

**MARKETING OF PROCESSED CATFISH IN KADUNA-METROPOLIS
KADUNA STATE, NIGERIA**

BY

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NIGERIA**

JANUARY, 2016

DECLARATION

I hereby declare that this dissertation titled “**Marketing of Processed Catfish in Kaduna-Metropolis, Kaduna State, Nigeria**” has been written by me and it is a record of my research work. No part of this work has been presented in any previous application for another Degree or Diploma in this or any other institution. All borrowed information have been duly acknowledged in the text and a list of references provided.

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CERTIFICATION

This dissertation titled ‘**Marketing of Processed Catfish in Kaduna-Metropolis, Kaduna State, Nigeria**’, by Omowa Abosede Elizabeth, meets the regulations governing the award of the Degree of Master of Science of the Ahmadu Bello University, Zaria, and is approved for its contribution to scientific knowledge and literary presentation.

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DEDICATION

This dissertation is dedicated to God Almighty, and also to my late father- Mr.
Olurotimi James Ware

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ABSTRACT

The main focus of this study was to evaluate marketing of processed catfish in Kaduna-Metropolis, Kaduna State, Nigeria. Primary data were collected from 152 respondents using structured questionnaire. The statistical tools used to analyse the data were descriptive statistics, gini coefficient, marketing margin analysis and marketing efficiency. The average age of the marketers was 33 years. The result also indicates 98% of the marketers had formal education with an average marketing experience of 2 years. The result revealed that about 46.7% of the consumer had preference for processed catfish. Total revenue (TR) of catfish marketing was ₦209, 245.80 and average total cost (ATC) was ₦192, 905.33 in central market Kaduna the cost of marketing services of anguwan Sarki and Kakuri was ₦1,521.00 and ₦1,253.00 with the level of marketing efficiencies of 0.62% and 0.50% respectively. The result of Gini coefficient value 0.7699, implying high level of disparity among the marketers. The study revealed that about 70.4% of the respondents indicates price fluctuation as the major constraint encountered. Catfish marketers should be encouraged to form cooperative societies to enable them solve some of their financial obstacle and easy access to other incentives from the government and non-governmental organization.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Agriculture in Nigeria is dominated by the small scale farmers who are engaged in the production of the bulk of food requirements of the country (Asogwa *et al.*, 2006). In spite of the fact that these small scale farmers occupy a unique and pivotal position, they belong in the poorest group of the population and as such cannot invest much on their farms Asogwa *et al.* (2006). According to Ajibefun (2002), the vicious circle of poverty among these farmers has led to the unimpressive performance of the agricultural sector. Thus, resources must be used much more efficiently, which entails eliminating waste, thereby leading to increase in productivity and incomes (Ajibefun and Daramola, 2003).

Nigeria, like some other developing countries is principally an agrarian nation who still face an ever increasing food crisis as the level of food production is yet to keep pace with demand. There is worsening food insecurity, even with massive food importation as evidenced by rising food import bill (Okoye, *et al.*, 2008). Akinsanmi (2009) reported that Nigeria is one of the worst hit countries globally given her unprecedented level of acute food shortage and its accompanying ravaging malnutrition. Though endowed with vast expanse of arable land for crop production and fresh waters for fish breeding, reports still show that Africa's largest country cannot produce food crops her population requires and had thus been depending on food importation to meet her domestic demands (Adepoju and Awodunmuyila, 2008).

In the face of strong consumer demand and dwindling global fish stocks, the Government of Nigeria at various levels (federal, state and local) has been collaborating with local and external stakeholders to increase supply through aquaculture which has been proven to possess high yield potentials to meet the current national demand of about 2.6 million metric tonnes estimated for 2007 (Osawe, 2011). Yet, Nigerian rural communities are lacking in infrastructural facilities such as roads, potable water supply and sanitation, energy, communication, health and education facilities. It is estimated that 85% of the extremely poor in Nigeria currently live in rural areas (World Bank, 2011). Nevertheless, the rural sector is predominantly agriculture based (including livestock, forestry and fisheries). It employs about 75% of the labour force and contributes about 40% of the GDP (Federal Government of Nigeria, 2007).

Suffice to note that the country has rich vegetation and abundant water resource capable of supporting a large population of livestock and fishes, with about 214 billion m³ of surface water and 87km³ of ground water both of which can also be used for irrigation (FAO, 2013). According to FAO, (2013), the full extent of water resources cannot be accurately stated as it varies with season and from year to year depending on rainfall. However, Nigeria is endowed with coastline of about 800 km, a continental shelf of about 256,000 km² and exclusive economic zone area of 210,900 km².

The Federal Ministry of Agriculture and Water Resources (FMAWR, 2008) estimated that local fisheries supplies in Nigeria is inadequate and this is partly responsible for the current low daily animal protein intake per head per day of 10g compared to FAO recommended 36g. Nigeria is currently the largest fisheries producer in Africa, with an annual output of over 635,379 tones (FMAWR, 2008).

Among the culturable species of food fish in Nigeria (carp, tilapia, catfish, etc.), catfish is the most sought after. It is very popular with fish farmers and commands very good commercial value which is two to three times that of tilapia in the markets (Osawe, 2011 and Olagunju *et al.*, 2007); fast growth rate; ability to survive on both natural and artificial food and environments; and can be cross-bred to enhance certain favourable traits (Oguntola, 2008). Consequently the catfish is vital to the sustainability of the aquaculture industry in the country having in possession the following good qualities identified by Osawe (2011) as: they survive in different culture systems and diverse environments, grow very fast, have high fecundity, improved survival of the fry and adaptation to supplemental feed.

These qualities have placed catfish farming in good position to serve as the only way of boosting fish production and thereby move the country towards self-sufficiency in food fish supply. To achieve economic optimum output and thus profitability, resources have to be optimally and efficiently utilized. The efficiency of input utilization in any agricultural enterprise enhances the profitability of such enterprise (Oladapo *et al.*, 2007).

Agricultural marketing assumes greater importance in the Nigeria economy because the excess production from the farm must be disposed off in order to earn some income with which farmers can purchase their goods and services not produced by them (Oladapo *et al.*, 2007). The link between the producers and the consumers is the market. Marketing therefore plays a central role in the development process. However, the marketing system of Nigeria's food and staple failed to address prices stability from time to time due to information asymmetry (Oladapo *et al.*, 2007).

Marketing plays a significant function in the performance of supply chains. Farmers require relevant and reliable infrastructure, labour, technology and coordinated markets in order to effectively market their agricultural products. Farmers benefit from markets if their participation minimizes transaction costs, hence they should focus on production, which they have a comparative advantage (Porter, 1985). Farmers can choose to sell their produce through different market outlets ranging from local markets, restaurants to retailer and wholesalers.

1.2 Problem Statement

Efficient marketing requires relevant quantitative and qualitative information that will be reliable at the lowest cost (Kohls and Uhl, 1972; Ebe, 2007). Thus, lack of market information, poor market structure, which leads to price instability, poor road network, high cost of transportation, low income of the farmers can affect marketing efficiency. In Kaduna State live catfish markets are concentrated more in the urban. Participants in the marketing system may have to travel long distances in order to buy or sell their produce, a situation, which at times created gaps between supply and demand and possible hikes in product prices. More so, catfish being an agricultural product is bulky and perishable.

It therefore, exerts various pressures on handling, packaging, transportation and sales with adverse antecedent effect on market prices. In addition, poor storage facilities coupled with improper handling and transportation stress lower quantity and cause losses leading to reduced market margins and poor returns. In spite of the importance of fish and the fishing industry, fish is an extremely perishable commodity, spoiling soon after death, due to enzymatic and microbial actions, resulting in disagreeable taste,

smell and texture; thereby reducing consumer acceptability (Brigitte *et al.*, 1994; Garrow and James, 1994; Falodun, 2011).

Therefore, to maintain the freshness of fish, the catch must be preserved or processed. However, several fish processing methods include fermentation, drying, frying, canning, Salting and smoking. There is little information on study which tries to look into the whole spectrum of marketing chain on catfish supply and processed catfish in Kaduna state. This makes the undertaking of seller concentration and performance of processed catfish marketing imperative. In view of the foregoing, the following research questions arise:

- i. What are the socio-economic characteristics of processed catfish marketers in the study area?
- ii. What is the degree of seller's concentration of processed catfish marketing?
- iii. What is the profitability of processed catfish marketing?
- iv. What is the efficiency of processed catfish marketing?
- v. What are the problems associated with processed catfish marketing in the study area?

1.3. Objectives of the Study

The broad objective of this study was to determine the seller concentration and performance of processed catfish marketing in Kaduna State. The specific objectives were to:

- i. describe the socio-economic characteristics of processed catfish marketers in the study area
- ii. estimate degree of seller's concentration of processed catfish marketing.
- iii. determine the profitability of processed catfish marketing.
- iv determine the efficiency of processed catfish marketing
- v. describe the problems associated with processed catfish marketing in the study area.

1.4. Justification for the Study

Many species of fish are farm produced all over the world, but Catfish is taking the lead because of its uniqueness. The demand for Catfish in Nigeria is unprecedented so much so that no matter the quantity supplied into the market, it would be consumed by ready buyers. This is so because of its low caloric value, low carbohydrate content, high in protein, low in fat, it is quick and easy to prepare and above all, it tastes great. (Vanguard, 2009).

Malnutrition is a major health hazard in many developing countries. Malnutrition impedes health, work-efficiency, productivity and general economic progress. It has been recognize that fish is a veritable source of protein, therefore if readily available and affordable fish can alleviate the problem of malnutrition, then the marketing of smoked fish would appear to follow the concept of excludability in which any individual is free to engage in processed catfish marketing. It is against this background that the study sought to analyze the economics efficiency and marketing of catfish farming in the study area.

CHAPTER TWO

LITERATURE REVIEW

2.1 Economic Importance of Catfish

The importance of catfish itself cannot be overemphasized. According to Anoop *et al.*, (2009), it provides food for the populace, it allows for improved protein nutrition because it has a high biological value in terms high protein retention in the body, higher protein assimilation as compared to other protein sources, low cholesterol content and one of the safest sources of animal protein.

Proteins are the major structural components of all cells of the body and amino acids are the building blocks of protein. Proteins can function as enzymes, membrane-carriers and hormones (Jensen, 1994). Protein contains approximately 22 amino acids, eight of which are essential because the body cannot produce them. Therefore, they must be obtained from our food. The sulphur-containing amino acids: methionine, cystine and cysteine are particularly important for the health of the brain and nervous system (Addo, 2005).

Protein is required for the growth, maintenance and repair of all body tissues. Protein is 90% of the dry weight of blood, 80% constituents of enzymes, hormones and antibodies (Fallon and Eing, 2001). Proteins encompass many important chemicals including immunoglobulin and enzymes. Lack of dietary protein can retard growth in children and in adult, can be a contributing factor in chronic fatigue, depression, slow wound healing and the decreased resistance to infections (Iyangbe and Orewa, 2009).

2.2 Catfish Production in Nigeria

Fish farming is the sub-set of aquaculture that focuses on rearing of fish under controlled or semi controlled conditions for economic and social benefits (Anthonio and Akinwumi, 2002). The African catfish is a species of catfish of the family *Clariidae* and its scientific name is *Clarias gariepinus* which was named by Burchell in 1822. The story of aquaculture in Nigeria is essentially the story of catfish culture and the hope of fish supply in Nigeria hangs on its development and culture. Food and Agriculture Organization (2002), made a statement that fisheries products represented a major source of export revenue for developing countries, amounting to over US \$ 20 billion per annum in late 1990s. This exceeded the values obtained from the exports of meat, dairy, cereals, vegetables, fruit, sugar, coffee, tobacco and oilseeds in 1997 from developing countries (International Trade Centre, 2002).

Statistics indicate that Nigeria is the largest African aquaculture producer, with production output of over 15,489 tonnes per annum, this is closely followed by Egypt with output of about 5,645 tonnes. Only five other countries: Zambia, Madagascar, Togo, Kenya and Sudan produce more than 1,000 tonnes each (FAO, 2007).

However, F.A.O (2007), estimated that Nigeria imports about 560,000 tonnes of fish estimated at about \$400 million annually while annual domestic fish supply in Nigeria stands at about 400,000 tonnes. This makes Nigeria one of the largest importers of fish in the developing world. Catfish production is important to the Nigerian economy. It serves as a source of income, reduces the rate of unemployment in the economy and increases the Gross Domestic Product (GDP). In most countries it fetches a higher price than tilapia as it can be sold live at the market as they have a market

value two to three times that of tilapia (Emokaro, 2010). According to Olagunju, *et al.*, (2007), it requires less space, time, money and has a higher feed conserving rate.

Many species of fish are farm produced all over the world, but Catfish is taking the lead because of its uniqueness. The demand for Catfish in Nigeria is unprecedented so much so that no matter the quantity supplied into the market, it would be consumed by ready buyers. This is so because of its low caloric value, low carbohydrate content, high in protein, low in fat, it is quick and easy to prepare and above all, it tastes great (Vanguard, 2009).

2.3 Fish Demand and Supply in Nigeria

The fisheries sub-sector in Nigeria account for about 40% of animal protein in the diet and it contribute to 4.47% of the Agricultural share of the Nation's GDP in 2003 (Ojo and Fagbenro, 2006). Recently demand for fish product has doubled as other sources of animal protein have become expensive due to pressure by the ever –increasing population and the high population cost of the other animal protein source. (Ojo and Fagbenro, 2006). Domestic fish demand in 1998 was 1.52 million tonnes while the domestic production was 292,800 tonnes (sufficiency ratio of 19.26%).

(Ojo and Fagbenro, 2004) In marketing, fish passes through various market participant and exchange point before they reach the final consumer. These markets intermediaries are the wholesale and retail .Both play important role in marketing of system, at all stages in the marketing channel, fish has to be packed un-packed to meet consumer's demand.

To maintain the freshness of fish, the catch must be preserved or processed. However, several fish processing methods include fermentation, drying, frying, canning, Salting and smoking may be done in a variety of ways: pre-drying or salting before smoking; cold-smoking which involves the use of little fuel-wood that produces low heat and the products obtained do not keep long; and Hot-smoking which entails the application of much more heat, through the burning of large quantity of fuel-wood (Clucas, 1982).

The products from hot-smoking are tastier (Osuji, 1976) and have longer shelf-lives (Maddison et al., (1993). Smoking preserves fish by drying, cooking and depositing natural wood-smoke chemicals like tars, phenols and aldehydes all of which have powerful bactericidal action and prevent the growth of other micro-organisms on the flesh of the fish (Garrow and James, 1994).

The flavour of smoke lies in the quantity of the smoke that the flesh is coated with (Anazonwu Bello, 1976). The smoke determines the colour, which is one of the qualities that attract consumers. The colour is largely dependent on the method as well as the type of fuel wood used in smoking the fish. The colour ranges from black, dark brown, golden brown or light brown to dirty white. Consumer preference for colour of smoked fish varies from place to place. Preservation by smoking is probably the oldest and most popular method of fish preservation in Nigeria and is carried out mostly by women. Fish may be smoked in a ways but the longer it is smoked, the better it will keep. However, in order to improve smoking techniques, some control must be exercised over temperature, airflow and Smoking density. Traditional open type oven produce non-uniform smoked product, consume high quantity of wood (Clucas, 1982).

2.4 Marketing System

The concept of marketing system includes both the physical distribution of economic input and products and the mechanism of process or coordinating production and distribution (Andargachew 1990 and Muhammed 2011). Branson and Norvel (1983) define the marketing system in terms of what is otherwise known as marketing channel. In broad terms, marketing system may be defined as the totality of product channels, market participants and business activities involved in the physical and economic transfer of goods and services from producers to consumers. Marketing system operates through a set of intermediaries performing useful commercial functions in chain formations all the way from the producer to the final consumers (Islam *et al.*, 2001 and Urgessa 2011).

2.4.1 Marketing channel

The term channel is derived from the Latin word canals, which means canal. The marketing channel can be viewed as large canal or pipeline through which products, their ownership, communication, financing and payment, and accompanying risk flow to the consumer (Backman and Davidson, 1962; Muhammed 2011). Formally, a marketing channel is a business structure of interdependent organization that reaches from the point of product origin to consumer with purpose of moving products to their final consumption destination (Kotler and Armstrong, 2003; Urgessa 2011).

Marketing channel is the set of interdependence organization that ease the transfer of ownership as products move from producer to consumer (Lamb *et al.*, 2004). Usually marketing follows a fairly well established channel from producers to consumers. Mendoza (1995) defined marketing channel as the path the goods follow from their sources of original production to their ultimate destination for final use.

Hence, the analysis of marketing channels is intended to provide a systematic knowledge of the flow of goods and services from their origin (producer) to their final destination (consumer). Marketing Chain is a term used to describe the numerous links that connect all actors and transactions involved in the movement of agricultural goods from the farm or point of production to consumers or final destinations (CIAT, 2004).

Marketing and distribution channels are important characteristics in the process of getting produce from source to consumers. Olukosi and Isitor (1990) categorized marketing channels into centralized and decentralized channels. Centralized channels deals with agents who serve as middlemen between producers and consumers while decentralized is a kind of channel where both consumers and agents can buy directly from the producers. Fish distribution channel is common to most developing countries with series of middlemen between producers and consumers (Moses, 2012)

2. 4.2. Marketing structure and conducts

2.4.2.1 Market structure

Market structure can be defined as those characteristics of the organization of a market which seems to influence strategically the nature of competition and pricing within the market (Olukosi *et al.*, 2005). According to Shaik *et al.* (2009) the market structure conduct and performance (SCP) framework was derived from the neo-classical analysis of markets. According to USAID (2008) Structure-Conduct-Performance (S-C-P) is an analytical approach or framework used to study how the structure of the market and the behaviour of sellers of different commodities and services affect the performance of markets, and consequently the welfare of the country as a whole. Among the factors considered important in determining market structures are the number and relative size

of buyers and sellers, the degree of product differentiation, the ease of entry and exit of buyers and sellers into and out of the market, the degree of vertical integration in the market, status of knowledge about costs, prices and market conditions among the participants in the market (Maiangwa *et al.*, 2004).

Market structure relates especially to the degree of competition in a market. It tends to consider whether the number of firms producing products is large or whether the firms are of equal sizes or dominated by small group. It is concerned with whether entry for new firms is easy or not.

Structure also relate to the degree of market knowledge which is available to these firms, Olukosi *et al.*, (2005). While Market performance on the other hand, is the assessment of how well the process of marketing is carried out and how successfully its aims are accomplished, Giroh, *et al*, (2013). However, in marketing system, the structure, conduct and performance of a market is one of the most important approaches to analysis of market. This encourages the participation of a large number of individuals at various types of markets and exchange points where the marketing services of assembling, storage, processing, transportation and break-of-bulk are performed. An important variable in market structure analysis is concentration, which shows a situation in which a few large firms have the largest share of business. The effects of market structure, conduct and performance can go a long way in affecting the supply response of agricultural products, especially in catfish processing and marketing.

Abbot and Makeham (1981) indicated that factors accounting for efficiency can be evaluated by examining enterprises for structure, conduct and performance. These elements measure the extent of deviation from the perfectly competitive norm. The

larger the deviation, the more imperfectly competitive is the market, that is on extreme case would be monopoly. One important approach to the study of market performance, namely the study of market organization or market structure analysis, suggests that relationship exists between structural characteristics of a market and competitive behavior of market participants and that their behavior in turn influences the performance of the market (Scarborough and Kydd 1992; Scott, 1995 and Gebremeskel *et al.*, 1998).

Among the major structural characteristics of a market is the degree of concentration, that is, the number of market participants and their size distribution; the relative ease or difficulty for market participants to secure an entry into the market. Market conduct refers to the behavior of firms or the strategy they use with respect to, for example, pricing, buying, selling, etc., which may take the form of informal cooperation or collusion (Gebremeskel, *et al.*, 1998).

An imperfect market structure has long been suspected in the US catfish processing sector. The sector is highly concentrated with a four-firm concentration ratio of 60-70% in the early 1990s (Dillard, 1995), and 52% in the early 2000s (Masuda, 2002). The number of processors is relatively small compared to the number of catfish growers; the number reached the highest of 37 in 1990, and decreased to about 20 processors lately, mainly located in the Mississippi delta region where more than 90% of catfish sold are produced (Bouras *et al.*, 2010). Farm-raised catfish are delivered live to processing plants to maintain the quality and freshness, and are processed shortly after arrival to the plants. Processors may have a certain degree of market power over catfish growers within the neighboring areas where the distance plays a role in maintaining the quality of

live catfish deliveries. The industry structure aroused concerns about potential market power imposed by processors at the farm level and wholesale markets, because the market power of catfish processing sector will erode the profit of catfish growers.

2.4.2.2 *Market performance*

Market performance refers to the extent to which markets result in outcomes that are deemed good or preferred by society. Market performance refers to how well the market fulfils certain social and private objectives (USAID, 2008). In other words, market performance is the appraisal of the extent to which the interactions of buyers and sellers in a market stimulate results that are consistent with social purposes (Olukosi *et al.*, 2005). Performance criteria are divided into two categories, those respectively related to economic efficiency and other performance objectives. These criteria are not, exhaustive and research projects may be directed at others, but it is hoped that the means of analyzing markets can be adapted for particular uses (Scarborough and Kydd, 1992).

Market performance refers to the impact of structure and conduct as a measured in terms of variables such as prices, costs, and volume of output (Bressler and king, 1970; Scott, 1995). By analyzing the level of marketing margin and their cost components, it is possible to evaluate the impact of the structure and conduct characteristic on market performance (Bain 1968; Scott, 1995). As a method for analysis the S-C-P paradigm postulates that the relationship exists between the three levels distinguished. One can imagine a causal relations starting from the structure, which determine the conduct, which together determine the performance (technological progressiveness, growth orientation of marketing firms, efficiency of resource use, and product improvement and

maximum market services at the least possible cost) of agricultural marketing system in developing countries (Meijer, 1994).

Siamwlla and Haykin (1983) analyzed the Asian catfish market comprehensively with respect to the S-C-P paradigm. They collected 1961-80 data within Asia countries. They estimated the price instrument of Burma, Thailand, Indonesia, and the U.S. They explained the long- and short-run conduct of countries participating in the catfish market and how policies affect the traded volume. An econometric model is used to estimate governments' short-run responses to fluctuations in world prices and domestic production.

Mohsen and Ltaifa (1992) examined exchange rate effects on the aggregate exports of 67 developed countries using cross-sectional data. They used an export supply function in terms of exchange rate's effects on trade. They found out that the exchange rate risk is less sensitive for developed countries as compared that of less developed countries. Deodha and Sheldon (1997) estimated the degree of imperfect competition in the world market for soymeal exports using a structural econometric model. They analyzed the world soymeal market with respect to exporting countries and mentioned that there is no statistical confidence to measure the degree of competitiveness in the soymeal market.

Dawe (2002) explained the behavior of prices in terms of technological changes and political disturbances that have affected rice production and trade. Dawe divided time into two periods paying respect to the pre-Green Revolution from 1950 to 1964 and the post-Green Revolution from 1965 to 81. He estimated the trends in the level and stability of Asian rice production in terms of the divided periods. Calpe (2004) also analyzed the international rice market with respect to developing countries, not major

export/import countries. He mentioned that the supply side of the rice market is still highly concentrated with the top four countries.

Delorme and Klein (2002) developed a model based on the previous S-C-P paradigm and made specification in terms of lag structure and simultaneous equations. They used U.S. manufacturing data from 1982 to 1992 and estimated the relationships between market concentration and profit/advertising. They mentioned that concentration does not depend on firm profitability and advertising seems to have no effect on profitability. As firms sell more than one product, actual profits are overstated in the observed industry code.

2.4.3 Concept of marketing efficiency

Abbott and Markham (1981) defined marketing efficiency in terms of the flow of products and services from the point of production to final consumers at minimal cost. Marketing efficiency is measured by market margins. Before choosing a marketing channel, smallholder farmers consider the costs associated with transportation, profits, level of trust among the available brokers and familiarity with the markets, among other factors (Makhura, and Mokoena 2003; Urgessa 2011). Marketing efficiency can be maximized by using strategies that reduce marketing costs: such as the use of co-operatives; increasing the size of activities; improving the business volume; creating awareness of markets among farmers; recruiting experienced market personnel; and introducing novel methods of marketing using managerial control.

Marketing efficiency is measured by comparing output and input values. Output values are based on consumer valuation of a good, and input values (costs) are determined by the value of alternative production capabilities (Crammer and Jensen, 1997). In such a

case, markets are efficient when the ratio of the value of output to the value of input throughout the marketing system is maximized.

The output of marketing is consumer's satisfaction with the goods and services and the inputs are the various resources of labor, capital and management that marketing firms use in the process accomplishing particular job without reducing consumer's satisfaction with the output of improvement in efficiency (Abbot and makeham 1981; Lele and Jain, 1997 and Urgessa 2011). However, if a reduction in marketing costs, results in reduction in consumer's satisfaction, then the cumulative effect may not bring an improvement in marketing efficiency.

Effective and efficient marketing systems the one that will induce the production of those products and quantities which when sold to the consumer will result in maximum returns after the deduction of minimum marketing charges and farm production costs (Kohls and Uhl, 1995; Muhammed 2011). However, consumer's satisfaction cannot be measured directly, changes analyzed in terms of "technical" efficiency and "pricing" efficiency.

Technical efficiency: it is concerned with the manner in which physical marketing functions are performed to achieve maximum output per unit of input. Technological changes can be evaluated to determine whether they will reduce marketing costs per unit of output. New methods of packaging and processing, for example may reduce waste and prevent deterioration in quality (Abbot and Makeham, 1981 and Urgessa 2011)

Pricing efficiency: pricing efficiency is concerned with the accuracy, precision, and speed with which prices reflect consumers' demand and are passed back

through the market channels to producer. Pricing efficiency is, thus, affected by rigidity or marketing costs and the nature and degree of competition in the industry. Activities that may improve pricing efficiency are improvement of market news and information and competition (Crammer and Jenson, 1982). The objective of price efficiency is to improve the operation of buying, selling and pricing aspect of the marketing process, so that it will remain responsive to consumer's preference (kohls and Uhl, 1985; Muhammed 2011).

2.4.4 Concept of marketing margin

A marketing margin is defined as the difference in the value of physical qualities at the various levels of the marketing process. It represents the difference between farm gate and wholesale prices, or between wholesale and retail prices. The total marketing margins constitute price diffusion. The marketing margin includes the marketing costs plus brokers profit. The marketing costs are the actual expenditure born by the producer or the broker plus the recurrent costs, if any, during the commodity's movement from producers to consumers (Al-Amir, 1992).

Marketing margin for a particular commodity is the difference between what the consumer pays for the final product and the amount the producer receives (Hays, 1975; Abbott and Makeham, 1986; Olukosi and Isitor, 1990; Amobi, 1996; Arene, 2003). At each intermediary level, it is the difference between price received on resale and the purchase price (Mejeha *et al*, 2001; Gabre-Madhin, 2001).

2.4.5 Empirical studies on marketing margin and efficiency

Wohlgenant (2001) reviewed the studies on marketing margins and the development of empirical models. Aside from the variables that come in when using a structural model that looks at the farm, retail, and input market equilibria, he also discussed other

possible explanatory variables that had been included in studies that used reduced-form models instead of a complete structural model. From the studies he reviewed, the primary factors that were commonly included in the analysis of reduced-form models were retail price, demand shifters like population and income, and marketing input costs. However, the study by Haji (2008) did a research on economic efficiency and marketing performance of vegetable production in the eastern and central Parts of Ethiopia; measured marketing efficiency by assessing marketing performance of vegetables in Ethiopia. Moreover, the study done by Mari (2009) on structure and efficiency analysis of vegetable production, and marketing in Sindh, Pakistan, measured marketing efficiency by looking on the relationships across marketing chains involved in the selected vegetable were studied by investigating marketing margins, distribution of costs and net returns across the functionaries.

Yusuf and Abdurrahman (2013) in their study revealed that leather wholesalers and retailers had the highest (28%) marketing margin among the various value chain actors. This was due to the fact that leather wholesalers and retailers transformed the leather to various high valued products such as bags, shoes and upholstery which are attractive to the customers. The study also revealed that '*pomo*' final consumers had lower marketing margin than the leather final consumers because '*pomo*' processing involve very little value addition as compared to leather processing. The marketing margin of each value chain actor was relatively low, which is an indication of good performance. The difference in the marketing margin of a particular product should be a good reflection of the cost of adding value to that product and other transaction cost.

2.4.6 Review of empirical studies on catfish farming

The world wide average per capita supply from aquaculture increased from 0.7 kilograms (kg) in 1970 to 6.7 kg in 2003 (an average annual growth rate of 7.2 percent), reflecting an increase in food fish production by more than 500 percent since the early 1980s, compared with an increase of less than 60 percent for meat (excluding milk products) in the same period. This has attracted numerous academic and non-academic interest resulting to a range of empirical investigation of the role fish (catfish) can play in the 21st century global economy and mostly the developing economy (World Bank, 2006).

On this background, Emmanuel and Omotoriogun (2010) investigated the socio-economic viability of catfish, *Clarias gariepinus* culture in some sampled farms in Lagos State between October, 2006 and March, 2007. The study found that the market price of fish (~~₦400–~~₦1,200) and debt/asset ratio of less than one. The financial outcome of the farm ranged between ₦48,210 and ₦1,841,002 depending on the size of the farm and they concluded that the catfish culture is economically viable in Lagos state.

Sikiru *et al.*, (2009) undertook socio-economic analysis of the productivity of *clarias* (catfish) through a random selection of 50 catfish farmers in Ijebu-Ode, Ogun state during 2005/2006 production season. The study discovered stocking capacity and rate of water change to be the significant factors of high productivity. High cost of inorganic fertilizer and unavailability of credit facilities were found to be main problems associating with catfish production.

Emokaro, Ekunwe, and Achille (2010) analyzed the economics of catfish farming in Lokoja and Adavi Local Government Areas of Kogi state. The simple random sampling

technique was used in selecting 40 catfish farmers. The result also showed estimated average annual gross revenue of \$5,723 and an average net profit of \$2,576, amen gross margin of \$2945.16 and a net profit margin of \$51.46%, which shows that catfish farming is a profitable business in the study area. Also, the benefit cost ratio was estimated at 1.82, indicating that the catfish farms in the study area are viable enterprises.

Ekunwe and Emokaro (2009) examined the technical efficiency of catfish farmers in Kaduna metropolis in Kaduna state of Nigeria. Primary data were obtained in a simple random sample of 60 farmers and descriptive statistics were used to analyze the socio-economic characteristics of catfish farmers while the stochastic production frontier function analysis was used to determine the technical efficiency of the farmers. The empirical result showed that the estimated farm level of technical efficiency ranged from 47.0% to 97.1% while majority of the farmers (90%) had technical efficiency exceeding 0.71. the study also found fingerling, labor and pond size being efficiently allocated while gender, household size and education were found to be negatively related to technical efficiency; and experience and age were found to be positively related to technical efficiency.

2.5. Factors Affecting Market Supply of Agricultural Goods

The market supply refers to the amount actually taken to the markets irrespective of the needs for home consumption and other requirements. Whereas, the marketed surplus is the residual with the producer after meeting the requirement of seed, payment in kind, and consumption by farmer (Wolday, 1994 and Muhammed 2011). An important aspect of supply chain is that they consist of some associated but distinct flows. One is the physical flow of the commodity and another is flow of money realized from final sale

back to the producer and all the enterprises that have been involved in processing and marketing. The efficiency and effectiveness of the practices and procedures that govern this latter flow are as important as technical efficiency with which the commodity is produced, processed and marketed (Westlake, 2005).

Marketing of agricultural products consists primarily of moving products from production sites to points of final consumption. In this regard, the market performs exchange functions as well as physical and facilitating functions. The exchange function involves buying, selling and pricing. Transportation, product transformation and storage are physical functions, while financing, risk-bearing and marketing information facilitates marketing (Urgessa 2011).

A number of studies investigated about factors that mainly affect marketable supply of agricultural commodities. The main factors which determine market supply could be divided into economic factors which include product price, provision of consumer goods, production cost and market supply costs and political factors which include the level of government intervention (Maro, 1986; Wolday, 1994). One of the expected important variables which influence the behavior of the market supply of producers is price. If price increases, producers will gain high revenue and would be motivated to increase the market supply (Wolday, 1994). Bellemare and Barrett (2006) estimated factors affecting sale of animals in Kenya and Ethiopia. They observed that the net purchase and net sales volume choices depend on expected market participation. The household head sex (female headed), age, family size, herd size, female TLUs, encumbered males, and small stock (sheep and goat) had significant and negative influence on number of animals sold. Unlikely, assets,

land holding, other income, encumbered females, and average price of larger stock (camels and cattle) had correlated positively with number of animals sold.

A study made in Alaba Siraro district by Wolday (1994), pointed out the major factors that influenced the marketable supply of teff, maize and wheat at Alaba Siraro district using cross sectional data and he investigated the relationship of farm level marketable supply of cereals to capture the influence of the independent variables on the marketable supply of food grain, he adopted multiple regression analysis with both dummy and continuous variables as explanatory variables. He identified that size of output (teff, maize and wheat) significantly and positively affected teff, maize and wheat supplied. On the other hand, access to market significantly and negatively affected volume of sale of teff and maize. Poor accesses to the market negatively affected maize sold while positively affected teff and wheat sold. Family size also significantly and positively affected quantity supplied of teff and wheat while it negatively affected quantity supplied of maize.

Another study by Wolelaw (2005) revealed major factors that affect the marketable supply of rice at Fogera district using multiple linear regression model. He investigated the relationship between the determinant factors of supply and the marketable supply of rice and her study revealed that the current price, lagged price, amount of rice production at farm level and consumption at household level had influenced marketable supply of rice at the district.

Similar study undertaken by Kinde (2007) indicated that, the major factors that affect marketable supply of sesame in Metema district by using cross-sectional data with dummy and continuous explanatory variables. In his study he implemented

multiple linear regression model to identify the relationship between the marketable supply of sesame and the hypothesized explanatory variables, hence his study acknowledged that amount of sesame productivity, use of modern inputs, number of language spoken by the household head, number of oxen owned, sesame area and time of selling of sesame influenced marketable supply of sesame positively. Another related study by Rehima (2006) identified that the key factors that affecting marketable supply of red pepper at Alaba and Siltie districts of SNNPRS using cross-sectional data with both dummy and continuous independent variables. In her study, she employed Tobit model and came up with the finding that distance to the market, frequency of contacts with extension agents, quantity of pepper produced and access to market information influenced marketable supply of pepper positively at the district. Recent studies are commonly using regression models to estimate the supply function.

2.6 Farm Profitability Analysis

This involves estimation of costs and returns of production. Gomez (1975) and Adeleke, *et al.*, (2008) developed a farm level model to evaluate alternative cropping mixtures and patterns. These involves as follows: (i) profitability: this is measured as the differences between value of yield and cost of production, and (ii) Net return: this involves the difference between value of yield and cost of inputs, including hired labour. In choosing economic indicators on the basis of production factors affected by potentials innovation. Abedullah and Mushtaq (2007) suggested the use of the following: (i) the gross margin and returns to variable cost, where only capital is affected. (ii) Yield/labour ratio, where only labour is affected, and (iii) Gross margin,

return to variable costs and monetary return to labour, where capital and labour are affected.

The major problems associated with cost-return analysis as basis for profitability assessment are: (i) It does not indicate the relative importance of each of the resources in production and (ii) It is location bound and specific in applicability due to use of money as the common unit of measurement and the prevailing price for estimates. Gomez (1975) said that in spite of the limitations, Cost and return analysis is a useful tool for enterprises comparison and indicating a profitability pattern of aggregate input use.

As with any economic analysis, the profitability of an investment is based on a comparison of the returns and cost of the investment. Another way to add value on the production side would be to reduce processing costs by increasing the efficiency (and thus the profitability) of production (Masters *et al.*, 2005). Hence, the profitability of crop production depends on reducing the farming cost as much as possible, and at the same time maximizing the income from the sale of crop.

Profitability in some farm business exists because they are managed more efficiently than others. The reward for doing the job better is usually profit. The prospect of earning and maintaining profitability serves as the incentives for creativity and efficiently among farmers. Profitability stimulates risky ventures and drives farmers to develop ways of cutting cost and improving technology always in an effort to satisfy consumer interest (Troke, 2008). Profitable agriculture is dependent on productive soil and guava production is not an exception.

Net farm income is the difference between gross income (revenue) and total cost of production. (Olukosi and Erhabor, 2008). It is used to show the levels of costs, returns and net profit that accrue to farmers involved in production. The technique emphasizes the costs (fixed and variable cost) and returns of any production enterprise. Olukosi and Ogungbile (2006) have examined two major categories of costs involved in crop production. These are fixed and variable cost. Fixed costs (FC) refer to those costs that do not vary with the level of production or output while variable cost (VC) refers to those costs that vary with output. The total cost (TC) is the sum of total fixed cost (TFC) and total variable cost (TVC).

CHAPTER THREE

METHODOLOGY

3.1 The Study Area

The study was conducted in Kaduna State. The State lies in North-West, Nigeria and shares common borders with Zamfara, Katsina, Niger, Kano, Bauchi and Plateau States. Kaduna State is located between latitude 09°N and 11°N and between longitude 06°E and 08°E of the Greenwich meridian. The state has a projected population of 7,037,153 people going by a population growth rate of 3.2% per annum of the 2006 population census. It has an estimated cultivated land area of about $45,786\text{km}^2$.

The State experiences both wet and dry seasons with the wet season commencing in the month of April in the southern part of the State and between May and June in the northern region. The dry season extends from October to April and is marked by dry harmattan winds. The annual rainfall varies between 1,107mm in Samaru to 1,286mm in Kaduna. Kaduna State shares common boundaries with Katsina, Kano to the north, Nassarawa to the south, Federal Capital Territory, Niger to the west and Plateau to the east. The entire land structure consists of an undulating Plateau with major rivers in the State including River Kaduna, River Wonderful in Kafanchan, River Gurara.

The State extends from the tropical grassland known as Guinea Savannah to the Sudan Savannah in the North. The grassland is a vast region covering the Southern part of the State. The prevailing vegetation of tall grass and big trees are of economic importance

during both the wet and dry seasons. There are 57 languages spoken as first languages in Kaduna State. Gbari and Hausa are major languages; most other languages are small and endangered minority languages, due to the influence of Hausa. Kaduna State provides the meeting point of the earliest histories of Nigeria. It is the home of Nok which gave its name to the oldest culture of Nigeria – the Nok culture (Kaduna State Official Website, 2013)

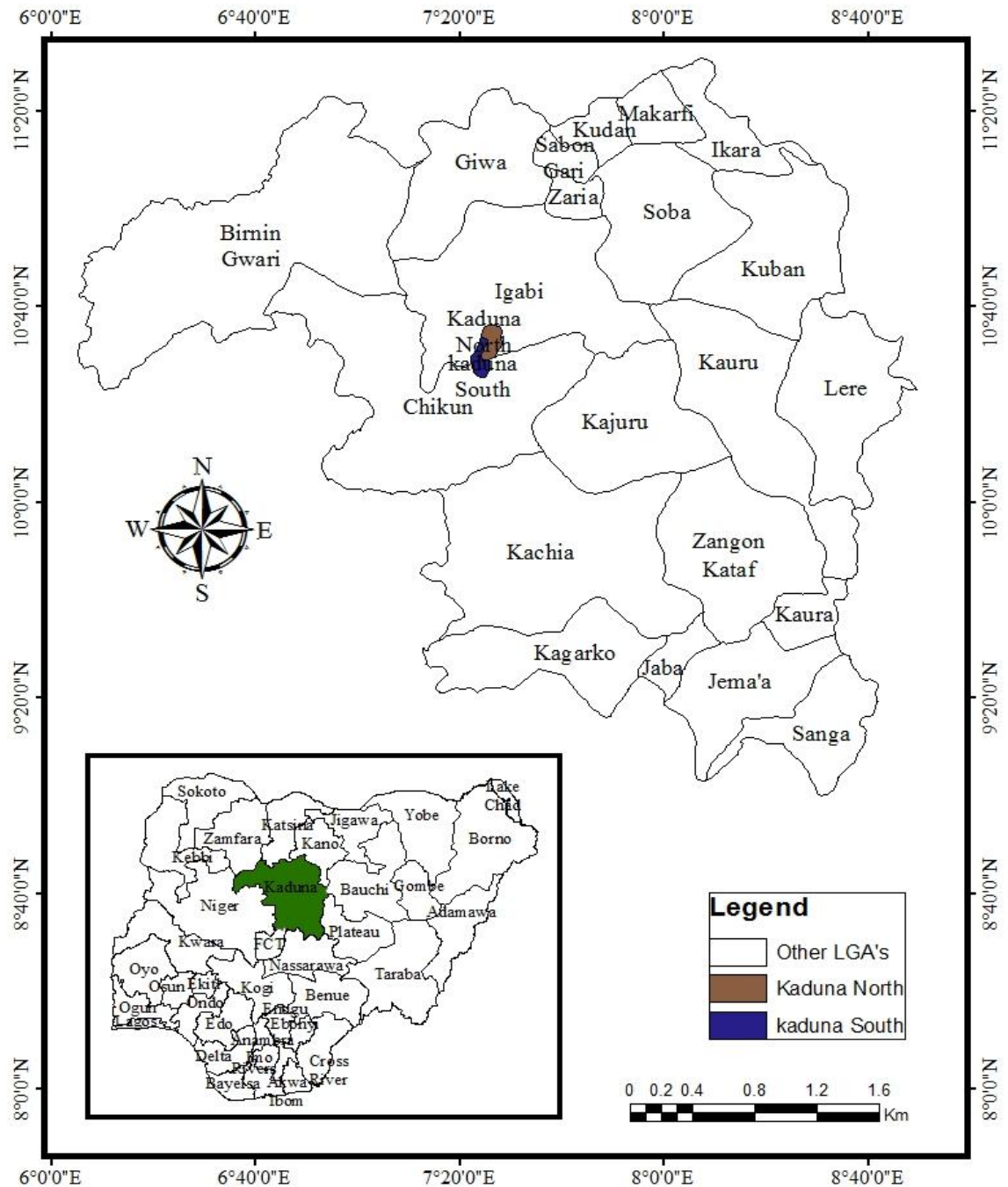


Figure 1: Map of Kaduna State Showing the Study Area

3.2 Sampling Technique

A multistage sampling technique was used to select respondents for this study. The first stage was purposive selection of the two Local Governments Areas (Kaduna south and

Kaduna north) based on predominance of catfish production and processing. Though the reconnaissance survey conducted revealed reasonable numbers of processed catfish marketers in some market within the state. Secondly, three major markets from each Local Government Areas (Kakuri, Katin Kwari and Central market (Kaduna south) and Kawo, Malali and Ungwan Sarki market (Kaduna north) were purposively selected based on predominance of processed catfish marketers. Finally, a simple random sampling was employed in selecting marketers from each market through the use of random numbers from the list of sample frame. Twenty-five percent (25%) of the sample frame (604) was used as the sample size.

Table 3.1: population and sample size of Marketers

LGA's	Markets	*Sample frame	Sample size (25%)
Kaduna South	Kakuri	92	23
	Katin Kwor	84	21
	Central	242	61
Kaduna North	Malali	40	10
	Kawo	126	32
	Ungwan Sarki	20	5
Total		604	152

* Source: Kaduna State Agricultural Development Project (KADP), 2013

3.3 Data Collection

Primary data was used for this study. Data were collected with the aid of structured questionnaire. The information was collected on (a) seller's socio-economic

characteristics such as age, household size, educational status, marketing experience, amount of credit received, and years spent on the cooperative. (b) Constraints faced by the sellers. (c) Costs and total return to the farmers

3.4 Analytical Techniques

The tools of analysis used include: Descriptive statistics; Gini Coefficient; Marketing Margin and Marketing efficiency

3.4.1 Descriptive Statistics

Descriptive statistics was used to achieve objectives (i) and (v) of the study. It involves the use of measures of central tendency such as mean, frequency distribution and percentages. These statistics were employed to describe the socio-economic characteristics of the respondents involved in processed catfish marketing which is objective (i), and identify the constraints associated with processed catfish marketing objective (v).

3.4.2 Gini Coefficient

Gini coefficient was used to examine the market seller concentration to achieve objective (ii). It was a measure of statistical dispersion most prominently used as a measure of inequality of wealth or product distribution. Mathematically, the Gini coefficient computation adopted from Ihenacho (2005) was expressed as follows:

$$GC = 1 - \sum X_{ab}Y_{ab} \dots \dots \dots (1)$$

Where:

GC = Gini Coefficient, X = Proportion of Sellers, Y = Cumulative Proportion of Sales,
 Σ = Summation Sign, and 1 = constant or unity.

The Gini coefficient varies from 0 to 1. If the coefficient is equal to zero (0), it implies perfect equality in the distribution, while if the value is one (1), it corresponds to perfect inequality. The closer the Gini coefficient is to zero, the greater the degree of equality, the lower the level of concentration and the more competitive the markets are. Consequently, as the Gini coefficient approaches unity, the greater is the degree of inequality, the higher the level of concentration, the more imperfect the markets are and the lower the efficiency of such markets (Ojo, 2012).

Gini coefficient is also used to show the degree of income inequality between different households in a population. It is a precise way of measuring the position of the Lorenz curve. The curve has values between 0 and 1. It is computed by measuring the ratio of the area between the Lorenz Curve and the 45⁰ line. If the Lorenz curve lies on the 45⁰ line, then, the value of the Gini Coefficient would be zero (0). In general, the closer the Lorenz Curve is to the line of perfect equality, the less the inequality and the smaller the Gini coefficient.

3.4.3 Marketing margin (MM) analysis

Gross Marketing margin of processed catfish marketers is determined by the difference between the cost price of processed catfish and the selling price (Anuebunwa, 2006). This tool was used to achieve objective (iii) of this study.

This is expressed as follows:

$$D = C - A \dots\dots\dots (2)$$

Where,

D = Processed catfish marketers' gross margin (₦)

C = Processed catfish marketers' gross earning (₦)

A = Cost of purchase of fish (₦)

The marketing share was therefore derived as the difference between the selling price of processed catfish and the marketing margin of processed catfish marketers. Marketing share is represented as follows:

$$\text{Marketing share} = \frac{C - D}{C} * 100 \dots\dots\dots(3)$$

Where,

D = processed catfish marketers' gross margin (₦)

C = Sales from processed catfish (₦)

Total marketing margin for fresh fish in the study area will equals the sum of the retail and wholesale marketing margin. According to Olukosi *et al.*, (2005), a larger variation between the marketing margins of participants indicates a wide price variation along the chain while a participant with higher marketing margin, is said to have a larger share of the marketing.

3.4.4 Marketing efficiency (ME)

Marketing efficiency was used to determine the performance of processed catfish marketers which is objective (iv), in addition to marketing margin computation. It is the maximization of the ratio of output to input. The marketing inputs are those costs incurred during the marketing of processed catfish such as: transport costs, commission, taxes, labour used, parking and storage cost. Output on the other hand, is the value added to the commodity as it passes through the marketing system.

The formula for calculating marketing efficiency of processed catfish marketing adopted from Inuwa *et al* (2011) is algebraically presented as:

$$ME = \frac{\text{value added by marketing}}{\text{Cost of marketing services}} \times 100 \dots\dots\dots(4)$$

The value added by fish marketing was computed using the formula:

$$VA = C_{PT} - C_{PU} \dots\dots\dots(5)$$

Where:

V_A = value added;

C_{PT} = cost of purchasing processed catfish plus storage cost/commission charges;

C_{PU} = cost of purchasing processed catfish.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Socio-economic Characteristics of Catfish Marketers in the Study Area

4.1.1 Age distribution of catfish marketers

The results presented in Table 4.1 shows the age distribution of catfish marketers in the study area. The results showed that about 46% of respondents' were within the age range of 21-30 years, the average age of the marketers was 33 years while the minimum and maximum ages were 17 and 60years for the processed catfish marketing with standard error 0.88 respectively. Implication of these findings is that large proportions of the respondents were adults and can adequately be regarded as active, agile, and physically disposed to marketing activities. Age is very important in agricultural production activities because age has a significant influence on the decision making process of farmers with respect to adoption of improved farming technologies and other production-related decisions. This findings supports Olaye *et al.* (2009) and Ya aishe *et al.* (2009), that majority of the sampled farmers in their study were within the productive age of between 21 and 50 years.

Table 4.1: Age distribution of catfish marketers

Variable	Frequency	Percentage
Age (years)		

≤20	4	2.6
21-30	70	46.0
31-40	42	27.6
41-50	24	15.7
51-60	12	7.8
Total	152	100
Minimum	17.00	
Maximum	60.00	
Mean	33.4	
S.E	0.88	

4.1.2. Sex of the catfish marketers

The result in figure 4.1 shows that about 94.7% of the catfish marketers were female while the remaining percentages (5.3%) were male. The result is in line with the findings of Adebayo (2013) opined that processed catfish marketers are more dominated by female gender than male. The PIND (2011) opined that women play a central role in catfish processed and marketing, contributing about 58% of the total agricultural labour in the southwest, 67% in the southeast and 58% in the central zones. However, the finding corroborates the study of Amos (2013) who observed that males constituted the majority of catfish marketing in Wamba LGA of Nassarawa state with 86.50% of total respondents.

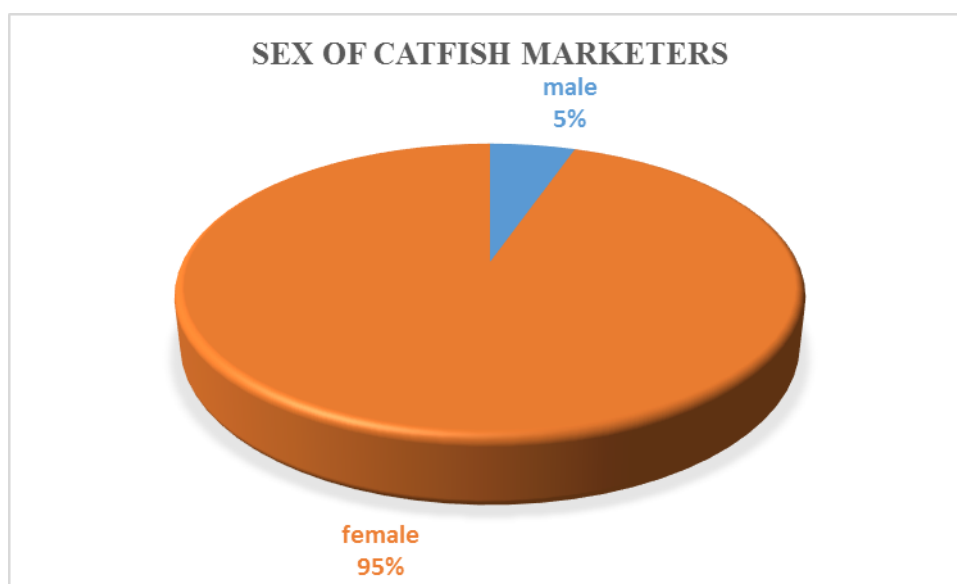


Fig. 4.1 sex of catfish marketers

4.1.3 Educational level of catfish marketers

The result presented in Table 4.2 shows the distribution of catfish marketers by their educational level. The result indicates that about 2.0% of the catfish marketers do not have access to formal education, 29.0% had primary education, 60% had secondary education, and about 7.8% had tertiary level education respectively. This implies that the educational level of the producers in the study area is low. The level of education is believed to influence the use of improved technology in agriculture businesses and, hence, farm productivity. The level of education determines the level of opportunities available to improve livelihood strategies, enhance food security, and reduce the level of poverty. It affects the level of exposure to new ideas and managerial capacity in production and the perception of the household members on how to adopt and integrate innovations into the household's survival strategies. Oluwatayo, Sekumade and Adesoji (2008) observed that the more educated a farmer is, the more the chances that the farmer will adopt innovations than the uneducated ones. Mohammed, Omotosho and Falola (2009) noted that level of education is expected to influence farmers' adoption of

agricultural innovations and decision on various aspects of farming. They also maintained that education is highly important for sustainable agricultural growth and development

Table 4.2: Educational status of catfish marketers

Education	Frequency	Percentage
No formal education	3	2.0
Primary education	45	29.6
Secondary education	92	60.0
Tertiary education	12	7.8
Total	152	100

4.1.4 Household size of catfish marketers

The results presented in Table 4.3 showed that about 28.0% of smoked catfish marketers had no household size, 46.0% had household size between 1-10 members, 19.7% had household size range between 11-20 members and about 3.2% had family size between 21-30 persons respectively. The average household size for catfish marketers was 6 members per household and standard error of 0.89. The implication of this is that, the larger the household size the better the marketing efficiency. The household members may help in providing some marketing functions at a reduce cost which is an incentive to an efficient marketing system. This agrees with Quartey (2005). Opined that household size affects efficiency since there may be synergies from larger household size in both production and consumption.

Table 4.3: Household size of catfish Marketers

Variable	Frequency	Percentage
Household Size		
Single	44	28.9
1-10	70	46.0
11-20	30	19.7
21-30	5	3.2
>30	1	0.65
Total	152	100
Minimum	0.00	
Maximum	34.0	
Mean	6.0	
S.E	0.89	

4.1.5 Catfish marketing experience

The result presented in Table 4.4 showed that the majority of the marketers 39.4% of had an average production experience between 1-10 years with the average mean of 16.9 years respectively, and standard error of 0.89. The minimum and maximum years of production experience was 1.00 and 46.00 respectively. These results implied that marketers in the study area have sufficient experience in catfish marketing. This finding is line with Girei *et al.*, (2013), who opined that majority of the respondents which accounted for about 83 percent numbering 62 falls within the age limit of 20 and 49 years

Table 4.4: Marketing Experience of catfish marketers

Variable	Frequency	Percentage
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Marketing Experience		
1-10	60	39.4
11-20	43	28.2
21-30	35	23.5
31-40	8	5.2
41-50	6	3.9
Total	152	100
Minimum	1.00	
Maximum	46.00	
Mean	16.9	
S.E	0.89	

4.1.6 Marketers cooperative association

The results presented in Table 4.5 showed the distribution of the respondents by the years spent as a members in cooperatives association. It was found that majority 84.9% do not belong to any catfish marketers association. While only 15.1% belong to the cooperative association. The result also shows that majority (78.3%) of the members spent 1-3 years as a members with average year of 2 years as members. Membership of a cooperative enables marketers to interact with other marketers, share their experiences and assist themselves. The implication of these results is that most of the marketers in the study area do not enjoy the assumed benefits accruing to cooperative societies through pooling of resources together for a better expansion and effective management of resources. This finding is at variance with Odebiyi (2010) that cooperative groups

ensure that their members derive benefits from the groups such as they could not derive individually.

Table 4.5: Processed Catfish Marketers cooperative association

Cooperative Membership N=152	Frequency	Percentage
Members	23	15.1
Non Members	129	84.9
Years of membership (n=23)		
1-3 years	18	78.3
4-6 years	3	13.0
7-9 years	2	8.7
Minimum	1	
Maximum	7	
Mean	2	
SE	0.06	

4.2 Consumer Preferences for Processed Catfish Marketers

The result in Table 4.6 shows the consumer preferences in the study area, the result revealed that about 46.7% of the consumer had preference for freshness of catfish. The products from hot-smoking are tastier (Osuji, 1976) and have longer shelf-lives (Maddison et al., (1993). The flavour of smoke lies in the quantity of the smoke that

the flesh is coated with (Anazonwu Bello, 1976). The smoke determines the colour, which is one of the qualities that attract consumers. The colour is largely dependent on the method as well as the type of fuel wood used in smoking the fish. The colour ranges from black, dark brown, golden brown or light brown to dirty white. Consumer preference for colour of smoked fish varies from place to place. 45.3% of the consumers said taste of catfish is their major preference, about 5.0%, 1.97% had consumer preferences of meat quality and medicinal benefit respectively, while on the other hand less percentages (0.65%) of the consumers reported that their preference was body size.

Table 4.6: Consumer preferences for catfish in the study area

Preference	Frequency	Percentage
Taste	69	45.3
Freshness	71	46.7
Meat quality	3	5.0
Medicinal benefit	8	1.97
Body size	1	0.65
Total	152	100

4.2.1. Average cost and return per ton of processed catfish marketing in Kaduna central market

Table 4.7 shows that the total revenue (TR) of catfish marketing was ₦209,245.8. The result also indicates the total contributions of cost of storage, cost of transportation, cost of marketing tax and cost of purchasing the product to be 0.52%, 4.41%, 1.22% and 93.9% respectively contributed to the overall total cost (₦192,905.33) of catfish marketing. The gross margin of catfish marketing was 16,340.47 as profit generated

from the market with return per naira invested of 1.08. This implies that processed catfish marketing at central market Kaduna is profitable by return 0.8 for every 1naira invested in the study area.

Table: 4.7: Average costs and returns per ton of catfish marketing of central market, Kaduna

VARIBLE	VALUE (₦)	% contribution
Total Revenue	20,9245.8	
Cost of storage (₦)	1265.75	0.52
Cost of transportation (₦)	7992.5	4.41
Cost of marketing tax (₦)	1692.08	1.12
Cost of purchasing product (₦)	181955	93.96
Total cost	19,2905.33	100
Marketing margin	16,340.47	
Return per Naira Invested (TR/TC)	1.08	

4.1.3 Average cost and return per ton of catfish marketing Kantin Kwari market

The result in Table 4.8 shows that the total revenue of catfish marketing was TR ₦428,500.00. The result also indicates the total contributions of cost of storage, cost of transportation, cost of marketing tax and cost of purchasing the product were 0.52%, 4.41%, 1.22% and 93.9% respectively contributed to the overall total cost (₦347,404.75) of catfish marketing. The gross margin of catfish marketing was ₦81,095.25 as profit generated from the market with average rate of return per naira

invested of 1.23. This implies that processed catfish marketing at Kantin kwari market Kaduna is profitable by return 0.23 kobo for every 1naira invested in the study area.

Total: 4.8: Average costs and returns per ton of catfish marketing of Kantin Kwari, Kaduna

VARIBLE	VALUE (₦)	% contribution
Total Revenue	428,500.00	
Cost of storage (₦)	1,796.00	0.52
Cost of transportation (₦)	15,306.25	4.41
Cost of marketing tax (₦)	3,885.00	1.12
Cost of purchasing product (₦)	326,417.50	93.96
Total cost	347,404.75	100
Marketing margin	81,095.25	
Return per Naira Invested (TR/TC)	1.23	

4.2.4 Average cost and return per ton of catfish marketing Kawo market Kaduna

The result in Table 4.9 the shows that the total revenue of catfish marketing was TR ₦89236.84. The result also indicates the total contributions of cost of storage, cost of transportation, cost of marketing tax and cost of purchasing the product were 0.33%,1.67%, 0.35% and 97.65% respectively contributed to the overall total cost (₦73992.1) of catfish marketing in the study area. The gross margin of catfish marketing was ₦81,095.25 as profit generated from the market with average rate of return per naira invested of **1.21**. This implies that processed catfish marketing at Kawo market Kaduna is profitable by return 0.21 kobo for every 1naira invested in the study area.

Table: 4.9: Average costs and returns per ton of catfish marketing of Kawo Market Kaduna

VARIABLE	VALUE (₦)	% contribution
Total Revenue	89236.84	
Cost of storage (₦)	244.74	0.33
Cost of transportation (₦)	1236.84	1.67
Cost of marketing tax (₦)	257.89	0.35
Cost of purchasing product (₦)	72252.63	97.65
Total cost	73992.1	100
Marketing margin	15244.74	
Return per Naira Invested (TR/TC)	1.21	

4.2.5 Average cost and return per ton of processed catfish marketing in Malali market

The result in Table 4.10 shows that the total revenue of catfish marketing was TR ₦95,557.43. The result also indicates the total contributions of cost of storage, cost of transportation, cost of marketing tax and cost of purchasing the product were 0.38%, 1.57%, 0.42% and 97.62% respectively contributed to the overall total cost (₦83,888.1) of catfish marketing. The gross margin of catfish marketing was ₦11,669.33 as profit generated from the market with average rate of return per naira invested of 1.14. This implies that processed catfish marketing at Malali market Kaduna is profitable by return 14 kobo for every 1naira invested in the study area.

Table: 4.10: Average costs and returns per ton of catfish marketing at Malali market, Kaduna.

VARIABLE	VALUE (₦)	% contribution
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Total Revenue	95557.43	
Cost of storage (₦)	319.05	0.38
Cost of transportation (₦)	1319.05	1.57
Cost of marketing tax (₦)	354.76	0.42
Cost of purchasing product (₦)	81895.24	97.62
Total cost	83888.1	100
Marketing margin	11,669.33	
Return per Naira Invested (TR/TC)	1.14	

4.2.6 Average cost and return per ton of catfish marketing Anguwan sarki market

The table 4.11 shows that the total revenue of catfish marketing was TR ₦227,675.00. The result also indicates the total contributions of cost of storage, cost of transportation, cost of marketing tax and cost of purchasing the product were 1.13%, 4.86%, 0.58% and 93.43% respectively contributed to the overall total cost (₦152,123.75) of catfish marketing. The gross margin of catfish marketing was ₦76,551.25 as profit generated from the market with average rate of return per naira invested of 1.50. This implies that processed catfish marketing at Unguwan sarki Kaduna is profitable by return 50 kobo for every 1naira invested in the study area.

Table: 4.11: Average costs and returns per ton of catfish marketing of Unguwan Sarki Kaduna

VARIABLE	VALUE (₦)	% contribution
Total Revenue	22,8675.00	
Cost of storage (₦)	1716.50	1.13
Cost of transportation (₦)	7391.50	4.86

Cost of marketing tax (₦)	882.50	0.58
Cost of purchasing product (₦)	142132.50	93.43
Total cost	152123.75	100
Marketing margin	76,551.25	
Return per Naira Invested (TR/TC)	1.50	

4.2.7 Average cost and return per ton of catfish marketing Kakuri market

The table 4.12 shows that the total revenue (TR) of catfish marketing was ₦ 137,675.00. The result also indicates the total contributions of cost of storage, cost of transportation, cost of marketing tax and cost of purchasing the product were 1.29%, 0.63%, 0.83% and 97.45% respectively contributed to the overall total cost (₦125324.05) of catfish marketing. The gross margin of catfish marketing was ₦12,350.95 as profit generated from the market with average rate of return per naira invested of 1.10. This implies that processed catfish marketing at Kakuri is profitable by return 10 kobo for every 1naira invested in the study area.

Table: 4.12: Average costs and returns per ton of catfish marketing of Kakuri Market
Kaduna

VARIBLE	VALUE (₦)	% contribution
Total Revenue	137,675.00	
Cost of storage (₦)	1617.50	1.29
Cost of transportation (₦)	791.50	0.63
Cost of marketing tax (₦)	782.50	0.83

Cost of purchasing product (₦)	122132.50	97.45
Total cost	125,324.05	100
Marketing margin	12,350.95	
Return per Naira Invested (TR/TC)	1.10	

4.3 Marketing Margin of processed catfish

This refers to the difference in price paid for a commodity at different stages of the marketing system. The margin is determined by calculating the average cost of marketing for each market in the various stages involved in the transaction of catfish business (Olagunju, 2008). The result in Table 4.13 shows the various unit price, buyers' price, seller's price, marketing margin and net return of catfish at different market under consideration in Kaduna state. The study reported that the net return of the various catfish markets were ₦169,340, ₦81,096 ₦15,244, ₦28,316, ₦18,366. ₦13,457 and ₦4,447 respectively. While on the other hand, marketing margin of the processed catfish marketing were presented in the table 4.13 were: the marketing margin for Kaduna central market was 1.08%, Kantin kwari market 1.23%, Kawo market 1.20%. The marketing of catfish marketers in Malali market was 1.50% while for Unguwan sarki and Kakuri market for catfish market were 1.10% and 1.03% respectively. The result has often been observed that the interplay of series of marketing activities causes variations in the marketing margin among the marketers of catfish in the state. This is in line with the earlier position of Adeyokunnu (1980), who noted that factors responsible for high margins include multiplicity of traders, which leads to duplication of functions and the small scale of operation, inefficient processing, transportation bottlenecks and losses due to storage. Marketing margin represents the

difference in price paid to the first Seller and that paid by the final buyer (Adegeye and Dittoh, 1985). The difference between the producer price and the final consumer price is a measure of the total value added in the marketing process. Marketing margins are mostly governed by the demand for, and supply of, marketing services. This margin can be measured in monetary terms. It can be expressed either in cash or as a percentage of the retail cost. Margins indicate the relative cost of marketing at a particular time as shown in the table 4.13.

Table: 4.13: Marketing margin of processed catfish

Markets	Selling price(₦/ton)	Purchasing price(₦/ton)	Marketing margin(₦/ton)	Net return(₦/ton)
Central market	209245	192905	1.08	169340

Kantin kwari market	428500	347404	1.23	81096
Kawo market	89236.8	73992.1	1.20	15244.7
Malali market	83888.1	55571.4	1.50	28316
Anguwan sarki market	142123.5	128675	1.10	13457.5
Kakuri market	122132	117675	1.03	4457.5

4.3.1 Marketing efficiency of processed catfish

Marketing efficiency is used to measure the market performance. Low market efficiency could be interpreted as an inefficient marketing system. However, according to Olukosi and Isitor (1990), market efficiency is a function of both pricing and operational efficiency. The net margins accruing to the wholesaler or the retailer is the difference between the marketing margin and the marketing cost. The marketing cost is the sum of transport costs, storage cost and other costs. Table 4.14 result shows that the marketing efficiency of processed catfish marketers and the overall of marketing services for processed catfish in central market was ₦1, 929.00 with the marketing efficiency of 0.90%. For Kwari market, the cost of marketing services was ₦3474 and the marketing efficiency was 1.09%. For kawo market cost of marketing services ₦7399 and the marketing efficiency was 1.92%. The marketing efficiencies for Malali markets was 1.03% with overall total cost of marketing services as ₦8388. While the cost of marketing services of Anguwan sarki and kakuri were ₦1, 521 and ₦1, 243.00 at the

level of marketing efficiencies of 0.62% and 0.50% respectively. The results presented in the table 4.16 reported that apart from Kwari market, Kawo market and Malali market which were greater than 1 (i.e. $me > 1$, over efficient), it implies that abnormal profit is being made in the trade, and some elements are unduly reaping from the efforts of others. The percentage efficiencies of central market, Anguwan sarki and Kakuri market were less than 1, this implies that in the markets there is under efficient (i.e. $me < 1$, under efficient). This implies that a sizeable loss is being recorded in the trade. A moderate level of efficiency is also achieved as a result of their efficiency level is greater than one.

Table: 4.14: Marketing efficiency of processed catfish

Markets	Cost of marketing services	Marketing efficiencies (%)
Central market	1929	0.90%
Kwari market	3474	1.09%
Kawo market	7399	1.92%
Malali market	8388	1.03%
Anguwan sarki	1521	0.62%
Kakuri market	1253	0.50%

4.3.2. Market concentration of processed catfish marketers

The degree of market concentration among catfish marketers was estimated by Gini coefficient (Gc). This estimation was necessary because the marketers were observed to be unequally distributed in the markets of the state. Quite often, the level of concentration of the marketers of catfish is determined, among other things, by the location and magnitude of the markets, and the associated marketing costs

(Adeyokunnu, 1980). The estimated Gini coefficient value for the catfish marketers is thus shown in Table 4.15. The concentration of processed catfish marketers in the study area. From Table 4.15, A = markets of quantities of processed catfish marketed (kg). B= Number of marketers (No). C= percentage of the total of marketers (%). D= Cumulative percentage of the total of marketers (%). E=Total quantities of catfish transacted within the time of research (kg). F= Fraction of the total of marketers. G= Percentage of quantities of catfish transacted (%). H= Cumulative percentage of quantities of catfish transacted (%). I= Fraction of the total of quantities of catfish transacted. J= Product of columns F and I; i.e.FI. Thus, the Gini coefficient (Gc) value = $1 - FI = 1 - 0.2301 = 0.7699$.

The catfish market in the study area showed concentrated sellers. The analysis of the degree of market concentration was carried in the study area, where wholesales of the commodities was significantly involved. Concentration ratio was estimated by taking volume of catfish sale in different market by sample traders.

The concentration ratio is expressed in terms of catfish market in the study area, which stands for the percentage of the market sector controlled by the biggest market. Six market concentration ratio is the most typical concentration ratio for judging the market structure (Kohls and Uhl, 1985).

The result revealed that central market and Kawo market had market concentration ratio of 65 and 68% respectively. This is generally considered as strong oligopoly and is another source of imperfect competition. This is a situation where sellers selling identical but non-homogeneous commodities due to fewer seller. According to Kohls and Uhl (2002) Market concentration, the portion of the industry sales made by the largest firms, is another source of imperfect competition. Successful competitors

frequently eliminate their rivals or discourage new firms entry, contributing to more concentrated markets. In general, the higher the level of market concentration, the less perfectly competitive the market is.

The result also revealed that kworì market and Kakuri market had market concentration ratio of 46 and 42% respectively. This is generally considered as weak oligopoly and is another source of imperfect competition. This is a situation where sellers selling identical but non-homogeneous commodities due to fewer seller. The result revealed that Malali market and Angwan sarki market had market concentration ratio of 24 and 18% respectively. This is generally considered as un-concentrated market.

Table 4.15: Concentration of catfish marketers

A	B	C	D	E	F	G	H	I	J	CR(%)
Central Market	30	19.7	19.7	120	0.20	19.7	22.6	0.23	0.046	65
Kworì Market	15	29.5	29.5	80	0.09	15.1	37.7	0.09	0.0081	46

Kawo	25	16.4	45.9	85	0.16	15.9	53.6	0.16	0.026	68
Malali	14	9.2	55.1	50	0.09	9.4	63	0.09	0.081	24
Anguwan Sarki	25	16.4	87.3	75	0.16	14.1	88.4	0.16	0.026	18
Kakuri	19	12.5	100	62	0.13	11.7	100	0.13	0.017	42
Total	152	100		532	1.00	100		1.00	0.2301	

CR = Concentration ratio

4.4. Constraints of Catfish Fish Marketing

Nigeria's business sector in general as well as the catfish subsector in particular has experienced some impediments which slowed the performance of the sector (Adegeye, 2008 and Dittoh, 1985). This has caused the output growth not to keep pace with its demand, thereby, resulting in declining exports and domestic supplies and a growing reliance on imports of the products.

The problems faced by processed catfish marketers in the study area were ranked according to their severity stated by the respondents in Table 4.16. The study revealed that about 70.4% of the respondents attested to the fact that Price instability and price fluctuation of fresh catfish were the first constraint faced by marketers. This finding is in line with Bureau of Statistic (2012) that says Prices for fresh fish product responded to the law of demand and supply as no price regulation mechanism exists.

The result in Table 4.16 clearly depicts that about 61.8% of sample catfish marketers faced capital shortage to conduct and expand their trading activities which rank second. Capital shortage was mainly due to lack of credit access. Provision of quality products by farmers to the market were followed by better prices, however, high cost of transportation might be as a result of bad network roads. Most of the roads that leads to

the farm gates are bad and difficult for vehicles to pass through thereby discouraging these marketer going to farm gate to buy before processing. This could also be as a result of the fact that the longer the distance from the farm to the market, the higher the transportation costs that will be incurred. This is in line with the findings of Seid *et al.* (2013) and Basappa *et al.* (2007) who found inadequate storage facilities, inadequate transport facilities, pests and diseases to be significant factors contributing to post-harvest losses of perishable product.

Lack of access to credit ranked fourth of the marketing problems limiting operation and expansion of marketing activities in the study area. The problem in accessing credit was mainly related to absence of collateral, high interest rate of commercial bank. The least problems encountered by the marketers were storage problem (44.1%), distance to market (36.8%), seasonality of fresh supply (32.9%) and low patronage (30.3%).

Table: 4.16: Constraints of catfish marketing

Constraints	*Frequency	Percentage	Rank
Price instability	107	70.4	1 st
Inadequate capital	94	61.8	2 nd
High cost of transportation	78	51.3	3 rd

Lack of access to credit	76	50.0	4 th
Storage problems	67	44.1	5 th
Distance to market	56	36.8	6 th
Seasonality of fish supply	50	32.9	7 th
Low patronage	46	30.3	8 th

*Multiple responses

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1. Summary

The main focus of this study was to determine marketing of processed catfish in Kaduna-metropolis, Kaduna State, while the specific objectives of the study are to:- describe the socio-economic characteristics of processed catfish marketers in the study area, estimate degree of seller's concentration of processed catfish marketing, determine the profitability of processed catfish marketing, determine the efficiency of processed catfish marketing, and also to describe the problems associated with processed catfish marketing in the study area.

Multi-stage sampling technique was employed in selecting the respondents. The first stage will be purposive selection of the two local governments (Kaduna south and Kaduna north) based on predominance of catfish processors. Simple random sampling was employed in selecting marketers from each market. Twenty-five percent (25%) of the sample frame (604) was used as the sample size and 152 questionnaires were distributed among processed catfish marketers in the study areas.

The average age of the marketers was 33 years while the minimum and maximum ages were 17 and 60years for the processed catfish marketing with standard error 0.88 respectively. The study shows that about 94.7% of the catfish marketers were female while the remaining percentages (5.3.0%) were male. The study revealed that about 25% of catfish marketers in the study area were single while about 75% were married respectively. The result indicates that about 2.0% of the catfish marketers do not have access to formal education, while 98.0% had formal education. It was found that majority 84.9% do not belong to any catfish marketers association. While only 15.1% belong to the cooperative association with average year of 2year being as membership. The result revealed that about 46.7% of the consumer had preference of freshness of catfish. Total revenue of catfish marketing was TR ₦209245.8, was derived by

multiplying the total products sold (price) by its cost incurred during the catfish marketing at central market with the average total cost ₦192905.33 of catfish marketing in central market Kaduna.

Marketing margins are mostly governed by the demand for, and supply of, marketing services. This margin can be measured in monetary terms. The cost of marketing services of Anguwan sarki and kakuri was ₦1521 and ~~₦1253~~ with the level of marketing efficiencies of 0.62% and 0.50% respectively. The result of Gini coefficient (Gc) value was $=1 - FI = 1 - 0.2301 = 0.7699$. The result revealed that central market and Kawo market had market concentration ratio of 65 and 68% respectively. This is generally considered as strong oligopoly and is another source of imperfect competition. kwori market and Kakuri market had market concentration ratio of 46 and 42% respectively. This is generally considered as weak oligopoly while Malali market and Angwan sarki market had market concentration ratio of 65 and 68% respectively. This is generally considered as un-concentrated market. The study revealed that about 70.4% of the respondents were severe with price instability in the market across the state.

5.2. Conclusion

In conclusion, there is great potential for the development, efficiency and commercialization of catfish marketing in the study area because smoked catfish has remained one among the moving business in the Study area which has positively enhanced the welfare of the marketers. There is need also to encourage establishment of catfish marketing boards in Nigeria because of their roles in providing quality and good price to both buyers and marketers both at domestic and international levels of the catfish market. The study also Concluded that the average rate of returns on investment

(return per naira invested) was 1.89 for catfish in central market, indicating that for every ₦1 invested in catfish in the study area, a profit of 89 kobo was made. Similarly, the average rate of returns on investment (return per naira invested) was 1.21, indicating that for every ₦1 invested in Kawo market on catfish, a profit of 21 kobo was made. Thus, it could be concluded that catfish marketing in the study area was profitable. This concludes that the result of marketing margin has interplay. A series of marketing activities causes variations in the marketing margin among the marketers of catfish in the state. Since the results of marketing efficiencies for Kwari market, Kawo market and Malali market which were greater than 1 (i.e. $me > 1$, over efficient), the study concluded that abnormal profit is being made in the trade, and some elements are unduly reaping from the efforts of others. Finally the study concluded that about 18.6% of the respondents were severe to the constraints of price instability in the market.

5.3 Contributions to knowledge

- i. The study revealed that processed catfish market in Kaduna state is a free market square where there is free entry and exit, the pricing policy was determined by the forces of demand and supply.
- ii. The study revealed that the marketing efficiencies of processed catfish and marketing is over efficient (i.e > 1) therefore, is profitable.
- iii. The study also revealed that about 18.6% of the respondents were severe to the constraints of price instability in the market across the state.

5.4 Recommendations

- i. Catfish marketers should be effectively linked to available financial institutions in the study area and the entire state for provision of on-lending facilities to those stakeholders in terms of loans and micro-credit such as business plan development, project management, bank lending regulations and loan repayment, financial management and record keeping to these stakeholders to promote their business performance.
- ii. There is the need for a strong inter-state partnership in order to encourage businesses to participate in terms of supply of catfish across the state and neighboring state, in order to develop an effective marketing system, this would enhance commercial catfish marketing in the study area and Nigeria general.
- iii. Government should provide adequate storage facilities, good roads for easier supply of catfish within the state metropolis to promote investment and development of small scale catfish marketing.
- iv. Catfish marketers should be encouraged to form cooperative societies to enable them solve some of their financial obstacle and easy access to other incentives from the government.

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**DEPARTMENT OF AGRIC ECONOMICS AND RURAL SOCIOLOGY
FACULTY OF AGRICULTURE, AHMADU BELLO UNIVERSITY – ZARIA**

Dear Respondent,

This questionnaire will be used by a student of the Department of Agricultural Economics and Rural sociology, Ahmadu Bello University, Zaria. Please, fill as

appropriate. All information will be treated with confidentiality and strictly for the purpose of research. Thanks for your co-operation.

A. SOCIO –ECONOMICS CHARATERISTICS

1. Category of ‘processed catfish’ marketer (a) Wholesaler (b) Retailer
2. Location of the marketer.....
3. Local Government Area.....
4. Age of the marketer.....
5. Marital status: i. single [] ii. Married [] iii. Divorced [] iv. Widowed []
v. Separated ()
6. primary occupation
7. Household size:.....
8. Source of capital: i. Banks [] iii. Cooperative society [] iv. Government []
v. Others (specify).....
9. Level of education: i. Non formal education () ii. Primary education () iii.
Secondary education [] iv. Tertiary education () Quranic education ()
10. Do you belong to any cooperative association? Yes () or No ()
11. If yes? For how long have you been into cowpea marketing?
12. Size of income per annum:

B PROCESSING AND MARKETING INFORMATION

13. Do you process catfish () or you source for processed catfish directly for sale ()

15. If you process catfish, what processing method do you use and what is the cost implication (last 12 months)?

Period	Quantity of catfish (specify unit)	Method of processing	Inputs used	Costs
1 st quarter				
2 nd quarter				
3 rd quarter				
4 th quarter				

16. What problems do you encounter in processing catfish?
.....
.....
.....
17. What major problems do you encounter in sourcing for processed or for sale?
18. What are your means of transportation to the market?
.....
.....
19. How much do you pay for transporting a specified unit?
20. Are there formal transport tariffs related to the 'processed catfish'?
21. If yes, how much?
22. Do you encounter problems in transporting processed catfish to the market?
.....
23. If yes, specify these problems
.....
.....
24. Provide the following information on 'catfish' processing activities in the last one years

a. **Smoked**

s/no	Major source of catfish	Average cost of catfish (lowest and peak periods)			
		Lowest	Quantity purchased (specify unit)	Peak	Quantity purchased (specify unit)
1					
2					
3					
4					
5					

25. Where do you sell your 'processed catfish'?.....
26. To whom do you sell them?
- b. Wholesalers (%.....) b. Retailers(%.....)
- c. Middlemen (%.....) d. Rural assemblers(%.....)
- e. Consumers(%.....) f. Others (Specify).....(%.....)
27. In what unit do you sell your 'processed catfish'? (specify number in bags)
1=bags, 2= carton, 3 = others (specify).....
28. Do you have agents selling the 'processed catfish' for you? (a) Yes (b) No
29. If yes, how much commission do you pay in Naira per unit? (state the unit).....
30. How much do you sell a unit of your 'processed catfish' on the average?
31. How do you contact your buyers?.....
32. What are the problems/challenges encountered in transporting your
33. 'processed catfish'?.....

34. Do you store your 'processed catfish' after processing? (a) Yes (b) No
35. If yes, what facilities do you use in the storage?.....
36. What are the problems/challenges you encounter in the course of storage of your 'processed catfish'?.....
.....
.....
37. Do you actually seek for market information? (a) Yes (b) No
38. If yes, how do you obtain market information, especially prices and demand?.....
.....
.....
39. To whom do you normally sell your 'processed catfish' (Use the table below)

Category of buyer	*Frequency of patronage (see code)	% of total product purchased	Problem(s) encounter in dealing with buyers
Wholesalers			
Retailers			
Consumers			

*Frequency: 1 =daily, 2 = weekly, 3 =monthly, 4 = quarterly, 5 = bi-annually, 6 = annually, 7 = others (specify).....

40. What general problems do you encounter in 'processed catfish' marketing?

Problems	Coping strategy (if any)

41. Suggest possible ways of solving the problems.....
.....
.....

Thank you.