding arrangements except the problem of counterpart release of funds by the Nigerian government

2.3 Inadequate Personnel

For almost 16 years, research staff strength of NIFFR was grossly inadequate as a result of government embargo on employment for both scientists and supporting staff. This made it impossible for NIFFR to cover several aspects of its mandates with respect to rural fishing communities. It was only recently that the scientific personnel strength of the Institute increased slightly from 22 to 34. For an Institute with a national mandate, the scope of research became highly limited during the period, thus affecting the impact on the livelihood of the fisher-folks. The University system is even more constrained by personnel. The GTZ is less constrained in terms of personnel.

2.4 Lack of Viable Co-operatives and Weak Government/Village Level Institutions

Viable cooperatives and village level institutional structures are veritable platforms for linkage of research provider with research end-users such as the rural fishing communities. The absence or weaknesses of these structures have made the dissemination, application and adoption of results difficult. There is the need, therefore, to strengthen these local level structures to make them more functional in terms of interaction between fisheries research provider and the fisherfolks and also to enable the latter optimise research results. The present pre-occupation of most village-level institutions in only settling disputes among community members and in communal or reciprocal activities are not sufficient.

Additionally, government institutional structures such as the Federal Department of Fisheries (FDF) need to be strengthened to enable them function optimally in the area of fisheries research policy formation, implementation and dissemination of fisheries research results. A stronger partnership between NIFFR and FDF is required.

2.5 Illiteracy in Rural Fishing Communities

Like poverty, illiteracy is an all-prevailing phenomenon in rural fishing villages and has negative impact on the flow of information. In all cases, studies have to rely on interpreters to convey information on fisheries results to local fishermen. There is need to pursue literacy skills among fishermen to raise their level of awareness and to enable them participate actively and adequately in matters affecting their general well-being. This would increase their advocacy/lobbying capacities.

2.6 Inadequate Number of Extension Agents

In addition to inadequate funding, inadequate number of extension experts in NIFFR is one factor responsible for the low level of interaction between the Institute and artisanal fisher-folks. The contribution of NIFFR to the livelihood of artisanal fisher-folk would be enhanced if adequate field extension experts are available for village level research and development. Extension agents are completely lacking in the University. The GTZ, because of improved funding was able to mobilise personnel for its extension work on the Kainji lake Basin.

2.7 Conflicting Government Policies

The frequent conflicting policies of government separating research from development have not helped demand-driven research aimed primarily at enhancing the livelihood needs of research target beneficiaries. In the absence of a strong central coordinating unit, government policies should encourage a dual role of Research and Development for fisheries research providers.

3. Description Of Fisheries Research Providers

3.1 National Institute for Freshwater Fisheries Research (NIFFR)

<i>ORGANISATION (name, year created, mandate)</i>	i). Name: National Institute for Freshwater Fisheries Research. ii). Year created: 1968 (First as a project – 1968-74, and later as a full-fledged Research Institute, 1975 till date). iii). Mandates: Research into capture (artisanal) and culture (aquaculture) fisheries including environmental and Socio-Economic and Extension Research. Training in fisheries manpower development also forms part of NIFFR mandates
<i>Coverage</i>	b) Mandates cover all inland water bodies in the country and focusing on all demographic groups (men/women, poor/rich, migrant/settled). NIFFR is also to link with organisations/institutions involved in the country's fisheries.
<i>Type of organisation (International or national research institute, NGO, private)</i>	NIFFR is a national research institute owned and funded by the Federal government of Nigeria as a parastatal in the Federal Ministry of Agriculture and Rural Development (FMA & RD).
<i>Types of fisheries covered and key research themes</i>	<ul style="list-style-type: none"> • Capture and culture fisheries • The key research themes include <ul style="list-style-type: none"> i) Artisanal fisheries ii) Biological stock Assessment, productivity and potential fish yields iii) Aquaculture iv) Post-Harvest Technology v) Fisheries Socio-Economic and Extension. vi) Surface and underground water Hydrology
<i>Finance (amount allocated for fisheries research)</i>	Average yearly research fund allocation for the past ten years is ₦11.5m (Capital) and ₦ 31.3m (recurrent)
<i>Number of research staff (by discipline)</i>	Total fisheries research scientists=34 made as follows: <ul style="list-style-type: none"> • Fisheries Biol/Mgt=5 • Aquaculture/Nutrition=5 • Fisheries ecology =8 • Microbiology/Chemistry=3

	<ul style="list-style-type: none"> •Genetics/Biotech. =1 •Socio-Econ/Ext. =6 •Fish Health =5 •Post Harvest Tech. =1
<i>Contribution to policy in fisheries sector (how?)</i>	<p>There are 2 major ways in which the Institute has contributed to fisheries policy in Nigeria:</p> <ul style="list-style-type: none"> • NIFFR in the early/mid-eighties drafted the first fisheries Law and regulation that guide fisheries resources development, management and exploitation in Nigeria. The draft was signed into law (The Inland Water Fisheries Decree) in 1992. • Outputs of major research results are passed to the National Council on Agriculture (NCA, apex policy-making body in agriculture) for policy-formulation.
<i>Contribution to strengthening capacities of fisherfolk and their organizations</i>	<p>Institute's contribution in this regard is in the following main areas:</p> <ul style="list-style-type: none"> • Enhancement of fish catch by fisher-folks through restocking and improved management practices • Improvement of fish processing methods to strengthen the capacity of fisher-folks to reduce post-harvest losses • Fisheries extension services with village level institutions with respect to gear regulation, obnoxious fishing method and fishing inputs revolving loan scheme.
<i>Contribution/place of social science research</i>	<p>Social science research studies are in the areas of social organisation of fishing villages, marketing, fish handling, processing, preservation and storage, subsidies, co-operatives and credit facilities, licensing etc .</p>
<i>Capacity for development oriented research</i>	<p>A limited number of researchers have been given opportunities in higher degree training in applied research relevant to the needs of fisher-folk with bias in participatory methods.</p>
<i>Partnerships with other organisations/groups of producers/decentralised local authorities.</i>	<p>NIFFR is collaborating with 18 Universities and 37 Agricultural Development Projects/Programmes (ADP) both in research, training and extension delivery. It is also in partnership with international organisations such as GTZ, DFID, FAO etc and non-governmental village level organizations in addition to fisheries l/hood groups.</p>
<i>Approach and intervention strategy (links with users and development contexts, procedure for needs identification, "on-farm" research,...)</i>	<p>There are five areas of linkage and intervention strategy between NIFFR and fisheries resource users:</p> <ul style="list-style-type: none"> • On-farm-Adaptive Research (OFAR). • Monthly Technology Review Meetings (MTRM./TRM). • Training Workshops • Diagnostic surveys to identify needs • Publication of fisheries Extension bulletins/guide for end-users
<i>Constraints, limits and opportunities</i>	<ol style="list-style-type: none"> 1. Constraints/Limits <ol style="list-style-type: none"> a) Inadequate and untimely release of funds by government b) Problems of transportation and other facilities for data collection and processing. c) Weak or non existing fisheries co-operatives d) Inadequate number of village level extension agents e) Poor physical capital of fishing communities. f) Difficulty in obtaining fisheries information at local level. 2. Opportunities. <p>The emphasis of the present administration is on poverty reduction/alleviation and this presupposes that programmes designed for the improvement of the livelihoods of rural fishing communities, if well articulated, could receive the approval of government, through increased research funding.</p>

<p><i>Key research results available on fisher-folk livelihoods.</i></p>	<ul style="list-style-type: none"> • Solar Tent for drying fish. • Improved traditional smoking kiln (Banda). • Self-policing and implementation of fisheries laws by the fisherfolks with particular reference to control and use of obnoxious gear and fishing licensing fees. • Establishment of transplanted clupeids (freshwater Sardines) in commercial quantities in Tiga Lake, Kano for exploitation by rural fishing communities. • Enhanced fish stocks of NIFFR restocked reservoirs • Provision of fishing gears and crafts on a revolving loan scheme to local fishermen in the Kainji Lake region.
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3.2 German Technical Co-Operation (GTZ)

<p><i>ORGANISATION (name, year created, mandate)</i></p>	<p>Kainji Lake Fisheries Promotion Project (KLFPP) 1993. Development of fisheries management plan for optimum sustainable exploitation of the fishery resources of Kainji Lake.</p>
<p><i>Coverage (geographical, population groups and categories concerned such as; poor and rich, women and men, migrants and settled populations..)</i></p>	<p>Kainji Lake Area, i.e. from the Damsites in the south to Pasatula in the north (covering about 316 fisheries communities)</p> <p>Population groups include majorly the Hausa from Kabbi and Sokoto; Nupe from Niger, Ibo, Yoruba, Urhobo from the southwest and south and indigenous ethnic groups such as Laru, gungawa, Kamberi, Lopawa and Bisian. Categories concerned are men, women, migrant and settled populations. Majority are relatively poor.</p>
<p><i>Type of organization (International or national research institute, NGO, private)</i></p>	<p>Bilateral technical assisted project between the Federal government of Germany and Nigeria.</p> <ul style="list-style-type: none"> - Federal Department of Fisheries (FDF) - Department of fisheries of the Ministry of Agric/Natural resources, Kebbi state (KSDF) - Department of Fisheries of the Ministry of Agric/Natural resources, Kebbi State (KSDF) - National Institute for Freshwater fisheries Research (NIFFR) <p>The project is been assisted by Germany (GTZ).</p>
<p><i>Types of fisheries covered and key research themes</i></p>	<p>Freshwater fisheries Research</p> <ul style="list-style-type: none"> - Annual frame surveys - Monthly catch Assessment surveys - Cost and earnings of fishing gears - Socio-economic activities of fisherfolk - Extension activities through demonstration and transfer of improved technologies.
<p><i>Finance (amount allocated for fisheries research)</i></p>	<p>About N4 million annually</p>
<p><i>No. research staff (by discipline)</i></p>	<p>On secondment to the project.</p> <ul style="list-style-type: none"> 1 Sociologist - (sociology) 1 Fisheries Biologist – (Fisheries management) 1 Aquatic Management expert - (Aquatic Management) 1 Statistician - (Statistics) 1 extension expert - (Agric extension) <p>Other supporting staff – 3 fisheries officers, 2 data importers, 13 field staff for data collection.</p>

<i>Contribution to policy in fisheries sector (how?)</i>	Estimates of annual fish yield from Kainji Lake - Implementation of a uniform fisheries law and regulations for the lake area.
<i>Contribution to strengthening capacities of fisher-folk and their organizations</i>	Establishment of a Fisheries Management Unit known as Kainji Lake Fisheries Management and Conservation Unit (KLFMCU) composed of fisheries officers from the two States (Kebbi and Niger); representatives of NIFFR; traditional institutions, Fed. Dept of Fisheries and fisherfolks. - Constitution of fishermen liaison officers drawn from contiguous fishing communities around the lake area (24 wakilis).
<i>Contribution/place of social science research</i>	Various socio-economic studies have resulted in the implementation of: - Alternative income sources for women (poultry, fish processing) Community mobilization for voluntary clearing of water hyacinth from beaches; - Airing of project activities on regular basis on FRCN, Kaduna and Niger Radio Booster station, Koro, New Bussa; and - Bottom-up approach in fisheries management
<i>Capacity for development oriented research (demonstrated by... incentives, training and experience for researchers in participatory methods etc)</i>	Researchers have undergone trainings both internally and abroad and are knowledgeable in the concepts and practice of participatory Rural Appraisal methods. All other staff involved in project activities undergo regular training locally to update knowledge in new technologies of data collection and analysis as well as in modern extension methodologies.
<i>Partnerships with other organisations/groups of producers/decentralised local authorities.</i>	- Agricultural Development Project (ADP) for extension work. Federal Department of fisheries (FDF) for extending the learned lessons at the Federal level. - Universities for information on fisheries management approaches.
<i>Approach and intervention strategy (thinks with users and development contexts, procedure for needs identification, "on-farm" research,...)</i>	- Regular campaigns - Participation of users in production of extension messages - Regular meetings with representatives of collaborating agencies (transfer of improved technologies to end-users.
<i>Constraints, limits et opportunities</i>	- Continuous use of banned fishing methods (especially beach seine) - None existence of virile fishermen organisation to serve as a springboard for implementing management plans. Limit(s) Lack of sufficient funds to carry out all planned activities opportunities - Existence of a management unit - Existence of fisheries law and regulations - Available of trained manpower - Operation within a democratic government
<i>Key research results available on fisherfolk livelihoods.</i>	- Information on the number of fisherfolks, fishing gear and monthly catches - Information on the nutritional conditions/Habits of fishermen's children Transfer of improved technologies (woodlot, cockerel exchange programme, improved smoking kilns) to fishing communities Assessment of socio-economic conditions in some selected fishing communities using participatory rural Appraisal (PRA) tools.

3.3 Federal University Of Technology (FUT), Minna Current Profile

<i>ORGANISATION (name, year created, mandate)</i>	Name: Department Of Fisheries, Federal University Of Technology, Minna, Nigeria. Year Established: 1993. Training of Fisheries Scientists, Research on and Community Service in Fisheries
<i>Coverage (geographical, population groups and categories concerned such as; poor and rich, women and men, migrants and settled populations..)</i>	Coverage: NIGERIA. Population Group: <ul style="list-style-type: none"> • Fishermen (poor) migrant • settled fish farmers (poor). • Migrant fish marketers
<i>Type of organisation (International or national research institute, NGO, private)</i>	National Academic/Research Institution
<i>Types of fisheries covered and key research themes</i>	vi) Capture Fisheries <ul style="list-style-type: none"> • Nets, • Traps • Hook and line • Stock assessment vii) Fisheries viii) Artisanal fisheries
<i>Finance (amount allocated for fisheries research)</i>	\$2,000.00 annually.
<i>Number of research staff (by discipline)</i>	<ul style="list-style-type: none"> • Nutrition – 2 • Breeding – 2 • Water quality – 1 • Fisheries management – 1 • Fish Biology – 1
<i>Contribution to policy in fisheries sector (how?)</i>	<ul style="list-style-type: none"> • Technical Review meetings with Agricultural Development Projects and Research Institutes.
<i>Contribution to strengthening capacities of fisherfolk and their organisations</i>	Create awareness on responsible fish farming and fish capture techniques.
<i>Contribution/place of social science research</i>	Marketing of fish and fish product research
<i>Capacity for development oriented research (demonstrated by... incentives, training and experience for researchers in participatory methods etc)</i>	Involvement in collaborative, national and international research in fisheries. Areas of collaboration include: <ul style="list-style-type: none"> • fish biodiversity • conservation • stock assessment • fish population dynamics

<i>Partnerships with other organisations/groups of producers/decentralised local authorities.</i>	<p>In partnership with:</p> <ul style="list-style-type: none"> • National Institute for Freshwater Fisheries Research (NIFFR) • Agricultural Development Projects <p>National Institute for Agricultural Research, NIAMEY.</p>
<i>Approach and intervention strategy (links with users and development contexts, procedure for needs identification, “on-farm” research,...)</i>	Linkage established through MTRM of ADPs and Workshops organised by stakeholders – NGOs and Government parastatals.
<i>Constraints, limits and opportunities</i>	<ol style="list-style-type: none"> 1. Strategic location close to major rivers and lakes 2. Funding for research and extension is inadequate.
<i>Key research results available on fisher-folk livelihoods.</i>	<ol style="list-style-type: none"> i) Integrated rice-cum-farming model established ii) Improvement of capture fisheries techniques

III EXPERIENCES OF COLLABORATION BETWEEN RESEARCH PROVIDERS AND ARTISANAL FISHERFOLK

1. Introduction

The National Institute for Freshwater Fisheries Research has been involved in a number of partnerships with fisher-folks in the rural fishing communities of the Kainji Lake Basin. Mixed result were recorded in these partnerships.

At various stages of conceptualization, planning and implementation most of the stakeholders were largely involved. Partnerships were however largely constrained by inadequate funds for project implementation and monitoring, migrant nature of the fisher-folks and the perception of livelihood groups that any offer from government is free and may not be repaid.

Four Case studies are summarised below using the format provided for this output.

2.0 Case Studies And Lessons Of Collaboration Between Research Providers And Artisanal Fisher-Folk

2.1 Fishing Inputs Revolving Loans Scheme

Title of case study of partnership	Fishing input revolving loan scheme
1. Actors involved	National Institute for Freshwater Fisheries Research (NIFFR) and fisher-folk in two fishing villages(Monai and Shagunu) in the Kainji Lake basin.
2. Origin of the collaboration.	◆ The schemes originated from the fisherfolks who desired to increase their output but were constrained by lack of inputs. They requested for input supply at subsidized rates from the government represented by NIFFR
3. Principal objectives of the partnership	<ul style="list-style-type: none"> ◆ To improve the socio – economic well being of the fishing communities through improved catches. ◆ To discourage obnoxious fishing methods through the use of standardized gears and ◆ To encourage the code of conduct for responsible fisheries through the use of standard fishing gears.
4. Other partners involved.	◆ None
5. Key activities in partnership	<ul style="list-style-type: none"> ◆ Participatory planning for scheme take off ◆ Setting up of the supply unit, the engine servicing unit, the processing and marketing units. ◆ Supply of fishing inputs (boats, outboard engines and netting materials) to the 10 selected fishermen from each of the two communities involved in the scheme. ◆ Recovery of the loan through the submission of 20% of daily beneficiaries' catches as part payment of loan to the Institute (NIFFR).
6. Process (approach, use of participatory methods...)	<ul style="list-style-type: none"> ◆ The approach was largely participatory. The selection of the beneficiaries was done jointly by the fishing communities and representatives of NIFFR. ◆ The partners also mutually agreed on the modality for repayment. ◆ Regular meetings between beneficiaries and NIFFR representatives.

7. Roles of fisherfolk in the process	<ul style="list-style-type: none"> ◆ Local fishers associations were involved to ensure and monitor facilities provided. ◆ Beneficiaries held regular meetings to discuss scheme and report defaulters on loan repayment.
8. Results and impacts	<ul style="list-style-type: none"> ◆ Repayment by beneficiaries was regular initially. ◆ Some beneficiaries later migrated to unknown destinations in a bid to avoid repayment. ◆ Beneficiaries later saw government offers as largesse. ◆ NIFFR' s inability to adequately monitor defaulters and enforce sanctions finally led to the collapse of the partnership.
9. Sustainability and replicability of the partnership	<ul style="list-style-type: none"> ◆ The partnership was not sustainable and replicable due to constraints listed in 8 above.
10. Key lessons	<ul style="list-style-type: none"> ◆ Input supply at subsidized rate to local fisher-folk was a desired need. ◆ Provision of fishing input on loan basis should be discouraged, instead inputs could be made available but on payment of cash for supply. ◆ Government institution (NIFFR), monitoring compliance of repayment should be better equipped to enable it do so adequately. ◆ Beneficiaries for such scheme should be resident and permanent, this should be known through a feasibility study
11. Ideas for activities and initiatives to improve partnership	<ul style="list-style-type: none"> ◆ Provision of fishing input on loan basis should be discouraged, instead inputs could be made available but on payment of cash for supply. ◆ Government institution (NIFFR), monitoring compliance of repayment should be better equipped to enable it do so adequately. ◆ Beneficiaries for such scheme should be identified as non-migrant fishers. ◆ Future partnerships should include rural financial/credit institutions knowledgeable in loan disbursement /recovery

2.2 Introduction of Simple Solar Tent Fish Dryers and Kainji smoking Kiln to Fisher-folk along Kainji and Jebba Lakes

Title of case study of partnership	Introduction of simple solar tent fish dryers and Kainji smoking kilns to fisherfolks along Kainji and Jebba Lakes.
1. Actors involved	<ul style="list-style-type: none"> ◆ NIFFR and fisher-folk. ◆ Fisher-folks included women, children and men.
2. Origin of the collaboration.	<ul style="list-style-type: none"> ◆ Declining quality of dried fish due to decreasing fuel wood prompted fisher-folk in the basin to request for alternative processing method from NIFFR
3. Principal objectives of the partnership	<ul style="list-style-type: none"> ◆ To introduce a better and more effective fish processing method to the fisher-folk. ◆ To increase the economic status or livelihood of the fisher-folk by reducing post harvest losses arising from spoilage. ◆ To reduce the incidence of forest degradation.
4. Other partners involved.	<ul style="list-style-type: none"> ◆ The other partners involved in the partnership were the fishing communities, ADPs, Universities and German Technical Cooperation (GTZ).
5. Key activities in partnership	<ul style="list-style-type: none"> ◆ The first step in the partnership was initial visit to fishing communities that requested for technology after initial demonstration

	<ul style="list-style-type: none"> ◆ General discussion with communities on partnership implementation ◆ Selection of participants by village committee. ◆ Selection of suitable sites for trials. ◆ Acquisition of processing units by selected beneficiaries. ◆ Demonstration of new technology under NIFFR's supervision. ◆ Evaluation and discussion on adoption between NIFFR and beneficiaries ◆ Handing over of trial units to beneficiaries.
6. Process (approach, use of participatory methods...)	<ul style="list-style-type: none"> ◆ The partnership was entirely participatory. ◆ The fishers chose participants. ◆ They were allowed to make their own rules and regulations ◆ They selected the site for the trials ◆ They provided the material for the trials ◆ They evaluated the products from the trials / technology.
7. Roles of fisherfolk in the process	<ul style="list-style-type: none"> ◆ NIFFR in the partnership was mainly an observer at the implementation stage, making inputs only when the fisher-folk are not on track. ◆ The fisher-folk were given a free hand to initiate ideas and manage the partnership (e.g. the substitution of local dark dyes for synthetic paints as solar absorbers on rocks and a specialized splitting of fish to enhance sun drying as in the case of solar tent drying. ◆ Provision of materials for making smoking kilns. ◆ Construction of smoking kilns.
8. Results and impacts	<ul style="list-style-type: none"> ◆ Trials were successful as fish were effectively smoked and sun dried. ◆ Fisher-folk were enthusiastic about the trials as they bought off existing supplies of solar tent units. ◆ Acceptance of sun dried fish in comparison to smoked fish was low ◆ Units used less quantity of fuel-wood. ◆ The non use of fuel wood in the solar tent drier and the reduced consumption of fuelwood by the improved smoking kilns were confirmed
9. Sustainability and replicability of the partnership	<ul style="list-style-type: none"> ◆ Partnership is sustainable and replicable in places with good sunshine (solar dryers) and limited fuelwood(improved banda)
10. Key lessons	<ul style="list-style-type: none"> ◆ The partnership was good and succeeded very well. ◆ The technologies are simple, easy to demonstrate and adopt. ◆ They are considered cheap. ◆ Could be extended to other parts of the tropical world.
11. Ideas for activities and initiatives to improve tpartnership	<ul style="list-style-type: none"> ◆ Enlightenment of fisher-folk on the quality of solar tent dried fish ◆ Training for beneficiaries on the construction and maintenance of solar tent dryer and improved smoking kiln. ◆ Enlightenment of fisher-folk on the adoption of the technology for the purpose of environmental conservation. ◆ There is the need for NIFFR to be empowered to enable it extend the technology to wider fishing communities.

2.3 *The Trial of an Alternative Fishing Gear for the Exploitation of Freshwater Sardine Clupeids on Lake Kainji, Nigeria.*

<i>Title of case study of partnership</i>	The trial of an alternative fishing gear for the exploitation of freshwater sardine (clupeids) on Kainji Lake, Nigeria.
<i>1. Actors involved</i>	Fishermen around the Kainji Lake Area and NIFFR
<i>2. Origin of the collaboration</i>	<ul style="list-style-type: none"> ◆ Observed depletion of fish stock caused by the use of beach seine nets and other obnoxious fishing methods. ◆ The concern of fisher-folk and NIFFR to conserve fish stocks through the reduction of by-catches in beach seine nets. ◆ Fishermen requested for intervention to curtail overfishing and resolution of conflict between beach seine users and non-beach seine users led to the partnership.
<i>3. Principal objectives of the partnership</i>	<ul style="list-style-type: none"> ◆ To conserve fisheries resources through the use of acceptable fishing methods ◆ To encourage adherence to the code of conduct for responsible fisheries ◆ To resolve conflict / crises between beach seine users and non-beach seine users.
<i>4. Other partners involved</i>	<ul style="list-style-type: none"> ◆ Nigerian- German Kainji Lake Fisheries Promotion Project (GTZ). ◆ Traditional Institutions ◆ ADP Extension staff.
<i>5. Key activities in partnership</i>	<ul style="list-style-type: none"> ◆ Community sensitization and enlightenment campaigns on the effect of obnoxious fishing methods. ◆ General discussion between partners on the problem. ◆ Discussion and agreement on possible solutions. ◆ Design and construction of an alternative fishing gear. ◆ Demonstration of fishing gear by partners. ◆ Evaluation of the performance of the new gear.
<i>6. Process (approach, use of participatory methods.)</i>	◆ Processes were generally participatory between partners and followed the approach listed in 5 above
<i>7. Roles of fisherfolk in the process</i>	<ul style="list-style-type: none"> ◆ Identification of the problem. ◆ Participation in gear design and construction. ◆ Participation in new gear trials. ◆ Participation in the monitoring and evaluation of the alternative gear.
<i>8. Results and impacts</i>	<ul style="list-style-type: none"> ◆ New gear was constructed and tried. ◆ Gear was found to be effective as by-catches were eliminated. ◆ Quantity of target fish species (clupeids) caught with new gear compared with the old gear was significantly lower. ◆ Consequently practitioners continued with the old method. ◆ Conflict between users/non users of beach seine continued.
<i>9. Sustainability and replicability of the partnership</i>	◆ Partnership was not sustainable and replicable as fisher-folk involved in the practice failed to adopt the new method.
<i>10. Key lessons</i>	<ul style="list-style-type: none"> ◆ Practitioners were unwilling to adopt the alternative technology because of reduced catches and income. ◆ Practitioners are willing to adopt a more efficient method for clupeid exploitation if available

<p>11. Ideas for activities and initiatives to improve partnership.</p>	<ul style="list-style-type: none"> ◆ Research into a more efficient and alternative gear for clupeid exploitation should be intensified. ◆ Continued education and enlightenment on the deleterious effect of the old practice. ◆ An alternative source of income should be identified and implemented for practitioners to discourage continued use of old method.
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2.4 Community Mobilization for Water Hyacinth Control on Kainji Lake

Title of case study of partnership	Community Mobilization For Water Hyacinth Control In Kainji Lake
1. Actors involved	<ul style="list-style-type: none"> ◆ German Technical Cooperation (GTZ) Kainji Lake Fisheries Promotion Project ◆ National Institute for Freshwater Fisheries Research ◆ Fisheries Departments of Kebbi and Niger Ministries of Agriculture and Natural Resources. ◆ Fishing Communities
2. Origin of the collaboration	<ul style="list-style-type: none"> ◆ Sudden invasion of Kainji Lake by water hyacinth. ◆ Destruction of fishing gears and obstruction of navigation and harboring of snakes by water hyacinth. ◆ Request by fishing communities to government through NIFFR for the control of the weed. ◆ NIFFR's assessment of the deleterious effect of the weed to fishing and hydro power generation
3. Principal objectives of the partnership	<ul style="list-style-type: none"> ◆ To control the weed in order to enhance the socio-economic well being of fisher-folk. ◆ To enhance navigation and reduce health hazards associated with the weed. ◆ To eliminate hazards posed to hydro electric turbines on Lake Kainji
4. Other partners involved	<ul style="list-style-type: none"> ◆ Traditional institutions, ADP extension staff, paramedical staff of the local government areas bordering the water bodies.
5. Key activities in partnership	<ul style="list-style-type: none"> ◆ Regular meetings with traditional authorities and representatives of local communities. ◆ Enlightenment campaigns on the need to control the weed. ◆ Communal clearing of water hyacinth from beaches ◆ Regular monitoring of water hyacinth clearing by fishing communities. ◆ Design, construction and installation of a boom to check the influx of water hyacinth into the main lake.

6. Process (approach, use of participatory methods..)	<ul style="list-style-type: none"> ◆ In all cases participatory approaches were used as regular meetings were held between all stakeholders to determine implementation strategies.
7. Roles of fisher-folk in the process	<ul style="list-style-type: none"> ◆ Were involved in all aspects of weed control. ◆ Regular reporting of level of hyacinth infestation. ◆ Organization of communities into groups for the purpose of water hyacinth control on specific days
8. Results and impacts	<ul style="list-style-type: none"> ◆ Communal arrangement for water hyacinth control was successful. ◆ Water hyacinth infestation on the lake has significantly reduced. ◆ Destruction of fishing gears by water hyacinth has significantly reduced. ◆ Beaches are now accessible throughout the year. ◆ Fishermen now record higher fish catches. ◆ Incidence of snake bites are now reduced
9. Sustainability and replicability of the partnership	<ul style="list-style-type: none"> ◆ Partnership is sustainable and replicable in other water bodies based on the success of a participatory approach adopted for Kainji Lake.
10. Key lessons	<ul style="list-style-type: none"> ◆ The participatory approach indicated the usefulness of early involvement of fishing communities in project's implementation. ◆ Close co-operation between partners is possible through this approach. ◆ Participatory approach adopted enhanced social network among fisher-folk.
11. Ideas for activities and initiatives to improve partnership.	<ul style="list-style-type: none"> ◆ Sustained discussion and interaction with all actors involved in the partnership. ◆ Strengthening of the existing institutions and structures for the partnership.

IV. INFLUENCE OF POLICIES, INSTITUTIONS AND PROCESSES (PIPs) REGARDING RESEARCH ON SUSTAINABLE LIVELIHOODS AND POVERTY REDUCTION OF ARTISANAL FISHING COMMUNITIES

1. Policy And Institutional Framework

Fisheries development is promoted by both the Federal and State Ministries of Agriculture under policy guidance of the Federal Ministry of Agriculture and Rural Development. The two major fisheries research institutes (NIFFRI and NIOMR) operate within the purview of the Federal Ministry of Agriculture and Rural Development. The Decree establishing the two national fisheries research institutes, which also stipulates their mandate, was promulgated in 1973 and they came into being in 1975.

Several other public and international organisations are also involved in fisheries research. In addition, Department of Fisheries in some Nigerian Universities, Polytechnics and Colleges of Agriculture and ADPs at the state level undertake fisheries research. International organisations like GTZ, JICA, FAO, DFID and IFAD have all participated at various times in fisheries research and development in the country. NGOs involved in fisheries research are very few and are mostly development oriented, although a few, such as Ala Mama Africa based in Obafemi Awolowo University, Ile-Ife, undertake some level of fisheries research with a major focus on rural fishing communities.

A major framework for fisheries research was the 1992 to 1998 National Agricultural Research Strategy Plan. This regulatory framework was made possible through the National Agricultural Research Project (NARP), a World Bank-assisted project executed by the Federal Government of Nigeria. The strategy plan had a fisheries component with some concern for artisanal fisher-folk and the improvement of their livelihoods.

Until NARP, the principle of demand-driven research and the use of participatory methods have not been well established in the institutes as a mechanism that will ensure downward accountability. Although the institutes engaged in a number of partnerships in the past (as listed in the preceding section), these could not be described as purely demand-driven. They emanated more from the perceived needs of the communities by the research institutes. Factors such as inadequate funding, inadequate research and extension personnel, policy instability and inconsistency impede the capacity of research institutes to adopt this principle.

Government is the major source of finances for agricultural research and funding has been inadequate and unstable. This is more so with fisheries research. Fisheries research, unlike crops and livestock research, for a long time was not given much priority largely due to a lack of appreciation for the contribution it makes to the GDP. In most cases, financial allocation to fisheries research is not only less than 1% of proposed budget but also less than 50% of approved budget is released.

Unstable and unfavourable macro-economic and institutional policies diminished the capacity of research institutes to carry out relevant research. For example, the Structural Adjustment Programme (SAP) introduced in 1986, led to a restriction in the overall credit expansion within the economy, high debt servicing commitment and drastic reduction in expenditure. It also meant rising inflation due to the declining value of the national currency, removal of subsidies on agricultural inputs and petroleum products. This affected the fisher-folk and the research institutes, whose most serious constraints have been inadequate budgetary and funding support. Generally, unfavourable policies, and to some extent,

poor financial management increased the cost of research, precluded acquisition of required research facilities and impaired the ability of research institutes to attract and retain high calibre staff. Research Institutes therefore focused more on core research mandates to near total neglect of the artisanal fisher-folk.

Furthermore, the linkage between the research institutes and other development interventions in rural fishing communities was weak. However, the Poverty Reduction Strategy Plan (PRSP) put together by the Federal Government in 2001 has a major component or initiatives which will focus on policy reforms, input delivery, support services provision, rural infrastructure development, rural institutional development and general investment in rural fishing communities. Additionally, the plan includes the development and promotion of aquaculture and the restocking of lakes and lagoons to increase fish production for the enhancement of the income of the rural fisher-folk. It is hoped that the policy reforms proposed by PRSP would lead to a strategic and institutional framework which will provide synergy for all development interventions.

2. CONTRIBUTION OF FISHERIES AND SOCIO-ECONOMIC RESEARCH REGARDING POLICIES AND PROCESSES

Research has contributed to policy and processes in several ways:

- For instance, NIFFR through research recommended a 3” mesh-size for artisanal fisherfolks living on inland waters. This singular technology led to the draft of Nigerian Inland Fisheries Regulations in 1983.
- Similarly, in collaboration with Federal Department of Fisheries, NIOMR also enforces the restriction order on fishing trawlers not to fish within the first 13 nautical miles of the Nigerian Continental Shelf waters. All these have been entrenched in the Nigerian Inland Fisheries Decree of 1992 and Sea Fisheries Decree of 1992, respectively.
- Also, GTZ in collaboration with NIFFR caused the revision and signing into law the Niger and Kebbi States Fisheries Edict for sustainable management of fisheries resources of Lake Kainji and other water bodies in the States. Additionally, GTZ and NIFFR also caused the establishment of Community Based Fisheries Management (CBFM) approach within fishing communities of Kebbi and Niger States. This is a major institutional change for the management of fisheries resources of Kainji Lake.
- Generally, the linkage between research, public policy and communities that depend totally or partially on fisheries is weak and needs to be strengthened. However, where a common problem confronts the fishing communities, the linkage between research, policy and communities become strong. This was clearly demonstrated on the water hyacinth issue. The Government in an ad hoc policy made money available on yearly basis and community heeded the call for collective efforts to clear the weed. This is still in operation on Kainji Lake. The linkage is usually demonstrated through the mechanism of extension activities.
- A number of other institutions have significant link with policies affecting fishing communities. For instance, the Nigerian Chamber of Commerce, Industry, manufacturing and Agriculture (NACCIMA) with branches in all the 36 states is represented in the meeting of National Council on Agriculture (NCA), the apex policy and decision-making body on Agriculture. FISON, NUFSD and NAFFA also act as strong pressure groups. There are also Local Government Authorities that have direct administrative and developmental control of rural communities. The local people relate directly with these Local Government Authorities and extension agents to air

their views and needs. The local people do not have direct influence on policy per se but when problems abound the Local Government Authorities take them up for remedial action.

- Government fisheries policy making in Nigeria is often over-centralised with Government administrators instead of key fisheries researchers being major actors. Policy making therefore tends to alienate not only the local people but also institutions like research institutes, universities, etc that are key fisheries research providers. This procedure often results in poor perception of roles and responsibilities to fishing communities who are the main targets of fisheries policy.
- The principal obstacles to effective contribution of research institutes to policy and processes are:
 - Inadequate and untimely release of fund
 - Inadequate personnel
 - Inconsistent Government Policies
 - Inadequate Extension Agents
 - Weak or Non-existence of local level organizations
 - Infrastructure
 - Manpower Development

Improvement in Policy Formulation can come through:

- Encouragement of formation of viable village level associations or organisations such as Community Based Fisheries Management Committees (CBFMC) to serve as a platform for linkage between research providers, fisher-folk and administrators. The involvement of the fisher-folk and community-based organisations is essential because legislation or policy decisions from top down are not as effective as community action and control measures.
- Decentralization of policy making process to involve a greater number of stakeholders in fisheries, for example, involving financial institutions in planning and administration of credit schemes
- Increased training of research scientists in the area of Participatory Rural Appraisal (PRA) tools to facilitate demand-driven research delivery to the fishing communities
- Adequate research funding (from public and private sources) is required to enhance participatory mechanisms for the identification of needs and preferences of fisher-folk
- Additionally, as in Ghana, the following are also relevant points of intervention in PIPs:
 - Creation of a national forum for holistic planning of the future of the artisanal fishers
 - Preparation and execution of a national campaign to promote the value of artisanal fisheries to the nation in financial, economic and social terms
 - Development of a national strategy for promotion of alternative livelihoods strategies for fisheries communities to maximize use of human and natural capital
 - Review of the existing fisheries policy

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LIST OF ABBREVIATIONS

APMEU -	Agricultural Project Monitoring and Evaluation Unit
ARCT -	African Regional Center for Technology
CBFMC -	Community Based Fisheries Management Committee
CBO -	Community Based Organization
DFID -	Department for International Development
FAO -	Food and Agricultural Organization
FDF -	Federal Department of Fisheries
FISON -	Fisheries Society of Nigeria
FMAWRRD-	Federal Ministry of Agriculture Water Resources & Rural Development
GTZ -	German Technical Cooperation
GDP-	Gross Domestic Product
IDRC -	International Development Research Cooperation
IFAD -	International Fund for Agricultural Development
JICA -	Japanese International Cooperation Agency
NACCIMA -	National Association of Chambers of Commerce Industry Manufacturers and Agriculture
NAFFA -	National Association of Fish Farmers and Aquaculturists
NARP -	National Agricultural Research Project
NCA-	National Council on Agriculture
NGOs -	Non-Governmental Organizations
NIFFR -	National Institute for Freshwater Fisheries Research
NIOMR -	Nigerian Institute for Oceanography and Marine Research
NORAD -	Norwegian Government International Aid Agency
NUFSD -	National Union of Fishermen and Seafood Dealers
OFAR -	On- Farm Adaptive Research
PRA -	Participatory Rural Appraisal
PIPs -	Policies, Institutions and Processes
PRSP -	Poverty Reduction Strategy Plan
SFLP -	Sustainable Fisheries Livelihood Programme
TED -	Turtle Excluder Device