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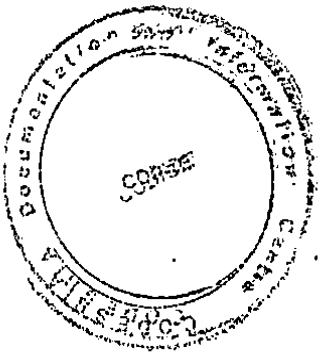
Economic analysis of crayfish production; processing and marketing amongst rural women in rivers state, Nigeria

JULY, 1995

ECONOMIC ANALYSIS OF CRAYFISH PRODUCTION, PROCESSING AND MARKETING AMONGST RURAL WOMEN IN RIVERS STATE, NIGERIA.

A THESIS
SUBMITTED TO THE COUNCIL FOR
THE DEVELOPMENT OF SOCIAL
SCIENCE RESEARCH IN AFRICA.



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CERTIFICATION

Joy Ngozi Williams, a Postgraduate Student in the Department of Agricultural Economics and with the Registration Number PG/M.Sc/92/13462 has satisfactorily completed the requirements for the degree of Master of Science in Agricultural Economics. The work contained in this thesis is original and has not been submitted in part or full for any other diploma or degree of this or any other University.

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Date

Date

DEDICATED to MY BROTHER,
MR EMMANUEL O. WILLIAMS.

ACKNOWLEDGEMENT

My immense gratitude goes to my Supervisor, HRH Prof. Dr. Emea O. Arua whose fatherly guidance, co-operation and encouragement led to the successful completion of this study.

Also my thanks go to all Members of Staff of the Department of Agricultural Economics particularly Dr. E.C. Okorji, Ag. Head of Department; Dr. SAND Chidebelu, Dr. Noble Jackson Nweze and Mr. Oji Kalu for their various assistance and guidance throughout the duration of my programme.

Moreover, I am very grateful to CODESRIA for funding this work through the Small Grants Programme for Thesis Writing, 1994.

I am also grateful to Prof. J.U. Okorie of the Department of Agric. Education, Prof. R.O. Ogbuji of the Department of Crop Science, Mr. Obilor of the Department of Agric. Extension, Dr. S.C. Chuta of the Department of English, and Rev. E.J. Phillips for their guidance.

A special note of appreciation goes to the following people: Mr. Jonah E. Charlie, Mr. Dawani Fiberesima, Mr. E. Coller, Mr. Christopher Ebi Okus and Fontunatus Olali all of the Port Harcourt City Council, Isaac G. Kalio,

of University of Port Harcourt Teaching Hospital, Dr. I.O. Johnson, Ngeribika's family in Okrika and Mr. A.G. Chamabila of Okrika Local Government Council.

I also wish to express my deep and sincere appreciation to my friends; Mr. Chukwudi Obi, Patterson "Mr P", Emeka Chuta, Ngozi Ifemedebe, Ben Okpukpara, Donna B. Anyaeze, Abraham Ngwuta, Onyema Ogbuji, Mgbechi Ogbuji, Ezenwanyi Ugiri, "Itogo" E. Okporlo and Chinedu Ogbonnaya for their care and friendship. To Mr. Emeka E.J. Iweala, I remain ever grateful for his love.

I wish to acknowledge with thanks the wonderful job done by Mr. J.O. Ezeala-Nwagu in typing the manuscript of this study.

Finally, I am grateful for the patience, love and encouragement shown to me by my brother, Mr. Emmanuel O. Williams and the rest of the family. To everyone who has contributed directly and indirectly to the successful completion of this work, I say, "Thanks!"

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April, 1995

ABSTRACT

Women have contributed significantly in Agriculture and the country's economy in general, but the contributions have remained largely unmeasured. As a result, this study examined the economics of crayfish production, processing and marketing amongst the rural women in Rivers State.

Primary and secondary data were sought for the study. Three sets of questionnaire were developed and contacts were made with the producers (fisherwomen), wholesalers and retailers in the twelve Local Government Areas that make up the riverine areas of Rivers State namely; Akuku-toru, Andoni-Opobo, Asari-toru, Bonny, Brass, Degema, Ekeremor, Ogbia, Sagbama, Southern Ijaw, Wakrike and Yenegoa.

Information were collected from one hundred and twenty (120) respondents who were randomly selected from the twelve (12) purposively chosen Local Government Areas. One set out of the three sets of questionnaire was administered to sixty (60) craryfish fisherwomen. The remaining two sets of questionnaire were directed to thirty-six (36) Retailers and twenty-four (24) Wholesalers of crayfish respectively in twelve (12) markets in the twelve (12) chosen Local Government Areas.

Gross Margin analysis and simple statistical tools such as Mean, frequency range and percentages were used to realise the specific objectives of the study.

From the results obtained, it was found that women in the riverine areas of Rivers State dominate the crayfish catching operations as well as the processing and marketing of crayfish.

Further analysis of the data collected, revealed that Crayfish production is a profitable venture amongst the rural women studied. The study showed that a fisher-woman earns an average of ₦9,635.55 kobo from an average of 120 kilograms of crayfish monthly after taking care of expenses.

For the marketing aspects, the results obtained showed that the average marketing margin for crayfish sold under the period of study (January 1993 - December 1993) was ₦11,103.20. This represents an average fisher-woman's share of 38.10% with a corresponding average retail price of 61.90%.

Furthermore, it was found from analysis that 13.10% of the marketing margin or 8.43% of the retail price covers all the costs incurred by the middlemen for crayfish in the study area. 86.90% of the marketing

margin or 56.87% of the retail price represented the middlemen's net profit. This suggests that the middlemen were making outrageous net profits.

The study revealed that the women involved in crayfish catching, processing and marketing in the study area lacked capital, extension services, storage facilities and were suffering high cost of transportation from boat drivers.

Based on the findings of the study, the following recommendations amongst others were made as follows:

1. Provision of extension services to the fisher-women by the federal and state governments;
2. Supplying of fishing gears such as nets and canoes to the fisherwomen at a highly subsidized rate by the federal, state and local governments;
3. Reduction in the number of middlemen in crayfish distribution by the fisherwomen through organizing themselves into cooperatives; and
4. Provision of storage facilities to the fisherwomen by the federal and state governments.

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CHAPTER ONE

INTRODUCTION

1.1 Background Information:

According to Dada and Guanadoss (1983), Nigeria is the largest consumer of fish and fish products in Africa. As a result, development plans of the Nigerian Government have recognized the importance of the potentials of the fisheries sub-sector of the economy.

The fishery industry in Nigeria can be categorized into commercial fishing and artisanal fishing. The commercial fishing or industrial fishing is composed of coastal trawling, shrimping, distant-water trawling and tuna fishing. On the other hand, the artisanal fishing is divided into coastal canoe fishery, brackishwater fishery, freshwater fishery and fish farming or aquaculture (Oyeleye, 1982).

Generally, artisanal production from coastal and brackishwater, inland rivers and lakes dominated the activity in the Nigerian fishing industry. Scheid and Sutineu (1979), observed that in many developing countries, large part of domestic fishery production is handled by the small-scale or artisanal fishery sector. Moreover, the weight of evidence recently available from different developing countries is that their artisanal fisheries

are basically the more economically viable and socially desirable, particularly with respect to the exploitation of the highly productive coastal ecosystems (Food and Agriculture Organisation, 1983).

In Nigeria, the Federal Department of Fisheries, estimated about 85 per cent of the inhabitants of the Coastal belts of the country as being gainfully employed by the Fishery Sector (Federal Department of Fisheries, 1980). Apart from providing employment, the artisanal fisheries also have other social benefits associated with them. These include the provision of cheap protein within the reach of the masses with lower purchasing power, the extensive use of locally available resources and indigenous skills.

Artisanal fisheries are also economically important in the sense that the boats and gears used are locally produced, easily repaired with local parts, and represent a low capital investment (National Research Council, 1988).

Of interest to fisheries in Nigeria and Worldwide is "Crayfish" which in Nigerian context, comprises mainly of prawn, shrimp, lobster and crayfish. Generally, these species are in the Crustacean family with the scientific name Decapoda natantia (Holthius, 1980).

In Rivers State of Nigeria and its environs, prawn, shrimps, lobster and crayfish are locally known as Opuro for the larger types and Ayiya for the smaller types. Because of the existing confusion in the use of the names "shrimp" and "prawn", Holthius (1980), drew attention to this problem. The term "prawn", he pointed out is usually employed for the larger forms that are more literally compressed and have a well-developed rostrum. On the other hand, "shrimp" is commonly used for the smaller forms often dorsoreventrally depressed and with a poorly developed rostrum.

In this work, the term "Crayfish" will be used to represent prawn, shrimp and lobster. This is as a result of the fact that prawn, shrimp and lobster are popularly known as "Crayfish" in Nigeria.

According to Idyll (1970), prawn, shrimp, lobster and crayfish are rich in the nutrient materials essential for the human diet. Some types are especially high in protein, and this is significant since hunger involves not only shortages of calories but critical shortages of protein, and especially animal protein (Ensminger et al, 1986).

Crayfish production in Nigeria is mainly carried out under the artisanal fisheries and women are mostly

involved in its production activities in the freshwater and brackishwater fisheries. Traditionally, fishing was regarded as almost exclusively a male job. However, studies have shown that women have an important part to play in agriculture as a whole. This can be seen glaringly in the production, processing and marketing of crayfish in Nigeria which are now stimulating enterprises.

Uwakah and Uwaegbute (1982) observed that women no longer regard any of the farming activities or operations as too tedious or strenous for them to perform. This is also applicable to fishing activities or operations. Crayfish fishing, processing and marketing are mainly women's operations in the riverine areas of Rivers State and no doubt in other places in the coastal regions of the country.

These activities performed by women are manifestation of the socio-cultural and economic changes that have placed women as self-reliant instead of being dependent on their husbands. The role of women in agriculture should be recognized worldwide and there is the need to adopt more benefitting policies on women. This will no doubt, increase their contribution to the national economy. In the words of Kachingwe (1986), "if more efforts were put into improving the role of women in

agriculture, their integration into national development would be accelerated".

1.2 Problem Statement:

Maurice (1989), in his study, noted that in Africa and Nigeria in particular, women are responsible for, in some cases, up to 90 percent of food production, processing and marketing. Olayide et al (1980), in a separate study, pointed out that the women folk constitute an important live wire of small peasant farming in Nigeria. Moreover, the rural dwellers and women in particular are predominant in the economic activities surrounding food production, processing and marketing in Nigeria.

The problem then, is that despite the fact that the bulk of the food needs of the Nigerian economy comes from the women in the rural areas, their contribution has remained largely unmeasured and under-rated. This could be seen to be the case in the areas of crayfish production, processing and marketing in the country.

The role of women especially in the catching of crayfish has been taken for granted and could be as Chikwendu (1980), rightly pointed out, that these women are being systematically discriminated upon. But, Adebusoye (1980), noted in his work, that there is a series of inimical loss of potential to a country's growth, which is inherent

in any policy that neglects the role of women in agriculture and food production.

Hence, in a bid to bridge the gap between the role of women in agriculture and the existing data, this study will help to bring to light the activities of women in crayfish production, processing and marketing in Rivers State.

The study will examine the socio-economic traits of these rural women. It will also determine the costs incurred and the revenue generated from the production, processing and marketing of crayfish by the women. Furthermore, the problems associated with the prevailing methods of crayfish catching, processing and marketing amongst the rural women in the study area will be identified and ways of tackling the problems, will be suggested.

1.3 Objectives of the Study:

The broad objective of this study is to analyse the economics of crayfish production, processing and marketing amongst rural women in Rivers State.

The specific objectives are to:-

1. examine the socio-economic characteristics of the rural women involved in crayfish production, processing and marketing in the study area;

2. describe the systems of crayfish production, processing and marketing prevalent in the study area;
3. determine the costs and returns of crayfish production amongst the rural women in the area of study;
4. determine the size of the marketing margins accruing to the middlemen involved in the crayfish marketing channels in the study area;
5. identify problems and prospects of crayfish production, processing and marketing in the area of study; and
6. provide recommendations based on the findings.

1.4 Justification of the Study:

Enwezor (1984), observed that the small-scale agricultural activity of the rural women is more vital in ensuring food security in Africa than the large-scale mechanised food production.

In Nigeria, most of the rural women are gainfully self-employed and are contributing immensely to the development of agriculture in the economy. The rural women in the riverine areas of Rivers State are not left out in this effort to meet up with the increasing demand for food. This effort is in the area of making crayfish available for consumption.

It is obvious that crayfish is an important source of protein in the Nigerian diets as virtually every food being prepared needs the addition of crayfish. But Ensiminger et al (1986), pointed out that most people do not eat enough of crayfish to contribute significantly to their diets. This could be due to the ever-rising price of crayfish in the Nigerian markets.

At present, information on the economics of crayfish production, processing and marketing by the rural women has been scanty. Few people know the fact that the rural women domindte the operations in catching and marketing of crayfish in some parts of the country.

As much has not been written on this aspect of women's activities in agriculture, there is therefore, the need for a study to be carried out. It is hoped the findings of the study will help to highlight the activities of the rural women in crayfish production, processing and marketing. Moreover, the study will make the Nigerian governments to appreciate the contributions of these women and hence seek better ways of encouraging them in their production and marketing activities thereby increasing their productivity.

It is hoped the information gained from this study will be useful to students, consumers, traders, planners, Ministry

of Agriculture and Natural Resources, and to other researchers interested in carrying out further studies on crayfish production, processing and marketing.

CHAPTER TWO

LITERATURE REVIEW

2.1 Review of Some Studies on the Artisanal Fishery:

According to Grofit (1981), the term "artisanal" is usually applied to any small-scale, mostly fishermen-owned, low capital operation, as opposed to industrial, large-scale, company or group-owned high-investing fisheries.

Food and Agriculture Organisation (1983), reported that small-scale and artisanal fisheries in many in-shore tropical locations have shown better performance than the industrialised fisheries with respect to economic returns, social benefits and continuity of production. Generally, artisanal production from coastal and inland rivers and lakes, dominates activity in the fishing industry in Nigeria (Ojo and Inang, 1984).

Coastal fishery which is common among the fishermen in Nigeria, refers to a fishery operating over or near the continental shelf on fishing grounds which may be reached in a few hours almost from the harbour or beach on which the vessel is based and which do not imply a prolonged stay at sea (Grofit, 1981).

Nigeria, though a coastal country, does not have a very large seaboard in relation to its area. As a result, the production of fish and sea foods from inland waters is considered very important in the economy in order to sustain the supply of fish and sea foods to other centres of the population very far from the sea.

Nigerian fisheries differ from State to State both in mode of production and by socio-economic aspects, and more by the net returns. In inland States, capture fisheries are carried out in the freshwater rivers, lakes and streams. The Maritime States are on the other hand, characterised by both marine and inland fisheries (Nwachukwu, 1987).

In 1980, 523,127 metric tonnes of crayfish were reported to have been produced by the artisanal sector of the Nigerian fishery (Federal Department of Fishery, 1980). Similarly, in a separate study, Fadayomi (1984), noted that the artisanal fisheries of Nigeria contributed about 66.3 per cent of total domestic fish production in 1983.

The rural women in Nigeria form an integral part of the artisanal fishery and are actively involved in the production of shrimp, crayfish, lobster and prawn. According to Borgostorin (1961), the tapping of the wealth

of the ocean is very necessary for the survival of human race. Though the women are contributing in meeting the food needs with respect to crayfish and other essential sea foods, their contribution is yet to be recognized by the governments in Nigeria.

This case is also applicable to the artisanal fishery in Nigeria. Though there are about 15 million traditional small-scale fishermen in the Third World as a whole, government policy often tend to concentrate resources in modern, large-scale, commercial fisheries that earn foreign exchange. Thus, the small-scale fisherman finds it difficult or impossible to obtain credit, extension service, marketing assistance or similar aid from development programmes (National Research Council, 1988). The problems nothwithstanding, the artisanal fishermen are always in fear of trawlers and other motorised fishing craft. When the fishermen are not competing with the trawlers, the trawls may rake up everything in water or destroy gears (nets, traps, buoys, etc.) set by them (Food and Agriculture Organisation, 1993).

Working on the artisanal fisheries of El Salvador, Fuentes (1976), indicated that the typical artisan fisherman has limited economic resources. In a separate

study in Costa Rica, Castro (1976), described the artisan fisherman as faced with lack of credit, exploitation by middlemen and lack of organized markets. Concerning the importance of an integrated to small-scale fisheries and rural development, Food and Agriculture Organisation (1983), made use of the approach of combined use of criteria related to socio-economic viability, ability to provide food at low costs, and energy efficiency to emphasize the importance of artisanal fishery. Hence, more emphasis is being put on the role of small-scale production in coastal areas, since this generally results in shorter marketing circuits with production costs that are accessible to local markets and to consumption by low-income groups.

Finally, Marr (1982), suggested that in any rural development strategy for small-scale fishermen, the fishermen's participation is essential in implementing the management strategies especially in the artisanal fisheries of the developing countries. The shortages in world protein especially in the developing countries have given added impetus to the development of artisanal fisheries in these areas. The Federal Government of Nigeria should not fail to recognise the importance of the small-scale fishermen and women who are contributing

greatly in making more protein available to the entire populace.

2.2 Review of Some Studies on Crustacea (Prawn, Shrimp and Crayfish):

Syme (1966), defined the term "Crustacea" to include lobsters, crayfish, prawns and shrimps. According to Rubash (1990), lobster, shrimp, prawn and crayfish are among the members of the family, Crustacea, which have been prized for their delectable and flavourful meat.

Generally, the Crustacean family are known to have about 21 grams of protein, little fat and some important minerals (Bender, 1975). Couture (1971), recognized crayfish, prawn and shrimp as important potential resources which can be sold locally, fresh, cooked, frozen and salted, peeled or whole. Lin (1955), in a separate study, identified so many species of prawn and shrimp as being of great economic value to the country of North China.

Longhurst (1970); Suselan (1976); Kurian and Sebastian (1976), also identified in separate studies carried out in Rem, Madagascar, Panama and Costa Rica respectively, that different species of prawn and shrimp are of interest to fishery and also are commercialisable. Bardach et al (1972), noted that shrimp and prawn are sold frozen, cooked,

dry, canned and exported to all parts of the world from Mexico and hence, have great economic value.

Omori (1975), in his work, reported that shrimp is of importance in the Phillipines and Thailand. He further mentioned that it is exploited along the South Coast of China where the demand for it is very high. Lai-Shing (1972) is also of the same view that shrimp is of commercial importance, especially in Japan.

In Nigeria, a total of 5,416.00 tonnes of shrimps were reported by the Fishery Statistics to have been caught between 1971 and 1979 (Federal Office of Statistics, 1980). Raitt et al (1965 and 1966), carried out studies on prawn fishery prospects in Nigeria and concluded that prawns are commercialisable and of high economic prospect. The economic potentials of prawn in Nigeria was also confirmed in a preliminary report on the prawn resources of Nigeria by Bayagbona (1962).

Due to the importance of prawn, crayfish and shrimp in all parts of the world, studies have been centred on how they can be cultured. Forster (1972); Meyers et al (1972); Henieu (1981); Meyers and Zeni-Eldin (1973); New (1976), have found in separate studies that the aquatic Crustacea are of worldwide interest, hence the need for their culture and diet formulation.

Finally, Racek (1973), noted that shrimp, prawn and crayfish are of commercial importance to any country. When in abundance, he pointed out, they are considered to be able to support an organised fishery and thus, help in increasing the protein in-take of any nation.

2.3 Review of Women's Role in Agriculture:

Economically, one of the outstanding features of African women is their full involvement in subsistence production and in supplying food to their families. As observed by Kisekka (1981), in Africa, women contribute up to 60-80 per cent of agricultural labour on their small-scale farms.

Maurice (1989), noted that in Africa and Nigeria in particular, women are responsible for up to 90 per cent of food production, processing and marketing. Meanwhile, Clark (1985), and Agbalaka (1989), are of the opinion that women make up 47 per cent of Africa's Agricultural labour force. Boserup (1970), identified in a separate study, the immense role of women in agricultural production. She concluded that more women than men are engaged in agricultural activities; hence, women have been found to contribute around 70 per cent of the total of agricultural production.

Women in Africa form an indispensible part of human resources for development. Adeyokunnu (1984), posits that women are responsible for 10 per cent of local food processing and domestic chores, 70 per cent of food production, 60 per cent of marketing and 80 per cent of food storage. Olayide et al (1980); Archaya and Patkar (1985); Okorji and Okereke (1988); Kafor (1991), are all of the view that women play a significant role in the production, processing and marketing of agricultural products.

Similarly, Azikiwe (1992), sees rural women as food producers, processors, transporters and marketers. The women therefore, possess the potential resources for rural and national development. Enwezor (1984) is of the opinion that the rural small-scale agricultural activities of the rural women are more vital in ensuring food security in Africa than the large-scale mechanised food production.

In his work, Callear (1983), remarked that main stream of national development for African countries flow directly through the initial agricultural sector in which women provide the largest part of the labour force and the managerial skills. He pointed out that diverting this main stream from its logical path by ignoring women's contribution, will definitely lead to stunted growth in

any economy. Moreover, Yolah (1989), underlined the essential roles of women at the Press Conference on "Africa"s Economic Crisis". He stressed that any policy of specific action toward increasing Africa's food production, has to focus on and support Africa"s women.

Burton (1982); Laufer (1985); Conghenour and Swanson (1983); and Pala (1979), in different studies, remarked that women"s labour in agriculture is so vital that no country can survive without it. In spite of the contribution by the women to agriculture, the national development planners often tend to pay little or no attention to them.

As Azikiwe (1992), rightly pointed out, any nation that underestimates the participation and contribution of the rural women to agriculture and food production, is bound to experience a snail speed development.

2.4 Processing and Marketing in Agriculture:

According to Imo (1990), processing involves the transformation of the raw food into other foods in which it can be eaten or stored. It improves the acceptability, palatability and digestability of the products. On the other hand, marketing in agriculture consists of all processes and services that are involved in the movement of farm

produced foods and raw materials and their derivatives from the farm to the final consumers (Eluagu et al, 1989).

Francis (1983), feels that marketing encompasses exchange activities conducted by individuals and organisations for the purpose of satisfying human wants. He further pointed out that the job of a marketer is to identify human wants and needs, design a suitable product price, communicates and makes the product accessible to the ultimate consumer. Baker (1981), defined marketing as a process of determining consumer demand for a productive service; motivating the sales and distributing it to the consumer at a profit.

Furthermore, Kohl (1961), viewed marketing as the performance of all business activities involved in the flow of goods and services from the point of initial agricultural production until they are in the hands of the ultimate consumer. Abbott and Makeham (1979), are of the opinion that marketing includes basic activities associated with the flow of goods and services from the production to consumption. Fowler (1961), viewed marketing as a vital part of the broad field of production with one major function of matching up areas of production with areas of consumption.

Processing and marketing of agricultural products are very vital. In terms of processing, Agada (1991), observed that the major risk of agricultural production in developing countries is the perishability of the products. In most cases, in the developing countries, the storage facilities for these perishable products are lacking and moreover, processing is minimal.

Olayemi (1974), noted that the seasonal price fluctuations and other market price disparities and deficiencies can be linked with problems of inadequate storage facilities and poor market information. Hall (1969), in his study, stressed that storage and marketing of staple foodstuffs if carried out efficiently, would be a major contribution to the solution of world hunger.

Anthonio (1971), observed that one of the most serious problems in marketing of staple foodcrops in Africa is the lack of efficient and adequate storage facilities. Similarly, Momoh et al (1986), and Onita (1986), reported the pathetic situation in Nigerian markets where several farm products are seen to rot away. This regretable situation is as a result of lack of processing and storage facilities and techniques.

In terms of supply of utility to farmers, the subsequent activities of storage and processing would

appear just as important as the original production of any product (Livingstone 1965). Hall (1969), stated that the ability to store efficiently and economically, provides the means whereby the rate of flow into the market can be adjusted and economical transporting of produce improved. Aboaba (1979), reported that in developed countries, efficient storage and processing of food have been recognized as major factors in the solution of food problems. In Nigeria and other developing countries, it is still a problem that its solution is yet to be found.

In less developed countries, the farmer hardly expects to receive right prices for his products because of the marketing risks associated with the purchase of his products as these products lacked quality control. Adegeye and Dittoh (1985), noted that the market structure refers to certain characteristics of the market which are believed to influence its nature of composition and the process of price formation.
In the Philipines, the market structure for fish has been analyzed in terms of the degrees of concentration of sellers and buyers, product differentiation, and conditions of entry and exit (Navero and Librero, 1976; Gurrero and Darrah, 1975; De la Cruz and Lizarrondo, 1978; Lizarrondo et al, 1979; and Pransey et al, 1979).

Effective marketing channels in Europe and America have been attributed to effective development of the fisheries and processing of fish products in these countries Franklin et al (1980). According to Tobor (1984), there are no separate markets for food fish in Nigeria except those maintained by industrial fishing companies in their premises. As a result of lack of efficient facilities for processing and storage, the fishermen sell fish in fresh conditions directly to consumers or through a long chain of middlemen.

Martinez (1976), pointed out that the marketing of artisan fish product is a small-scale operation involving numerous individuals which often results in inefficient operations. Market access to artisanal fishermen is impeded by lack of credit, lack of processing facilities, transportation and capital. Moreover, the small-scale fishermen's lack of organisation precludes them from influencing the market. Hence, the unavoidable dependence on middlemen for the means of marketing is often a great liability (National Research Council, 1988).

However, with government support for improved transportation, storage and processing facilities, the risks suffered by the artisanal fishermen and women would be greatly reduced.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Study Area:

The study area was limited to the riverine areas of Rivers State as a result of the availability of inland fishing waters.

Rivers State occupies an area of about 50,000 square kilometers. It lies between latitudes $40^{o}17^{1}$ and $5^{o}N$ and longitudes $5^{o}22^{1}$ and $7^{o}31^{1}E$. The State is bounded by Abia and Imo States in the North-East, Delta State in the West, Akwa Ibom State in the East and the Atlantic Ocean in the South. The population of the State is 3,983,857 (Federal Republic of Nigeria, 1992) (See Fig.1 and II).

Rivers State's vegetation is characterised by Mangrove forest in the South and thick forest with arable land in the North. Fishing and farming are the main occupations of the people. The State has twenty four (24) Local Government Areas and is divided into riverine and upland areas based on its natural features.

There are twelve (12) Local Government Areas in the riverine areas of the State where the study was based. These Local Government Areas are the following:-

1. Akuku-toru Local Government Area;
2. Andoni-Opobo Local Government Area (ANOLGA);
3. Asari-toru Local Government Area (ASALGA);
4. Bonny Local Government Area;
5. Brass Local Government Area (BALGA);
6. Degema Local Government Area (DELGA);
7. Ekeremor Local Government Area;
8. Ogbia Local Government Area;
9. Sagbama Local Government Area (SALGA);
10. Southern Ijaw Local Government Area;
11. Wakrike Local Government Area (WALGA); and
12. Yenegoa Local Government Area (YELGA).

The Local Government Areas in the upland areas are:- Ahoada Local Government Area (ALGA), Emohua Local Government Area, Omoku/Ndoni Local Government Area (ONELGA), Obia-Kpor Local Government Area(OBIALGA), Etchie Local Government Area (ELGA), Gokana Local Government Area, Khana Local Government Area, Port-Harcourt Local Government Area (PHALGA), Ikwerre Local Government Area (KELGA), Oyigbo Local Government Area, Tai/Eleme Local Government Area and Abua/Odual Local Government Area.

The State's main feature is its termination on the Atlantic Ocean. As a result of this, fishing is the predominant occupation of the people surrounded by the deltaic terrain. The upland people are mainly crops and livestock farmers.

FIG. 1: Map of the Federal Republic of Nigeria Showing all the States.

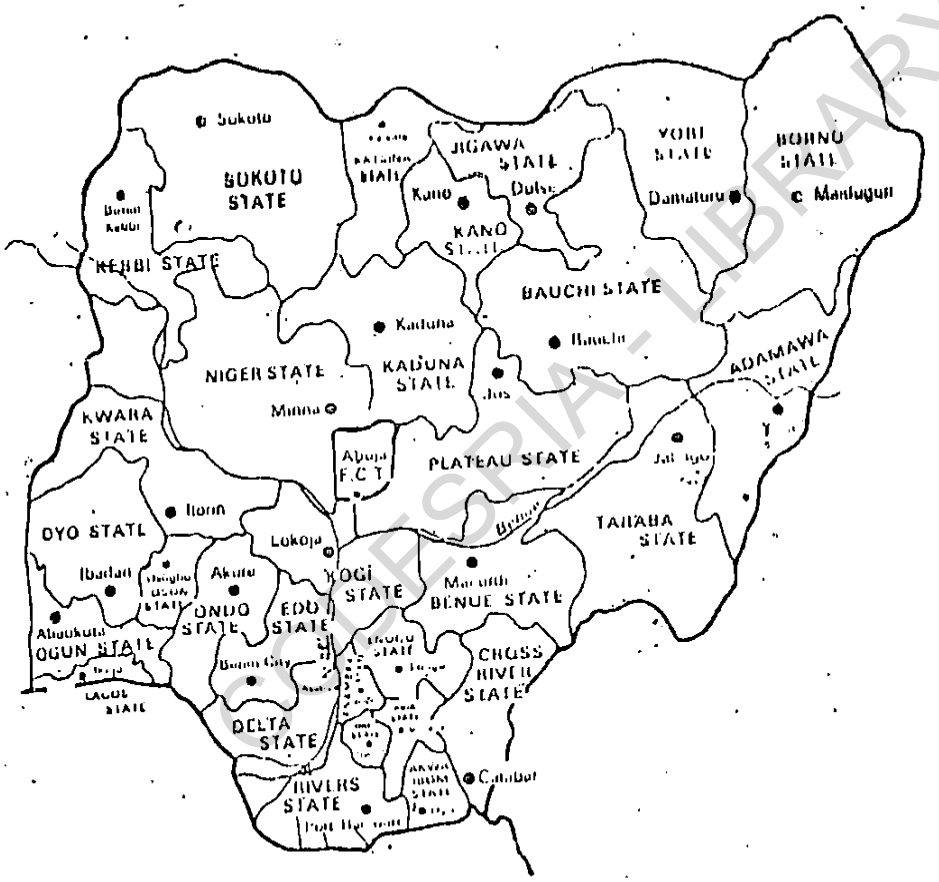
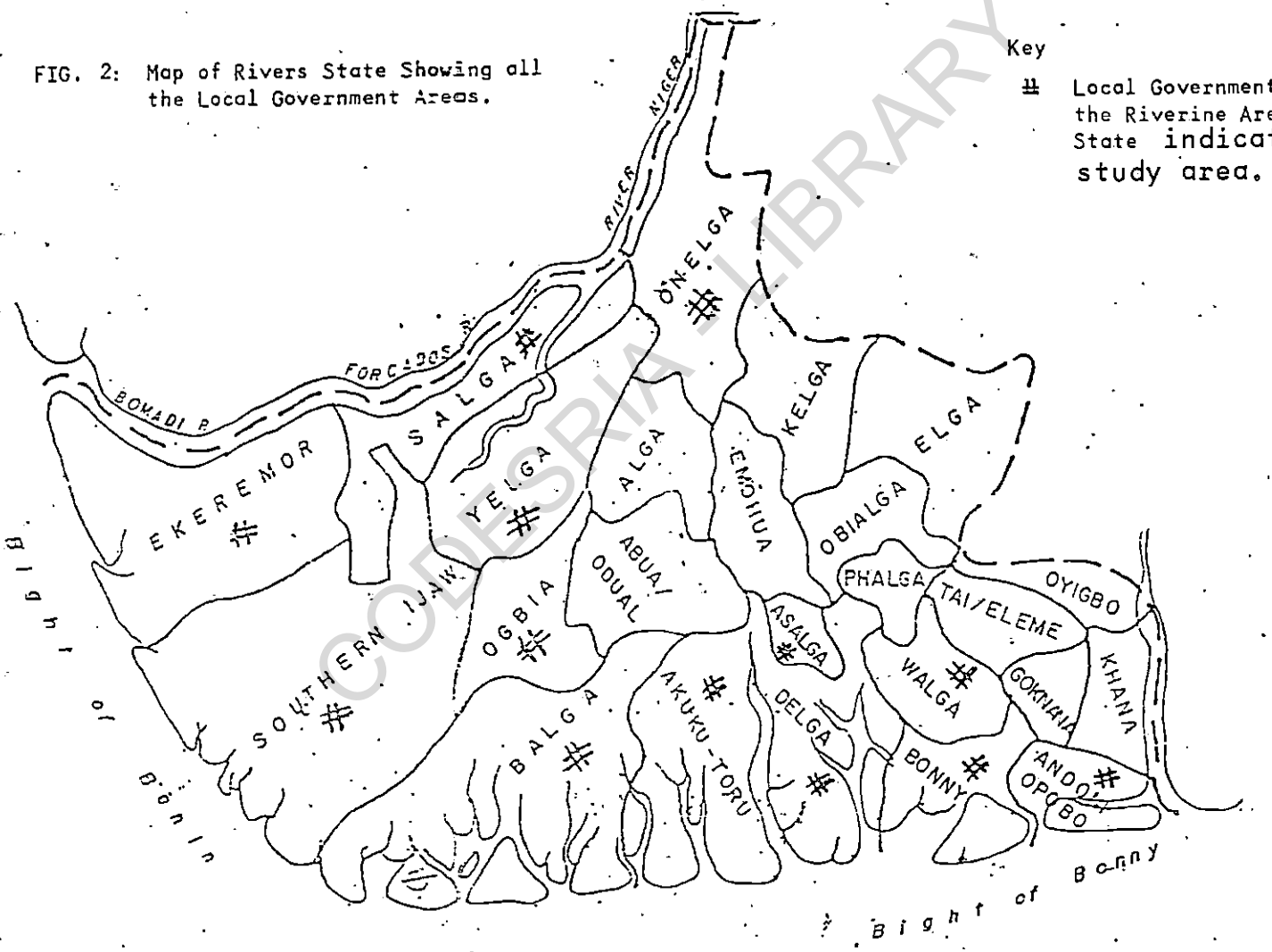


FIG. 2: Map of Rivers State Showing all the Local Government Areas.



3.2 Sampling Procedure:

A three-stage sampling procedure was used for this study. This was adopted in the following ways:-

Stage 1: Selection of towns/villages from the Local Government Areas of Study:

The riverine part of the State, comprising twelve (12) Local Government Areas was purposively chosen for the study. This is because the main occupation of the inhabitants is fishing and thus stand a better ground to provide useful and reliable information about the study than the upland areas.

A community or town was randomly selected from each of the twelve (12) Local Government Areas and in turn, a village was randomly selected from each of the selected 12 towns in the 12 Local Government Areas.

Stage 2: Selection of Crayfish Fisherwomen:

From each of the 12 (twelve) purposively selected Local Government Areas, a list of the Crayfish fisherwomen was compiled - through the help of the village heads. With the compiled list, five (5) Crayfish fisherwomen were randomly selected from everyone of the chosen villages. This gave a total of sixty (60) fisherwomen (respondents) from the twelve (12) Local Government Areas.

Stage 3: Selection of the Middlemen Engaged in Crayfish Marketing:

The wholesalers and retailers were chosen from the twelve selected villages. A list of the wholesalers and retailers in the twelve (12) villages was compiled. From the list, two (2) wholesalers and three (3) retailers were randomly selected. This gave a total of twenty four (24) wholesalers and thirty six (36) retailers.

3.3 Data Collection:

Primary and secondary sources of data were obtained for the study. Contacts were made with the producers (fisherwomen), wholesalers and retailers by the researcher and oral interview was used to gather information.

Moreover, three sets of structured questionnaire were developed. One set out of the three sets of questionnaire was administered to the crayfish fisherwomen. Information generated include the socio-economic characteristics of the fisherwomen, methods of crayfish production and processing, types and costs of inputs and revenue got from the sale of Crayfish. Direct observations and participation were used by the researcher in getting more information from the fisherwomen.

The remaining two sets of questionnaire were directed to the wholesalers and retailers of Crayfish respectively in

12 markets in the 12 chosen villages. Information with regard to sources of Crayfish to the wholesalers and retailers, the purchase and selling prices, transportation costs, processing costs and other aspects of marketing costs were obtained.

The researcher made use of field assistants/ interpreters in some areas where language barrier posed some problems.

Secondary data relevant to the study were collected from journals, textbooks, conference proceedings, research reports and records from the Federal and State Ministries of Agriculture and Natural Resources and Fisheries Divisions.

3.4 Data Analysis:

The data collected from the field survey were analyzed with the following analytical tools:-

Objectives 1, 2 and 5 were realised using descriptive statistics such as means, frequency distributions and percentages.

Objective 3 was realised using Net Margin Analysis. The Net revenue or Income of the Crayfish fisherwomen was got through the following:-

$$NI = GM - FC$$

where;

NI = Net Income

GM = Gross Margin

FC = Fixed Cost

The Gross Margin (GM) was got through the following:-

GM = Total Income - Variable Cost

GM = TI - VC.

Where,

GM = Gross Margin

TI = Total Income

VC = Variable Cost

Part of Objective 4 was realised using Gross Margin Analysis (ie)

GM = Total Income - Variable Cost

while the remaining part was realised with the use of Marketing Margin Analysis.

3.5 Determination of Marketing Margins and Marketing Costs:

In determining the marketing margins and marketing costs of the middlemen involved in crayfish distribution in the area of study, the studies on marketing margins by Upton (1979), Lemchi (1991) and Adeyokunnu (1973) were consulted and used.

From their studies, the purchase prices were deducted from the retail prices to give the marketing margins.

The average prices of both the wholesalers and retailers were used and the margins were got by removing or deducting the costs incurred by these middlemen from the returns accruing to them. Furthermore, the average selling prices and the average purchase prices were determined by getting the average prices given by each of the wholesalers and retailers. The average prices were added up to give the mean average price. Likewise, the mean marketing cost was obtained by finding the average of the marketing costs incurred by the wholesalers and retailers in each of the 12 Local Government Areas chosen for the study.

The size of the marketing margin was determined by the size of the marketing costs incurred by the middlemen. The costs as used in this study are made up of the average purchase price and the average marketing costs of the middlemen in the 12 Local Government Areas of study.

The next step was the determination of the middlemen's profits as a percentage of consumer price or retail price per kilogram of crayfish. From this, the net margins or net profits of the middlemen were computed. (See Appendix VII).

CHAPTER FOUR

PRESENTATION OF DATA AND ANALYSIS OF FINDINGS

One hundred and twenty questionnaires were administered to the producers, wholesalers and retailers of crayfish in twelve (12) Local Government Areas in the riverine areas of Rivers State. Out of the one hundred and twenty questionnaire, sixty (60) respondents were the producers while thirty six (36) respondents and 24 respondents were the retailers and wholesalers respectively.

Issues analyzed include the socio-economic traits of respondents, marketing channels, marketing costs, costs and returns of crayfish production, marketing margins and the problems militating against the production, processing and marketing of crayfish in the study area.

The researcher with the help of some trained enumerators, filled the answers in the appropriate spaces provided in the questionnaire. As a result, there was no case of questionnaire loss during the field survey. This Chapter, hence, presents the results obtained from the field survey in the areas studied.

4.1 Age Distribution of the Respondents:

Crayfish production and marketing have no age limit. Women are involved in catching and marketing of crayfish

irrespective of their age, so long as they are able to cope with the activities involved. The age distribution of the respondents is presented in Table 1.

From the table, majority of the producers were within 36-45 years with a percentage of 43.3. Close to this, is 30 per cent of the producers within the age range of 15-25 years. This is followed by 15.3% of the producers under the age range of 26-35 years. 8.3% were under the age range of 56-65 years. Lastly, only one of the producers was found to be over 65 years with a percentage of 1.7% of the total number of producers.

The age distribution of the middlemen involved in crayfish marketing were also considered and the result got from the survey is presented in table 1.

From the table, most of the wholesalers of crayfish were within 36-45 years with a percentage of 41.7. 5 respondents were within the age range of 15-35 years with a percentage of 16.7 of the total respondents. 3 were between 56-65 years. None was found to be over 65 years.

In terms of the retailers, the table indicates that majority of them were between 36-45 years as was the case in the wholesalers age range. This is closely followed by

Table 1 Age Distribution of the Crayfish Fisherwomen, Wholesalers and Retailers

Age Distribution	Producers		Wholesalers		Retailers	
	Number	Percentage	Number	Percentage	Number	Percentage
Under 15 years	-	-	-	-	-	-
15 - 25	18	30	5	20.8	4	11.1
26 - 35	8	15.3	4	16.7	10	27.8
36 - 45	26	43.3	10	41.7	14	38.9
46 - 55	5	8.3	3	12.5	3	8.3
56 - 65	2	3.3	2	8.3	3	8.3
Over 65 years	1	1.7	-	-	2	5.6
Total	60	100	24	100	36	100

Source: Field Survey, 1994.

26-35 years where there is 27.8% of the retailers. 4 retailers were found to be between 15-25 years, 3 were between 46-55 years, 3 were between 56-65 years while 2 were found to be above 65 years.

4.2 Educational Background of the Respondents:

The levels of education attained by the respondents are presented in table 2.

As the table indicates, 55% of the producers had no formal education and hence had no records of their activities. This is closely followed by 21.7% or 13 respondents who had incomplete primary school education. 10 respondents or 16.7% completed primary school education; only 2 respondents or 3.3% attempted secondary school education while 2 were able to finish their secondary school education.

Further analysis shows that the middlemen involved in crayfish marketing are mostly literate. 4.2% or only one wholesaler was found to be illiterate but had her

Table 2 Educational Background of the Crayfish Fisherwomen, Wholesalers and Retailers

Educational Level	Producers		Wholesalers		Retailers	
	Frequencey	Percentage	Frequency	Percentage	Frequency	Percentage
No formal education	33	55.0	1	4.2	4	11.0
Attempted Primary School	13	21.7	2	8.3	5	14.0
Completed Primary School	10	16.7	13	54.2	22	61.0
Attempted Secondary School	2	3.3	8	33.3	4	11.0
Completed Secondary School	2	3.3	-	-	1	3.0
Beyond Secondary School	-	-	-	-	-	-
	60	100	24	100	36	100

Source: Field Survey, 1994.

literate children helping out in the business. 13 respondents among the wholesalers completed primary school education. While 2 and 8 attempted primary school and secondary school respectively.

Among the retailers, 61% representing 22 respondents completed their primary school education. 5 respondents attempted primary school, 4 respondents attempted secondary and 1 retailer was able to complete secondary school education. Meanwhile, 4 respondents were found to have had no formal education.

As indicated in table 2, the middlemen had formal education and were able to keep meaningful records. The records helped them to know beforehand, how much profit they expected to get from a basket of crayfish.

4.3 Marital Status of the Respondents:

Table 3 shows that most of the fisherwomen are married and this represents an average of 76.2%. 5 women were single while another 5 women were widowed. 4 fisherwomen indicated that they were divorced.

Furthermore, most of the women involved in crayfish marketing are married with an average of 62.5% and 72.2% for the wholesalers and retailers respectively. 12.5% or 3 wholesalers are single and 19.4% of the retailers, single.

Table 3 The Distribution of Marital Status of Respondents

Marital Status	Producers		Wholesalers		Retailers	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Married	46	76.7	15	62.5	26	72.2
Single	5	8.3	3	12.5	7	19.4
Divorced	4	6.7	3	12.5	2	5.6
Widowed	5	8.3	3	12.5	1	2.8
Total	60	100	24	100	36	100

Source: Field Survey, 1994.

12.5% and 5.6% of the wholesalers and retailers respectively are divorced while 12.5% and 2.8% of the wholesalers and retailers respectively were found to be widowed.

From the foregoing, the set-backs in terms of inability to expand in their business could be as a result of tradition which compels a woman to handover the proceed from her business to the husband.

4.4 Family Size of the Respondents:

The family size of the respondents was studied and the distribution is presented in table 4.

The household or family size as used in this study comprised of the man, wives, children and other relatives who live in the same house and feed together. The result from the data collected showed that the crayfish fisherwomen have families with sizes ranging between 1-5 people and 6-10 people. 41.7% of the respondents indicated that their family size ranges between 1-5 people while 58.3% indicated that their family size ranges between 6-10 people in number.

The family composition of the fisherwomen is an important factor determining availability of labour for crayfish catching and processing. The implication of the above result is that there is the possibility of availability of more labour force coming from family sources.

Table 4: Family Size of the Respondents

Family Size	Producers		Wholesalers		Retailers	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
1 - 5	25	41.7	9	37.5	17	47.2
6 - 10	35	58.3	15	62.5	19	52.8
1 - 15	-	-	-	-	-	-
Total	60	100	24	100	36	100

Source: Field Survey, 1994.

The result from the data collected showed that the middlemen have family sizes ranging between 1-5 and 6-10 people. 37.5% and 62.5% were found to have family sizes ranging between 1-5 and 6-10 people respectively for the wholesalers. Retailers were found to have family sizes ranging between 1-5 and 6-10 or 47.2% and 52.8% respectively. No respondent had any family size that ranges between 11-15 people.

4.5 Occupations of the Respondents:

The occupations of all the respondents were taken into consideration to determine whether the respondents have alternative means of livelihood. The result from the analysis showed that all the crayfish fisherwomen chose crayfish catching as their primary occupation. The respondents indicated that most of their time is being occupied by crayfish catching as fishing starts as early as 5.30 a.m. for the morning trip and ends around 12.00 noon. The evening fishing trip starts around 7.00 p.m. and ends at around 12.00 midnight.

The middlemen involved in crayfish marketing chose crayfish marketing as their primary occupation. They indicated in the oral interview conducted by the researcher, that their business starts as early as

7.00 a.m. everyday and closes as late as 6.00 p.m. daily. As a result, they have no extra time left for any other alternative occupation.

4.6 Reasons given by the Crayfish Fisherwomen for being in the Crayfish business (Production):

Table 5 Distribution of Crayfish Fisherwomen according to reason(s) for being in Crayfish catching

Reasons	Frequency distribution	Percentage of Respondents
(a) Crayfish catching business is profitable	41	68.3
(b) Lack of alternative employment	12	20.0
(c) Fishing is a way of life	7	11.7
Total	60	100

Source: Field Survey, 1994.

The women chosen as crayfish fisherwomen had different reasons for being in the crayfish catching business. A total of 68.3% or 41 respondents gave their reason for being in crayfish fishing to be as a result of the profitability of the business. 20% or 12 respondents indicated that their being in the business was because of no alternative employment as the crayfish fishing

operations were tedious and exposed them to attack by diseases in the water. Lastly, 11.7% or 7 respondents acknowledged that fishing is a way of life and that despite the risks inherent in the business, that they would still be fishing daily.

SYSTEMS OF CRAYFISH CATCHING, PROCESSING AND MARKETING

4.7 Systems of Crayfish Production Amongst the Fisherwomen in the Riverine Areas of Rivers State:

Crayfish fishing is a profitable enterprise in the riverine areas of Rivers State. Fisherwomen from various villages in the twelve (12) riverine Local Government Areas of the State are mostly involved in crayfish fishing.

The crayfish fishing system common to these villages is known as "Ngoro". To form or build the equipment used in the "Ngoro", nine or ten yards of fishing net are attached to two hard mangrove wood poles about 25 to 35 feet long and 5 to 6 inches thick. The poles are in turn attached to the side of a canoe and held in place or position with the aid of strong ropes.

The "Ngoro" is normally operated by two fisherwomen who walk alongside the canoe in a strong current close to the river mouths and creeks (See Plates I-III).

At every change of tide, the "Ngoro" is inspected, the crayfish collected, and dumped in the basket being carried by the canoe. The "Ngoro" is then operated facing in the direction of flow of water and occasionally inspected to suit every change in tide.

As more and more crayfish are collected, water coming through the baskets and dropping into the canoe, is bailed out by the help of a kid with a bailer constantly in his or her hand. The operation is repeated continuously till the tide has ebbed.

About 50 to 80 kilograms of fresh crayfish could be caught in a day, depending on the season. The best season given by the fisherwomen is August to February. Crayfish fishing is poor in other months due to frequent rainfalls which usually raise the level of the water in the river, hence, making it impossible for the women to wade through. The best time given by the fisherwomen for crayfish catching is in the night period because of the quietness of the river which by then, is undisturbed.

Below are pictures showing some of the activities involved in crayfish catching. Plate I, shows the fisherwomen dipping in the "Ngoro" into the river before catching of crayfish takes off. Plate II, shows fisherwomen from

Okrika in Wakrike Local Government Area preparing their "Ngoro" for crayfish catching. At the middle and on the canoe, is someone who bails water from the canoe. Plate III, shows crayfish fisherwomen from Southern Ijaw getting ready for the night operation of catching crayfish.

Plate I Showing the Crayfish fisherwomen dipping the "Ngoro" in the river for Crayfish catching.

Plate II: Showing the crayfish fisherwomen from Okrika in Wakrike Local Government Area of Rivers State with an "Ngoro".

Note: The Plates did not appear clear enough due to the weather condition.

Plate III Showing Crayfish fisherwomen from Oporoma in Southern Ijaw Local Government Area of Rivers State.

4.8 Crayfish Catching Locations:

The different locations where crayfish could be caught were studied and the sixty fisherwomen sampled reported that they fish for crayfish in two major locations namely; the Rivers/Creeks and Coastline. Rivers are the natural surface stream of water of considerable volume and consistent flow while Creeks refer to the salt water of

a small river emptying into the lower parts of a wide river. Coastline connotes a broad zone covered by both water and land and extending indefinitely landward and seaward from a shoreline.

Rivers/Creeks are predominantly the fishing locations amongst the fisherwomen in the study area. From the survey, it was found that 52 (86.7%) of the crayfish fisherwomen go to Rivers/Creeks to catch crayfish while 8 (13.3%) crayfish fisherwomen indicated that their operational area is the Coastline.

4.9 The Fishing Gears for Crayfish:

From the survey, the crayfish fisherwomen identified nets, barriers, and bailers as the fishing gears they use while fishing for crayfish. Other fishing gears for crayfish include poles and ropes.

All the fisherwomen sampled agreed that canoe is a major input in crayfish catching. Though they do not need to stay in the canoe while catching crayfish, the canoe is used in getting to the operational areas. Moreover, the canoe helps in other ways such as carrying other equipment or gears that will be used during the fishing trip. The canoe also carries the person who bails the accumulated water from the crayfish out from the canoe

during the catching of crayfish. The bailing of water prevents the crayfish caught from escaping into the river when they are dumped from the nets into the baskets.

4.10 Frequency of the Fishing Trips:

From the survey, it was observed that the number of days the crayfish fisherwomen spent on crayfish catching varies. Their responses as regards how often crayfish is caught and the number of hours spent on each fishing trip, show that 54 (95%) crayfish fisherwomen go to catch crayfish everyday while 5 (8.3%) go to fish for crayfish every other day. Only one fisherwoman responded to have gone fishing for crayfish every 4 days and gave her reason as to being old and unable to go fishing more frequently.

4.11 Number of hours spent per fishing trip:

Table 6 Distribution of the Respondents According to the number of hours spent per trip:

Number of Hours	Absolute Frequency	Percentage of Respondents
Less than 1 hour	-	-
1 - 2 hours	9	15
3 - 4 hours	47	78.3
5 - 6 hours	4	6.7
7 - 8 hours	-	-
More than 8 hours	-	-
Total	60	100

Source: Field Survey, 1994.

From table 6, the time spent 3-4 hours is predominantly on each outing for crayfish catching. 9 fisherwomen indicated that they spend up to 1-2 hours per fishing trip while 4 respondents indicated that they spend up to 5-6 hours per outing (See Fig.3). It was observed that the number of hours spent per outing does not determine the quantity of crayfish caught. The tide and the weather have effect on the quantity of crayfish to be caught per trip.

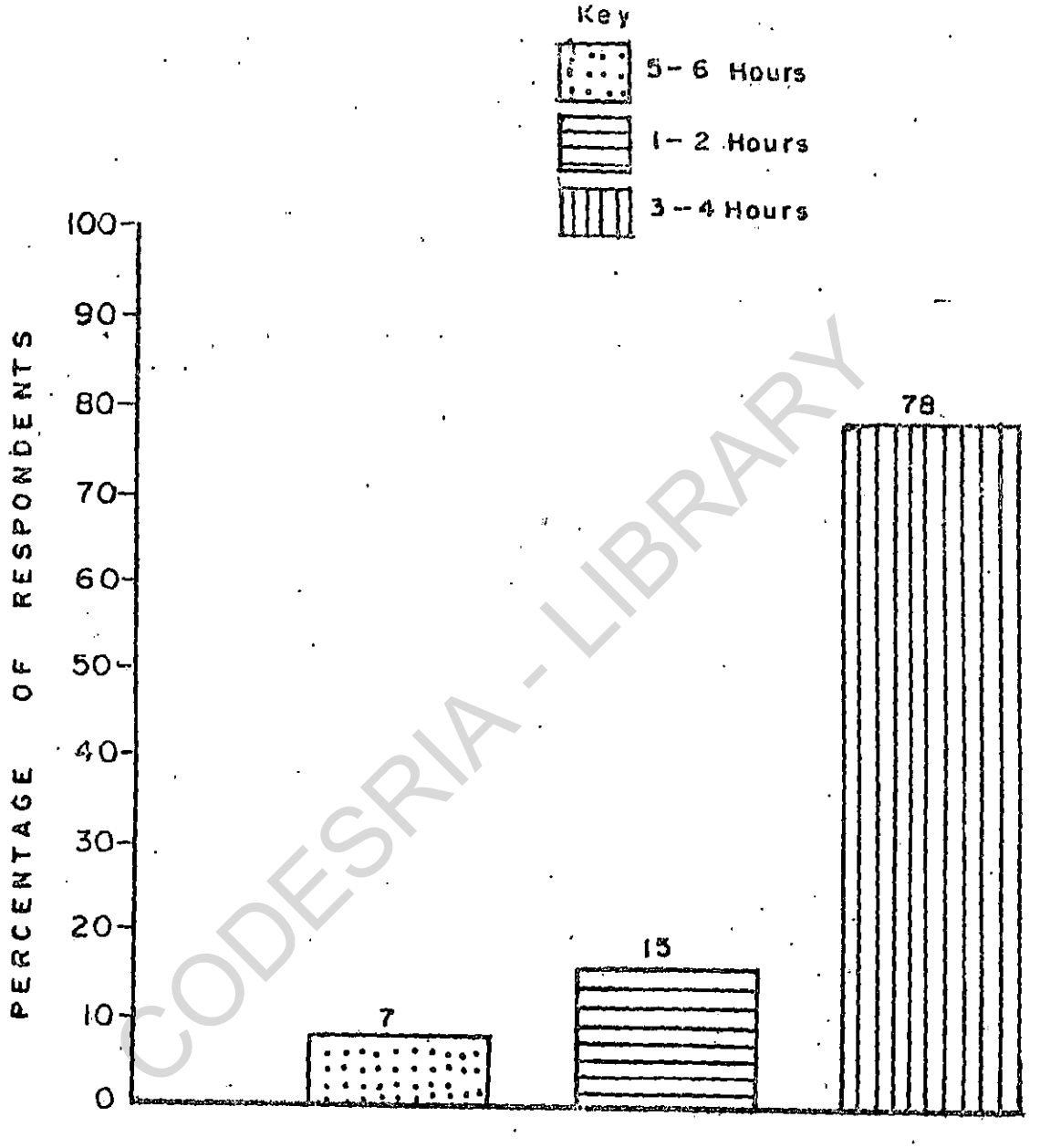


Fig. 3 : Histogram Distribution of Crayfish Fisherwomen According to Number of Hours Spent per Fishing Trip in the Riverine Areas of Rivers State.

Source: Field Survey, 1994.

4.12 Effect of Season and Time on Catch Per Outing:

All the fisherwomen indicated that the dry season is the best season for crayfish catching. They indicated also that they usually get their biggest catch in the dry season and that rainy season is the season they experience their lowest catch per trip. The rainy season affects the catch because as the rain falls, the water gets disturbed and the crayfish are scattered to different locations.

Table 7 shows the frequency distribution of the respondents according to their size of catch per outing or fishing trip for crayfish.

Table 7 Distribution of Fisherwomen According to Catch Per Trip in a Day:

Number of Baskets	Absolute Frequency	Relative Frequency
Less than 1 basket	-	-
1 - 2 basket(s)	22	36.67
3 - 4 baskets	38	63.33
5 - 6 baskets	-	-
7 - 8 baskets	-	-
More than 8 baskets	-	-
Total	60	100

Source: Field Survey, 1994.

22 fisherwomen representing an average of 36.67% indicated that they caught an average of 1-2 basket(s) of crayfish while 38 (63.3%) fisherwomen indicated that they caught an average of 3-4 baskets per outing (See Fig.4). The number of baskets caught usually depended on the weather and the mood of the river.

From the survey, it was observed that the crayfish fisherwomen indicated that though they fish in the early morning hours, their catch was not as much as their catch during the night hours.

PROCESSING OF CRAYFISH

The processing of crayfish is done through drying with fire. The following processes or operations are involved in crayfish processing amongst the crayfish fisherwomen in the riverine areas of Rivers State:

4.13 The Sorting of Crayfish:

The first step in the processing of crayfish is the sorting. The crayfish caught are washed and the debris from the sea, sorted out. The sorting is done through gradually picking out of the debris by hand. In this case, family labour is used mostly.

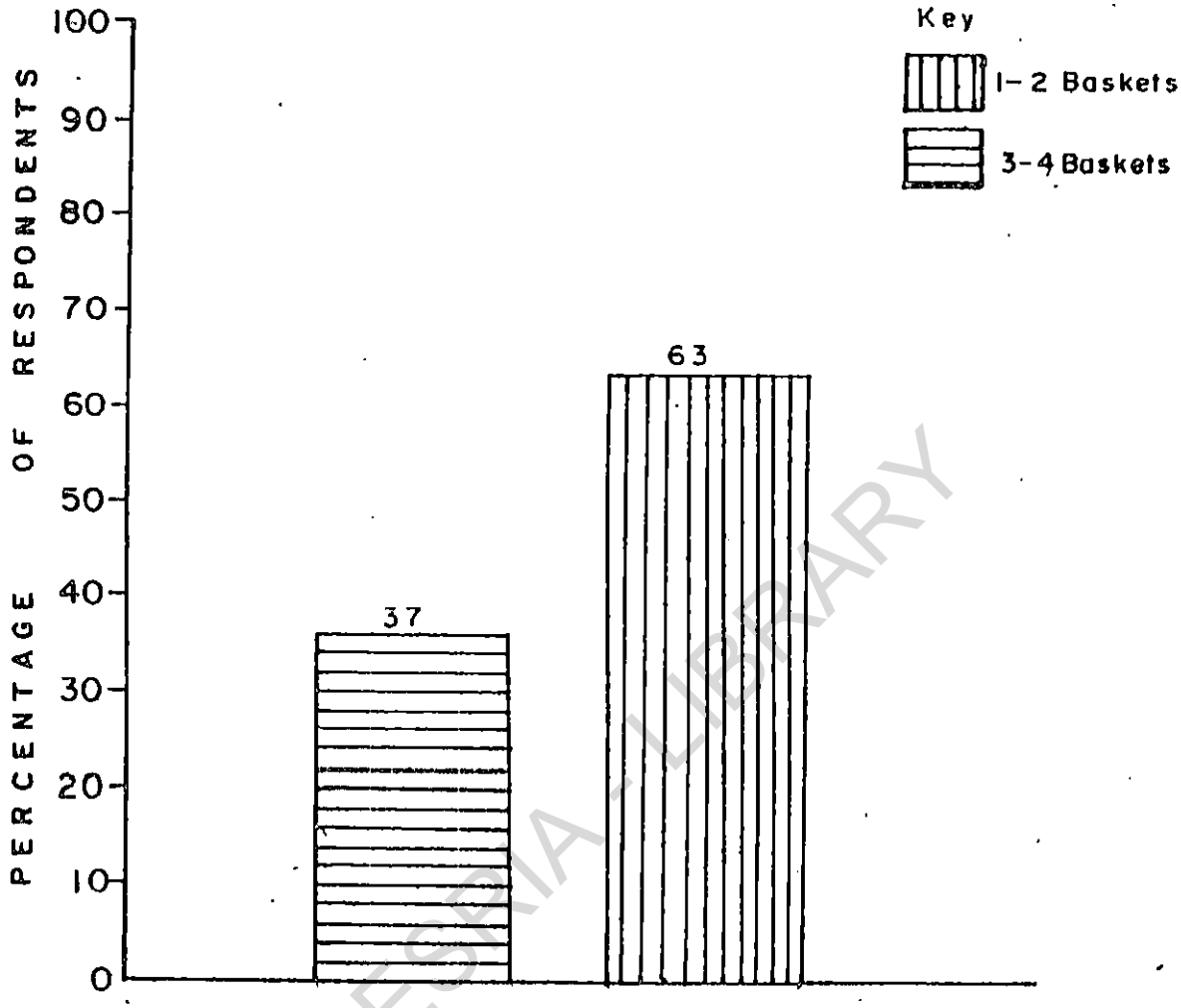


Fig. 4 : Percentage Distribution of Fisherwomen According to th Quantity of Crayfish Caught per Trip in the Riverine Areas of Rivers State.

Source : Field Survey, 1994.

4.14 The Dripping Process:

Immediately after washing and sorting of the crayfish, the whole lot is spread on a mat or racket outside and left to drip dry. The dripping of the crayfish is very important as it aids the drying to be very fast in the oven.

4.15 Oven-drying of the Crayfish:

No time is wasted when drying crayfish in the oven as delay could result in spoilage of the fresh crayfish. The fire is prepared beforehand and allowed to glow constantly. The fresh crayfish are placed on the rackets in thin layers and in turn, the rackets are placed on the top of the oven. The crayfish are then left to dry but are turned occasionally to ensure complete and even dryness.

According to the fisherwomen sampled, the processing of crayfish could take less than a day for the crayfish that will be sold fresh while it can take up to less than a day or 1-2 days to process the crayfish that will be sold dry.

Majority of the fisherwomen took less than a day to process both the crayfish that will be sold fresh and the ones that will be sold dry. 45 respondents

(75%) indicated that the crayfish that will be sold dry took less than a day to be processed while only 15 (25%) fisherwomen indicated that at times, it took them up to 1-2 days to process the crayfish that will be sold. This is to make sure that the crayfish are moisture-free in order to avoid spoilage. On the other hand all the fisherwomen sampled pointed out that the crayfish they sold fresh, took them less than a day to process.

Below is Plate IV showing the altar and racket for drying the crayfish.

Plate IV Showing an altar and some rackets on top.

4.16 Labour Sources for the fisherwomen:

Labour was employed by the fisherwomen to carry out specific operations during the fishing trips and also during the processing of the crayfish caught. Such operations included bailing of water, holding of nets during fishing and the procurement of firewood during processing. The labour was supplied mostly by the members of the household and a few hired labour. The family labour consists of the fisherwomen's children and other relatives who are disposed to carry out the specific operations.

Hired labour was not common amongst the fisherwomen and when necessary, they contract the operations to the labourers on hire basis.

Most of the sampled fisherwomen obtained labour from family sources as 54 (90%) respondents, had their family members helping them out while only 6 (10%) respondents hired labour. This suggests that hiring of labour is not very common in the study area. This could be attributed to the large family sizes of the fisherwomen in the study area. Moreover, the children of the fisherwomen at the age of seven can easily paddle canoes, bail water from the canoes among other operations during fishing trips.

4.17 Capital:

Capital represents the resources that accrued from the previous efforts of the fisherwomen. The fisherwomen's capital included a variety of equipment ranging from durable equipment such as cutting axes, matchets, canoes, bailers etc., to undurable equipment such as ropes, nets, baskets and poles.

The sampled fisherwomen spent an average of ₦5,500 to acquire most of their equipment.

4.18 Marketing And Distribution of Crayfish:

The survey indicated the existence of four main levels in the distribution of crayfish in the study area. The levels are: Producers → Brokers (Village Merchants) → Wholesalers → Retailers. For these four main levels of distribution for crayfish, there exist 3 (three) main types of markets. The first is the farm gate market which is the point of sale by producers at the river banks or at their homes. The second market is known as the

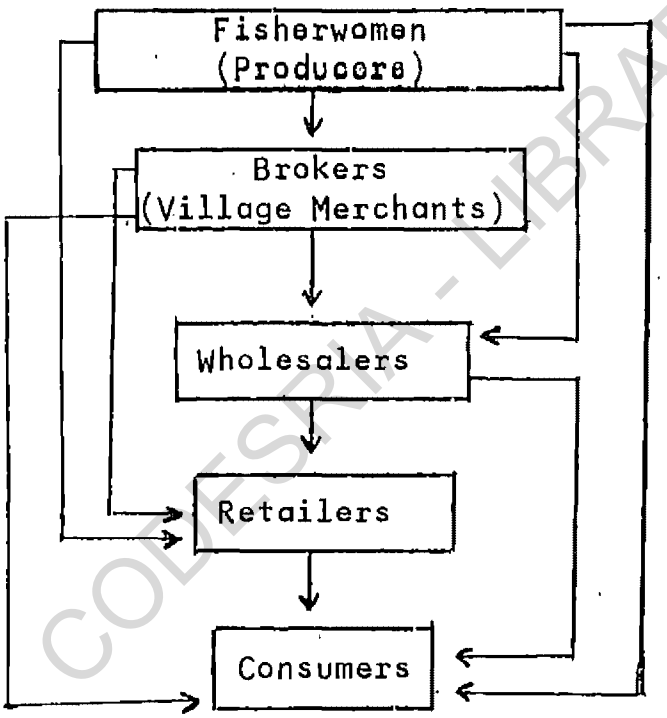
primary markets which are open-air markets without shades or stalls. The participants in the open-air markets include the producers, brokers, retailers and the consumers. The third market is the conventional or central markets. Participants in these markets include the wholesalers and retailers who have stalls and the consumers.

The fisherwomen sold their crayfish at the farm gate markets to the brokers/village merchants who move from village to village in search of crayfish to buy. The brokers sell some of their crayfish to the wholesalers in the central markets and some to other retailers and other brokers like themselves. The wholesalers who bought in bulk, then sold to the retailers and consumers. The retailers who buy in small quantities get their stock of crayfish from the wholesalers and at times from the producers and brokers. The retailers sell finally direct to the consumers.

In this study, data from middlemen were collected from 12 markets in the 12 villages chosen for the study. See appendix VI.

These markets are the Central or Conventional Markets. Presented below, is the diagram of the marketing channels of crayfish in the study area.

Fig. 5: Marketing Channels for Crayfish in the Riverine Areas of Rivers State



Source: Field Survey, 1994.

Note: From the study, only fresh crayfish is distributed direct from the fisherwomen (producers) to the consumers.

Plates V, VI, VII, show some of the middlemen nvolved in Crayfish marketing in the study area.

Plate V Showing a Wholesaler with a 5-kilogram-basket of dry Crayfish.

Plate VI Showing a Retailer of dry Crayfish.

Plate VII Showing a Retailer who buys and sells fresh Crayfish in Bonny Main Market.

4.19 Marketing Processes of the Crayfish Fisherwomen:

The fisherwomen sampled indicated that they sold their crayfish both fresh and in dry states. The fisherwomen indicated further that the processed and dried crayfish are financially more rewarding than those sold fresh.

From the survey, the fisherwomen mentioned that they sold most of their fresh crayfish at the river banks while most of the dry ones were sold at the markets.

From the analysis, 65% (39) of the fisherwomen indicated that they sold their fresh crayfish at the river banks while 35% (21) indicated that they sold theirs at the markets. Furthermore, the survey result showed that the markets the producers go to sell their crayfish is on average, 6 kilometers from their homesteads. On the other hand, 95% (57) of the fisherwomen indicated that they sold their dry crayfish in the market while only 5% (3) of the fisherwomen sold their dry crayfish at the river banks.

The producers commuted to and fro the markets mostly by motorised boats. The distance covered by the producers during crayfish sale was very short, hence this suggests that the markets were mostly primary markets in their respective villages.

The result of the survey further indicated that the fisherwomen sold their crayfish to mostly brokers (village merchants). Table 8 presents the frequency distribution of the producers according to those that bought their fresh and dry crayfish.

Table 8 Frequency distribution of the fisherwomen according to whom they sold their fresh and dry crayfish in the area of study.

Middlemen	Fresh Crayfish		Dry Crayfish	
	Absolute Frequency	Percentage Frequency	Absolute Frequency	Percentage Frequency
Brokers	49	81.6	38	63.3
Wholesalers	4	6.7	18	30.0
Retailers	3	5.0	4	6.7
Consumers	4	6.7	-	-
Total	60	100	60	100

Source: Field Survey, 1994.

Majority of the fisherwomen sold their crayfish to the brokers. As the table indicates, 49 (81.6%) of the respondents sold their fresh crayfish to the brokers. 4 (6.7%) indicated that they sold their fresh crayfish

to the wholesalers while 4 (6.7%) and 3 (5.0%) sold their fresh crayfish to the consumers and retailers respectively.

On the other hand, 38 (63.3%) of the fisherwomen sold their dry crayfish to the brokers while 18 (30%) sold theirs to the wholesalers. 4 (6.7%) of the respondents sold their processed and dry crayfish to the retailers.

The survey showed from the results, that the fisherwomen were unable to hold their crayfish for a long time. This they attributed to the urgency in meeting their immediate needs for cash to be used in meeting their household commitments. This as a result, led to hurried sales and low price receipt.

4.20 Measure of Crayfish for Sale in the Riverine Areas of Rivers State:

In the study area, crayfish was sold in baskets. From the survey, all the fisherwomen sampled, indicated that the measure of crayfish for sale, common amongst them was basket. The measurement of crayfish was done using a 5 kilogram (kg) basket as a standard. The 5kg basket was the commonest of the baskets used by the producers and it was used as a standard measure for

ayfish in the study area. Plate VIII shows the
skets (5kg) and some wholesalers of crayfish in
e study area.

Plate VIII Showing the 5kg-baskets in the study area.

21 Price-fixing in Crayfish Sales by the Producers:

From the survey, it was observed that price for ayfish could be fixed through three different methods the fisherwomen. 42 of the producers (70%) fixed eir prices for crayfish caught through bargaining with eir customers. On the other hand, 18 respondents presenting 30% indicated that they fixed their prices sed on the input costs and the expenses incurred during e production process.

This suggests that some of the producers were enlightened and knew that they deserved a fair price for their produce while majority of the producers had their fate in the hands of the greedy brokers (village merchants) and thus, accepted any price given based on their bargaining powers.

4.22 Costs and Returns of Crayfish Production Amongst the Crayfish Fisherwomen in the Riverine Areas of Rivers State:

The survey showed that the resources available for the production of crayfish in the study area consist of fixed and variable resources. The fixed resources include canoes,paddles, cutting axes,matchets, bailers, poles and ropes while the variable resources consist of labour and marketing costs.

To estimate the gross revenue and hence, the net revenue earned by the crayfish fisherwomen, the difference between the gross revenue earned and the variable costs incurred was determined through the following formula

$$GM = TI - VC$$

where;

GM = Gross Margin

TI = Total Income

VC = Variable Cost.

Further in the analysis, the net revenue was determined from the above through the following formula:

NI = GM - FC

where;

NI = Net Income or Revenue

GM = Gross Margin

FC = Fixed Cost.

The result of the costs-returns analysis showed that the total revenue from the sale of crayfish amounted to ₦135,604.8 kobo for the year 1993. The total variable cost was estimated at ₦19201.20kobo. The estimated gross margin was ₦116,403.6 kobo. The net revenue or net income was computed by deducting the fixed costs from the total income. This gave a net income of ₦115,626.6 per annum for a crayfish fisherwomen in the riverine areas of Rivers State. The calculation of the depreciation costs that gave the fixed costs is presented in Appendix I.

Further analysis gave the average monthly net revenue for a fisherwomen in the study area to be

₦9,635.55kobo/kilogram of crayfish.

The computation of the above figures is presented in table 9 below.

Table 9 Average Gross and Net Margins of Crayfish Fisherwomen in the Riverine Areas of Rivers State

Item	Unit	Quantity	Average Price/Unit (₦)	Average Amount (₦)	
1 Crayfish Sales/Yield	kg	17,520.00	7.74	135,604.8	135,604.8
Total Revenue					135,604.8
2 Variable Costs					
Transportation				2,320.60	
Processing				10,677.00	
Repairs				3,640.70	
Labour				1,582.90	
Miscellaneous				980.00	
Total Variable Costs					19,201.20
Gross Revenue					116,403.6
3 Fixed Costs					
Depreciation on Canoe		1	3,500.00	350.00	
Depreciation on Paddles		4	100.00	200.00	
Depreciation on Matchet		1	200.00	67.00	
Depreciation on Axe		1	350.00	35.00	
Depreciation on Altar and rackets		1	500.00	125.00	
Total Fixed Costs					777.00
Net Revenue					115,626.6

Source: Field Survey, 1994.

From the result, the average gross profit margin was computed after determining the total cost of Crayfish produced. The total cost of Crayfish sold or produced was estimated at ₦19,978.20kobo. After deducting the cost of crayfish sold from the crayfish sales/yield and dividing by sales, the gross profit margin was 0.85 or approximately, 85%.

This percentage indicates profit relative to sales after deducting production costs.

From the result, it follows therefore, that for every ₦1.00 invested in the production of crayfish by the fisherwomen in the study area, 85kobo profit was realised. Hence, it is conclusive to say that crayfish production is profitable amongst the rural women in the riverine areas of Rivers State and therefore, has a great economic potential.

Note: The computation of the gross profit margin is presented in Appendix V.

4.23 Costs Incurred by the Middlemen in the Distribution of Crayfish in the Riverine Areas of Rivers State:

The costs incurred by the wholesalers and retailers in the distribution of crayfish in the area of study include transportation, processing, storage, rates and

handling costs. These costs/kilogram of crayfish marketed are presented in table 10.

(a) Average Monthly Processing Cost Incurred by the Middlemen:

The wholesalers who buy fresh crayfish, process and sell dry incurred some processing costs. These costs include the cost of purchasing firewood and the cost of the altar/racket (oven) built. The depreciation value of ₦125 for the altar/racket was used. The depreciation computation is presented in Appendix I. The table below, presents the average monthly cost of processing fresh crayfish that will be sold dry by the wholesalers.

Table 10 Average Monthly Processing Cost incurred by Wholesalers who buy fresh Crayfish, Process and Sell dry in the Study Area

Local Government Area	Average Processing Cost/kg (₦)	
Akuku-toru	580.00	5.83
Andoni-Opobo	350.00	3.18
/ ' toru	424.86	5.30
/	Na	Na
		0.78

As the table indicates, the average monthly processing cost/kg of crayfish ranges from ₦1.83 in Yenegoa to ₦11.15 in Degema with a Mean of ₦6.00/kg in the riverine areas. The processing cost varies among the wholesalers due to the quantity of crayfish processed and the cost of firewood used. In some areas, the cost of firewood was cheaper than in other areas.

(b) Average Monthly Transportation Cost Incurred by the Middlemen in the Study Area:

The average monthly transportation cost incurred by the middlemen from various areas vary due to distance covered. The cost is presented in table 11.

Table 11 Average Monthly Transportation Cost per Kilogram of Dry Crayfish in the Study Area

Local Government Area	Transportation Cost (₦)/Kg	
	Wholesalers	Retailers
Akuku-toru	11.70	7.03
Andoni-Opobo	Na	13.86
Asaritoru	8.49	2.40
Bonny	6.11	4.20
Brass	Na	4.21
Degema	13.44	8.68
Ekeremor	12.62	8.21

Table 11 Contd.

Ogbia	9.48	2.37
Sagbama	8.21	3.07
Southern Ijaw	Na	5.21
Wakarike	13.57	9.25
Yenegoa	Na	3.44
Mean ($\bar{X}$)	10.45	5.10

Source: Field Survey, 1994. Na = Not Available

From the analysed data, the average transportation cost per kilogram of dry crayfish traded by the wholesalers ranges from ₦6.11 kobo in Bonny to ₦13.57 in Wakrike. The grand mean for the average transportation cost for wholesalers in the riverine areas gave ₦666.44kobo or ₦10.45/kg.

For the retailers, Ogbia has the least transportation cost while Wakrike has the highest cost. The mean transportation cost for the retailers of dry crayfish in the riverine areas of Rivers State, is ₦5.10kobo/kg of crayfish. It can be observed that the cost of transport incurred by wholesalers is higher than that of the retailers. This could be attributed to the fact that wholesalers cover a lot of distance in search of crayfish. They go to various fishing ports and villages for

their supply of crayfish. The areas that have low average transportation costs such as Bonny and Akuku-toru indicated their source of supply to be from the brokers who bought from the producers.

Table 12

Average Monthly Transportation Costs/kg of fresh Crayfish Incurred by the Wholesalers Who Buy Fresh Crayfish, Process and sell dry and Retailers who buy and sell fresh Crayfish in the Study Area

Local Government Area	Transportation Costs (₦)/Kg	
	Wholesalers	Retailers
Akuku-toru	17.2	2.52
Andoni-Opobo	4.13	1.13
Asari-toru	24.31	Na
Bonny	Na	1.29
Brass	5.10	2.85
Degema	33.58	1.92
Ekeremor	15.88	2.37
Ogbia	14.24	Na
Sagbama	22.67	2.48
Southern Ijaw	24.45	1.96
Wakrike	Na	4.27
Yenegoa	5.45	Na
Mean ($\bar{X}$)	16.70	2.31

Source: Field Survey, 1994. Na = Not Available

The average transportation cost per kilogram of fresh crayfish traded by the wholesalers ranges from ₦4.13/kg in Andoni-Opobo to ₦33.58/kg in Degema. It can be observed that average transportation cost for fresh crayfish is higher than the highest average transportation cost for dry crayfish traded by the wholesalers (Table 12).

The reason for the high transportation cost is traceable to the weight of the fresh crayfish which is almost double the weight of the dry ones. The women interviewed complained of high transportation cost and of the boat drivers being too reluctant to convey their crayfish due to excessive weight. The mean average transportation cost for the wholesalers who buy fresh crayfish, process and sell dry was ₦16.70/kg.

For the retailers, the average transportation cost for fresh crayfish ranges from ₦1.13/kg and ₦4.27/kg in Andoni-Opobo and Wakrike, respectively. The grand mean for the area of study was ₦2.31/kg.

The reason for the low transportation cost incurred by the retailers of fresh crayfish is because they usually buy in small quantities from Creeks near the markets, hence needless to travel far distances for sale. In this case, the transportation was usually by Head portrage.

(c) Average Monthly Handling Cost Incurred by the Middlemen:

The handling cost includes the cost of loading and off-loading. The average handling costs incurred by wholesalers and retailers of dry and fresh crayfish are presented in table 13.

Table 13 Average Monthly Handling Cost/kg Incurred by the Wholesalers who buy fresh, process and sell dry and the Retailers who buy and sell fresh Crayfish in the Study Area.

Local Government Area	Average Handling Cost/kg (₦)	
	Wholesalers	Retailers
Akuku-toru	2.56	0.28
Andoni-Opobo	1.07	0.77
Asari-toru	1.52	Na
Bonny	Na	0.23
Brass	1.27	0.80
Degema	5.20	0.70
Ekeremor	1.15	0.74
Ogbia	1.57	Na
Sagbama	2.93	0.85
Southern Ijaw	2.12	0.53
Wakrike	Na	0.64
Yenegoa	0.85	Na
Mean ($\bar{X}$)	2.02	0.62

Source: Field Survey, 1994. Na = Not Available

Table 14

Average Monthly Handling Cost/kg Incurred by the Wholesalers and Retailers who buy and sell dry Crayfish in the Study Area.

Local Government Area	Average Handling Cost/kg (₦) Wholesalers	Retailers
Akuku-toru	1.50	0.73
Andoni-Opobo	Na	3.63
Asari-toru	0.88	0.30
Bonny	1.00	1.00
Brass	Na	0.53
Degema	1.24	1.43
Ekeremor	1.73	1.52
Ogbia	1.26	0.86
Sagbama	1.71	0.91
Southern Ijaw	Na	0.56
Wakrike	2.94	2.63
Yenegoa	Na	0.54
Mean ($\bar{X}$)	1.53	1.16

Source: Field Survey, 1994. Na = Not Available

From the tables 13 and 14, the average handling cost/kg amongst the middlemen ranges from ₦0.62/kg for the retailers who buy and sell fresh crayfish to ₦2.02/kg for the wholesalers who buy fresh

crayfish, process and sell dry. The mean average monthly cost of handling crayfish for the wholesalers who buy and sell dry crayfish was estimated at ₦1.52/kg while that of the retailers who buy and sell dry crayfish gave ₦1.16/kg.

Furthermore, table 13 indicates that the wholesalers who travelled to far distances and bought fresh crayfish, incurred the greatest handling cost/kg while the retailers of fresh crayfish incurred the least handling cost/kg.

This could be because, the retailers of fresh crayfish usually buy in very small quantities so as to be able to finish their stock within a day or two. Further delay usually led to spoilage as the crayfish change colour from light pink to deep red.

(d) Cost of Packaging Materials:

The wholesalers and retailers of both fresh and dry crayfish incurred cost of packaging. For the retailers, the packaging materials includes waterproof bags both small and big. The wholesalers usually use baskets. The distribution of the cost is presented in table 15.

Table 15 Average Monthly Cost of Packaging Materials per kg of Crayfish Incurred by the Middlemen in the Study Area

Local Government Area	Average Monthly Packaging Cost/kg (₦)			
	Wholesalers who buy fresh, process and soll dry	Wholesalers who buy and sell dry	Retailers who buy and sell fresh	Retailers who buy and sell dry
Akuku-toru	2.17	1.77	0.62	1.05
Andoni-Opobo	0.98	Na	1.35	3.45
Asari-toru	1.23	1.06	Na	0.47
Bonny	Na	1.44	0.42	1.71
Brass	1.40	Na	0.86	0.61
Degema	3.45	1.96	0.94	2.38
Ekeremor	1.60	2.18	1.18	0.66
Ogbia	2.63	1.55	Na	0.34
Sagbama	1.78	1.62	1.07	0.41
Southern Ijaw	1.97	Na	0.67	0.67
Wakrike	Na	3.85	1.36	1.92
Yenegoa	0.54	Na	Na	0.68
Mean (X)	₦1.78	₦1.93	₦0.94	₦1.20

Source: Field Survey, 1994. Na = Not Available.

The mean average monthly packaging cost incurred by the middlemen varied from ₦0.94/kg for the retailers who buy and sell fresh crayfish to ₦1.78/kg for the wholesalers who buy fresh crayfish, process and sell dry.

The wholesalers incurred greater packaging cost than the retailers as the table above indicates. This could be because most of the retailers who buy from the wholesalers usually have their purchased crayfish packaged free of charge by the wholesalers. Moreover, the retailers use smaller waterproof bags which cost far less than the baskets and bags the wholesalers used in packaging.

(e) Rent

Some of the middlemen especially the retailers of fresh crayfish had no need for stalls. Most of them were using umbrellas as shade and usually stayed along the road to sell their crayfish. The average monthly rent paid by some of the middlemen are presented below.

Table 16 Average Monthly Rent/kg Paid by the Middlemen in the Study Area.

Local Government Area	Rent/kg (₦) Wholesalers who sell dry Crayfish	Retailers who buy and sell fresh	Retailers who buy and sell dry
Akuku-toru	0.36	Na	0.36
Andoni-Opobo	Na	Na	0.75
Asari-toru	0.35	Na	0.24
Bonny	0.25	Na	0.44
Brass	Na	0.20	0.32
Degema	0.40	Na	0.40
Ekeremor	0.36	0.25	0.36
Ogbia	0.4	Na	0.27
Sagbama	0.38	Na	0.26
Southern Ijaw	Na	Na	0.44
Wakrike	0.54	Na	0.54
Yenegoa	Na	Na	0.22
Mean ($\bar{X}$)	0.38	0.22	0.38

Source: Field Survey, 1994. Na = Not Available.

As table 16 indicates, there is not much difference between the rent paid by the wholesalers and retailers. Average rent paid ranged from ₦0.22/kg for retailers who buy and sell fresh crayfish to ₦0.38/kg for

wholesalers and ₦0.35/kg for the retailers who buy and sell dry crayfish. In the study area, rent was paid according to the size of stalls. Most of the stalls had the same size, hence, the almost uniform rent paid by both the wholesalers and retailers of dry crayfish.

(f) Miscellaneous Charges:

The miscellaneous charges paid by the middlemen was only the local market rates in some areas and sanitation fees in others. On the average, wholesalers paid more monthly miscellaneous charge/kg of crayfish than the retailers. This was because most of the wholesalers have stores and were easily accessible to the local government officials. On the other hand most of the retailers have no stores and were constantly moving from one place to another thereby making it difficult for the local government officials to charge them rate and sanitation fees.

The wholesalers in the riverine areas of Rivers State, incurred an average miscellaneous charges/kg of ₦8.33/kg while the retailers of dry and fresh crayfish incurred an average monthly miscellaneous charges of ₦4.88/kg and ₦6.43/kg respectively.

Table 17 Average Marketing Costs/kg (₦) of Crayfish Incurred by the Middlemen in the Study Area

Local Government Area	Wholesalers		Retailers		Total
	Fresh, Process and Sell dry	Buy dry and sell dry	Buy dry and sell dry	Buy fresh and and sell fresh	
Akuku-toru	18.67	6.97	9.66	4.86	40.16
Andoni-Opobo	7.00	Na	16.69	3.35	27.04
Asari-toru	17.39	7.53	5.52	Na	30.26
Bonny	Na	5.79	11.30	3.40	20.49
Brass	6.92	Na	10.13	5.04	22.09
Degema	25.10	6.76	12.30	3.10	47.26
Ekeremor	12.81	7.59	11.38	4.00	35.78
Ogbia	16.30	7.78	5.48	Na	29.56
Sagbama	16.61	7.60	5.85	3.76	33.82
Southern Ijaw	18.59	Na	6.01	2.92	27.52
Wakrike	Na	9.64	15.42	5.04	30.10
Yenegoa	6.75	Na	8.49	Na	15.24
Mean ($\bar{X}$)	16.24	7.46	9.85	3.94	29.94

Source: Field Survey, 1994. Na = Not Available.

A summary of the average monthly marketing costs/kg of crayfish incurred by the middlemen show that the middlemen in Degema have the highest marketing cost of ₦47.26/kg. Yenegoa has the least marketing costs of ₦15.24/kg. It could be observed that the wholesalers who buy fresh crayfish, process and sell dry incurred the greatest average monthly marketing costs of ₦16.24/kg. This is because of the cost of transportation which the respondents complained, was very high and also the cost of firewood used in processing.

On the other hand, the retailers that buy and sell fresh crayfish incurred the least average monthly marketing costs of ₦3.94/kg. This could be as a result of their purchases which are usually in small quantities to avoid spoilage.

4.24 Purchase and Selling Prices of Crayfish in the Riverine Areas of Rivers State:

As crayfish flows through its channels of distribution and at different levels of exchange, there exist some differences in its price. The marketing margin for this study has been defined as the difference between the price the crayfish fisherwomen received and the price paid by the final consumers.

Similarly, marketing margin can be defined as the difference between the purchase price and the selling price at the different levels of exchange. The prices at which each individual in each group of the marketing channel of crayfish offered her product for sale, varied widely.

This depended largely on the personal relationship between the fisherwomen and the middlemen. For instance, the crayfish fisherwomen sold their produce mostly to the brokers and wholesalers at lower prices than they sold to the retailers. This could be because the brokers and wholesalers always visit the fisherwomen with gifts for them and their families.

The average purchase and selling prices of the middlemen were computed and they are presented in tables 18, 19, 20 and 21.

Table 18 Average Monthly Purchase and Selling Prices of Wholesalers who buy fresh Crayfish, Process and Sell dry in the Riverine Areas of Rivers State

Local Government Area	Quantity Bought (kg)	Average Monthly Purchase Price/ kg (₦)	Quantity Sold (kg)	Average Monthly Selling Price/ kg (₦)
Akuku-toru	100	56.91	56	302.14
Andoni-Opobo	110	52.08	85	161.98
Asari-toru	80	60.25	52	305.05
Bonny	Na	Na	Na	Na
Brass	90	60.11	77	177.62
Degema	70	65.90	56	314.69
Ekeremor	80	60.41	69	211.88
Ogbia	100	56.25	75	213.30
Sagbama	68	58.64	42	353.14
Southern Ijaw	72	65.51	57	285.38
Wakrike	Na	Na	Na	Na
Yenegoa	115	55.53	90	157.71
Mean ($\bar{X}$)	88.5	65.73	65.9	275.88

Source: Field Survey, 1994. Na = Not Available.

From the table, the average monthly purchase price/kg of fresh crayfish ranges from ₦65.73/kg for 68kg of fresh crayfish in Sagbama to ₦55.53/kg for 115kg of fresh crayfish in Yenegoa. In some areas such as Wakrike and Bonny, wholesalers who buy fresh crayfish, process and sell dry were not picked in the random sampling; hence, their monthly averages were not included in the above table.

The mean average monthly purchase price of the wholesalers who process their crayfish before selling in the riverine areas, was ₦58.54/kg for a mean quantity of 88.5 kilograms of fresh crayfish.

After processing, the mean average selling price of the wholesalers was ₦275.88/kg for an average quantity of 65.9 kilograms of dry crayfish.

Table 19 Average Monthly Purchase and Selling Prices of Wholesalers who buy and Sell dry crayfish in the Riverine Areas of Rivers State.

Local Government Area	Quantity in kg	Average Purchase Price/kg	Average Selling Price/kg
Akuku-toru	55	80.00	245.91
Andoni-Opobo	Na	Na	Na
Asari-toru	85	80.85	160.80
Bonny	80	84.17	142.47

Table 19 (Contd.)

Local Government Area	Quantity in kg	Average Purchase Price/kg	Average Selling Price/kg
Brass	Na	Na	Na
Degema	50	81.33	289.67
Ekeremor	55	101.56	232.05
Ogbia	75	82.67	162.33
Sagbama	78	84.62	161.96
Southern Ijaw	Na	Na	Na
Wakrike	56	107.05	250.46
Yenegoa	Na	Na	Na
Mean ($\bar{X}$)	66.75	87.78	205.71

Source: Field Survey, 1994. Na = Not Available.

The monthly average purchase prices of the wholesalers computed ranged from ₦81.33/kg of dry crayfish in Degema to ₦80.85/kg of dry crayfish in Asari-toru.

Wholesalers who buy and sell dry crayfish in Andoni-Opobo, Brass, Southern Ijaw and Yenegoa were not picked during the random sampling of the wholesalers.

Table 20 Average Monthly Purchase and Selling Prices of Retailers of fresh Crayfish in the Riverine Areas of Rivers State

Local Government Area	Quantity in kg	Average Wholesale Price/kg (₦)	Average Retail Price/kg (₦)
Akuku-toru	90	14.22	27.87
Andoni-Opobo	50	14.50	28.50
Asari-toru	Na	Na	Na
Bonny	120	18.16	35.30
Brass	50	23.66	90.50
Degema	50	15.42	35.17
Ekeremor	40	34.78	66.18
Ogbia	Na	Na	Na
Sagbama	50	23.82	82.67
Southern Ijaw	50	14.15	54.00
Wakrike	55	31.15	49.79
Yenegoa	Na	Na	Na
Mean ($\bar{X}$)	61.67	21.10	52.22

Source: Field Survey, 1994. Na = Not Available.

As table 20 indicates, the average monthly purchase prices of retailers for fresh crayfish range between ₦14.50/kg in Andoni-Opobo and ₦18.16/kg in Bonny. The average monthly selling prices range from

₦28.50/kg in Andoni-Opobo and ₦90.50/kg in Brass. The mean monthly purchase and selling prices were ₦20.10/kg and ₦52.22/kg respectively.

Table 21 Average Monthly Purchase and Selling Prices of Retailers of Dry Crayfish in the Riverine Areas of Rivers State.

Local Government Area	Quantity in kg	Average Wholesale Price/kg (₦)	Average Retail Price/kg (₦)
Akuku-toru	55	245.91	292.01
Andoni-Opobo	40	232.90	356.25
Asari-toru	85	160.80	217.45
Bonny	80	142.46	172.81
Brass	95	145.32	184.30
Degema	50	289.67	364.50
Ekeremor	55	232.05	309.39
Ogbia	75	162.33	224.34
Sagbama	78	161.97	220.69
Southern Ijaw	45	221.67	294.44
Wakrike	56	250.46	314.80
Yenegoa	90	149.81	192.78
Mean ($\bar{X}$)	67	218.09	261.98

Source: Field Survey, 1994.

The retailers' average monthly purchase prices/kg of dry Crayfish range from ₦232.90/kg in Andoni-Opobo to ₦289.67/kg in Degema. The average monthly selling prices were between ₦294.44/kg of dry crayfish in Southern Ijaw and ₦364.50/kg in Degema.

The mean average purchase and selling prices for 67kg of dry crayfish were ₦218.09/kg and ₦261.98/kg respectively.

4.25 Determination of Marketing Margins and the Fisherwomen's Share of the Retail Price Per Kilogram of Crayfish in the Riverine Areas of Rivers State:

In this study, marketing margins for crayfish is the same as the difference between the farm-gate price of crayfish and the retail price for crayfish.

The farm-gate price is the same as the prices at which the brokers, wholesalers and retailers buy their crayfish from the fisherwomen. The marketing margins in this study are expressed as percentages of the retail price. The fisherwomen's share of the retail price is the retail price less the value of the marketing margin.

In table 22, the marketing margins and the fisherwoman's share of the consumer's spending per kilogram of crayfish in the study area are presented as follows;

Table 22 Average Marketing Margins and the Fisherwoman's Share of the Consumer's Spending Per Kilogram of Fresh Crayfish in the Riverine Areas of Rivers State

Local Government Area	Average Marketing Margin as Percentage of Retail Price/kg	Average Fisherwoman's Share as Percentage of Retail Price/kg
Akuku-toru	48.97	51.03
Andoni-Opobo	49.12	50.86
Asari-toru	Na	Na
Bonny	48.54	51.46
Brass	73.85	26.15
Degema	56.21	43.79
Ekeremor	47.44	52.56
Ogbia	Na	Na
Sagbama	72.83	27.17
Southern Ijaw	73.15	26.85
Wakrike	37.43	62.57
Yenegoa	Na	Na
Mean (X)	56.39	43.61

Source: Field Survey, 1994. Na = Not Available.

Table 23 Average Marketing Margins and the Fisherwoman's Share of the Consumer's Spending Per Kilogram of Dry Crayfish in the Riverine Areas of Rivers State

Local Government Area	Average Marketing Margin as Percentage of Retail Price/kg	Average Fisherwoman's Share as Percentage of Retail Price/kg
Akuku-toru	53.80	46.20
Andoni-Opobo	91.04	8.96
Asari-toru	65.79	34.21
Bonny	36.64	63.36
Brass	74.36	25.64
Degema	74.65	25.35
Ekeremor	51.93	48.07
Ogbia	77.30	22.70
Sagbama	55.47	44.53
Southern Ijaw	88.60	11.40
Wakrike	71.75	28.25
Yenegoa	67.66	32.34
Mean ($\bar{X}$)	67.42	32.58

Source: Field Survey, 1994.

Tables 22 and 23 show the average marketing margins and the fisherwoman's share of the consumer's

spending per kilogram of both fresh and dry crayfish respectively in the riverine areas of Rivers State. As table 22 indicates, Sagbama and Southern Ijaw have the highest marketing margins of 72.83% and 73.15% respectively. Wakrike has the lowest marketing margin of 37.43%.

The average marketing margins for fresh crayfish in the study area is 56.34% while the corresponding average fisherwoman's share is 43.61%.

The high marketing margins observed in Sagbama and Southern Ijaw could be as a result of the fisherwomen selling their fresh crayfish to the brokers who in turn hurriedly sold to the wholesalers to avoid spoilage. The distributive chain in these areas was a little longer than in other areas such as Akuku-toru and Degema. In Wakrike most of the retailers and consumers bought direct from the fisherwomen hence, the low marketing margins and the corresponding high fisherwomen's share of the consumer's spending per kilogram of the crayfish bought.

In table 23, it can be noticed that Andoni-Opobo has the highest marketing margin of 91.04% for dry crayfish in the study area. This could be due to

far distances the wholesalers in that area are used to covering before selling their stocks. The average marketing margins for dry crayfish in the study area is 67.42% with a corresponding fisherwoman's share of consumer's spending of 32.58%.

From the foregoing, it could be seen that the average marketing margins for both dry and fresh crayfish in the study area is 61.90% and the corresponding fisherwomen's share is 38.10%. These figures show that the average marketing margins for crayfish in the riverine areas of Rivers State is high. This could be attributed to the identified long chain of distribution existing in the area of study.

The average marketing margins of 61.90% for crayfish seems to be too high when compared to the findings of other research studies. For instance, Lemchi (1991) in his study, found the marketing margins for gari in Imo State to be 20.64% though he attributed the low margin to the fact that gari has close substitutes and a very high price elasticity. On the other hand, Osuji (1980) found rice to have marketing margins of 57.49% in Abeokuta. With the

fisherwoman's share of 32.58% and 43.61% for dry and fresh crayfish respectively, it signifies that for every one naira the consumer spends on every kilogram of dry crayfish, what gets to the fisherwomen is ₦32.58kobo while ₦67.42kobo goes to cover the marketing costs incurred and the net profits of the middlemen.

Furthermore, for every one naira the consumer spends on every kilogram of fresh crayfish, what gets to the fisherwoman is ₦43.61kobo while ₦56.39kobo represents the marketing costs and the middlemen's net profit.

4.26 Gross and Net Profits of the Wholesalers and Retailers Per Kilogram of Crayfish in the Riverine Areas of Rivers State:

According to Upton (1979), the terms "gross margin" and "gross profit" are often used to mean the same thing. Gross Profit is the excess of Sales over Purchases, plus other extra incomes such as commissions etc., whereas, gross margin is the excess of Sales over Purchases only.

There are no extra incomes to the wholesalers and retailers sampled and as a result, gross margin and

gross profit are used to mean the same thing in this study. As a result, net profit is used also to mean the same as net margin and this can be derived as follows:

NM = GM - MC

where;

NM = Net Margin(₦)/kg

GM = Gross Margin(₦)/kg

MC = Marketing Costs ₦/kg.

The average gross and net margins per kilogram of crayfish in the study area, are presented in appendices VIII, IX, X and XI.

As appendix VIII indicates, the average gross margin of wholesalers who buy fresh crayfish, process and sell dry is ₦10,217.50 with a net margin of ₦8,105.94 of crayfish. This represents a NM as percentage marketing cost of 427.24% and an average total cost of 109.07%. The implication of the above figures is that for every ₦100.00 the wholesalers incurred as marketing costs/kg, they made a net margin of ₦427.24kobo/kg above the marketing cost. Furthermore, for every ₦100.00 the wholesalers incurred as total cost, they made a net margin of ₦109.07kobo/kg of crayfish.

For the wholesalers who buy and sell dry crayfish, the average gross margin they made was ₦7277.23 with a net margin of ₦6361.22 of crayfish. This represents NM as percentage marketing costs of 701.95% an average total

cost of 98.15% and an average retail price of 37.43%. These figures imply that for every ₦100.00 the wholesalers incurred in bringing and selling of dry crayfish, they made a net margin of ₦701.95. For every ₦100.00 incurred as total cost, the wholesalers made a net margin of ₦98.15 and for every ₦100.00 spent by the consumer on every kilogram of dry crayfish, what they got to the retailers as net margin was ₦37.43/kg (Appendix IX).

For the retailers who buy and sell fresh crayfish, the average gross margin was ₦1,651.30 with a net margin of ₦1,371.71. This net margin represents an average marketing costs of 516.88%, an average total cost of 91.36% and an average retail price of 43.73%. These figures, imply that for every ₦100.00 the retailers of fresh crayfish incurred as marketing costs/kg, they made a net margin of ₦516.88. Moreover, for every ₦100.00 the retailers invested in the business per kilogram of fresh crayfish, they made a net margin of ₦91.36. For every ₦100.00 the consumers spent on every kilogram of fresh crayfish, the retailers made a net margin of ₦43.73 (Appendix X).

The retailers who buy and sell dry crayfish made gross margin of ₦3,865.50 of dry crayfish with a net margin of ₦3,349.47. This net margin made, represents a NM as percentage / marketing cost of 783.48%, an average total cost of 26.02% and an average retail price per kilogram of 20.35%. The implication of this, is that, for every ₦100.00 the retailers of dry crayfish incurred as marketing costs/kg, they made a net margin of ₦783.46. Also, for every ₦100.00, the retailers invested in the business (total cost), they made a net margin of ₦26.02/kg. Moreover, for every ₦100.00 the consumer spent on every kilogram of dry crayfish, the retailers made a net margin of ₦20.35. (Appendix XI).

From appendices VIII, IX, X and XI and the figures (net margins), it could be observed that the wholesalers who buy fresh crayfish, process and sell (dry) have higher gross and net margins than their counterparts who buy and sell dry crayfish. This could be as earlier observed, due to the fact that the wholesalers who buy fresh, process and sell (dry) are mainly brokers who go along with assorted gifts to buy crayfish from the fisherwomen. Most of the wholesalers who buy and dry crayfish got their supplies from the

producers at higher costs.

While the wholesalers who buy fresh crayfish, process and sell dry made an average net margin of ₦8,105.94, their counterparts who buy and sell dry crayfish, made an average net margin of ₦6,361.22. In terms of the retailers, those who buy and sell fresh crayfish got higher net margin than those who buy and sell dry crayfish. This stems from the fact that retailers who buy and sell fresh crayfish do not cover much distance during their marketing activities and moreover, they get their supplies mostly from the producers at the river banks.

4.27 Distribution of Marketing Margins for Crayfish in the Riverine Areas of Rivers State:

In order to know the proportion of the Marketing Margin that the wholesalers and retailers of crayfish got as their net margins and the part that covers their costs, the overall composition of the marketing margin is presented in table 24.

Table 24 Average Marketing Margin Per Kilogram of Crayfish Marketed in the Riverine Areas of Rivers State.

Local Govt. Area	MM(₦)	MC(₦)	NM(₦)	MC as %age of MM	NM as %age of MM	MC as %age of Jr	NM as %age of Jr
Akuku-toru	11,660.50	1,359.97	10,300.53	11.66	88.34	8.46	64.13
Andoni-Opobo	Na	Na	Na	Na	Na	Na	Na
Asari-toru	11,611.33	1,211.50	10,399.83	10.43	89.57	6.56	56.27
Bonny	7,091.57	1,301.22	5,790.35	18.35	81.65	9.41	41.88
Brass	Na	Na	Na	Na	Na	Na	Na
Degema	14,158.33	1,496.93	12,661.40	10.57	89.43	8.20	69.47
Ekeremor	11,430.70	1,526.16	9,904.04	13.35	86.65	8.97	58.21
Ogbia	10,625.40	1,239.83	9,385.57	11.67	88.33	7.37	55.78
Sagbama	10,614.00	1,236.67	9,377.33	11.65	88.35	7.18	Na
Southern Ijaw	Na	Na	Na	Na	Na	Na	Na
Wakrike	11,633.74	1,988.30	9,645.44	17.09	82.91	11.28	54.71
Yenegoa	Na	Na	Na	Na	Na	Na	Na
Mean ($\bar{X}$)	11,103.20	1,420.07	9,683.06	13.10	86.90	8.43	56.87

Source: Field Survey, 1994. Na = Not Available.

Where:

MM = Marketing Margin/kg.

MC = Marketing Costs/kg.

NM = Net Margins/kg.

Jr = Retail Price/kg.

Table 4.34 above indicates that out of an average Marketing Margin of ₦11,103.20/kg, marketing costs represents an average of 13.10% while the remaining 86.90% accounted for the average net margins that went to the wholesalers and retailers of dry crayfish. This implies that a little part of the marketing margin was used to cover marketing costs incurred while the bulk went to the middlemen as profit.

Moreover, the marketing cost as a percentage of retail price gave an average of 8.43% while the net margins represented an average of 56.87% of the retail price. The implication of this is that, for every ₦100.00 the consumer spends on every kilogram of dry crayfish, ₦8.43kobo goes to cover the marketing costs incurred by the middlemen while ₦56.87kobo represents the middlemen's net margin.

From the above figures, it would be conclusive to mention that the wholesalers and retailers of dry crayfish in the riverine areas of Rivers State are making abnormal profit because they are charging prices far much above what it costs them to buy and sell their crayfish.

4.28 Identified Problems of Crayfish Production, Processing and Marketing Amongst Women in the Riverine Areas of Rivers State:

The problems identified in the course of this study include the following:

(a) Production Problems:

The Crayfish fisherwomen indicated that their major problem among others was in the crayfish catching operations. They complained of making use of old and worn-out nets which greatly affect their catch. They further indicated that the costs of the fishing gears were high and most of the times beyond what they could afford. Moreover, the fisherwomen indicated that they lacked the collateral for securing loans from bank and as a result, could not increase their productivity due to lack of fund.

(b) Storage Problems:

The crayfish fisherwomen complained of lack of efficient methods of processing and preservation of their fresh crayfish. They pointed out that though they catch more crayfish during the dry season, they do not gain much owing to much wastage through deterioration of crayfish due to high temperature. This rapid decomposition of the crayfish during the hot weather makes the women lose a lot of money during the marketing of their crayfish.

(c) Marketing Problems:

The major problem identified amongst the women in the marketing of crayfish was in the area of shelter. Most of the middlemen especially the retailers had no stalls and as a result, were left to the mercy of rain and sun.

(d) Transportation Problems:

Most of the women, both in the production and marketing of crayfish indicated that the cost of transportation is a big menace to them. They complained of the boat drivers exploiting them by hiking the fare but the boat drivers attributed the high cost of transportation to high cost of boat and spare parts.

CHAPTER FIVE

SUMMARY, RECOMMENDATIONS AND CONCLUSION

5.1 Summary of Findings:

Crayfish catching, processing and marketing activities are dominated by women in the Riverine areas of Rivers State. The women have crayfish production and marketing as their primary occupation and have no time for any secondary occupation. For the women in production, crayfish fishing is best done in the night or in the early hours of morning. Crayfish fishing business is regarded as a profitable enterprise as they are able to catch an average of 2-3 baskets of fresh crayfish per day or outing trips. This in turn gives an average net revenue of ₦115,626.67 per year for an average quantity of 1,460 kilogram of fresh crayfish. The processed (dry) crayfish yields more money than the fresh and unprocessed ones.

Despite the activities of these women in the study area, most of them interviewed, revealed that they have no cooperative associations and never had any visitation from extension agents in the State.

In terms of the marketing and distribution of crayfish, the crayfish wholesalers and retailers were found not to be the only ones involved in the distribution of crayfish in the study area. The brokers or village merchants were found to be the ones that have major contacts with the fisherwomen.

The selling prices of the middlemen were found not to correspond to their purchase prices and marketing costs. The average gross margin per kilogram of crayfish for the retailers who buy and sell fresh crayfish was ₦1,651.30 with an average net margin of ₦1,371.71. This represented an average marketing costs of 516.88%, an average total cost of 91.36% and an average retail price of 43.73% per kilogram of fresh crayfish. For the retailers who buy and sell dry crayfish, their average gross margin was ₦3,865.50 with an average net margin of ₦3,349.47. This represented average marketing costs of 783.46%, an average total cost of 26.02% and an average retail price of 20.35%.

On the other hand, the wholesalers who buy fresh crayfish, process and sell (dry), have an average gross margin of ₦10,217.50 with a corresponding net margin of ₦8,015.94. For the wholesalers who buy and sell

dry crayfish, they made an average gross margin of ₦7,277.23 with a net margin of ₦6,361.22 This net margin represented an average marketing costs of 701.95%, an average total cost of 98.15% and an average retail price of 37.43%.

The average marketing margin per kilogram of crayfish in the area of study was found to be ₦11,103.20 or 61.90% of the retail price per kilogram of crayfish while the fisherwoman's share of the consumer spending gave 38.10%. Out of the average marketing margin for crayfish, marketing costs incurred by the middlemen took an average of 13.10% of net margin with a corresponding middlemen's average net margin of 86.90%. Marketing costs as percentage of retail price, gave an average of 8.43% while the net margin gave an average of 56.87% of the retail price.

From the above figures, it therefore meant that little was expended by the middlemen as marketing cost and almost all the net profit went to them. Furthermore, it was found from the study that the average marketing costs took up 8.3% of the retail price while the net margin represented an average of 56.87% of the retail price. The middlemen were found to be charging

very high prices for crayfish because for every ₦100.00 the consumer spends on every kilogram of crayfish, ₦8.43 goes to cover the marketing costs of the middlemen while ₦56.87 goes to the middlemen as their net margins.

5.2 Recommendations:

Based on the findings of this study, the following recommendations call for some policy measures:-

1. Increase in the Strength of Extension Services:

The fisherwomen contribute a lot in meeting the protein needs of the Nigerian populace. As a result, they should be encouraged by the Ministry of Agriculture and Natural Resources through the provision of extension services. This will in turn educate them on the importance of cooperative activities in their various fishing ports and villages. This will no doubt help the fisherwomen thereby increasing their productivity and standard of living.

2. Provision of Loan to the Fisherwomen:

The Federal and State governments should encourage the fisherwomen through provision of loans. The loans to be provided should have no restriction as the

fisherwomen complained of having no collateral securities. Once a fisherwomen is engaged full-time in crayfish catching, provision of a guarantor by the fisherwoman should be considered enough for the loan to be disbursed to her. In effect, this will help the fisherwomen in meeting up with the high cost of nets, canoes and other necessary equipment for catching of crayfish.

3. Subsidies on Fishing Gears:

Most women in the villages expressed their desire to enter the crayfish production business but have been unable to do so due to the high cost of fishing gears. Therefore, the State government should ensure that as many women as possible go into crayfish production by supplying some of the fishing gears such as nets and canoes at highly subsidized rate. This will in turn enable these women to be engaged fully in crayfish production and produce at a lower cost.

4. Reducing the Number of Middlemen:

It was found from the study that crayfish caught by the fisherwomen go through a number of hands before reaching the final consumer. This long chain in distribution, led to unnecessary increases in the price and marketing margins of crayfish. Therefore, the

fisherwomen should ensure that they go into joint ventures by organising themselves into cooperative societies which will in turn, take over on their behalf, the marketing aspects of their enterprise.

5. Provision of Cheaper Means of Transportation:

It is true that in the riverine areas, the fisherwomen have no other choice of transportation apart from the boats and canoes. That notwithstanding, the fisherwomen through organising themselves into cooperative societies could pull their resources together and buy their own common transport system. This will no doubt discourage them from selling their hard-earned produce at give-away prices to the brokers.

6. Provision of Storage Facilities:

The study identified that the fisherwomen and fresh crayfish middlemen were incurring much loss due to crayfish spoilage. To ensure better utilisation of crayfish resources, the Federal and State governments should give the fisherwomen assistance in the acquisition of giant and motorized cold storage facilities around the shores.

5.3 Conclusion:

This study showed that crayfish production is highly profitable amongst the rural women in the riverine areas of Rivers State. The women studied, were fully engaged in crayfish and based their livelihood on it.

In determining the size of marketing margins for crayfish in the study area, it was found that the marketing margin is high. The middlemen, especially the brokers or village merchants earned excessive profits and this could be observed in their net margins.

The problems militating against crayfish production, processing and marketing amongst the rural women ranged from production problems, high transportation fares, storage inadequacies, lack of adequate operational funds, complicated by inability to raise loans from the finance institutions.

In spite of the many problems the fisherwomen encounter, they are still relentless in their efforts to produce more crayfish. Since the entire Nigerian populace need the addition of crayfish in their diets, there is need for the Governments (Federal and State) to help in improving the social and economic activities of these women.

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APPENDIX I

CALCULATION OF DEPRECIATION FOR THE FIXED COST ITEMS USING STRAIGHT LINE METHODS

Formula for Depreciation Using Straight Line Method:

$$\frac{\text{Total Costs} - \text{Estimated Salvage Value}}{\text{Estimated Useful Life}}$$

For this Study, the Salvage Values of the Fixed Cost Items were not estimated. Hence, the formula becomes:

$$\text{Depreciation} = \frac{\text{Total Costs}}{\text{Estimated Useful Life.}}$$

(i) Canoe:

Cost per Unit	=	₦3,500.00
Total Cost of 1 Canoe	=	₦3,500.00
Estimated Useful life	=	10 years
Depreciation	=	$\frac{₦3500.00}{10 \text{ years}}$
	=	₦350.00/year.

(ii) Paddle:

Cost per Unit	=	₦100.00
Total Cost of 4 Paddles	=	₦400.00
Estimated Useful Life	=	2 years
Depreciation	=	$\frac{₦400.00}{2 \text{ years}}$
	=	₦200/year.

(iii) Matchet:

Cost Per Unit	=	₦200.00
Total Cost of 1 Matchet	=	₦200.00
Estimated Useful Life	=	3 years
Depreciation	=	$\frac{₦200.00}{3 \text{ years}}$
	=	₦66.67
	=	₦67.00/year

(iv) Axe:

Cost Per Unit	=	₦350.00
Total Cost of 1 Axe	=	₦350.00
Estimated Useful Life	=	10 years
Depreciation	=	$\frac{₦350.00}{10 \text{ years}}$
	=	₦35.00/year.

(v) Altar/Rackets:

Cost Per Unit	=	₦500.00
Total Cost of 1 Altar/racket	=	₦500.00
Estimated Useful Life	=	4 years
Depreciation	=	$\frac{₦500.00}{4 \text{ years}}$
	=	₦125.00/year.

APPENDIX II

DEPARTMENT OF AGRICULTURAL ECONOMICS
UNIVERSITY OF NIGERIA, NSUKKA

Dear Madam,

This is a research study in partial fulfilment for the award of Masters degree in Agricultural Economics. Kindly supply your honest answers to the questions put forward to you.

Every information supplied here will be used for the purpose of this research study only.

You need not write your name. Thank you for your kind cooperation.

Yours faithfully,

Williams, J.N.

QUESTIONNAIRE TOOL

CRAYFISH FISHERWOMEN (PRODUCERS)

Please tick (√) for the correct answer or fill in details as appropriate.

A. SOCIOECONOMIC CHARACTERISTICS:

1. Name of Town or Village .....
2. Local Government Area .....

3. Age of the fisherwoman:

(a) ( ) under 15 years

(b) ( ) 15-25 years

(c) ( ) 26-35 years

(d) ( ) 36-45 years

(e) ( ) 46-55 years

(f) ( ) 56-65 years

(g) ( ) over 65 years.

4. Educational background:

(a) ( ) No formal education

(b) ( ) Attempted primary school

(c) ( ) Completed primary school

(d) ( ) Attempted secondary school

(e) ( ) Completed secondary school

Others (specify) .....

5. Occupation:

(a) Primary occupation .....

(b) Secondary occupation .....

(i) .....

(ii) .....

(iii) .....

6. Marital Status:

(a) ( ) married

(b) ( ) single

(c) ( ) divorced

(d) ( ) widowed.

7. Family Size:

(a) ( ) 1-5

(b) ( ) 6-10

(c) ( ) 11-15

Others (specify) .....

8. Reason(s) for being in the crayfish fishing business:

(a) ( ) Crayfish fishing business is highly profitable.

(b) ( ) Lack of alternative employment.

(c) ( ) Fishing is a way of life.

Other reasons:

(i) .....

(ii) .....

(iii) .....

B. SYSTEMS OF CRAYFISH PRODUCTION, PROCESSING AND MARKETING.

1. At which location(s) do you catch crayfish?

(a) ( ) Coastline

(b) ( ) Rivers/Creeks

(c) ( ) Estuaries

Others (specify) .....

2. Which of the fishing gear(s) below do you use in catching crayfish?

   (a) ( ) Nets

   (b) ( ) Barriers

   (c) ( ) Traps

   Others (specify) .....

3. Do you make use of canoes while fishing for crayfish?

   (a) ( ) Yes

   (b) ( ) No.

4. How often do you go to catch crayfish?

   (a) ( ) Everyday

   (b) ( ) Every 2 days interval

   (c) ( ) Every 4 days interval

   (d) ( ) Weekly

   (e) ( ) Monthly

   Others (specify) .....

5. How many hours do you spend per outing or fishing trip?

   (a) ( ) less than an hour

   (b) ( ) 1-2 hours

   (c) ( ) 3-4 hours

   (d) ( ) 5-6 hours

   (e) ( ) 7-8 hours

   (f) ( ) more than 8 hours.

6. How many baskets of crayfish do you catch per outing?

(a) ( ) less than a basket

(b) ( ) 1-2 baskets

(c) ( ) 3-4 baskets

(d) ( ) 5-6 baskets

(e) ( ) 7-8 baskets

(f) ( ) more than 8 baskets

Others (specify) .....

7. In which season do you get the biggest catch?

(a) ( ) during the rainy season

(b) ( ) during the dry season.

8. By what time do you get the biggest catch?

(a) ( ) in the day time

(b) ( ) in the night.

9. Do you process the crayfish caught?

(a) ( ) Yes

(b) ( ) No.

10. If the answer to question 9 is Yes, what method(s) of processing do you adopt for the crayfish caught?

(a) ( ) drying under the sun

(b) ( ) drying with fire

Others (specify) .....

11. How long does it take to process the crayfish that will be sold fresh?

(a) ( ) less than a day

(b) ( ) 1-2 days

(c) ( ) 3-4 days

(d) ( ) 5-6 days

(e) ( ) 7-8 days

(f) ( ) Above 8 days

Others (specify) .....

12. How long does it take to process the crayfish that will be sold dry?

(a) ( ) less than a day

(b) ( ) 1-2 days

(c) ( ) 3-4 days

(d) ( ) 5-6 days

(e) ( ) 7-8 days

(f) ( ) Above 8 days

Others (specify) .....

13. Which form of crayfish is financially more rewarding?

(a) ( ) processed and fresh

(b) ( ) processed and dry

(c) ( ) unprocessed and fresh

(d) ( ) unprocessed and dry

Others (specify) .....

14. Where do you sell the unprocessed (fresh) crayfish?

(a) ( ) markets

(b) ( ) at the river banks.

15. Where do you sell the processed (dry/fresh) crayfish?

(a) ( ) markets

(b) ( ) at the river banks.

16. If the answers to questions 14 and 15 are markets, how far away are the markets from the banks?

(a) ( ) less than 1 kilometer

(b) ( ) 1 kilometer

(c) ( ) less than 2 kilometers

(d) ( ) 2 kilometers

Others (specify) .....

17. To whom do you normally sell the unprocessed crayfish?

(a) ( ) brokers

(b) ( ) wholesalers

(c) ( ) retailers

(d) ( ) consumers

Others (specify) .....

18. To whom do you sell the processed crayfish?

(a) ( ) wholesalers

(b) ( ) brokers

(c) ( ) retailers

(d) ( ) consumers

Others (specify) .....

19. What is the measure of crayfish for sale?

(a) ( ) basket

(b) ( ) cigarrette cup

Others (specify) .....

20. How do you arrive at the price at which you sell your crayfish?

(a) ( ) fix price arbitrarily

(b) ( ) fix price in consideration of input prices and other expenses incurred

(c) ( ) fix price based on market condition of supply and demand

(d) ( ) fix price through bargaining with customers

Others (specify) .....

21. Do you consider the price fair enough to make you increase the quantity of crayfish you catch?

(a) ( ) Yes

(b) ( ) No.

22. Do you think that buyers of your crayfish manipulate price(s) to your detriment?

(a) ( ) Yes

(b) ( ) No.

23. If Yes, in what way(s) do you consider that prices be arrived at?

(i) .....

(ii) .....

(iii) .....

24. How do you transport your crayfish to the place of sale when not sold at the river banks?

(a) ( ) foot/barrow

(b) ( ) canoe/motor boat

(c) ( ) commercial/public transport

Others (specify) .....

25. What is the source of labour used in both processing and catching of crayfish?

(a) ( ) family labour

(b) ( ) hired labour

26. What quantity of crayfish/basin do you sell in a day and how much money could be realised at the following places/markets?

Markets/Places	Processed fresh		Unprocessed fresh		Processed dry	
	Qty.	Amt.	Qty.	Amt.	Qty.	Amt.
(a) River banks						
(b) Urban markets						
(c) Daily local markets						
(d) Neighbouring markets						
(e) Weekly markets						

27. Give the average income generated from the sell of the following form of crayfish monthly from January 1993 to December 1993.

Month	Processed dry		Unprocessed fresh		Processed fresh	
	Qty.	Amt.	Qty.	Amt.	Qty.	Amt.
(a) January						
(b) February						
(c) March						
(d) April						
(e) May						
(f) June						
(g) July						
(h) August						
(i) September						
(j) October						
(k) November						
(l) December						

C. PRODUCTION AND MARKETING COSTS:

1. What amount is spent on each of the following equipment used in crayfish catching?

Equipment	Quantity	Amount (₦)
(a) Canoe		
(b) Basket		
(c) Net		

Equipment	Quantity	Amount (₦)
(d) Matchet		
(e) Axe		
(f) Rope		
(g) Pole		
(h) Bailer		
(i) Paddle		
(j) Miscellaneous		

2. What was the average amount of money spent on labour in a month for crayfish production in the following areas?

   (a) catching ₦.....

   (b) processing ₦.....

   (c) marketing ₦ .....

3. What quantity of crayfish did you transport in a month (using the following means) at what cost through the following distances? From:

Market/Place		Qty.	Cost	Dis-tance	Means of transport
River to homestead					
River to market	Local Neighbouring Urban				
Homestead to market	Local Neighbouring Urban				

4. What was the average amount of money spent on processing of crayfish/basin in a month?

   (i) Drying under the sun ₦.....

   (ii) Drying with fire ₦.....

   (iii) Others (specify):

   (a) ..... ₦ .....

   (b) ..... ₦ .....

5. What was the average amount of money spent on repairs per month?

   ₦ .....

D. PROBLEMS ASSOCIATED WITH CRAYFISH PRODUCTION:

1. What are the major problems associated with crayfish production?

   (a) ( ) financial problems

   (b) ( ) production problems

   (c) ( ) marketing problems

   Others (specify) .....

2. What are your marketing problems?

   (a) ( ) No stroage facilities

   (b) ( ) Transportation problems

   (c) ( ) Located far from the markets

   Others (specify) .....

3. Do you require government assistance in any form? for example,

(a) ( ) Extension services

(b) ( ) Loan

(c) ( ) Marketing services

Others (specify) .....

Other comments: .....

.....

.....

.....

APPENDIX III

DEPARTMENT OF AGRICULTURAL ECONOMICS
UNIVERSITY OF NIGERIA, NSUKKA

Dear Madam,

This is a research study in partial fulfilment for the award of Masters degree in Agricultural Economics. Kindly supply your honest answers to the questions put forward to you.

Every information supplied here will be treated as confidential and will be used for the purpose of this research study only.

You need not write your name. Thank you for your kind cooperation.

Yours faithfully,

Williams, J.N.

QUESTIONNAIRE TOOL
CRAYFISH WHOLESALERS

A. SOCIOECONOMIC CHARACTERISTICS:

Please tick (√) for the correct answer or fill in details as appropriate.

1. Name of Market .....

2. Name of Town or Village .....

3. Local Government Area .....

4. Age:

(a) ( ) under 15 years

(b) ( ) 15-25 years

(c) ( ) 26-35 years

(d) ( ) 36-45 years

(e) ( ) 46-55 years

(f) ( ) 56-65 years

(g) ( ) over 65 years

5. Educational background:

(a) ( ) No formal education

(b) ( ) Attempted primary school

(c) ( ) Completed primary school

(d) ( ) Attempted secondary school

(e) ( ) Completed secondary school

Others (specify) .....

6. Marital Status:

(a) ( ) Married

(b) ( ) Single

(c) ( ) Divorced

(d) ( ) Widowed

7. Occupation:

(a) Primary occupation .....

(b) Secondary occupation:

(i) .....

(ii) .....

(iii) .....

8. Family size:

(a) ( ) 1-5

(b) ( ) 6-10

(c) ( ) 11-15

Others (specify) .....

9. Where do you get your supply of crayfish from?

(a) ( ) brokers

(b) ( ) producers

Others (specify) .....

10. How do you transport your crayfish from place of purchase to the place of sale?

(a) ( ) foot/barrow

(b) ( ) bicycle/motorcycle

(c) ( ) commercial/public transport

Others (specify) .....

11. What was the average monthly transportation charge per bag of crayfish from January 1993 to December 1993?

Month	Charge/bag (₦)	Quantity carried
January		
February		
March		

Month	Charge/bag (₦)	Quantity carried
April		
May		
June		
July		
August		
September		
October		
November		
December		

12. What was the average monthly charge for loading and off-loading per bag of crayfish?

₦ .....

13. What was the monthly cost of empty bags and ropes/ baskets for crayfish?

₦.....

14. Do you pay any form of Local Government rate at the place of purchase?

(a) ( ) Yes

(b) ( ) No.

15. If Yes, how much per bag?

₦ .....

16. What was the average monthly price at which you purchased crayfish from January 1993 to December 1993?

Month	Unprocessed/fresh		Processed/dry	
	Price	Quantity	Price	Quantity
January				
February				
March				
April				
May				
June				
July				
August				
September				
October				
November				
December				

17. In which group(s) of crayfish wholesalers do you belong?

(a) ( ) those who buy fresh and sell fresh

(b) ( ) those who buy fresh, process (dry) and sell.

(c) ( ) those who buy dry and processed crayfish.

Others (specify) .....

18. What is the measure of crayfish for purchases and sales?

(a) ( ) basket

(b) ( ) cigarrette cup

Others (specify) .....

19. Give the average monthly selling price of your crayfish from January 1993 to December 1993.

Month	Unprocessed/fresh		Processed/dry	
	Price	Quantity	Price	Quantity
January				
February				
March				
April				
May				
June				
July				
August				
September				
October				
November				
December				

20. Do you do any form of processing before selling your crayfish?

(a) ( ) Yes

(b) ( ) No.

21. If Yes, what was the average monthly cost of processing your crayfish from January 1993 to December 1933?

Month	Type of Processing	Cost of Processing	Quantity
January			
February			
March			
April			
May			
June			
July			
August			
September			
October			
November			
December			

22. How do you arrive at the price at which you sell your crayfish?

(a) ( ) fix price arbitrarily

(b) ( ) fix price in consideration of purchase price and other expenses incurred.

(c) ( ) fix price based on market conditions of supply and demand.

(d) ( ) fix price through bargaining with retailers.

(e) ( ) by Crayfish Wholesalers Association.

Others means (specify) .....

23. Do you belong to any association for crayfish wholesalers?
    (a) ( ) Yes
    (b) ( ) No.

24. If Yes, how much is the monthly/annual due?
    # .....

25. How much is the rent/per month for your store?
    # .....

26. How much do you pay for electricity, if any?
    # .....

27. Is there any local rate you pay at your place of sale?
    (a) ( ) Yes
    (b) ( ) No.

28. If Yes, how much is the pay per month?
    # .....

29. What was the cost of loss incurred in a month due to crayfish damage?
    # .....

30. What other types of costs did you incure?
    # .....

31. Do you consider cost of transportation too high?
    (a) ( ) Yes
    (b) ( ) No.

32. If Yes, what do you think is/are the factor(s) responsible for it?

(a) ( ) cost of fuel

(b) ( ) cost of spare parts

(c) ( ) place of purchase far from place of sale

(d) ( ) unpatriotic attitude of boat/motor vehicle drivers.

Others (specify) .....

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Other comments .....

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APPENDIX IV

DEPARTMENT OF AGRICULTURAL ECONOMICS
UNIVERSITY OF NIGERIA, NSUKKA

Dear Madam,

This is a research study in partial fulfilment for the award of Masters degree in Agricultural Economics. Kindly supply your honest answers to the questions put forward to you.

Every information supplied here will be treated as confidential and will be used for the purpose of this research study only.

You need not write your name. Thank you for your kind cooperation.

Yours faithfully,

Williams, J.N.

QUESTIONNAIRE TOOL
CRAYFISH RETAILERS

Please tick (√) for the correct answer or fill in details as appropriate.

1. Name of Market .....
2. Name of Town or Village .....
3. Local Government Area .....

4. Age:

(a) ( ) under 15 years
(b) ( ) 15-25 years
(c) ( ) 26-35 years
(d) ( ) 36-45 years
(e) ( ) 46-55 years
(f) ( ) 56-65 years
(g) ( ) over 65 years

5. Educational background:

(a) ( ) No formal education
(b) ( ) Attempted primary school
(c) ( ) Completed primary school
(d) ( ) Attempted secondary school
(e) ( ) Completed secondary school

Others (specify) .....

6. Marital Status:

(a) ( ) Married
(b) ( ) Single
(c) ( ) Divorced
(d) ( ) Widowed

7. Occupation:

(a) Primary occupation .....
(b) Secondary occupation:
    (i) .....
    (ii) .....
    (iii) .....

8. Family Size:
   (a) ( ) 1-5
   (b) ( ) 6-10
   (c) ( ) 11-15

9. In which group(s) of crayfish retailers do you belong?
   (a) ( ) those who buy fresh and sell fresh
   (b) ( ) those who buy fresh, process and sell.
   (c) ( ) those who buy dry and processed crayfish.

10. From where do you get your supply of crayfish?
   (a) ( ) wholesalers
   (b) ( ) producers
   (c) ( ) brokers
   Others (specify) .....

11. In what measure do you purchase your crayfish?
   (a) ( ) basket
   (b) ( ) cigarrette cup
   Others (specify) .....

12. Give the average monthly price at which you bought your crayfish from January 1993 to December 1993.

Month	Unprocessed/fresh		Processed/dry	
	Price	Quantity	Price	Quantity
January				
February				
March				

Month	Unprocessed/fresh		Processed/dry	
	Price	Quantity	Price	Quantity
April				
May				
June				
July				
August				
September				
October				
November				
December				

13. How do you arrive at the price at which you buy your crayfish?

(a) ( ) Price set by the wholesalers/producers

(b) ( ) Price reached through bargaining with wholesalers/producers

Other means (specify) .....

14. How do you transport your crayfish from the place of purchase to the place of sale?

(a) ( ) Head (Portrage)

(b) ( ) Commercial/Public transport

Other means (specify) .....

15. What is the average monthly charge per bag of crayfish for transportation from January 1993 to December 1993?

Month	Charge/bag (#)	Quantity carried
January		
February		
March		
April		
May		
June		
July		
August		
September		
October		
November		
December		

16. How much was spent on loading and off-loading/bag in a month?

    #.....

17. How much was spent on wheelbarrow pushers in a month?

    #.....

18. Do you buy empty bags/ropes for crayfish?

    (a) ( ) Yes

    (b) ( ) No

19. If Yes, what was the cost of the empty bags/ropes used in a month?

    #.....

20. Do you do any form of processing after purchasing the crayfish for sale?

    (a) ( ) Yes

    (b) ( ) No.

21. If Yes, what was the average monthly cost of processing crayfish from January 1993 to December 1993?

Month	Type of Processing	Cost of Processing	Quantity
January			
February			
March			
April			
May			
June			
July			
August			
September			
October			
November			
December			

22. How do you arrive at the retail price of your crayfish?

(a) ( ) fix price arbitrarily

(b) ( ) fix price in consideration of the purchase price and the expenses incurred

(c) ( ) fix price based on market conditions of demand and supply

(d) ( ) fix price through bargaining with consumers

(e) ( ) price fixed by the Crayfish Retailers Association

Other means (specify) .....

23. Give an average monthly price at which you sold your crayfish from January 1993 to December 1993.

Month	Unprocessed/fresh		Processed/dry	
	Price(₦)	Quantity	Price(₦)	Quantity
January				
February				
March				
April				
May				
June				
July				
August				
September				
October				
November				
December				

24. What is the rent per month for your store or shed?

₦.....

25. What is the monthly electricity bill, if any?

₦.....

26. Is there any form of Local rate payable at your place of sale?

(a) ( ) Yes

(b) ( ) No.

27. If Yes, how much per month?

₦.....

28. Do you belong to any Crayfish Retailers Association?

(a) ( ) Yes

(b) ( ) No.

29. If Yes, how much is the monthly due?

₦.....

30. What other cost(s) did you incure last year?

₦.....

Other comments:

.....

.....

.....

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APPENDIX V

GROSS PROFIT MARGIN FOR CRAYFISH PRODUCTION

Formula for Gross Profit Margin:-

$$\frac{\text{Sales - Cost of Goods Sold}}{\text{Sales}}$$

i.e

$$\frac{\text{Crayrish Sales/Yield - Cost of Goods Sold or (TC)}}{\text{Crayfish Sales}}$$

Crayfish Sales/Yield = ₦135,604.8

Cost of goods sold or
Total Cost = ₦19,978.20

$$\frac{₦135,604.8 - ₦19,978.20}{₦135,603.87}$$

$$= 0.85$$

or 85%.

APPENDIX VI

NAMES OF THE MARKETS IN THE 12 (TWELVE) VILLAGES USED IN THE STUDY

Local Government Area	Name of Village Market
1. Akuku-toru	Obonoma Main Market
2. Andoni-Opobo	Inyonrong Daily Market
3. Asari-toru	Ilelema Market
4. Bonny	Ayaminimah Main Market
5. Brass	Ogbolomabiri Creek Market
6. Degema	Tombia Main Market
7. Ekeremor	Ayamasa Town Market
8. Ogbia	Amakalakala Market
9. Sagbama	Okumbiri Daily Market
10. Southern Ijaw	Oporoma Main Market
11. Wakrike	Okrika Town Market
12. Yenegoa	Odi Market

APPENDIX VII

DETERMINATION OF MARKETING MARGINS AND MARKETING COSTS

$$\text{Percentage } \pi/kg = \frac{(\pi(₦)/kg)}{Pr/kg} \times \frac{100}{1}$$

where: π = Profit

Pr = Retail price

The proportion of the consumer's spending per kilogram of crayfish that covered the marketing costs per kilogram of crayfish was determined using the formula below:

$$\frac{(MC/kg)}{Pr/kg} \times \frac{100}{1}$$

where: MC = Marketing Costs.

The fisherwoman's share as a percentage of the consumer's spending per kilogram of crayfish was computed through the formula below:

$$FS = \frac{(\text{Average producer price/kg})}{Pr/kg} \times \frac{100}{1}$$

where:

FS = Fisherwomen's share in percentage/kg

Pr = Retail price/kg.

The part of the marketing margin that represents the middlemen's net profits was calculated by the formula:

$$\text{Net } \pi = \frac{(\pi(₦)/kg)}{MM/kg} \times \frac{100}{1}$$

ere:

Net π = net profits in percentage.

MM = marketing margin/kg.

From 100 per cent, the remaining percentage after e net profit in percentage has been substracted which ves that part of the marketing margin that went to ver the marketing costs incurred by the middlemen.

APPENDIX VIII

Average Gross and Net Margins Per Kilogram of Crayfish Marketed By The Wholesalers who Buy Fresh Crayfish, Process and Sell (Dry) in The Riverine Areas of Rivers State.

Local Govt. Area	JN(₦)	JW(₦)	GM(₦)	MC(₦)	NM(₦)	NM as %age of MC	NM as %age of TC
Akuku-toru	5,691.30	16,920.00	11,228.70	2,812.60	8,416.10	299.23	98.97
Andoni-Opobo	5,728.70	13,767.92	8,039.22	1,055.00	6,984.20	662.01	102.96
Asari-toru	4,820.00	15,862.72	11,042.72	2,620.00	8,422.72	321.48	113.21
Bonny	Na	Na	Na	Na	Na	Na	Na
Brass	5,410.00	13,677.07	8,267.07	1,042.33	7,224.74	693.13	111.97
Degema	4,612.70	17,622.60	13,009.90	3,781.00	9,228.90	244.09	109.95
Ekeremor	4,832.60	14,620.00	9,787.40	1,930.00	7,857.40	407.12	116.19
Ogbia	5,625.02	16,222.52	10,597.50	2,455.00	8,142.50	331.67	100.77
Sagbama	3,987.80	14,832.00	10,844.20	2,502.00	8,342.20	333.42	128.54
Southern Ijaw	4,716.67	16,266.67	11,550.00	2,800.83	8,749.17	312.38	116.38
Wakrike	Na	Na	Na	Na	Na	Na	Na
Yenegoa	6,385.56	14,193.77	7,808.21	1,016.84	6,791.37	667.89	91.75
Mean ($\bar{X}$)	5,181.04	15,398.53	10,217.50	2,201.56	8,015.94	427.24	109.07

Source: Field Survey, 1994. Na = Not Available.

APPENDIX IX

Average Gross and Net Margins Per Kilogram of Crayfish Marketed By The Wholesalers Who Buy and Sell Dry Crayfish in the Riverine Areas of Rivers State

Local Govt. Area	JN(₦)	JW(₦)	GM(₦)	MC(₦)	NM(₦)	NM as %age of MC	NM as %age of TC	NM as %age of Jr
Akuku-toru	4,400.00	13,525.00	9,125.00	853.34	8,271.66	969.33	157.46	51.50
Andoni-Opobo	Na	Na	Na	Na	Na	Na	Na	Na
Asari-toru	6,872.00	13,668.00	6,796.00	922.00	5,874.00	637.09	50.78	31.78
Bonny	6,733.33	11,397.23	4,663.90	708.62	3,955.28	558.17	53.14	28.61
Brass	Na	Na	Na	Na	Na	Na	Na	Na
Degema	4,066.67	14,483.33	10,416.66	852.33	9,564.33	1,122.14	194.44	52.48
Ekeremor	5,586.00	12,763.00	7,177.00	929.50	6,247.50	672.14	95.89	36.72
Ogbia	6,200.00	12,175.00	5,975.00	952.33	5,022.67	527.41	70.22	29.85
Sagbama	6,600.00	12,633.33	6,033.33	930.00	5,103.33	548.75	67.77	29.65
Southern Ijaw	Na	Na	Na	Na	Na	Na	Na	Na
Wakrike	5,994.96	14,025.93	8,030.97	1,180.00	6,850.97	580.59	95.48	38.86
Yenegoa	Na	Na	Na	Na	Na	Na	Na	Na
Mean ($\bar{X}$)	5,806.62	13,083.85	7,277.23	916.02	6,361.22	701.95	98.15	37.43

Source: Field Survey, 1994. Na = Not Available.

APPENDIX X

Average Gross and Net Margins Per Kilogram of Crayfish Marketed By the Retailers Who Buy and Sell Fresh Crayfish in the Riverine Areas of Rivers State

Local Govt. Area	JW(₦)	Jr(₦)	GM(₦)	MC(₦)	NM(₦)	NM as %age of MC	NM as %age of TC	NM as %age of Jr
Akuku-toru	1,280.00	2,508.30	1,228.30	342.20	866.10	253.10	53.39	34.52
Andoni-Opobo	725.00	1,425.00	700.00	235.92	464.08	196.71	48.30	32.57
Asari-toru	Na	Na	Na	Na	Na	Na	Na	Na
Bonny	2,179.17	4,235.00	2,055.83	239.20	1,816.63	759.46	75.13	42.90
Brass	2,083.33	4,525.00	2,441.67	355.10	2,086.57	587.60	85.57	46.11
Degema	770.83	1,758.33	987.50	216.63	770.87	355.85	78.07	43.84
Ekeremor	1,391.20	2,647.10	1,255.90	281.45	974.45	346.23	58.26	36.81
Ogbia	Na	Na	Na	Na	Na	Na	Na	Na
Sagbama	1,190.83	4,383.33	3,192.50	265.03	2,927.47	1,104.58	201.08	66.79
Southern Ijaw	725.00	2,700.00	1,975.00	205.80	1,769.20	859.67	190.07	65.53
Wakrike	1,713.33	2,738.33	1,025.00	355.00	670.00	188.73	32.39	24.47
Yenegoa	Na	Na	Na	Na	Na	Na	Na	Na
Mean ($\bar{X}$)	1,339.85	2,991.15	1,651.30	277.37	1,371.71	516.88	91.36	43.73

Source: Field Survey, 1994. Na = Not Available.

APPENDIX XI

Average Gross and Net Margins Per Kilogram of Crayfish Marketed by the Retailers who Buy and Sell Dry Crayfish in the Riverine Areas of Rivers State

Local Govt. Area	JW(₦)	Jr(₦)	GM(₦)	MC(₦)	NM(₦)	NM as %age of MC	NM as %age of TC	NM as %age of Jr
Akuku-toru	13,525.00	16,060.50	2,535.50	506.63	2,028.87	400.46	14.46	12.63
Andoni-Opobo	9,316.00	14,250.00	4,934.00	875.00	4,059.00	463.89	39.83	28.48
Asari-toru	13,668.00	18,483.33	4,815.33	289.50	4,525.83	1,563.33	32.43	24.49
Bonny	11,397.23	13,825.00	2,427.67	592.60	1,835.07	309.66	15.31	13.27
Brass	13,805.33	17,508.50	3,703.17	525.00	3,178.17	605.37	22.18	18.15
Degema	14,483.33	18,225.00	3,741.67	644.60	3,097.07	480.46	20.47	16.99
Ekeremor	12,763.00	17,016.20	4,253.20	596.66	3,656.54	612.84	27.37	21.49
Ogbia	12,175.00	16,825.40	4,650.40	287.50	4,362.90	1,517.53	35.01	25.93
Sagbama	12,633.33	17,214.00	4,580.67	306.67	4,274.00	1,393.68	33.03	24.83
Southern Ijaw	9,975.00	13,250.00	3,275.00	314.97	2,960.03	939.78	28.77	22.34
Wakrike	14,025.93	17,628.70	3,602.77	808.30	2,794.47	345.72	18.84	15.85
Yenegoa	13,483.33	17,350.00	3,866.67	445.04	3,421.63	768.84	24.57	19.72
Mean ($\bar{X}$)	12,604.21	16,469.72	3,865.50	516.04	3,349.47	783.46	26.02	20.35

Source: Field Survey, 1994.

Where:

JN = Wholesalers' purchase price/kg

JW = Wholesalers' selling price/kg

Jr = Retail price/kg

GM = Gross Margin

MC = Marketing Costs

NM = Net Margin

TC = Total Cost (Purchase price plus marketing costs).