SMALL-SCALE FISH PRODUCTION, PROCESSING AND MARKETING IN IBEJU-LEKKI LOCAL GOVERNMENT AREA OF LAGOS STATE, NIGERIA

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ABSTRACT

This paper used two methods in evaluating fish production: Processing and Marketing in the artisanal fisheries of Ibeju-Lekki Local Government Area of Lagos State. These are questionnaires and Participatory Rapid Appraisal (PRA). The methods clearly brought out the forms and nature of operation of the different types of fishing methods, the fish species landed and processed, the marketing and distribution channels of the final products. Fish production in Ibeju-Lekki LGA depicts all forms and nature of operation of almost all types of fishing gears in the coastal marine waters of Lagos State, Nigeria. Fishing is done all through the year with varying intensities and the fish produced forms the bulk of the fish processed and sold in Lagos State. The fisheries are organized in such a way that the "organogram" is followed religiously through the rank and file (though informal), from the producer through the processor cum marketer to the consumer. Standard prices also exist for fishes along the distribution chain. About 90% of the fish landed are processed (smoked) and sold by the women folk who combine the functions of the processor and marketer. And about 10% are consumed fresh.

INTRODUCTION

Fishing in Nigeria is one of the oldest occupations especially for coastal dwellers and it could be traced to the same origin with hunting. Certain elements of design and construction employed in the fishing gears are the same as in hunting. For the fish caught to get to distant markets or last the household for more than a day, it is necessary to employ preservation and processing methods.

Fish is a major source of animal protein and an essential food item in the diet of many Nigerians, being relatively cheaper than meat. Much of the fish consumed consists of cheap species such as *Sardinella*, Bonga, moonfish, ilisha, and tilalpia, especially in the coastal and inland rural areas where incomes are generally low (Tobor 1990).

Tobor (1990) also asserted that fish is a highly perishable commodity, worsened by the high ambient tropical temperatures in Nigeria. Artisanal fishery is responsible for about 80 percent of Nigeria's domestic fish production. However, the sector is disadvantaged due to lack of access to ice or refrigerated storage. Therefore, the traditional methods of sun-drying, salting and; smoking are used in preserving fish that cannot be sold fresh, although smoke-drying has been found to be the prevalent form of fish preservation in this sector.
Post harvest losses in the sector is a major problem cutting across fishing, processing and marketing, especially during glut. The losses are estimated to be between 30 and 40 percent (Tobor, 1984). These losses are also a function of the different fishing gears, poor handling, processing and distribution network. It is in view of this that a study was carried out with the following objectives:

(A) The Purse Seine Net Fishery

The Purse seine net fishery is entirely dominated

Table 1: Fish Production at Ibeju-Lekki LGA for 2002 (Catch/kg)

Month	Purse-/seine net	Multifilament Gillnet	Monofilament Gillnet	Total fish production
January	27,430.6	1,140.2	12,167.2	40,738.0
February	25,825.6	1,110.1	12,032.1	38,967.8
March	20,915.4	1,055.9	10,1114.5	32,085.8
April	17,355.3	992.1	10,254.8	28,602.2
May	17,106.1	840.2	7,480.3	25,426.6
June	11,757.9	155.3	5,651.2	17,564.4
July	5,654.2	123.1	3,021.5	8,798.8
August	5,720.3	203.5	3,836.7	9,760.5
September	6,926.8	215.9	4,520.4	11,663.1
October	19,750.6	3,457.1	13,522.9	36,730.6
November	25,072.1	3,159.2	11,788.3	40,019.6
December	30,778.3	3,856.5	14,291.5	48,926.3

by Ghanaian fishermen using Ghana type of boats (simply referred to as "Ghana Boats"), encircling method and outboard engines of about 40 45 hp. The boats measuring between 16.6m and 21.6m in length are virtually imported as all its parts, including woods for repairs are imported from Ghana. The nets varying in sizes are usually about 150m long and 28 35m deep. The major target fishery is usually the pelagic species (Clupeidae) *Ethmalosa fimbriata and Sadinella maderansis.* On board "Ghana boats are usually between 14 and 20 crew members with different functions. The captain is always in charge of the boat whether the boat owner is on board or is represented. If represented however, the representative on return gives a full account of the trip to the owner. He is also responsible for the sale of the catch.

(b) The Multifilament Gill Net Fishery

Nigerians, mainly indigenous Yoruba dominate this type of fishery. The boats used are smaller than the Ghana types (length between 8.3 and 9.3m) using 20 25 hp Yamaha outboard engine. The crew, usually between two and three men also targets Clulpeidae. All the components of the boat are locally purchased in Nigeria. The fishing method is bottom set gill net, which is usually about 91m long.

(c) The Monofilament Gill Net Fishery

The indigenous Yorubas operating locally dugout boats of about 5.3m long and without outboard engine also dominate the monofilament gill net fishery. The mode of propelling the boats therefore is by the use of paddles. The crew usually of one or two men depends on the presence of trawlers for fishing. It is the sound of the trawlers, which scare fishes that facilitate their catch. The length of the net used here is about 3m.

Seasonality of Fishing Operation

Though fish production takes place throughout the year, it is seasonal with its peak during the dry season when the sea is calm and warm. During this period, fishermen were seen hustling and bustling and are rarely available for other

activities. During the slack season however, fishermen become idle (forced leave) and hardly in alternative enterprise(s) like farming. All other livelihood groups are affected by this inactivity, but the women fish processors sometimes engage in trading. Table 2 is a presentation of the seasonal variation in fishing.

(a) To obtain information from stakeholders in the sector on the mode of fishing methods, processing and marketing of the products.

(b) To provide useful information for policy makers and planners in a bid to assist the stakeholders in the sector.

STUDY METHODOLIGIES

Two methods were tested on the field, the questionnaires and Participatory Rural Appraisal (PRA). These two methods were designed to generate background information on the fishing methods, processing and marketing of fish in Ibeju-Lekki LGA of Lagos State, using Orimedu, Magbon-Alade and Idasho study sites. There was dearth of specific information on the subject in the area and this was the major reason for selecting the community for this study. However, secondary sources of background information were gathered through library search for papers in journals, texts and reports. Semi-structured interviews were conducted with the stakeholders fishermen, processors and/or marketers, fisheries organization, institutions and NGOs involved in fisheries.

RESULTS AND DISCUSSION

Fish Production

Three methods of fish production presently exist in the three fishing communities studied. These are Purse seine net, Multifilament gillnets and the Monofilament gillnets fisheries. In the early period of fishing, precisely up till the 1970's when outboard engines were introduced, the use of hook and lines, set nets and encircling net methods were predominant. The hook and line method involved fishing with baited hooks while the set or encircling net methods involved setting the net in an area suspected to be good fish abode and pulling the net in a circular form to gather the fish and "harvest:. The activities of the fishermen terminate at the beach on handing over their landing to the women. Taking over fish from the fishermen is based on the arrangements made by the fishermen or boat owner. Paramount in the mind of the fisherman is that the quantity of fish he lands is very clear to him before disposal and his subsequent departure to sea for another fishing trip.

Fish landing is a very strenuous task for fishermen. In addition to the sandy beach (landing sites) which makes it almost impossible for boats to anchor, the usually rough nature of the beach makes the discharge of catch difficult. Thus catch is discharged in the middle of the sea where it is a little restful. Table 1 shows the quantity of fish produce over a period of one year (January December 2002), using the different fishing gears in Ibeju-Lekki LGA.

Table 2: Seasonal Calendar for Fishing Operation for all Types of Gears

Month	
January	Peak period for sawa fishing (Sardinella maderensis)
February	Peak period for sawa fishing " "
March	Low fishing for all species
April	Low fishing activities
May	Peak period for bonga fishing (*Ethmalosa fimbriata)*
June	Peak period for bonga fishing " "
July	Very low fishing (rough sea), sharks more available
August	Very low fishing (rough sea, sharks more available
September	Fishing of bonga commences
October	Fishing for bonga continues
November	Peak period for sawa fishing (*Sardinella eba)*
December	Peak period for sawa fishing (*Sardinella eba*)

Where the monofilament gill net boats depend on trawlers for fishing, there are two fishing periods per day for the purse seine net and multifilament gill net boats. While the morning trip lasts between 3.00am and 9.00am. the afternoon trip is between 6.00am and 4.00pm. the distance to the fishing ground is usually covered within 30 minutes of sailing. During the slack season, few fishermen (mainly Ghanaians) migrate with the fish but others are forced to resume "seasonal unemployment" as they rarely engage in other economic activities. Boat operation is either by direct owner fisherman or hired. The source of fund is either through the personal effort of fisher folks themselves or from informal self-help groups. Sometimes, technical advices are obtained from the Lagos State Agricultural Development Programme and international NGOs like UNDP, UNIDO, DFID and IFAD.

Fish Processing and Packaging

(a) Fish Processing Methods:

Fish processing methods are predominantly the same in the three communities studied.

Table 3: Commonly Processed Fish Species at Ibeju-Lekki LGA

Scientific Name	English Name	Local Name
Sardinella maderensis	Flat Sardine	Sawa
Ethmalosa fimbriata	Bonga	Agbdo
Illisha africana	West African Shad	Palamu
Pseudotholitus senegalensis	Croaker	Apo

The fish is ready for smoking after cleaning and washing (using well water). The equipment used is either round or rectangular mud oven or galvanized plate oven. The galvanized plat ovens are made of iron sheets or disused 44-gallon drum supported by planks. Wooden sticks are arranged on the drums to hold fish but are gradually being replaced by iron rods. The women fish processors maintain the mud/drum ovens in what is called fish (smoking) houses. Each "house" accommodates between three to five ovens depending on size. They also maintain wells from which water is fetched for cleaning the fish. Over 90% of fish landed are smoked while the rest is either sold or consumed fresh.

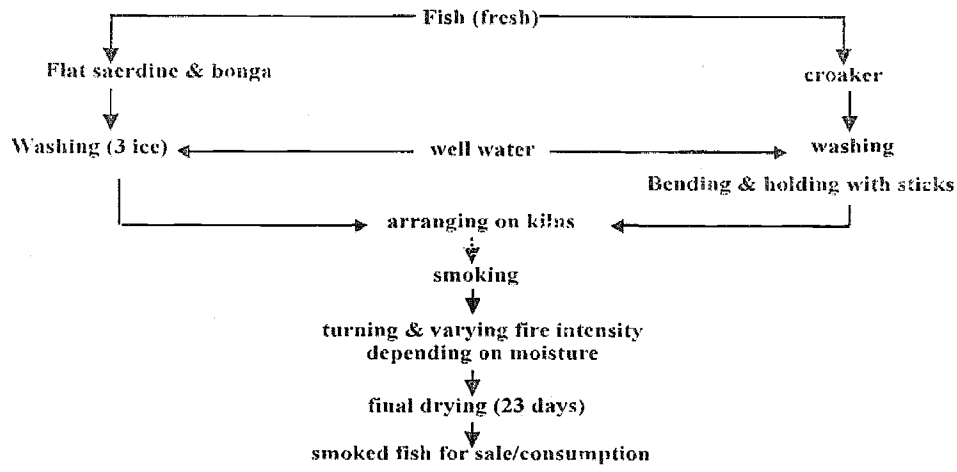

Figure 1: Flow Diagram for Fish Processing

The duration for dry smoking to achieve excellent dryness of fish is usually between 1 3 days and wood is the main source of energy for smoking. Some woods are preferred as the quality of fish depends on the type of wood used (Gaye et al 998). The smoked fish can last for upwards of five months devoid of insect infestation, having been preserved by dispensing whole dried pepper among the lot. Fish processing/smoking remains the main duty of the womenfolk assisted by their children.

(b) Fish Packaging and Storage

Smoked or processed fish is usually left (stored) on the smoking kiln with small dried pepper dispersed on them. When the kiln is required for use, the smoked fish is then packaged and stored in baskets covered with Hessian sacks. The baskets are made from raffia palm.

Fish Marketing

Fish marketing, whether fresh or smoked is carried out predominantly by women. It commences from the landing site when the fish changes hand from the fishermen to their wives, landladies/landlords' wives, mothers or concubines. Usually, fish is sold on the basis of "cash and carry" which negates the operative system when fresh fish could be bought sometimes, on credit. Such credit purchases are inimical to the progress of the fishermen who are constrained to go to sea due to lack of funds for fueling, repairs and food.

During slack seasons, fish processors await their customers (who buy in bulk). But fish is taken to the market for sale during glut, as processors/marketers could no longer wait patiently for their customers. The major markets include Oju-Olobun, Iddo and Otto fish markets. Others are Mushin, Mile 12 and Ikorodu fish markets all in Lagos.

The fish marketing/distribution chain which, exists in Ibeju-Lekki LGA though informal, is well arranged in such a pattern that has stood the test of time. Figure 2 is a typical marketing/distribution chain observed during the study period.

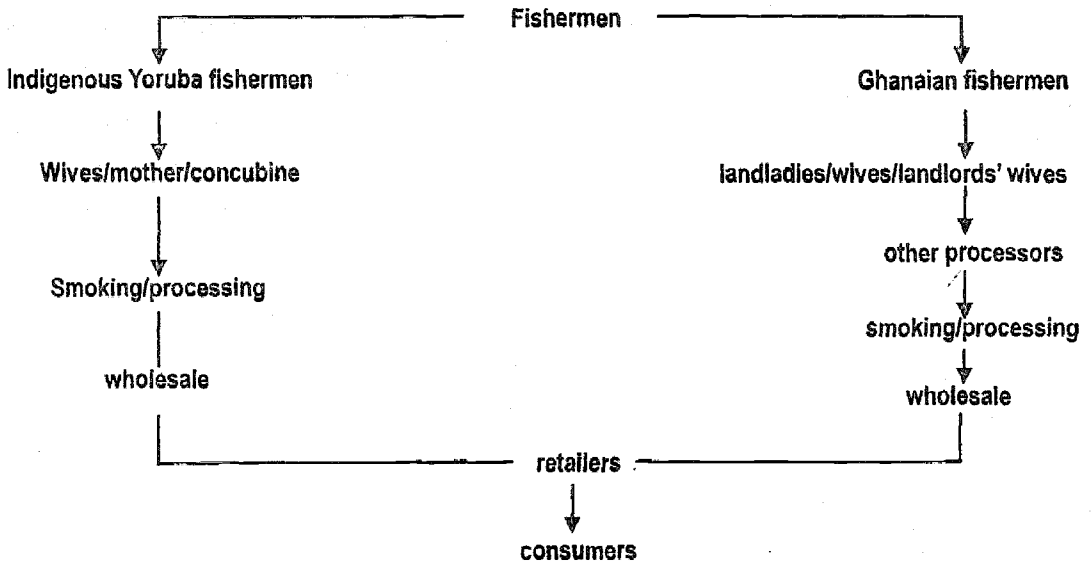

Figure 2: Fresh/Smoked Fish Marketing Channel

CONCLUSIONS AND RECOMMENDATIONS

Gender differentiation in fishing activities in the Ibeju-Lekki LGA is obvious. While males dominated fish production, the aspect of fish processing and marketing was predominantly female affair. Each residential building had an attached fish-smoking house. The roles of children were mainly in assisting their parents in fishing, construction of smoking infrastructure and processing of fish.

Disposal of fish is not a major problem except during glut when fishermen sell on credit and the processors have to dispose of their smoked fish early enough, sometimes on credit too, to give room for the processing of more fish. During this period of glut, outright burial of spoilt fresh fish is a common sight. This is due to delayed landing, absolute absence of icing at sea, lack of refrigeration facilities and inadequate smoking infrastructure to cope with the glut.

The Lagos State Agricultural Development Programme (LSADP), as the fishermen put it, "in its early stage was of immense assistance in the area of inputs subsidies and technical advice, operation and repair/maintenance of outboard engines". The "Magbon-Alade fish smoking kiln", designed by the Nigerian Institute for Oceanography and Marine Research for mass smoking of fish was to tackle post harvest loses due to spoilage of landed fish which could not processed immediately, especially during glut. The communities accepted the equipment, but were limited by costs.

This study showed that the three communities lack formal cooperative societies and this makes accessibility to bank credit a mirage. It was revealed that there was no known case of a fisher folk-beneficiary of bank credit in the communities. Individuals source for financial assistance from informal sources (which are often not enough) to be able to remain in the fishing business. There were no cases of insect infestations of smoked fish during this study and water for processing was not a problem because they had dug-wells that supply the households. However, the processors asserted that during heavy rains, well water was not clean enough to wash fish, as it would have been mixed up with floodwater. Also, there were periods of insect infestations (in the past), which could destroy ready smoked fish in which case such product had to be returned to fire for further smoke drying.

From the study, it is obvious that the communities lack refrigerating facilities for preserving fresh fish until when required for smoking. /they also lacked potable water, clearing market for finished products and formal credit to purchase appropriate inputs for sustainability.

Amadi (1989) established the importance of the artisanal fishery sector in the Nigerian economy, it becomes imperative on government to subsidize fishing inputs, provide potable water, good access road, reliable electricity supply and credit facilities at controlled low-level interest rate for the fishery sector. The need for a co-operative form of clearing market for smoked fish and the enabling environment for NGO's participation towards further improvement of fish production need to be over emphasized.

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