CROSSING THE CHASMS OF AGRICULTURAL DEVELOPMENT IN NIGERIA:
Consumer Preference Studies: Market Integration Syntheses and Value Chain Diagnoses to the Rescue

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SUMMARY OF PRESENTER'S BIODATA

Shehu Alhaji Musa was born on the 20th March, 1968 at Gwagwarandan Village, Albasu Local Government Area, Kano State, Nigeria. He had his Bachelor's degree in General Agriculture from Usman Danfodiyo University, Sokoto (UDUS) in 1994 and in 1997, he obtained his M.Sc. degree in Agricultural Economics from Abubakar Tafawa Balewa University (ATBU) Bauchi, Nigeria. He obtained a doctorate degree (PhD) in Agricultural Economics in 2003 under the auspices of ATBU/Purdue University, USA, BEAN/COWPEA Collaborative Research Support Programme (BEAN/COWPEA-CRSP), a United States Agency for International Development (USAID) project.

Professor Musa's vision is geared towards achieving a vibrant, thriving and sustainable agriculture through the use of innovation and technologies as a veritable tool to help developing countries (most especially Nigeria) to meet up with growing needs of food security assurances. While his mission is to ensure the use of cutting edge technologies and strategies to organize agricultural sector actors along the various agricultural value chain systems that will usher Nigeria into a more sustainable path of economic prosperity and development. Besides this, his aspiration is also to contribute towards addressing the quest for educational and economic development of developing nations (with special emphasis on Nigeria) using knowledge-based driven strategies and the attainment of the comprehensive transformation of an educational system that will make Nigerian youths to be substantially self-reliant job creators and not job seekers.

Professor Musa's areas of teaching, research interest, scope and focus are: agricultural marketing (especially consumer preferences, market integration and value chain), agricultural finance, environmental economics, agribusiness management, farm management, production economics, socio-economics and Environmental Impact Assessments (EIAs), agricultural policies, agricultural projects management as well as national and international consultancies.

Prof. Musa has published over 110 articles in peer-reviewed journals and edited conference proceedings of professional academic associations. He has, to his credit, eleven (11) technical reports submitted to various local and international institutions and agencies. Similarly, over thirty (30) papers have been presented at various national conferences of professional associations such as the Nigerian Rural Sociological Association (NRSA); Farm Management Association of Nigeria (FAMAN); Agricultural Society of Nigeria (ASN); Agricultural Extension Society of Nigeria (AESON); Nigerian Society for Animal Production (NSAP); National

Association of Agricultural Economist (NAAE) and Forestry Association of Nigeria (FAN). In an addition, Prof Musa has presented over twenty-two (22) papers at various international conferences such as World Cowpea Research Conferences (3&5); BEAN/COWPEA-CRSP; Purdue Improved Cowpea Storage (PICSI), Purdue Improved Crop Storage (PICSII) and American Association of Agricultural Economics (AAAE). He has also participated in over fifteen (15) international workshops and training in the course of his academic career. He has been the keynote or guest speaker at the national conferences of NAAE and FAMAN in 2014 and 2016, respectively.

Prof. Musa also established national and international reputations in research and professional consultancies. For instance, he served as co-principal investigator and principal investigator for international programmes such as the USAID Project on the Consumer Preferences of Cowpea in Nigeria and actively lent support in similar projects for many West and Central African countries; he also coordinated sucrose analyses for cowpeas in Nigeria. Others included Tomato Value Chain Analysis (TVCA), which was under the umbrella of the Agricultural Development in Nigeria (ADENI) - a French government-sponsored project. He had served as the Nigerian Consultant to BEAN/COWPEA CRSP, GATES/MARKETS projects as well as PICSI and PICSII projects.

For over 25 years Prof. Musa has acquired vast experiences in teaching both undergraduate and postgraduate students at ATBU, Bauchi; Kano University of Science and Technology, (KUST), Wudil; Adamawa State University, (ADSU), Mubi and at Bayero University, Kano (BUK). He has therefore supervised many students' projects and theses: over 30 undergraduate students, 2 MBAs, 2 PGDs, 15 M.Sc. students and 4 Ph.D students.

In the course of his working career, he served for four years (two consecutive terms) as Head of Agricultural Economics and Extension Department, BUK. During his tenure, the Department witnessed tremendous development including successful mounting of postgraduate programmes, mounting of B.Sc Sasakawa Africa Fund for Extension Education (SAFE) programme, which is now becoming a nationally-recognized programme. Similarly, his tenure witnessed the massive recruitment of academic staff in both agricultural economics and agricultural extension areas. Furthermore, he served as General Manager of National Open University Consults and Investment Limited (NOUNCIL), the company's transformation in terms of Internally Generated Revenue (IGR) during his short stay was a record to showcase.

As part of community services to his state, he served, on *pro bono* basis, as Special Adviser to Kano State Government on Food Security. Subsequently, he become the Provost of Audu Bako College of Agriculture (ABCOA) Dambatta.

Presently, Professor Musa is the Vice-Chancellor of Kano University of Science and Technology, Wudil where he is serving his second term in the office. In this position, Prof. Musa has shown considerable foresight, experience and leadership skills and undoubtedly, KUST, Wudil has recorded unprecedented developments in all areas but most especially in the terms of collaboration and linkages, accreditation, physical infrastructure, expansion of academic programmes, recruitment of academic and non-academic staff, community outreaches, staff and students' welfare, as well as information and communication technology just to mention a few. It is therefore not surprising that many consider Prof. Musa as the architect, redeemer and legendary master builder of modern KUST, Wudil.

He has presented over 20 academic papers to buttress his effort in community engagements and has received many honours and awards in the course of his academic pursuit. Professor Musa is a registered member of eight (8) professional bodies, namely: Nigerian Rural Sociological Association of Nigeria (NRSA – 1996), Farm Management Association of Nigeria (FAMAN-1998), Agricultural Society of Nigeria (ASN-2000), African Farm Management Association (AFMA-2005), Nigerian Society of Animal Production (NSAP-2006), Nigerian Association of Agricultural Economist's (NAAE-2007), International Association of Agricultural Economists (IAAE-2015) and African Agricultural Economists Association (AAAE-2016).

Prof. Musa is a Fellow of Certified Financial Analysts of Nigeria (FCFA-2015), Fellow of the Nigeria Association of Agricultural Economists (FNAAE-2015), Fellow Farm Management Association of Nigeria (FFAMAN-2016), Fellow, Institute of Corporate Administrators of Nigeria (FICAN-2017), Honorary Fellow of Nigerian Institution of Mechanical Engineers (FNiMechE-2017), Fellow, Technology Education Practitioners Association of Nigeria (FTEPAN-2018).

Prof. Musa is happily married to Maryam Ibrahim Na'ibbi and the marriage is blessed with Ainau, Muhammad, AbdurRahman, Abdullahi and Abubakar.

CROSSING THE CHASMS OF AGRICULTURAL DEVELOPMENT IN NIGERIA:Consumer Preference Studies: Market Integration Syntheses and Value Chain Diagnoses to the Rescue

PREAMBLE

In the Name of Allah, the Most Beneficent and the Most Merciful, I thank Almighty Allah for giving me the opportunity to stand here today to present the 46th Inaugural Lecture of this great university. It is indeed an honour and a privilege which I cherish greatly.

Agriculture over the years has proved itself as a major factor behind the growth of the Nigerian economy and more so, a pillar of national food security. Nigeria's economy comprises two main sectors – petroleum and agriculture. Petroleum export contributes about 45% of the Gross Domestic Product (GDP) but employs only a fraction of the population. Agriculture, on the other hand, contributes over 41.8% to the country's GDP, employs directly or indirectly, about 65% of the total population and provides employment to about 80% of the rural population (CBN, 2009).The sector is highly concentrated on crop production, which accounts for 90% of output. Fishery, forestry and livestock production account for the remaining 10%. However, Nigeria is still listed by FAO among nations that are at the moment technically unable to meet their food needs from rain-fed production due to low levels of input and is likely to remain so even at intermediate levels of inputs between 2000 and 2025 except concerted efforts are taken by all stakeholders to remedy the situation (NINCID, 1999).With the growing population of Nigeria, the production of food is not increasing in a way that can meet up with high demand (Ojo, 2003).

In spite of the above situation, the country's agricultural potential is high, because Nigeria has 82 million hectares of arable land but so far only 34 million hectares have been cultivated making about 58.53% of cultivable land for future utilization. With government's renewed focus on the diversification of the economy and emphasis on the non-oil sector, agriculture is increasingly becoming important as a source of consumer and industrial demand that can generate employment and transform the country to a leading player in the global market. The Agricultural Transformation Agenda (ATA) and the Agriculture Promotion Policy (APP) of the present government are reported to have increased agricultural output by 11% to 202.9 million tonnes between 2011 and 2019. Also, the schemes are reported to have boosted commercial banks' lending to agriculture from 0.1% in 2011 to 5% in 2019 and reduced the 2019 food import bill by N466 billion. In addition, the Economic Recovery and Growth Plan (ERGP) prioritize food security and aims to achieve self-

sufficiency in tomato paste, rice and wheat by 2019/2020, respectively. ERGP projects indicate that the value of agricultural production would increase by 31% to N21 trillion in 2020. Despite these policy interventions, the agricultural sector is still largely underdeveloped, primarily because the focus is on production, rather than on enhancing value addition across value chain segments (PWC, 2017).

Nigeria has great potentials of becoming the food basket of the West African Sub-region given that she is endowed with a huge expanse of arable land, beneficial climate, abundant streams, lakes, forest and grassland, as well as a large, active population that can sustain a highly productive agriculture. Despite these enormous qualities and contributions of agriculture, the sector has not performed as expected and thus slipped into systemic decline, particularly in the past four decades due to the inadequate supply of inputs and the refusal to pay attention to the food demand, value chain and consumption pattern of consumers.

A modern food consumer is highly concerned about the safety and quality of the food products purchased. This concern goes simultaneously with their awareness of the relationship between the production, value and quality of food products. Moreover, the awareness has contributed towards growing demand for food from non-conventional production practices as well as an increasing consumer interest in having a closer relationship with food producers (Musa, et al 2006). Food production and consumption have their influences on each other. An adequate and effective demand for food is needed to sustain the growth in food production, because producers need a market for their products. Moreover, consumption parameters provide the necessary information on linkages from food consumption to incentives for agricultural production through the marketing sector.

Mr. Vice Chancellor, Sir, my presentation today would serve as business opportunities for all the audience, who farm and those who are planning to venture into it. Therefore, let us do agriculture instead of saying agriculture by adding value to what we produce in order to meet what consumers need.

INTRODUCTION

In agricultural production and marketing, product value and quality variables are immensely important considerations because each agricultural produce/product represents a differentiated product, which supplies a unique bundle of attributes that influences consumer demand and preference and the prices they are ready to pay. Therefore, when a consumer purchases an agricultural product, he is not purchasing the product itself, but its quality attributes. He is ready to pay the premium price if he

finds the value and quality characteristics he is looking for in the product and may ask for a discount if he does not find them.

Generally, in any economy consumer preferences and demand constitute the bedrock, which influences the production decisions of producers, since consumer satisfaction is the major target of producers if they are to stay in business. Chairman, Sir, the much talked about value addition in agriculture is founded on the preferences and demand of consumers. This is because there is a nexus between value addition and consumer preferences. It is what consumers need and demand for that you, the producer, will add to your product to make it sell better. The consumer is a king, who you must satisfy to survive or stay in business. In like manner, in a green economy like the Nigerian, consumer preferences and demand are the direct signals, which influence the production decisions of farmers, since they are most likely to produce products with high consumer demand in the market and of economic value.

Therefore, consumer preferences ensure that the right type of products are produced and the right type of value is added to agricultural produce, thus ensuring that agricultural resources are appropriately deployed to the best advantage. Indeed, this phenomenon of farmers reacting to the preferences of consumers is called the "SUPPLY-RESPONSE" model in production economics and is of paramount importance not only to the farmers and marketers of agricultural produce, but also to policy makers, who plan for the farmers. Most pricing, value addition and breeding policy decisions and other government intervention measures can be traced directly to this concept (Adegeye and Dittoh 1985 and Musa, 2003). Therefore, Chairman, Sir, the consumer and his preferences are major keys that can unlock the potentials in the Nigerian agricultural sector and subsequently lead to sustainable agricultural production and economic development. Based on this, the consumer and his preferences must be accorded due recognition in agricultural production, value chain addition and marketing.

With increasing globalization, urbanization and level of education, consumer quality expectations for goods and services are increasing, especially in the food sector. This, therefore, calls for a careful consideration of what is presented to consumers in the market place because the consumer is a king and must be satisfied (Kohls and Uhl, 1980 and Musa 2003). Perhaps we can use these simple equations to illustrate the importance of satisfying the "Consumer is King" dictum and its impact on the survival of a business or firm. A business or firm's revenue (R) depends on consumers buying or purchasing its product/service if they are satisfied with the value

they get for their purchases. Therefore, revenue (R) depends on consumer satisfaction (CS). This means that R is a function of CS and can be written as:

R = f (CS)……..(1)

If a firm's survival (FS) is also a function of revenue (R), then this means that;

FS = f(R)…….(2)

And if R = f (CS) then:

FS = f (CS)…….(3)

Figure 1: *Marketing agricultural products in Nigeria*

CONSUMER PREFERENCE AND VALUE ADDITION IN AGRICULTURE - CONCEPTUAL FRAMEWORK

The Consumer and His Preferences

In order to understand who a consumer is, let us first understand what consumption is. Consumption is the process by which goods and services are, at last, put to final use by people. It is at the end of the line of economic activities that start with the evaluation of available resources and proceeds through the production of goods and services, value addition and the distribution of goods and services among people and groups. From this simple meaning of consumption, we can then say that we are all consumers. Every person in the world is a consumer because we daily consume one good/service or the other in order to survive.

The Consumer as King

In any free market economic system, the forces of supply and demand are the two major factors that shape the direction of the economy, especially as an economy moves away from subsistence. While the supply side is represented by the producers/manufacturers/marketers of goods and services, the demand side is represented by the consumers whose behaviours determine or even dictate what should be produced or supplied. The consuming side has a greater pull because at some point in time everyone is a consumer of one product/service or the other, since no one can be a complete island to himself and does not need the products or services of others. Thus, in a free enterprise economy, producers usually direct or target their production efforts towards those segments of society where there is a higher demand for their products/ services so as to maximize their profit and stay in business. This means that in today's production and marketing world, the consumer is the reason why any business subsists and survives. Without consumers, no business can survive because entrepreneurs are to produce for consumers.

Therefore, if businesses will wind down because of lack or low patronage of their goods/services by consumers, then the whole economy will slow down. It is the aggregation and survival of various producing units that keep the economy going. This is why the consumer is considered king. For you to survive as a producer, you have to produce what he needs and not what you need. The consumer is king because it is he/she that chooses the product they want to buy. Production is itself started in the first place to please consumers. Who would produce or manufacture products if there is no one to buy them? The consumer is therefore the king for any product, because he is the one who can make, mar or break a market. Therefore, the priority of a business organization is to satisfy the needs of the consumer because he is the king that must be satisfied if one wants to survive and stay afloat in business and to also determine its fluidity.

Figure 2: *A Consumer making purchases of agricultural products*

Consumer Food Choices, Preferences and Models and their Place in Agriculture
Consumer food choice is influenced by food product prices, value and quality and the consumers' income. In choosing food, consumers look beyond the physical product alone. Among the things they demand are varieties of food, high value, quality, nutritious content and safe foods at a reasonable cost. Therefore, in order to win the competition in today's market, producers have to make efforts to offer good value for their food and provide consumers with a favourable ambience (Soriano, 2002). It will guarantee a continuous demand if the value of the product exceeds the expectation and satisfaction of the consumer.

Today, consumers are no more passive receptacles/receivers of what is produced by producers, but have become very active and sensitive to what they consume because of increasing levels of education and awareness of health and safety issues. Based on this, millions of naira are spent yearly by agropreneurs, who want to survive and produce food products that can meet the quality expectations of consumers. Special care is now being taken by producers about the consumption and purchasing behaviours of consumers and their motives in food selection and choices.

Factors in Consumer Food Selection and Choice
Indeed, consumer food selection, choice and preference constitute a complex phenomenon, which is premised on three main groups of factors as follows:

i. **Product-related factors** rely on the chemical, physical and sensory properties and attributes of the products, such as taste, aroma, texture, visual appearance, nutrient content, price, convenience, accessibility and packaging.

ii. **Consumer-related factors** incorporate the personality, psychology and physiology of the consumer and are normally expressed by the age, gender, education, income, experience, mood, satiety, hunger, wellness and health of the consumer.

iii. **Environmentally- related factors** include the place or region of the production of the product, method of production (whether conventional or organic), sustainability of the environment, cultural beliefs, fashion and a host of others (Shepherd, 1989 and Kresic *et al*.,2010)

Another grouping of factors considered by Steptoe *et al.* (1995), which potentially influences food preference by the consumer include health, mood (positive or negative), convenience (ease to prepare and availability), sensory appeal (appearance, taste and smell), natural content (no additives), price, weight control (low in calorie and fat) and ethical and environmental concerns (country of origin, method of production and packaging).

Vice Chancellor Sir, the importance of considering these factors that influence consumer food selection and choice is predicated on the understanding that it is the aggregation of these factors that constitute the preference structure of the individual food consumers. His expectation is that he will find a combination of these factors or characteristics in whatever food choice he makes for which he is ready to pay a fair or premium price or abstain from purchasing or ask for a discount. Thus, if producers and other actors in the food value chain can understand these factors, then they will be well equipped to know what value to add to their products to meet consumer needs and preferences.

Then, What is Consumer Food Preference?

Based on the foregoing discussion so far, we can now safely *define consumer food preference as a process whereby a consumer chooses one food product or service rather than the other because of the visible appealing quality characteristics and values he finds in the product or service, which are at congruence with his quality expectations* (Musa *et al.*, 2012). He is ready to pay the premium price if he finds these characteristics/values in a product or service but may abstain or ask for a discount if he does not find them or is not satisfied with the level of the characteristics/values in the product or service. *These premiums give producers and other actors the incentives to improve product quality and quantity and consequently enhance the welfare of both consumers and producers.* This implies that for the food producer to survive in the market and maximize his profit, he must take special care to meet or incorporate quality characteristics/values in his product or service.

Consumer Preference Models

Sir, because of the mixed nature of the audience, I will abstain from going into the complexities of economic models, but I will try to come down to a level where everyone can understand. With this in mind, I will like to say that consumer preference falls within the precincts of random utility economic models, which are concerned with people's choices and decisions. Broken down, these models are concerned with judgements of preferability, worth, value and the goodness of a good or commodity which aim at bringing about utility (satisfaction) maximization to the consumer of a good as he makes his choice or selection.

With the above in mind, I hasten to say that consumer preference models are many and varied. They include such models as the conjoint analytical model, hedonic model, contingent valuation model, discrete choice model and ranking techniques.

- ***The Conjoint Analytical Model*** estimates the part-worth or utilities of the qualities or attributes of a food commodity in terms of their relative contribution to overall consumer stated preferences.
- ***The Hedonic Pricing Model*** stipulates that the price of any food commodity is a linear summation of the implicit value of its attributes.
- ***The Contingent Valuation Model*** is used to gauge consumers' willingness to pay (WTP) for the attribute of a commodity.
- ***The Discrete Choice Model*** estimates consumer Willingness to Pay (WTP) for an alternative commodity as a result of change in the levels of attributes, which were expected in a particular commodity.
- ***The Ranking Techniques*** rank consumers' preference for certain characteristics of food commodity in their purchasing decisions. Examples here include **Garret's Ranking Technique** (GRT) and the **Consumers' Computed Preference Index** (CCPI).
-

Regardless of the models or method used, the basic point is founded on consumer utility (satisfaction) maximization based on product attributes, values or characteristics. The ground work for these models can be traced to Lancaster's model of the Consumption Theory, which regards the properties or qualities of a good (e.g. agricultural, automobile, computers, etc) and not the good itself as the direct object of utility maximization (Lancaster, 1966). This means that a good itself does not provide utility (satisfaction) to the consumer; rather it is the properties, characteristics, values, qualities or attributes that provide the utility derived from its consumption.

Chairman sir and distinguished audience from this it can be argued further that because the attributes/values of a good affect its price, then we can say that the attributes traded in markets are an integral part of market price determination because they are the objects of utility, which characterize the preference structure and demand of individual consumers. This means that the effective management of these quality attributes is a very important aspect of agriculture and the economy in general. There exists a large pool of preference studies on food attributes and consumer preferences, as the subject matter has become an important concern for researchers due to the increased interest of consumers as well as producers on food quality and value chain in agriculture.

Value Addition in Agriculture

Value chain consists of the full range of the activities that are required to bring a product or service from conception through the different phases of production to delivery to final consumers and disposal after use (Kaplinsky, 1999). This concept can be viewed from two perspectives. In a micro view, value chain includes the range of activities performed within a firm to produce certain output. But in a broader view, it encompasses the complex range of activities implemented by various actors in an industry (primary producers, processors, traders, service providers, etc) to transform a raw material into a more valuable form for consumption by the final consumer. This approach sees value chain as a series of backward and forward linkages, which culminate in the original raw material being transformed to meet the needs of the final consumer. In this context, the preferences of the final consumer or even intermediate consumer of a product are crucial in the operation of the value chain.

The Value Chain Conceptual Framework

In the literature, several conceptual frameworks have been developed by various authorities to explain the concept of value chain. These include the Filiere, Porter, Global and Systematic approaches:

i) **The Filiere Approach**: it was initiated by the French in the 1980s and used to analyse the agricultural systems in developing countries. The word *filiere* means a thread or chain. In this context, this approach sees value chain as a framework used to map the flow of commodities and identify the agents and activities involved in the flow of a commodity from the producers to the final consumer. The approach focuses mainly on physical and quantitative technical relationships than other considerations in the value chain.

ii) **The Porter Framework**: This approach named after its proponent, M. E. Porter (1985), sees value chain as a tool that can be used by firms to gain competitive advantages over their competitors in an industry. He argues that since it is somewhat difficult for firms to detect their sources of competitive advantage by looking at the firm as a whole, it should disaggregate its operations into a series of activities, locate activity or activities in which they have a competitive edge over others and concentrate in it/them so as to have an advantage over others. This advantage should be looked in terms of producing qualitative goods at a lower cost and the willingness of consumers to pay higher prices for their goods. However, this approach sees value chain merely as a tool for the assisting the executive manager in taking strategic decisions.

iii) **The Global Approach**: it sees value chain from a global perspective, especially from the standpoint of globalization. As espoused by Kaplinksky (1999) and others, value chain can be used to examine ways in which firms, regions and countries are globally integrated in their production and marketing activities. In this context, international trade relations are considered as part of a network of producers, exporters, importers and markets whereby knowledge and relationships are developed to gain access to markets and suppliers.

iv) **The Systematic View Approach**: it sees value chain as a system and process of interaction between actors, supporters and influencers. Value chain actors deal directly with the production, processing, packaging and trading of a product. Supporters are the people and companies that provide service to the value chain actors, while the influencers are people, organizations and institutions that create the enabling environment for value chain activities by setting up and managing the regulatory framework.

The Agricultural Value Chain

An agricultural value chain consists of a series of activities that adds value to the final product, beginning with production, processing, getting the final product and selling it to the end user or consumer and disposal after use. Value addition may not necessarily involve altering the product or service, but can be achieved through the adoption of new product differentiation, handling, packaging and distribution techniques, so that farmers can reliably meet consumer demands. At each step in the chain, an agricultural product or service gains some value, which ultimately gives more added value than the sum of the added values of all activities. It is, therefore, a veritable strategy for transforming unprofitable agricultural enterprises into profitable

ones by adding form, time, place and information utilities to agricultural products and services (Berhanu, 2012).

Consumer demand for value added agricultural products in Nigeria is rising rapidly due to the growing population, urbanization and rising per capital income (Ilu and Annatte, 2016). This suggests that there is the urgent need for a strategic regime of value chain activities to increase local production so as to mitigate the huge annual expenditure on agricultural imports. It was in realization of this need that the Federal Government's Agricultural Transformation Agenda (ATA) (2011-2015) had as one of its main goals the enhancement of capacity for value chain addition in the agricultural sector. Indeed, the overall goals of the ATA are to develop the domestic farm-market agricultural value chain, create local job opportunities, reduce the nation's dependence on imported agricultural product so as to satisfy local demand and improve the livelihood of smallholder producers [Federal Ministry of Agriculture and Rural Development (FMARD) and Ilu and Annatte, 2016]. Therefore, value chain development has almost become a magic formula for sustainable agricultural investments.

Consumer Preference and Value Addition in Agriculture

Normally, there is a trade-off or nexus between consumer preference and value addition. Indeed, it is the preferences of consumers that determine what values to add to a product to make it more appealing to consumers, because, in the market, the consumer is king. Many raw agricultural commodities have intrinsic values in their original state, which cannot be realized except they are changed into other forms more appealing and useful to consumers either by processing and repackaging or through other biotechnological or engineering processes, for instance raw cassava into garri and cassava chips and wheat and other grains to flour, which is in turn processed into bread and other important confectioneries preferred by consumers.

Therefore, if actors in the agricultural value chain want to survive and make a profit, they have to take cognizance of consumers' preferences for different agricultural products and build them into their products. Agricultural produce contains a bundle of differentiated quality characteristics, which influences consumer preference. Knowledge of these quality characteristics is, therefore, very important for farmers, processors, marketers and consumers, so that they can make informed production, processing, marketing and consumption decisions. In this respect, we can now construe value addition in agriculture as a process of changing or transforming an agricultural product or service from its original form or state to a more valuable and

appealing form based on the perceived needs, tastes and preferences of consumers. So, consumer utility (satisfaction) is the ultimate motive of value addition in agriculture.

With the globalization of the world's economies, the ***produce-and-then-sell mentality*** of commodity producers is being replaced by the strategy of first determining what attributes consumers want in their food products and then produce products with these attributes in order to satisfy them. ***It is no more business as usual.*** Producers no longer think of themselves as only producing agricultural raw commodities but as producers of products for end users with diverse needs, preferences and choices. Therefore, in order to survive and make profit, agropreneurs now have a challenge of being responsive to consumer demands by producing what is desired through value addition in a sustainable manner.

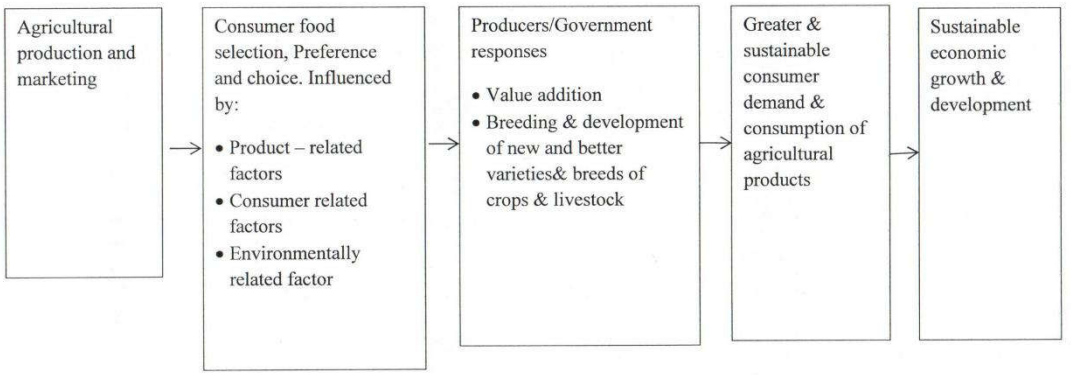


Figure 3: *Schematic Representation of the Linkages between Agricultural Production, Value Addition, Marketing and Consumer Preferences in Enhancing Sustainable Economic Growth.*

The Relevance of Consumer Preference and Value Chain Studies

Consumer preference and value chain studies in agriculture presuppose that by understanding consumer preferences and the interactions within commodity value chains, it is possible for private and public agencies to identify points of intervention to increase the efficiency of production and marketing by increasing total generated value as well as increase the competence of intended actors. Understanding the mechanism operating within the value chain system will help in distinguishing the bottlenecks and failures that will allow for improvement possibilities within the system. Improvement along the entire value chain will reflect in the quality of local agricultural production with the hope of making local agricultural products compete favourably with imported ones. These studies will therefore be of relevance to all

stakeholders, especially agricultural development planners and policy makers, extension workers, farmers, processors and marketers and also serve as the basis for further research.

CONSUMER PREFERENCE SYNTHESES AND VALUE CHAIN DIAGNOSTICS: EMPIRICAL EVIDENCE FROM NIGERIA

The food sub-sector of Nigerian agriculture parades a large array of staple crops and livestock made possible by the diversity of our agro-ecological production systems. The major food crops are:

• Cereals - sorghum, maize, millet, rice, wheat,
• Tubers - yam, cassava
• Legumes –cowpeas, groundnut,
• Others –Fruits and vegetables

The major livestock include:

- cattle
- sheep
- goats
- some camels and donkeys
- a large population of poultry and
- fisheries

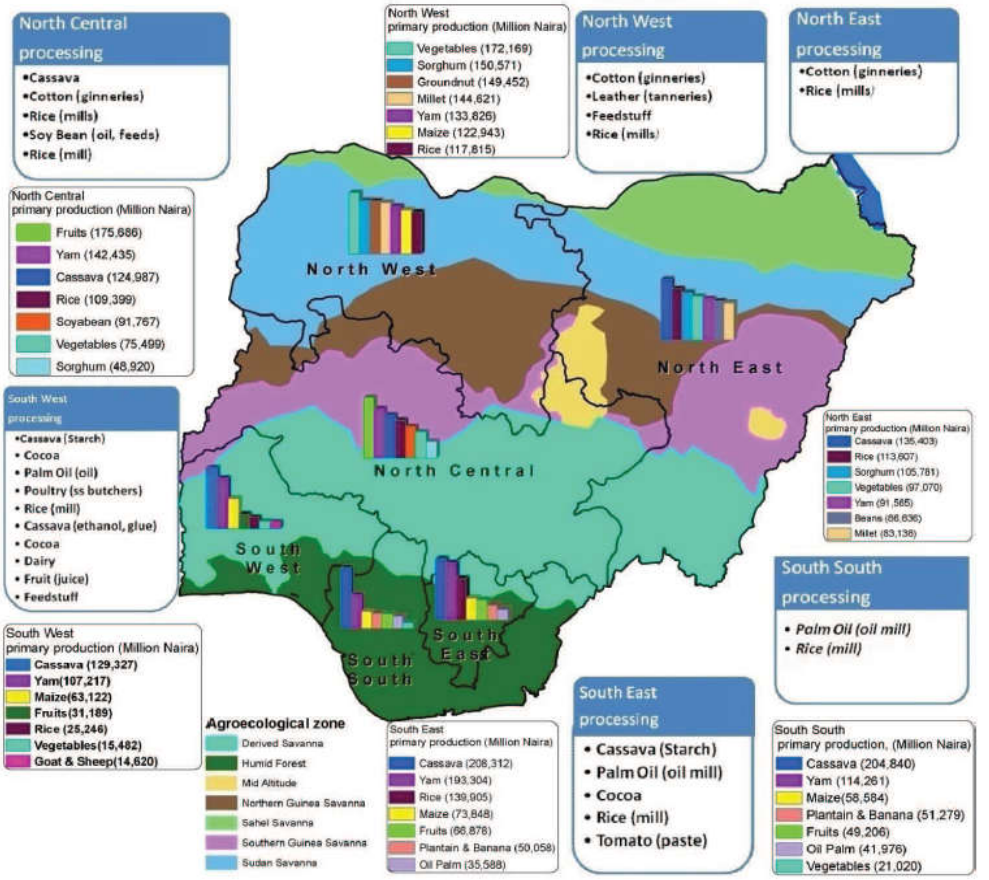
These are the commodities that are of considerable importance for food security and the expenditures and incomes of households in Nigeria. There exists a large pool of consumer preference studies on food attributes and value chain addition, as the subject matter has become an important concern for researchers due to the increased interest of consumers as well as producers. ***Here under are some empirical research works on consumer preference and value chain of selected agricultural products in Nigeria carried out by my humble self or under my supervision and/or participation.*** This lecture examines various segments of the 13 most promising agricultural product value chains in Nigeria, including cowpea, rice, cassava (gaari),maize, tomato, sweet orange, banana fruit juices, cattle, sheep, goat (beef, mutton and chevron), poultry (chicken) and fisheries.

Methodology

Study Areas

Over the years, the study location of our research efforts covers the entire country including both production and consumption regions. However, most of the outcome of the modest research efforts considered for presentation in this inaugural lecture

were undertaken in the northern states of Nigeria especially in Kano, Yobe, Borno, Jigawa, Sokoto where most of the commodities are produced while one was undertaken in Southwest Nigeria. Figure 4 shows the spatial distribution of the centres of primary agricultural production, processing as well as other value addition activities in Nigeria:



Source: *Prepared by IITA Geospatial Lab, Nigeria*

Figure 4: *Centres of Primary Agricultural Production, Processing and Value Addition Activities in Nigeria*

The studies were grounded in the concepts of consumer preferences, market integration and value chain development.

Empirical Models

Consumer Preference Models

Most of the consumer preference studies utilized the Hedonic Pricing Model and a few others the Conjoint Regression and Descriptive Models.

The Hedonic Pricing Model

This model was used to analyse the consumer preferences for the quality characteristics of cowpea grains, sweet orange and banana fruits, cattle, sheep and goats. A good way of understanding the hedonic analysis framework is to view each good in terms of the set of characteristics it possesses (Ladd and Suvannut, 1976). For any given good, say cowpea, let the set of characteristics be ordered and denoted by $X = (x_1, \ldots\ldots, x_k)$. It is then assumed that the preference of consumers in the market for a product is solely determined by its corresponding characteristics vector. In addition, it is assumed that there is a functional relationship between the good's price, P and the characteristic vector X in the form of equation P= f(x). This functional relationship specifies the hedonic relationship or hedonic regression typical for the good in the market. Empirical estimation, using hedonic price analysis, then takes the form of:

$$P_n = \sum_{j=1}^{m} X_{nj}\beta_{nj} + \varepsilon \qquad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4)$$

Where: P_n is the price of the commodity, X_{nj} are its quality characteristics while β_{nj} gives the implicit values of the commodity characteristics and ε is random error.
From the general function, the regression model that was estimated in this form:

$$P_{it} = \alpha_{io} + \sum \gamma_{ir} Y_{irt} + \sum \Psi_{Ik} M_{ikt} + \sum \beta_{Ij} X_{ijt} + \varepsilon_{It} \quad \ldots. \quad (5)$$

Where: P_{it} is the price of the commodity in the market i (i = 1, 2, 3….., N) at time t (t = 1, 2, …… ,T). Y_{irt} is Yearly dummy (r = 1, 2, ..,N) and M_{ikt} is monthly dummy (k = 1, 2, …., 11) to account for the effect of time in price variability. X_{ijt} referred to the commodity's characteristics (j = 1, 2, …., J), α is constant term, β, Ψ and γ are parameters estimated and ε is a stochastic error term.

Then the explicit form of the model is expressed as:

$$Y = a + b_i X_n + \ldots U \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (6)$$

Where Y is the price of the commodity, ɑ, intercept, b_i, coefficient, X_n, commodity characteristics and U the error term.

Conjoint Analysis Using Regression Models for Consumer Preference

In Conjoint Analytical models, the assumption is that a respondent will choose the product or profile that would give them the maximum utility. According to the random utility model, a respondent's utility can be written as:

$$Uj = V + ej$$

Where *Uj* represents total utility derived from the product, *Vj,* the commodity components (characteristics) that give the utility and *ej* denotes a stochastic error.

Regression analysis attempts to establish the nature of the functional relationship between commodity variables and the utility derived by consumers. For some studies, a logit regression model was used for consumer preference analysis. For example, the consumer preference model for rice was specified as:

$$Y = a_0 + a_1X_1 + a_2X_2 + a_3X_3 + a_4X_4 + a_5X_5 + a_6X_6 + a_7X_7 + a_8X_8 + a_9X_9 + U \quad (7)$$

Y is 1 or 0 , i.e 1 for consumer preference for imported rice and 0 for consumer preference for local rice.

$X_{1\text{-}9}$ are characteristics desired by consumers such as taste, cleanliness, colour, grain shape, swelling capacity, price, odour, colour and suitability to local and continental recipes.

VALUE CHAIN MODELS

Specification of the General Model for Value Chain

In any agricultural enterprise, the net profit margin is the difference between the total revenue (TR) and the total costs (TC) (Olukosi and Ogunbile, 2005). This means that in the agricultural value chain, the profit margin is the difference between the total revenue derived from each of the various enterprise units (production, processing and marketing) and the total costs involved in them. Therefore, in estimating the profitability of each agricultural value chain enterprise, the various activities and costs involved in them together with the accruing revenue have to be accounted for. The level of costs and profits for local and commercial enterprises, however, differ. The net profit model by Olukosi and Ogunbile (2005) is specified as:

$$NI = GR - TC \quad (1)$$

$$TC = TFC - TVC \quad (2)$$

Therefore, $NI = GR - (TFC + TVC)$ (3)

Where NI is net income received by each agricultural value chain actor, GR, gross revenue received by each actor, TC, total costs incurred by each actor, TFC, total fixed costs of each actor and TVC as the total variable costs of each actor. For instance, in rice milling the net income model can be specified as:

NI = TR = TC ……. (4)

Where: NI = Net income from milling operation, TR = Total revenue accrued from milling charges and TC = Total cost of inputs used in rice milling
Where TC=TVC+TFC.....……(5)
TVC = Total Variable cost of inputs used in rice milling (₦) expressed as:

$$\sum_{i=1}^{n} P_i X_j = \left(P_{x2} X_1 + P_{x2} X_2 + P_n X_n\right) \text{.....(13)}$$

Where: P_{X1}= The Rental value of land for milling workshop (N), P_{X2}= The Unit cost of diesel/electricity used in rice milling (litre/kw), X_2= The Quantity of diesel/electricity utilized in rice milling (litre/kw), P_{X3}= The Unit cost of water used in rice milling (litre), X_3 = The Quantity of water used in rice milling (litre), P_{X4}= The Unit cost of lubricants used in rice milling (litre), X_4 = The Quantity of lubricants used in rice milling (litre), P_{X5} = The Unit cost of maintenance for milling machine X_5 Quantity of spare part used in maintaining milling machine, P_{X6} = The Unit cost of labour utilized in rice milling (manday) and X_6 = The Amount of labour utilized in rice milling (manday).
TFC = The Depreciated value of equipment used in rice milling.

It should, however, be noted that value addition does not necessarily show the profitability of value chain activity, rather it shows the value that is added to the commodity as it moves along the value chain and also the rate of the value added by each actor along the value chain.

RESUME OF THE SYNTHESES AND DIAGNOSTICS OF CONSUMER PREFERENCE AND VALUE CHAINS FOR SELECTED AGRICULTURAL COMMODITIES

Consumer Preference and Value Chain for Cowpea in Nigeria

Cowpea (*Vigna unguiculata (L) Walp*) belongs to the leguminous crop family and is regarded as the most important economic and nutritional indigenous African legume (Musa, 2003 and Baribusta, *et al*., 2010). It is a source of relatively low cost high

quality protein and the grains are consumed in over 50 different dishes across West and Central Africa (WCA) in both milled form and whole grains. The most common use of milled cowpea are cowpea balls or fritters, popularly called *kosai* or *akara* and steamed cakes, popularly called *moin-moin*, *ole-le* or *alle-le*. Boiled whole grains are sometimes eaten with oil or mixed with cereals like rice and eaten with stew (Langyintuo *et al* 2003 and Mohammed, 2007). Cowpea leaves are also used as fodder for livestock and at the same time to maintain soil fertility through its nitrogen fixing ability (Voh *et al*; 2001). There is therefore a high propensity for its consumption across West and Central Africa (WCA), thus raising its demand in local and international markets. It is based on the nutritional and economic importance of this crop that the above study was conceived and undertaken. Nigeria is the largest producer of cowpea worldwide, as 58% of worldwide, production comes from this country. Yet, Nigeria is still the largest consumer of the crop. To supplement our production, substantial amounts of cowpea come into the country from the Republics of Chad Cameroon, signifying that we are still not producing enough cowpea to feed our nation.

The main objective of this study was to determine the cowpea grain quality characteristics that command premium or provoke a discount in Ghanaian, Malian and Nigerian markets. Specifically, the study looked at the impact of the grain size, texture, colour, eye colour and bruchid-damaged grains on cowpea market prices. The data for the study were collected from six markets in Ghana, two in Mali and three in Nigeria: Iddo in Lagos; Monday Market in Maiduguri and Dawanau in Kano. The price variable is reported as market price per kilogramme.

Figure 5: *Different Types of Cowpeas*

Figure 6: *White Cowpea*

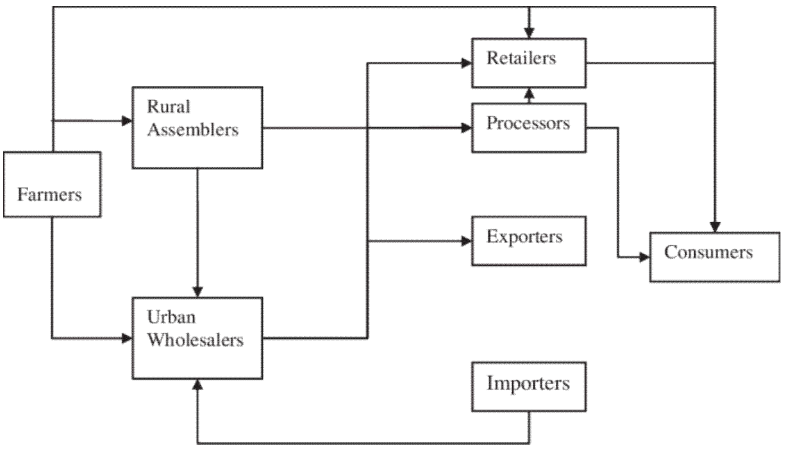
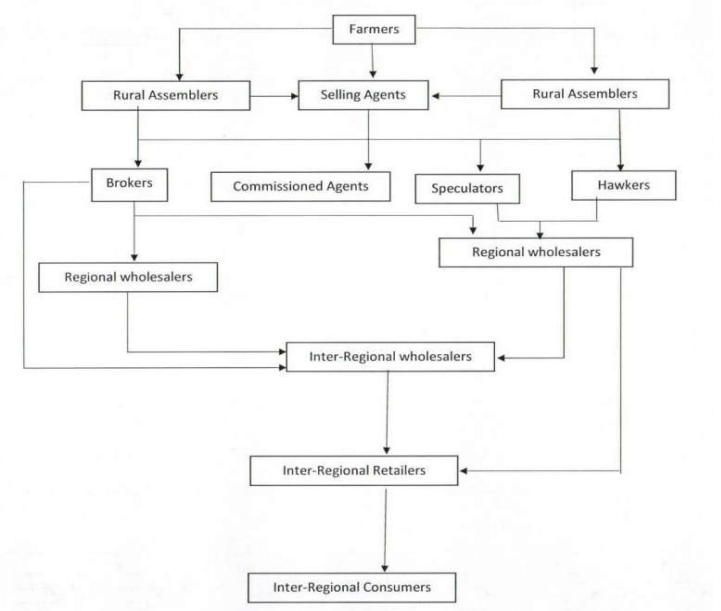


Figure 6: *The Typical Within Country Cowpea Value Chain in West and Central Africa*

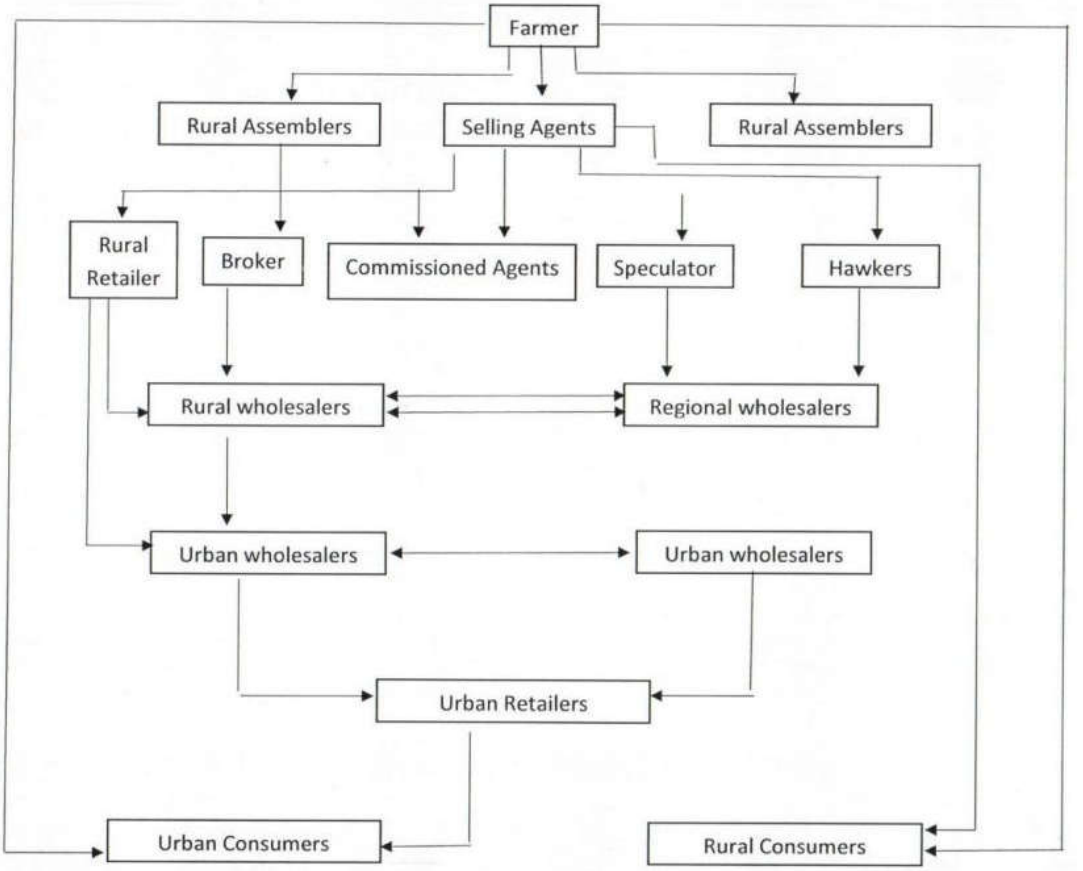
Cowpea Marketing Channels in Nigeria

Figures 7, 8 and 9 depict the path of cowpea as it moves from farmers to the final consumers within a state as well as intra-regional and inter-regional circuit respectively.



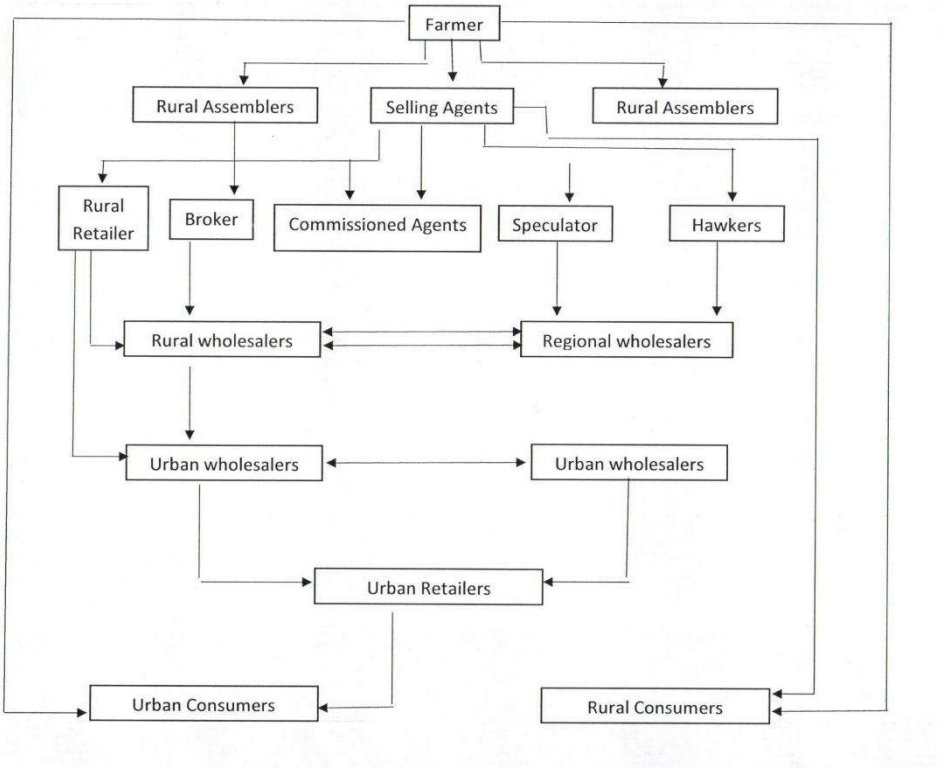
Source: *Field Survey, 1998-2001*

Figure 7: *Cowpea Trade Channel Within a State*



Source: *Field Survey, 1998 – 2001*

Figure 8: *Intra-Regional Cowpea Trade Circuit in Nigeria*



Sources: *Field Survey, 1998 – 2001*

Figure 9: *Inter-Regional Cowpea Trade Circuit in Nigeria*

Figure 7 shows the connectivity of intermediaries and/or actors on the market within a state. Intermediaries are those directly involved in buying and selling. Thus, they operate in the process of exchange. Trader and commission agents are found among these intermediaries. The latter are paid for their services while the former invests private capital and runs financial risks. Although the marketing channels in all Figures (7-9), are complicated, suffice it to say that farmers do sell directly to urban consumers in both the cases (Figures 7, 8 and 9). While intra-regional cowpea is from farmers to inter-regional urban consumers, nonetheless, in all the channels, farmers, selling agents, commission agents, wholesalers and retailers take an active role in the marketing channels of cowpea in Nigeria.

Cowpea Network Flow in Nigeria

Figure 10 portrays the trans-border cowpea trade between Nigeria and Niger across all the northern states bordering Niger Republic as well as Cameroon and Chad

Republic. Importantly, Dawanau Market serves as the centre-piece for the influx of foreign cowpea varieties into Nigeria. Inland also, most of the cowpea produced in northern Nigeria was conglomerated in Dawanau Market before it outflows to some other northern and southern parts. Other important distributor markets in the northern region include Sokoto Central, Zamfara, Jibia, Kontagora, Maigatari, Potiskum, Gombetudu and Muna Garage (Maiduguri). All these markets supply cowpea to Dawanau and then to other southern urban markets. In the southern parts of the country, a two-way trade has been established between major urban markets. For instance, Benin and Lagos as well as Lagos and Ibadan markets. The Figure also indicates reported cases of minimal exports to other countries.

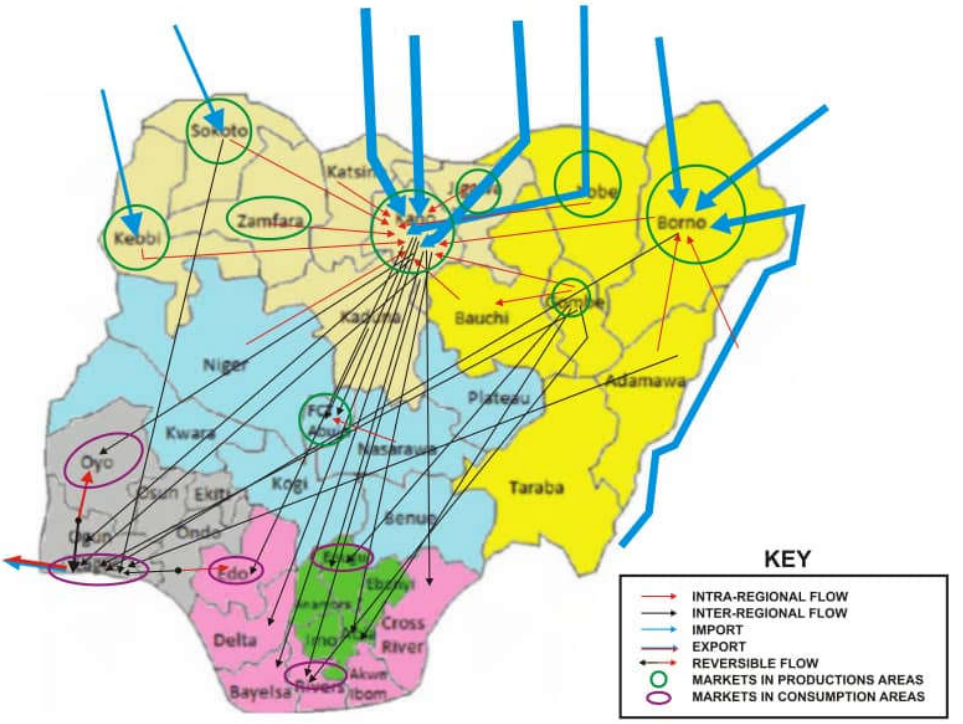


Figure 10: *Cowpea Network Flow in Nigeria*

Price Integration for Nigerian Cowpea Markets

Marketing is interdependent with others. Thus, no market works in isolation if it has to exert influences. The efficient market hypothesis states that a market is efficient if current prices fully reflect all relevant information (Markiel, 1987). A market is therefore said to be efficient with respect to some information set if prices would be unaffected by revealing that information to all participants. How prices on two or more spatially separated markets adjust in the long and in the short run periods becomes a fundamental question that needs to be answered.

Lutz (1994) posited that "price integration deals with the way price information is transmitted from one-market segment to another by arbitrage activities." It studies how price changes in spatially separated markets mutually affect one another. The magnitude and speed of transmission are important indicators of the functioning of the market. As such, price integration is one of the instruments that indicate to what extent markets are imperfect and may show in which market segment improvements are needed dynamics of integration. Further, it indicates the extent of price variability and factors contributing to that among regions.

In view of the above, this study considered the assessment of price integration between production and consumption regions highly imperative. To accomplish this, cointergration and unit root tests were utilized, with the aid of shazam econometric software, version of 2003.

A hierarchy between markets exists, with Dawanau on the leading side and Lagos and Maiduguri considered as important centres of price formation among others, on which prices in their respective rural areas depend. Because of the above, the simple configuration of the model fits very well in the Nigerian situation. Prices in these centres can be taken as proxies for clearing prices in the extended region on which the limited local supply and demand has a direct influence. In particular, when rural surpluses exist one may argue that the central market dominates the local price formation being that the nearest market can clear the market surplus.

Retail Price Integration for Nigerian Cowpea Markets

Markets are interdependent with others. Thus, no market works in isolation if it has to exert influences. Results of the analyses are subsequently presented.

Retail Integration Between Kano and Lagos Cowpea Markets

Table 1 reports outcome of market integration for ten (10) selected cowpea varieties. From this table, it was evident that high levels of coefficients of determination were

obtained from regression analyses of cowpea prices between Kano and Lagos dispersed markets. The lowest value of R-square (39.37%) was in respect of Aloka variety.

Table 1: *Retail Price Interaction Between Kano and Lagos Cowpea Markets*

S/N	Variety	R^2	$R^{2\ adj}$	B	D.W.
1	Olo-two	64.76	63.59	1.28^{NS}	1.94
2	Olo–one	47.48	45.73	1.05^{NS}	1.80
3	Oloyin-new	55.93	54.47	0.46^{NS}	1.80
4	Oloyin–old	55.92	54.45	0.12^{NS}	2.02
5	Aloka	39.37	37.35	1.06^{NS}	1.99
6	Dangombe	60.02	58.69	$O.36^{NS}$	1.86
7	Dansokoto	73.22	72.33	0.40^{NS}	1.93
8	Saddam	71.71	70.77	2.39**	1.93
9	Gongola	64.45	63.26	0.59**	1.87
10	Banjara	60.56	59.24	2.54**	1.75

T= 1%-2.750
5% 2.042
10%- 1.697

While the highest value of the coefficient of determination was accounted for by the Dansokoto variety. Also, price variability observed in Lagos for Saddam in Olo-two, Dangombe, Gongola and Banjara was caused by price variation to the tune of 71.71, 64.45 and 60.56 percentages, respectively in the corresponding, prices of these respective varieties at Kano location.

More so, from Table 1, the magnitude of the difference between R-square and R-square adjusted was very small. This is true for all the cases of ten (1) varieties included in this analysis of price integration between Kano and Lagos markets. From the same Table also, B coefficients were statistically significant at conventional levels of 1 and 5 percentage. However, the coefficient of B for Saddam and Banjara were conventionally not significant statistically. All the values of Durbin-Watson obtained indicated the absence of autocorrelation between all the pairs of comparing varieties.

Retail Integration Between Maiduguri and Lagos Markets

When the Maiduguri Market was considered as a reference market for the Lagos Market, the result (Table 2) similarly indicated high values of the coefficient of determinations. These ranged from 40.18% (minimum) to 82.33% (maximum) in a

similar manner the magnitude of difference between R-square and R-square adjusted was small.

From Table 2, it was however evident that Oloyin-new Dansokoto, Saddam and Gongola have coefficients of Bs which are all statistically significant at any of the conventional levels of significance. Nonetheless, Olo-two Oloyin-old, Aloka Dangombe and Banjara all had significant values of B coefficients.

Table 2: *Retail Price Relationship Between Maiduguri and Lagos Markets*

S/N	Variety	R^2	R^{2adj}	B	D.W.
1	Ola-two	82.33	81.76	0.19^{NS}	1.99
2	Ola- one	46.76	45.04	0.91^{NS}	1.90
3	Oloyin –new	48.48	46.81	1.99*	1.70
4	Oloyin-old	53.62	52.12	0.18^{NS}	1.91
5	Aloka	40.18	38.26	1.03^{NS}	1.97
6	Dangombe	48.08	46.41	1.56^{NS}	1.85
7	Dansokoto	64.38	63.23	2.39**	1.88
8	Saddam	46.25	44.51	1.98*	1.69
9	Gongola	51.36	49.79	4.7***	1.69
10	Banjara	62.75	61.55	1.60^{NS+}	1.78

T=1%-2.750
5%-2.042
10%-1.697

Results of the autocorrelation tests shows the positive values of Durin-Watson, which approximates to the desired value of 2, which is indicative of no autocorrelation.

Retail Integration between Kano and Maiduguri Markets

Results (Table 3) of the integration between Kano and Maiduguri retail pairs indicate lower values of the coefficients of determination. Thus, 40.34, 41.54, 31.34, 53.95, 41.36, 60.54, 61.32, 27.83, 27.57 and 52.40 percentages were obtained for Olo-two, Olo-one, Oloyin-new, Oloyin-old, Aloka, Dansokoto, Saddam, Gongola and Banjara, respectively. However, the difference between R-square and R-square adjusted was of similar magnitude in the two previous market interactions at retail levels.

From Table 3 also, higher coefficients of B were generally obtained between Kano and Maiduguri Markets. Hence, only Oloyin–old and Aloka have a significant value of B. The rest of the varieties have B-coefficients that are all statistically not significant like the previous cases. The coefficient of Durbin-Watson are all positive

and approximate to a positive of 2, which statistically indicates the absence of autocorrelation.

Table 3: *Retail Price Relationship Between Kano and Maiduguri Markets*

S/N	Variety	R^2	R^{2adj}	B	D.W.
1	Ola-two	40.34	38.36	3.21***	1.99
2	Ola- one	41.54	39.59	6.58***	1.70
3	Oloyin –new	31.34	29.05	7.9***	1.96
4	Oloyin-old	53.95	52.45	0.12^{NS}	2.02
5	Aloka	41.36	40.27	1.01^{NS}	1.98
6	Dangombe	60.54	59.23	5.09***	2.00
7	Dansokoto	61.32	60.03	3.23***	1.70
8	Saddam	27.83	25.42	5.63***	2.19
9	Gongola	27.57	25.16	3.12***	1.72
10	Banjara	52.40	50.81	3.92**	1.67

T= 1%-2.750
5%-2.042
10%-1.697

Integration at Wholesale Level for the Nigerian Cowpea Market
This section report the outcome of market integration analyses of wholesale level only.

Whole Price Relationship Between Kano-Lagos Markets
In a similar manner to retail assessment, wholesale assessment was carried out. For the price relationship between Kano and Lagos wholesale result (Table 4) showed generally higher level of the coefficient of determination than pair comparison between markets. The lowest adjust coefficient of determination is 90.90% and the highest, 98.21% (Table 4).

Table 4: *Wholesale Price Relationship Between Kano and Lagos Markets*

S/N	Variety	R^2	R^{2adj}	B	D.W.
1	Ola-two	98.27	98.21	0.06^{NS}	1.90
2	Ola- 0ne	96.71	96.60	0.44^{NS}	1.86
3	Oloyin –new	94.29	94.10	0.03^{NS}	1.85
4	Oloyin-old	94.13	93.93	0.02^{NS}	1.91
5	Aloka	91.28	90.90	1.16^{NS}	1.89
6	Dangombe	96.60	96.49	0.14^{NS}	1.83
7	Dansokoto	95.79	95.65	0.40^{NS}	1.94
8	Saddam	97.61	97.53	$O.11^{NS}$	1.96
9	Gongola	94.99	94.83	0.20^{NS}	1.95
10	Banjara	93.40	93.18	0.15^{NS}	1.94

T= 1%-2.750
5%-2.042
10%-1.697

The value of the Durbin-Watson statistics is all approximately to a positive value of 2. In addition, the coefficients of B as a measure of market linkage are all statistically not significant for all the studied varieties there is no marked difference between the coefficient of determination and the corresponding value of adjusted-R^2 with an average of 0.17% for all varieties.

Wholesale Integration Between Maiduguri and Lagos Markets

Generally lower values of the adjusted coefficient of determination were obtained in comparison to Kano-Lagos market pairs. The lowest (75.02%) adjusted R^2 was accounted by Olo-one comparison between the market pairs while Aloka accounted for highest value of coefficient determination (87.46%). As a test for autocorrelation, all the values of Durbin-Watson were close to 2. The coefficient of B for five (Banjara, Angola, Saddam, Dangombe and Oloyin-new) were not statistically significant. While the remaining five varieties have a significant B coefficient at 1% and 5% levels of significance. Other details about the level of integration were as contained in Table 5.

Integration of Cowpea Varieties at Kano and Maiduguri Markets

Result as presented in Table 6 shows slightly higher level of R^2 adjusted then hitherto established between Maiduguri-Lagos comparisons. The lowest is 77.81% and the highest is 92.07% with an average of 82.85% for all varieties. With exception of Aloka, Dangombe and Gongola, all varieties had a positive B coefficient all found to

be statistically significant at 1% and 10%. The Durbin–Watson test statistics all have positive values which approximate to a value of 2 in all the cases.

Table 5: *Wholesale Price Relationship between Maiduguri and Lagos Markets*

S/N	Varienty	R^2	R^{2adj}	B	D.W.
1	Ola-two	82.33	81.76	0.19^{NS}	1.99
2	Ola- One	75.80	75.02	1.23^{NS}	2.00
3	Oloyin –new	83.51	82.98	3.33***	1.90
4	Oloyin-old	82.61	82.05	0.28^{NS}	1.74
5	Aloka	89.67	87.47	0.26^{NS}	1.89
6	Dangombe	85.27	84.79	2.90***	1.94
7	Dansokoto	80.52	79.89	1.10^{NS}	2.18
8	Saddam	78.64	77.96	2.53**	1.84
9	Gongola	77.75	77.03	2.33**	1.85
10	Banjara	77.85	77.14	2.74**	1.85

T= 1%-2.750
5%-2.042
10%-1.697

Table 6: *Wholesale Price Relationship Between Kano Maiduguri Markets*

S/N	Variety	R^2	R^{2adj}	B	D.W.
1	Ola-two	78.51	77.81	0.49^{NS}	1.99
2	Ola- 0ne	83.34	82.78	0.78^{NS}	1.85
3	Oloyin–new	81.42	80.80	0.69^{NS}	2.04
4	Oloyin-old	87.63	87.21	1.04^{NS}	1.91
5	Aloka	83.14	82.57	3.18^{***}	*1.75*
6	Dangombe	92.32	92.07	1.71*	1.96
7	Dansokoto	90.10	87.67	0.67^{NS}	1.73
8	Saddam	83.98	83.45	0.58^{NS}	2.12
9	Gongola	74.83	73.99	3.25***	1.61
10	Banjara	80.78	80.14	0.72^{NS}	1.76

T= 1%-2.750
5%-2.042
10%-1.697

Implications of Price Integration for the Nigerian Cowpea Market

Understanding the degree of price [market] integration is crucial to the appropriate formulation of food security programme and polices. This section discusses the

results of price integration between Kano [reference] and other [Lagos and Maiduguri] markets selected in this study.

Implications of Price Integration between Kano and Lagos Cowpea Market

The extent of retail price variation between Kano and Lagos market generally showed that the Kano Market dominantly determined the retail prices of most (80%) cowpea varieties available in Lagos markets. More specially, Kano retail prices substantially controlled the price of Olo-one, Oloyin-new, Oloyin-old, Aloka, Dangombe, Dansokoto and Gongola varieties. However significant influence of Kano prices on prices of Lagos market as per Saddam and Banjara varieties could not be substantiated. On a general note, nonetheless, Lagos price variation for these varieties was accounted by the Kano price. By and large, it determined and controlled Lagos price at the retail level. This revelation may not be surprising owing to the fact that the Lagos Market has more or less, no local supply source[s]. This it is a typical representation of the consumption market only. Meanwhile, the position of Kano Market as the largest for cowpea in the world may also lend additional support to the finding. The magnitude of the difference between R-square and adjusted for this market pair comparison further supports the dominance of the Kano price over the Lagos corresponding price.

Implications of Retail Integration between Maiduguri and Lagos Markets

When Maiduguri prices (the supply market) were compared with Lagos prices (the dependent market), the results of OLS estimates were somewhat very similar to the Kano-Lagos comparison. On a more specific note, however, the retail prices of Oloyin-new Dansokoto and Gongola cowpea at the Lagos location were not determined by the corresponding prices of these varieties at Maiduguri markets.

As expected meanwhile, Maiduguri prices as per Olo-two, Olo-one, Oloyin-old Aloka, Dangombe and Banjara varieties significantly influence or controlled the retail prices of these corresponding cowpeas at Lagos market. The strength of this market linkage was slightly lower than the Kano-Lagos price linkage. This is not unexpected due to the reflectively smaller nature of the Maiduguri market compared to the Kano market. More so, the Maiduguri-Lagos distance is more than Kano-Lagos route.

Implications of Retail Price Integration between Kano and Maiduguri Markets

The result of the OLS estimate shows a very week level of market linkage between the comparing pairs. Specific estimates show that the prices of Olo-two, Olo-one, Oloyin-new, Dangombe, Dansokoto, Saddam, Gongola and Banjara at Maiduguri

were not significantly influence by the corresponding prices of these varieties at the Kano market. The afore-finding is not a variation from normal expectation. This is because the two markets are both located within major producing areas of cowpea in Nigeria. Therefore, each of the market has its own local supply sources of cowpea numerously located within its vicinity. More so, the comparison is at the retail level and the distance between these markets is comparatively less than the preceding pairs. Nonetheless, a very strong (significant) price linkage was found between Kano and Maiduguri in the specific cases of the Oloyin–old and Aloka varieties. This is to say that Kano prices dominated Maiduguri prices as per these two varieties.

In summary, the results of cowpea market integration indicated that all varieties showed seasonal and cyclical price variations in the selected markets which might be useful for traders to target the highest profiting months. Evidence of strong significant price integration was found between Lagos and Maiduguri markets most especially at the wholesale level. Kano cowpea prices significantly controlled prices of cowpea varieties at Maiduguri wholesale level. The lowest level of integration was however, found between Kano and Maiduguri retail markets. Generally, price movement was more clustered in Lagos market for both retail and wholesale transactions than Maiduguri and Kano. In all, the three pairs of cowpea market studied (Kano, Maiduguri and Lagos) exhibited strong evidence of market connections and price responsiveness both within and outside production regions. It is noted that with improvement on market price at both intra and inter-regional levels, the degree of cowpea market integration will be further enhanced in Nigeria. It is recommended that government should improve infrastructural and transport facilities in cowpea markets as this will improve the flow of information of price movements in the cowpea markets.

In Maiduguri market, the variables included in the model accounted for 68.39% of the variability of cowpea price. Up to five variables were statistically significant in influencing cowpea price and consumer preference. These were bowl weight (1%), grain size (1%), testa colour (1%), age of variety (old) (10%) and source (5%). However, while grain size (large), testa colour (brown cowpea) and old stock attracted premium of 56 kobo, ₦6.76 and ₦5.41 per kg of cowpea, bowl weight attracted a discount of ₦14.65 for a unit reduction in the weight of the measuring bowl. The consumers also discounted local varieties by about 60 kobo in preference

for imported varieties. All the monthly dummies were statistically significant with positive coefficients.

Table 7: *Hedonic Regression Results for Kano (Dawanau), Maiduguri (Monday), and Lagos (Iddo) Cowpea Markets*

VARIABLE	KANO (Dawanau Market)		MAIDUGURI (Monday Market)		LAGOS (Iddo Market)	
	Estimated Coefficient	T-ratio	Estimated Coefficient	T-ratio	Estimated Coefficient	T-ratio
Bowl Weight	-14.918 (2.963)	-5.035***	-14.653 (4.027)	-3.639***	-18.803 (3.060)	-6.146***
Grain Size	0.56626 (0.1249)	4.533***	0.55718 (0.1490)	3.739***	0.59538E-01 (0.1473)	-0.4043*
No of Holes per Grain	0.83307E-01	1.106NS	0.50139E-01 (0.9478E-01)	0.5290NS	0.86005E-01 (0.7529E-01)	0.142NS
Testa Colour	2.6723 (1.685)	1.586NS	6.7648 (1.648)	3.993***	2.4953 (3.825)	0.6523 NS
Testa Texture	-1.0353 (1.098)	-0.9428 NS	-1.7455 (1.648)	-1.059 NS	-3.7009 (1.474)	-2.511*
Eye Colour	-0.43495 (1.791)	-0.2428 NS	-2.2968 (1.521)	-1.510 NS	0.63174 (3.852)	0.1640 NS
Eye Texture	-0.49041 (0.9316)	-0.5264 NS	2.2182 (1.671)	1.327 NS	0.71471 (1.097)	0.6513 NS
Gender	0.8493E-01 (0.7568)	0.1122 NS	6.3907 (1.226)	0.1511 NS	0.80403 (0.8418)	0.9551 NS
New Variety(Age)	0.29246 (1.861)	0.1572 NS	5.4147 (2.576)	2.481*	10.406 (1.952)	0.5331***
Source	4.0124 (1.019)	3.938***	-0.49928 (1.555)	3.482***	-016654 (0.9131)	-0.1824 NS
Average Monthly Dummies(Jan-Dec)	13.6751 (1.7544)	6.3690***	10.5143 (3.041)	2.8166***	25.3012 (2.3423)	9.365***
Average Yearly Dummies (1998-2001)	-0.49449 (1.7685)	-0.326 NS	7.3388 (2.53)	2.059**	3.4292 (2.054)	1.7015*
Constant	47.099 (1.7685)	6.597***	35.257 (10.02)	3.519***	63.566 (7.827)	8.121**
R-Square Adjusted = 0.8284			0.6839		0.9030	
Dubin Watson = 1.9612			1.9534		1.7461	

Values in parentheses are standard errors

*** =P< 0.01(1%), ** = P< 0.05 (5%) , * =P< 0.10 (10%) NS = Not significant

In Lagos market, the variables included in the model accounted for 90.30% of the variability in cowpea price. Among the variables, bowl weight (1%), testa colour (5%) and newness (age) of variety (grains) (1%) were statistically significant in explaining consumer preference and cowpea price variability. While newness of variety had positive influence on consumer preference and price, bowl weight and testa colour negative effects. From the table, it could be observed that consumers are willing to pay premium of N10.41/kg of old stock of grains and will ask for a discount of N18.80 per unit reduction in the weight of cowpea bowl and N3.70/kg for grains that are smooth-textured. The monthly and yearly variables were all statistically significant with positive coefficients.

From the fore-going analysis, it shows that cowpea grain size is the most important factor determining cowpea price in Nigeria at statistical levels of 1%, 5% and 10% in different markets. In the Maiduguri market, the coefficient for **white skinned cowpea** was negative and statistically significant. The coefficients for **bowl weight** were negative and statistically significant in all three markets in Nigeria, indicating that consumers pay a lower price per kilogram when they are purchasing a larger bowl size of cowpea. The coefficients for **new variety cowpea grains** variable were positive in all the three markets and statistically significant in Lagos and Maiduguri. The coefficient for **imported source** was statistically significant in the Maiduguri and Kano markets. Imported cowpea were discounted in Maiduguri and earned a premium in the Kano market. Also, testa colour significantly influenced consumer preference in Maiduguri while source and storage periods significantly affected consumer preference and price in Kano market. In all locations, monthly dummies and year proxies significantly affected arbitrage. Most of these findings agree with those of Langyintuo et al. (2002) in their study of cowpea production and marketing in West and Central Africa of which the author was a participant.

Consumer Preference for Cowpea

The results of the study indicate that cowpea consumers in Ghana, Mali and Nigeria are willing to pay a premium for **large cowpea grains**. The coefficients for grain size were positive and statistically significant in all the markets except Central Market Ghana and Iddo Lagos (Table 8). Cowpea consumers discounted grains with **storage damage f**rom the very first bruchid hole. The impact of price on other cowpea quality characteristics, such as **skin colour and texture and eye colour, varied locally**.

Table 8: *Estimated Coefficients for Selected Markets in Nigeria, Southern Ghana and Mali*

Country / Market	Grain size	No. of Holes	Eye Colour	Skin Texture	Skin Colour	R^2
Southern Ghana	0.0057***[1]					
Makola (Accra)		-0.0030***	-0.0160	-0.0328	0.0118	0.46
Kaneshie (Accra)	0.0256***	0.0009	-0.0096	-0.1148***	-0.0269	0.65
Malata (Accra)	0.0239***	-0.0001	-0.0132	-0.0329	-0.0653*	0.71
Nima (Accra)	0.0179***	-0.0012	-0.0482*	-0.0809*	-0.0101	0.56
Central (Kumasi)	0.0035	0.0004	-0.0299*	-0.0059	-0.0233	0.57
Asafo (Kumasi)	0.0061**	-0.0002	0.0008	-0.0222	0.0014	0.58
Mali						
Marché de Sabalibougou	0.0033***	-0.0002	-0.0295	0.0098	-0.0221***	0.90
Marché de Médine	0.0042***	-0.0001	-0.0435***	-0.0076	-0.0186**	0.86
Nigeria[2]						
Iddo (Lagos)	0.0005	0.0008	0.0059	-0.0345*	-0.0232	0.91
Monday (Maiduguri)	0.0042***	0.0005	-0.0214	-0.0163	-0.0630***	0.71
Dawanau (Kano)	0.0043***	0.0008	-0.0040	-0.0096	-0.0249	0.85

Source: *Individual Country Studies (Mishili, 2005; Jamal, 2005; Shehu, 2003)*

Statistical Significance (*** = 1% ; ** = 5% ; * = 10%)For Nigeria, grain size was entered in the model as dummy variable, 1 for large grain size and otherwise.

Table 9: *Estimated Model Coefficients for Additional Variables in Nigeria Markets*

Country / Market	Bowl wt	Eye Texture	Gender	New Variety	Imported Source
Nigeria	-0.1751***[1]				
Iddo (Lagos)		0.0067	0.0075	0.0969***	-0.0016
Monday (Maiduguri)	-0.1364***	0.0207	0.0595	0.0504*	-0.0046***
Dawanau (Kano)	-0.1389***	-0.0046	0.0008	0.0027	0.0374***

Source: *Shehu , 2003*

Statistical Significance (*** = 1% ; ** = 5% ; * = 10%)

Facilitated by expressing the hedonic coefficients as a percentage of the average price in the market for the data period (Table 8: see appendix). For instance, in Nigerian markets the range of price premiums is between 1.2% and 1.4% of the average cowpea grain price per kilogramme for every increase of cowpea grain size by one gram per 100 grains. Coefficients for **grain damage,** as measured by the number of bruchid holes per 100 cowpea grains, were expected to have a negative sign. The coefficient for **grain eye colour** is negative and statistically significant in the markets in southern Ghana and Mali. Consumers in the markets studied preferred **cowpeas with a smooth skin,** as shown in Iddo Market (Table 8). Smooth skinned cowpeas are best for foods, which use whole cowpea. Rough textured cowpea is easier to dehull and hence preferred for foods requiring milling.

Consumers discounted white cowpea grains everywhere except at Makola. In the Maiduguri market, the coefficient for **white skinned cowpea** was negative and statistically significant. The coefficients for **bowl weight** were negative and statistically significant in all three markets in Nigeria, indicating that consumers pay a lower price per kilogramme when they purchase a larger bowl size of cowpea. The coefficients for **new variety cowpea grains** variable were positive in all the three markets and statistically significant in Lagos and Maiduguri. The coefficient for **imported source** was statistically significant in the Maiduguri and Kano markets. Imported cowpea is discounted in Maiduguri and earns a premium in the Kano market.

The Cowpea Value Chain

The value chain of cowpea in Nigeria encompasses many steps from production to transportation, storage, processing, wholesale or retail sale. Cowpea farmers typically keep some cowpea for family consumption and trade the rest in informal markets directly to consumers. The bulk of cowpea production is sold to traders, who come to weekly village markets to buy cowpea directly from farmers. About 40% of the traders buy cowpea directly from farmers; nearly half (46.7%) often do so, but 13.3% never buy directly from producers (Purdue, 2014). Cowpea is traded in traditional open markets, ranging from the weekly village markets in rural areas, to open air or covered wholesale markets where large quantities of grains are aggregated in larger towns and villages and retail markets in urban areas. Informal sales and purchases along the roadside are also an integral part of the system. Throughout Nigeria particularly in the North, the standard unit of measure for cowpeas amongst wholesale traders is 100-kilogramme bags with re-bagging cowpeas being common. Many wholesalers often apply insecticides in order to preserve the value of their product from weevils (bruchids). It is customary for both buyers and sellers to

visually inspect the cowpea to verify that there are no stones and damage with weevil holes. Price is determined by negotiation on the spot between buyer and seller. Retail traders buy cowpea from wholesale traders and resell to consumers in *mudu or tiya.* Women typically make up the bulk of consumers purchasing cowpea from retail traders and process it to use in preparing products and dishes like *kosai* or *akara*, *moin-moin*, *ole-le* or *alle-le, danwake, etc*. for home consumption or for sale. For those processing to sell, each woman's business is small in size, but as a group they are an important part of the economy and process a significant amount of cowpea, each using an average of 2.5 kilogrammes per day (Otoo, 2011). There also exist commission agents between wholesalers and purchasers, who receive commissions. The cleaning/sorting function is also prevalent in markets (e.g Dawanau in Kano) catering to higher income consumers in order to capture a greater share of the value added by selling to such consumers in urban super markets.

Cowpea Value Chain Gross Margins

A gross margin of 30% has been reported for cowpea producers and 60% after 6 months of storage in some parts of Nigeria and Burkina Faso. Investing in storage is estimated to have a Return on Investment (ROI) of 14%. Estimated gross margins for intermediaries is 4%, wholesalers 2% and retailers 10% (Purdue 2014).This means that cowpea storage especially during the off-season period, is very lucrative with an added margin of 30% after 6 months of production.

In summary, consumers, in the Nigerian, Ghanaian and Malian markets studied almost universally preferred larger size cowpea grain. For statistically significant coefficients, the premium for larger grain size ranged from 1% to 4.3% of the average price. Only in two of the markets were the coefficients for bruchid damage statistically significant. In those markets, the discount per bruchid hole was 0.02% to 0.5% of the average price. Preferences for eye, skin and texture varied widely from market to market. The value chain of cowpea in Nigeria encompasses many

steps from production to transportation, storage, processing, wholesale or retail sale. Cowpea farmers typically keep some for family consumption and trade the rest in informal markets directly to consumers. Women typically make up the bulk of the consumers purchasing cowpea from the retail traders and processing it to use in preparing products and dishes like *kosai* or *akara*, *moin-moin*, *ole-le* or *alle-le, danwake* etc. for home consumption or for sale. A gross margin of 30% has been reported for cowpea producers and 60% after 6 months of storage in some parts of Nigeria and Burkina Faso. This means that cowpea storage, especially during the off-season period, is very lucrative with an added margin of 30% after 6 months of production.

Table 10 : *Cowpea Marketing Margins for Selected Northern and Southern Markets in Nigeria*

Post Purchase Activities	Kano-Lagos		Maiduguri-P/Harcourt		Gombe-Enugu		Maiduguri-Benin		Sokoto-Ibadan	
	Amount ₦	%	Amount ₦	%	Amount ₦	%	Amount ₦	%	Amount ₦	%
Initial Price paid to farmers	930,000.00		870,000.00		1,024,000.00		992,000.00		990,000.00	
Rebagging (cost of bags, knitting and insecticide)	17,000.00	9.44	17,000.00	8.10	18,000.00	9.38	16,000.00	8.33	19,850.00	10.03
Guarding	1,500.00	0.83	1,500.00	0.71	1,600.00	0.83	1,800.00	0.94	1,900.00	0.83
Loading	6,000.00	3.33	6,000.00	2.86	6,400.00	3.33	6,400.00	3.33	8,250.00	4.17
Commission fees (assistantship and selling agent)	6,000.00	3.33	6,000.00	2.86	4,896.00	2.55	4,800.00	2.50	5,700.00	2.88
Transportation	90,000.00	50.00	120,000.00	57.14	89,500.00	46.61	105,600.00	54.69	100,000.00	50.50
Road barriers	2,500.00	1.39	3,000.00	1.43	3,000.00	1.56	2,850.00	1.48	2,500.00	1.26
Holding expenses	16,500.00	9.17	12,000.00	5.71	15,000.00	7.82	10,800.00	5.63	15,600.00	7.88
Uploading	3,000.00	1.67	4,500.00	2.14	4,500.00	2.34	3,200.00	1.67	4,950.00	2.50
Others associated costs (logging and feeding)	5,600.00	3.12	7,500.00	3.57	8,600.00	4.48	9,200.00	4.79	8,600.00	4.34
Final price received	1,080,000.00		1,080,000.00		1,216,000.00		1,184,000.00		1,188,000.00	
Total marketing margin	180,000.00		210,000.00		192,000.00		192,000.00		198,000.00	
Marketing cost	150,100.00		179,000.00		153,456.00		162,650.00		169,000.00	
Traders' profit	29,900.00	16.61	31,000.00	14.76	38,544.00	20.07	29,350.00	15.29	32,650.00	14.65

Table 10 contained cowpea-marketing margins from five selected northern markets (Kano, Maigatari, Gombe, Maiduguri and Sokoto) to five selected southern (Lagos, Port Harcourt, Enugu, Benin and Ibadan) cowpea markets. The table showed that

rebagging, transportation and holding expenses constituted the largest components of the margin in all cases. More specifically, transportation accounted for 50.00%, 57.14%, 46.61%, 54.69% and 50.50% in Kano-Lagos; Maigatari-Port Harcourt; Gombe-Enugu; Maiduguri-Benin and Sokoto-Ibadan routes respectively. In the same respect, respective order arrangement above, re-bagging constituted 9.44, 8.10, 9.38, 8.33 and 10.03 percentages. Other cost especially feeding and accommodation follows next in importance, which is in turn followed by loading and off-loading expenses. Nonetheless, commission fees component has also been recognized as an outstanding component. The traders' component share of the margin has been estimated, for Kano-Lagos (16.16%), Maiduguri-Port Harcourt (14.75%); Gombe-Enugu (20.17%); Maiduguri-Benin City (15.29%) and Sokoto-Ibadan (14.65%). The process takes between 1-3 weeks to complete a circle.

ECONOMIC ANALYSIS OF RICE VALUE CHAIN AND CONSUMER PREFERENCE IN KANO STATE, NIGERIA

Rice *(Oryza sativa. L)* belongs to the family *poceae*. USAID (2009) reported that rice is the most important food crop for half of the human race. It is the world's most consumed cereal after wheat and shapes the lives of millions of people; more than half of the world's population depends on rice for 80 percent of its food caloric requirements. Rice also provides more than 50 percent of the daily calories ingested (Braun, 2006).

Kano State is one of the most important rice producing areas in the country. This is largely due to more than 22,000 hectares of the irrigation schemes of the Hadejia Jama'are River Basin Development Authority and the upland production areas of Tudun Wada and Rogo (Kebbeh *et al*, 2003). The state also has large processing rice clusters, which are scattered in production areas, including Kura, Karfi, Kwanar Dawaki, Tudunwada, Bunkure, Chiromawa and Garko. Rice is sold in large volumes in Dawanau, Sabon-gari, Singa, Tarauni, Rimi, Yan Kaba and Kurmi markets. It is also traded as a major commodity in most of the LGAs in the state where both local and other traders are involved.

The demand for rice in Nigeria had been increasing from 3.75 million metric tonnes in 2003 to 4.45 metric tonnes in 2007 (USAID. 2009). Projections estimate the rice consumption growth rate at 4.5 percent per annum, which represented a 70 percent increase in total rice consumption by the end of the last decade (FAO, 2006). However, only about half of that demand was met by domestic production with rice importation, therefore, making up the shortfall. Rice imports represented more than 25 percent of all agricultural imports, making Nigeria a major rice importer in the

world market (IRRI, 2003). This trend in increasing rice importation has made Nigerian rice consumers show a stronger preference for imported rice because of its high quality in terms of cleanliness. While part of the issue relates to the biophysical properties of the local varieties produced, the major problem is the appearance and the cleanliness of the local rice, which affect the quality delivered to the market. A combination of these and other factors has resulted to lack of the competitiveness of Nigerian rice with the imported in terms of poor quality to meet market specification as well as low capacity to meet market quality standard. There is therefore the need for integrated quality management along the entire rice commodity chain from production through processing, marketing and consumption.

The broad objective of the research was, therefore, to carry out an economic analysis of rice value chain and consumer preference in Kano state, Nigeria. The specific objectives were to:

i) determine the profitability of rice production, processing and marketing activities along the rice value chain,
ii) determine consumer preference in relation to local and imported rice.

Figure 11: *Rice Marketing in Nigeria*

Figure 12: *Paddy Rice*

FINDINGS

Consumer Preference for Rice

Table 12 presents the results of descriptive statistics showing the factors determining choice and preference for the type of rice consumed. The results show that the consumers of local rice indicated its price, taste and suitability to local recipes as major determinants in the choice and preference for consumption as shown by 75.9%, 61.5% and 81.5%, respectively. For imported rice, 72.2% of the consumers indicated cleanliness as the major factor determining choice and preference. This implies that the consumers of both local and imported rice have different factors determining choice and preference for the type of rice consumed.

Logit regression was run to further determine important factors determining the choice and preference for the type of rice consumed. Results show that factors, such as swelling capacity, taste and cleanliness significantly influenced consumer preference on the type of rice consumed at the 1% level of significance and colour and grain shape significantly influenced consumer preference at 10% level of significance. Price, cooking duration and odour were not significant factors determining choice and preference as shown in Table 13.

The result implies that swelling capacity, taste, grain colour, cleanliness and shape were all important determinants for choice and preferences for both local and imported rice.

Value Addition Along the Rice Value Chain

Value is added to rice as it moves from the point of production until it finally reaches the ultimate consumer. The Value added to rice was obtained from the analysis of cost and returns of production, paddy trading, parboiling, milling and milled rice trading. Table 11 presents the value added to rice as it moves along the value chain:

Table 11: *Value Added to Rice Along the Value Chain in Kano State*

Actor	**Producer**	**Paddy Trader**	**Parboiler**	**Miller**	**Milled Rice Trader**
Function	Production	Trading	Processing	Processing	Trading
Output	Raw paddy	Raw paddy	Parboiled paddy	Milled or white rice	Milled or white rice
Value (N)	3775	4240	4485	4590	5350
Change in Value (N)	353	465	245	105	76

Source: *Field Survey, 2010*

Table 12: *Factors Determining Consumer Preference for Local and Imported Rice in Kano State*

Factors	Local Rice		Imported Rice	
	Frequency	Percentage	Frequency	Percentage
Price				
Yes	13	24.1	4	7.4
No	41	75.9	50	92.6
Total	54	100	54	100
Swelling capacity				
Yes	5	9.3	17	31.5
No	49	90.7	37	68.5
Total	54	100	100	1 00
Taste				
Yes	33	61.1	4	7.4
No	21	38.9	50	92.6
Total	54	100	54	100
Cleanliness				
Yes	7	13.0	39	72.2
No	47	87.0	15	27.8
Total	54	100	54	100
Cooking duration				
Yes	2	3.7		
No	52	96.3	54	100
Total	54	100	54	100
Colour				
Yes	1	1.9	5	9.3
No	53	98.1	49	90.7
Total	54	100	54	100
Odour				
Yes	1	1.9	3	5.6
No	53	98.1	51	94.4
Total	54	100	54	100
Grain shape				
Yes	1	1.9	4	7.4
No	53	98.1	50	92.6
Total	54	100	54	100
Suitability for recipe				
Yes	10	18.5		.
No	44	81.5	54	100
Total	54	100	54	100

Source: *Field Survey, 2010*

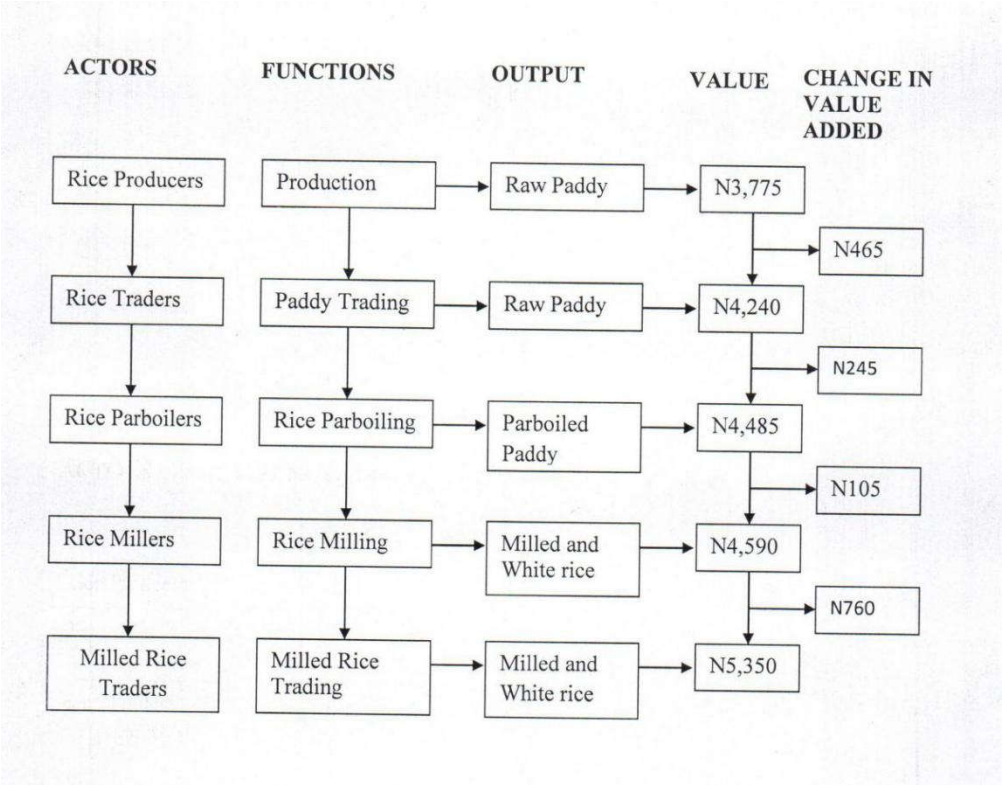
Table 13: *Result of Logit Regression for Consumer Preference for Local and Imported Rice*

Variable	Coefficients	t-value	LOS
Constant	3.64	0.23	NS
Price	0.51	0.61	NS
Swelling capacity	2.45	2.68	0.01*
Taste	-2.99	-3.53	0.01*
Cleanliness	2.80	3.74	0.01*
Cooking duration	-6.19	-0.39	NS
Colour	3.50	1.93	0.1**
Odour	0.33	0.22	NS
Grain shape	-3.03	-1.52	0.1**

2 log likelihood= 16.27
* Significant at 1%
** Significant at 10%
NS= Not significant

The result (Figure 12) reveals that the value of a 75kg bag of raw paddy at the point of production is ₦3,775 but the value increases to ₦4, 240 when the rice moves to the paddy trader. The value further increases to ₦4,485 after the raw paddy has been parboiled and ₦4,590 when parboiled paddy is milled. The value of rice is at its highest (₦5,350) at the point of trading. The first change in the value added is between the cost of producing the paddy and its value, which is ₦353. Change in the value added to rice between the point of production and the point of marketing of raw paddy by the paddy trader is ₦465 and the change in the value added to paddy trading and parboiling is ₦245. Change in value between parboiling and milling was ₦105. The final change in the value added is between rice milling and milled rice trading (₦760). This implies that even though value is added at every stage of the value chain, the value addition is not uniform. Different values are added at every stage of the value chain. The highest change in value added is ₦760, which was the value added between rice milling and milled rice trading while the least change in value added is ₦105, which is the change in value added between rice parboiling and rice milling. It can therefore be deduced that the highest value addition along the rice value chain is during the process of marketing, paddy trading and milled rice trading while the least value is added during rice processing - parboiling and milling. The high value added in trading could be attributed to the fact that the various marketing functions in trading confer on the commodity the utilities of place, time and procession, which make the it available at the right time and place for the consumer.

Figure 12: *Rice Value Chain Actors, Functions, Output and Value Addition in Kano State*



In summary, it can therefore be seen that the result for consumer preference shows that **swelling capacity, taste, colour of grain, cleanliness and grain shape are all important determinants for choice and preference for both local and imported rice consumed.** For the value chain, **the highest value addition along the rice value chain is added during the marketing processes of paddy trading and milled rice trading,** while the least value is added during rice processing, parboiling and milling. The high value added in trading could be attributed to the fact that the various marketing functions in trading confer on the commodity the utilities of place, time and procession, which make it available at the right time and place for the consumer.

MAIZE VALUE CHAIN AND CONSUMER PREFERENCE IN SELECTED LOCAL GOVERNMENT AREAS OF KANO STATE

Maize is one of the major crops cultivated in Northern Nigeria. The crop can be processed and consumed in a variety of ways by man and livestock. It is eaten in the

form of *tuwo, brabisko, masa and kunnu* and in the form of *akamu* and *agidi* in southern Nigeria. It could also be roasted or boiled and eaten on-the-cob or processed into flour, popcorn, corn flakes and baby food. Despite these numerous uses of the crop, not much is known about its value chain in Kano State and therefore, its full economic potentials are not realised or harnessed by producers, processors, marketers and consumers. It is against this backdrop that a study on the value chain and consumer preference for maize was conducted in Doguwa, Garun Mallam, Gwarzo, Kano Municipal, Nassarawa and Tarauni Local Governments of Kano State.

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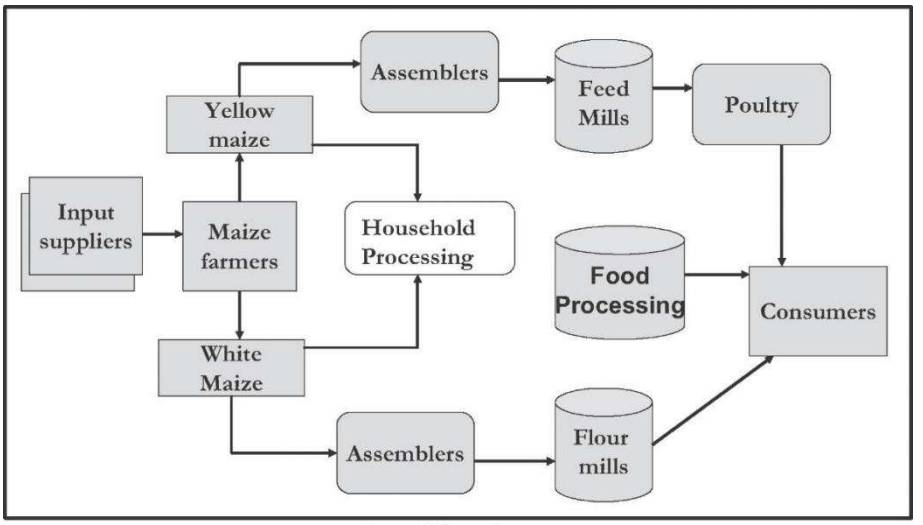
Table 14 shows consumer preference for maize in Kano State. Majority of the consumers prefer white maize, as indicated by 77.78%. According to them, it is because it is readily available in the market, has good processing quality, better taste, longer storage period and lower price than yellow maize. Yellow maize is predominantly used by feed mills to process animal feeds. About 48.90% of the consumers prefer consuming maize in form of cooked flour (*tuwo* and other forms) while 26.70% prefer eating it boiled. About 44.40% consume it because of price affordability and 42.20% because of taste.



Source: The authors

Figure 13: *Maize Value Chain in Nigeria*

Figure 14: *Yellow Maize*

Figure 15: *White and Yellow Maize*

Figure 16: *Maize Marketing in Nigeria*

The **maize value chain** starts from producers/farmers to processors, marketers (wholesalers and retailers) and finally, consumers, as shown in Figure 13. The results of the study further shows that producers/farmers have total estimated revenue and net profit of ₦153, 626 and ₦80, 250.75 per hectare with a return on Naira invested of ₦1.00 and production efficiency of 109.37%. This implies that maize production is profitable and efficient. Processors, on the other hand, have total revenue and net profit of ₦262, 500 and ₦148, 532.68 per processing cycle per year with 30 processing cycles of 250kg per cycle. They have a return on the Naira invested of ₦1.30 and processing efficiency of 130.33%. Wholesalers have total revenue of

₦42.20 and a net profit of ₦16.56 per kilogramme of maize marketed while retailers have total revenue of ₦42.31 and net profit of ₦14.06 per kg of maize sold. Processors had the highest marketing efficiency of 130.33% and added value of ₦91.04 per kg of maize processed and sold.

In summary, majority of the consumers prefer white maize because it is readily available in the market, has good processing quality, better taste, longer storage period and lower price than yellow maize. Also, most consumers prefer consuming maize in form of cooked flour (*tuwo* and other forms), some in boiled form and others because of price affordability and taste above other grains. Maize processors have the highest marketing efficiency of 130.33% and added value of ₦91.04 per kg of maize processed and sold followed by wholesalers along the value chain. The various actors in the maize value chain complain of different factors hindering their efficiency in production and marketing. Producers (71.40%) and processors (66.70%) complain of the high cost of inputs and markets complain of irregular supply (58%), price fluctuation (50%) and inadequate storage facilities (47%). Consumers, on the other hand, complain of the high price of maize (78%) and lack of standard measures and weights (70%).

Table 14: *Consumer Preference for Maize and Maize Products in Kano State*

Variable	Frequency	Percentage
Garri Type Preferred		
· White	40	66.7
· Yellow	20	33.7
	60	**100**
Reason for Preferring Garri Type		
· **White Garri**		
Easily Available	5	8.33
Good for soaking	20	33.33
Taste	5	8.33
Stores longer	2	3.33
Price	3	5
Health reason	1	1.67
Amount of starch	-	-
· **Yellow Garri**		
Easily Available	1	1.67
Good for soaking	1	1.67
Taste	1	1.67
Stores longer	-	-
Price	1	1.67
Health reason	15	25
Amount of starch	5	8.33
	60	**100**

VALUE CHAIN AND CONSUMER PREFERENCE FOR CASSAVA IN SOME SELECTED MARKETS IN OYO STATE, NIGERIA

Cassava is one of the most important food crops grown in the tropics and a significant source of calories for more than 500 million people worldwide (Mroso, 2003). Nigeria is the world's leading producer of cassava with an estimated annual production of 2.6 million tons from an estimated area of 1.7 million hectares (Agbetoye and Oyedele, 2005 and Igbaifuam 2011). Cassava roots can be processed and consumed in a variety of ways. The roots can be processed into *garri* (granulated roasted cassava), which is one of its major products and also into cassava flour, fermented pastes (*fufu or foofoo*), chips and granulated cooked fried cassava (*kwosai or atieke*). Other forms in which cassava can be consumed include cooked and roasted sedimented starches, tapioca (gelatinized dried cassava), drinks made with cassava components and the leaves cooked as a vegetable. Industrial starch and ethanol are also major products of cassava. Root peels, pellets, broken roots and tapioca are also used as feedstuff for livestock. *Garri,* which is a major product of cassava, is widely consumed (especially in the Southern part of Nigeria) in the dry form and soaked in water or as a paste made with hot water (*eba)* and eaten with any kind of soup or sauce (Igbaifua, 2011).

Most cassava in Nigeria is processed in the **"fresh cassava value chain**" by informal/artisanal small scale processors, which transform fresh cassava into products, such as *garri* and *fufu*. This sector accounts for more than 90% of the actual processing of fresh cassava. Upon harvesting, fresh roots are peeled, washed and grated into a paste, which is dewatered, fermented, pressed to remove further water, sieved and fried to produce dried *garri*. For *fufu* production, the roots are peeled, chipped, soaked/fermented, dried and sometimes grated. There is also the **"dry cassava value chain",** which processes cassava into flour, starch, feedstuff, glucose and ethanol (Hartwich *et al* 2010), which are highly demanded in the international market. The demand for cassava products in Nigeria exceeds the supply, leading to an imbalance. The imbalance is occasioned by the high cost of processing equipment, road transportation difficulties, high cost of production and low profit margins (Hartwich *et al* 2010). Based on these constraints, a study was conducted in some selected markets in Oyo State on the value chain and consumer preference for garri (a major product of cassava). The study covered Bodija, Ojaoba, Ojei, Oyo-Sabo and Oparinde markets using a total of 150 respondents comprising the processors, marketers and consumers of *garri*.

FINDINGS

Table 15: *Consumer Preference for Garri in Some Selected Markets in Oyo State*

Variable	Frequency	Percentage
Type of Maize Preferred		
· White Maize	35	77.78
· Yellow Maize	10	22.22
	45	**100**
Form Maize is Consumed		
· Cooked Flour	22	48.90
· Boiled Maize	12	26.70
· Pop Corn	6	13.30
· Roasted Maize	5	11.10
	45	**100**
Reason for Consuming Maize		
· Health	6	13.30
· Taste	19	42.20
· Price Affordability	20	44.40
	45	**100**

Table 15 shows consumer preference for both white and yellow garri. About 66.7% prefer white to yellow garri. About 60% gave various reasons for preferring white garri, with 33.33% indicating it being good for soaking as their main reason. On the other hand, about 40% also indicated why they preferred yellow garri with 25% of them stating health reasons, since the oil added to it is a source of Vitamin A.

There is still much to be done in the cassava value chain (for both the fresh and the dry) consumer preference. Not much has been done on the cost and returns for fufu, cassava flour, tapioca, *kwosai* and other forms in which the crop is consumed. Therefore, a vast array of research opportunities abounds in the cassava value chains and consumer preference in Nigeria.

Figures 17 and 18 shows the cassava value chain in Nigeria while Table 8 reveals the various activities in the cassava (garri) value chain, the costs involved, valued added and their marketing efficiencies.

Figure 17: *Traditional Garri Processing*

Figure 18: *White and Yellow Garri*

Figure 19: *Garri Marketing*

Table 16: *Cost and Returns for Cassava (Garri) Processing and Marketing in some Selected Markets in Oyo State*

Variable	Processing (0.3 tonne of raw cassava) (₦)			Retail Marketing (0.05 tonne of garri) (₦)	
	White Garri (₦)		Yellow Garri (₦)	White Garri (₦)	Yellow Garri (₦)
Purchasing Price	3,000	3,000		5,000	5,200
Processing/Marketing Cost	1,065	1,165		350	450
Total Processing/Marketing Cost	4,065	4,165		5,350	5,650
Selling Price (Revenue)	5,000	5,200		6,000	6,600
Net Return	935	1,035		650	950
Value Added	2000	2,200		1,000	1,400
Processing/Marketing Efficiency (%)	187.7	188.8		285.7	311.1
Return on Investment	0.878	0.889		1.857	2.111

The results in Table 16 reveal the profitability of ₦935 per 0.3 tonne of processed white garri, ₦1,035 for yellow garri with added values of ₦2,000 and ₦2,200, respectively. On the other hand, white garri marketing revealed a profitability of ₦650 per 0.05 tonne of garri sold while yellow garri has ₦950 with added values of

₦1,000 and ₦1,400, respectively. The results generally show that yellow garri processing and marketing have higher profitability (₦2,200 and ₦1,400) and processing/marketing efficiencies (188.8% and 311.1%) than white garri. The reason may be due to health issues attached to its consumption. Therefore, yellow garri processing has the highest level of value addition of ₦2,200 followed by white garri processing at ₦2,000.

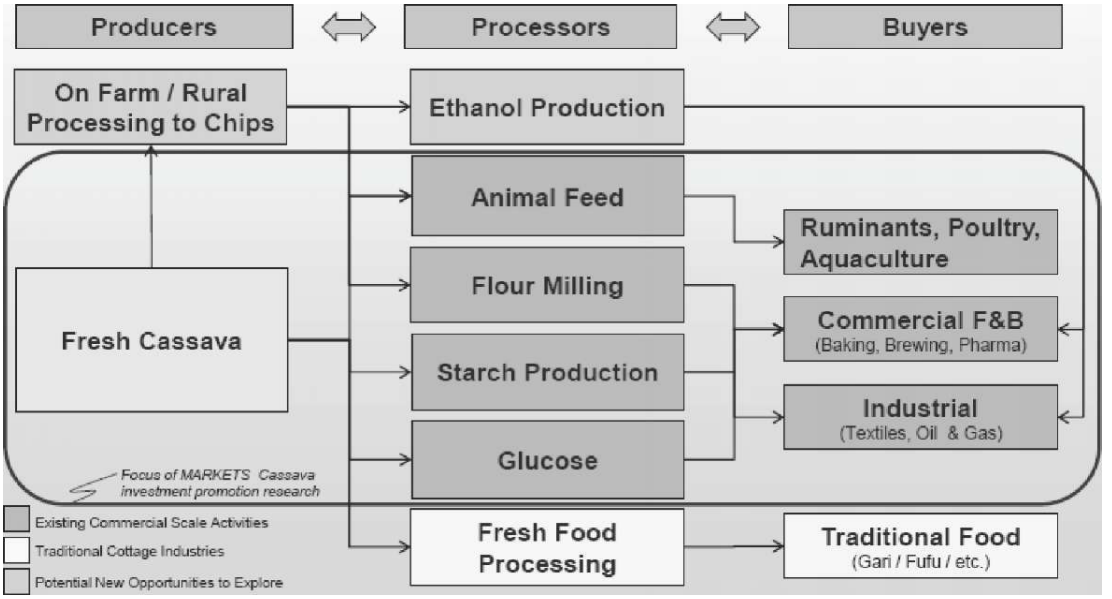


Figure 20: *Generalized Cassava Value Chain in Nigeria*

In summary, most consumers prefer white to yellow garri because it is good for soaking while some others prefer yellow garri for health reasons since the oil added to it is a source of Vitamin A. However, yellow garri processing has the highest level of value addition of ₦2,200 followed by white garri processing at ₦2,000 due to the health reason stated above.

TOMATO VALUE CHAIN AND CONSUMER PREFERENCE ANALYSIS IN KANO RIVER IRRIGATION PROJECT, NIGERIA

Tomato is one of the most important vegetable crops cultivated in Nigeria. The country is its 14th largest producer in the world and first in sub- Saharan Africa. Nigeria's tomato consumption per capita was estimated at 10.9 kg in 2013. While the country's domestic demand for it is estimated at 2.3 million tonnes annually, only 1.8 million tonnes is produced and has even reduced as a result of the outbreak and attack of *Tuta absoluta* that led to huge losses in some Northern states. This has led to the

massive importation of an average of 150,000 metric tons of tomato concentrate per annum put at a staggering value of $170 million, resulting in unnecessary pressure on our foreign exchange reserves. Also, it has been reported that 50% of the tomato produced is lost after harvest, partly due to poor infrastructure for processing, inadequate packaging facilities and inadequate storage facilities. It is therefore necessary to study the entire value chain for Nigerian tomato to improve its production and processing. Based on this, a study on tomato value chain and consumer preference analysis was undertaken in the Kano River Irrigation Project. The specific objectives of the study, among others, included the assessment of the tomato value chain and the preference and consumption patterns of consumers at the urban level in the study area.

To achieve the objectives of the study, data on the production pattern, marketing and consumption of tomato were obtained from farmers, traders and consumers using checklists and questionnaires. The data from farmers (small and large scale) was obtained based on focus group interviews. Secondary data were also obtained from FAO, the National Bureau of Statistics and some State Agricultural Development Projects (ADPs). Discussion with three tomato processing companies was used to obtain information on tomato paste processing constraints and prospects in the country.

Figure 21: *Tomato Plants*

Figure 22: *Tomato Marketing in Nigeria*

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Pattern of Tomato Consumption and Preferences among Consumers

The survey showed that, like in most other regions of Nigeria, tomato is consumed either fresh, dried or in canned/bottled form as paste, puree or ketch-up. Among urban consumers, three different forms of tomato were consumed and these include: fresh, dried and canned tomato products. The pattern of consumption among the consumers interviewed indicated the following:

- 25% used fresh tomato only
- 29% used fresh and dried only
- 24% used fresh, dried and canned tomato
- 22% used fresh and canned tomato only.

This pattern shows that, as all the consumers used fresh tomato, it is thus the most preferred among urban cities. However, depending on the season, they used other forms of tomato (dried or canned) only when the fresh is no longer available and thus its price is relatively high compared to the other forms of tomato. Therefore, the form in which tomato is consumed is influenced by the season of the year.

The Tomato Value Chain

The tomato value chain, as shown in Figure 23, is characterized by somewhat complex interrelationships and interactions between the various actors and enterprises

involved in tomato production, distribution, processing and consumption. The chain also shows the position of consumers as the end users who all the actors are:

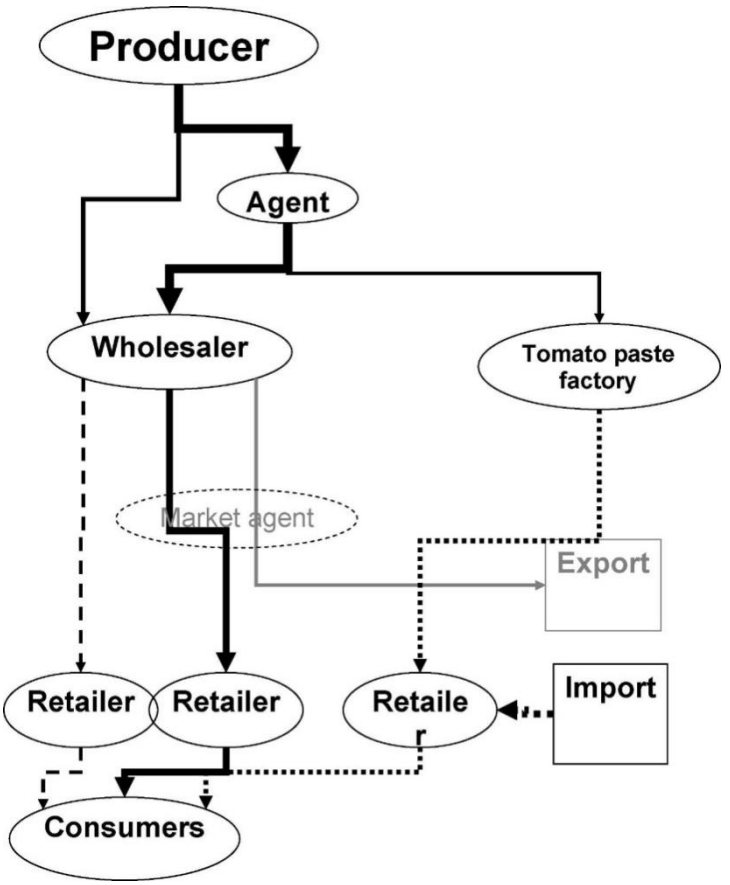

Figure 23: *Tomato Value Chain in Nigeria*

Targeting and thus their consumption pattern and preferences are important in explaining how the chain functions. All of the actors add one value or the other as the commodity moves along the chain. Tomatoes are first raised in nurseries before transplanting in the field. The input supplies required include seeds, fertilizers, pesticides, nursery supplies, ancillary equipment, etc. Most producers have very small holdings, making commercial production impossible. The main channel of distribution involves producers, commission agents, assemblers or regional wholesalers, urban wholesalers and retailers and, finally, consumers. The producers sell to the assemblers in the rural assembly market through the commission agents, who receive a commission per basket of tomato sold. The assemblers or regional

wholesalers move the product to urban markets where they sell to the urban traders through the commission agents there and finally, the produce reaches the ultimate consumers. At any level along the chain of distribution, commission agents exist to play the role of intermediation between market middlemen for a fee. Processors get their supplies directly from farmers or dealers.

Sensitivity analysis The predominant price at which farmers sell their tomato last season was 100 naira per basket. Other selling prices were 500 naira and 200 naira per basket obtained some days or weeks within the harvesting season, particularly towards the end of the season when supply from farmers is drastically reduced. A sensitivity analysis was conducted to see how the gross and net margins per acre would vary under the different price regimes. It can be noted that farmers will obtain a positive net return per acre at the price of 200 and 500 naira per basket and the break-even price is around 155 naira per basket. Therefore, at less than below 155 naira per basket of tomato, farmers will only receive negative net returns per acre. This will affect the sustainability of the tomato production enterprise because many farmers would tend to change to a more promising enterprise. Table 17 gives the result of the sensitivity analysis under different price regimes.

Table 17: *Sensitivity Analysis of Tomato Production*

Prices per basket Naira	Cost of Production per Acre	Output per acre in basket	Gross revenue in naira	Net revenue in Naira
100	70967	430	43000	-27,967
166	70967	430	71380	413
200	70967	430	86000	15,033
500	70967	430	215000	144,033

Seasonality and Price Instability of Tomato

The tomato product seasonality can be analysed by looking at Figure 24. It explains the relationship between the supply of fresh tomato within a year and the magnitude of dried and canned tomato consumption among urban consumers in the country. Between January and April, the supply of fresh tomato is adequate and thus consumers rarely use the other forms. However, from April to September supply drastically declines, thus representing the off-season period for the crop and consumers turning to other forms. Seasonality causes the price to fluctuate, thus affecting the consumption patterns of consumers. Generally, they use other forms of tomato (dried or canned) when the fresh is not very much available due to seasonality.

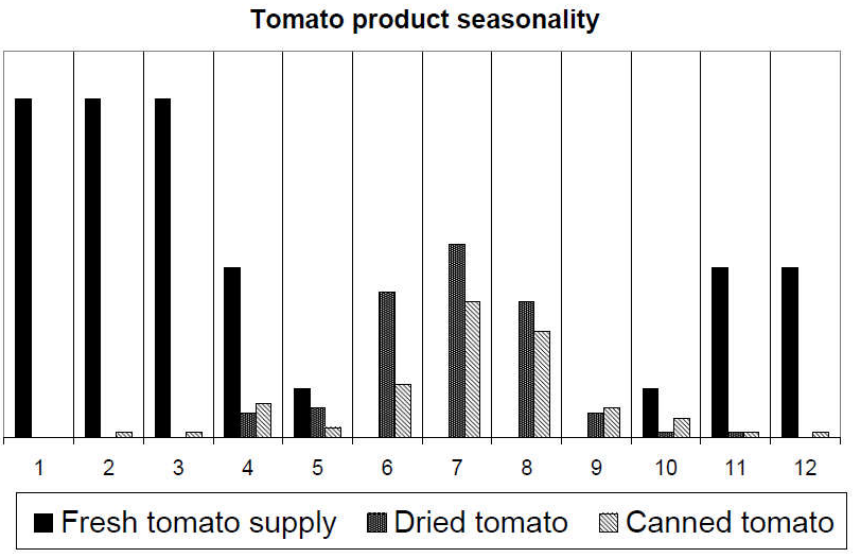

Figure 24: *Effect of Seasonality on the Forms of Tomato Consumed by Consumers*

In summary, the study revealed that the main channel of distribution in the tomato value chain involves producers, commission agents, assemblers or regional wholesalers, urban wholesalers, retailers and finally, consumers all of who engage in various value addition activities. In terms of consumer preference, it was observed that among its urban cities three different forms of tomato were consumed. These include: the fresh, the dried and the canned with all preferring the fresh above others. However, the form of tomato consumed at different times of the year is influenced by seasonality.

ECONOMETRIC ANALYSIS OF THE CHARACTERISTICS AFFECTING CONSUMER PREFERENCE FOR SWEET ORANGE AND BANANA FRUITS IN KANO METROPOLIS, NIGERIA

Sweet orange (*Citrus sinensis* L) is among the fruits highly demanded by consumers in Nigeria. It is an important nutritional, economic and industrial crop. Nutritionally, it is an important source of vitamins, minerals and roughage, which aid digestion and thus promote good health. Industrially, it can be processed into canned or bottled juice for export to earn foreign exchange. The rind of sweet orange contains an acid, which is an expensive commodity used for flavouring and making perfumes and pharmaceuticals (Apapa and Apapa, 2003 and Rao, 2005).

In Nigeria, studies on the quality characteristics of fruits, particularly for sweet orange and banana fruits that influence consumer preference and price, are rare. Most studies have concentrated in the main on their general marketing, particularly on the structure, conduct and performance of their market. No much attempt has been made to study the effects of the quality characteristics of these fruits on consumer preference and price. It was based on this that this study was carried out to determine the effects of the characteristics of sweet orange fruits on consumer preference and price in Kano Metropolis, Nigeria. Specifically, the study made attempt to:-

i. identify the sweet orange and banana fruits characteristics that influence consumer preference and price.
ii. determine the effects of the key sweet orange fruit characteristics on consumer preference and price.

The study was carried out in the Kano metropolis, using the Yan –Lemo Fruits Market and the Faculty of Agriculture, Bayero University, Kano as the main study areas.

Figure 25: *Sweet Orange Fruits*

In this study, the most important sweet orange fruit characteristics identified that influence consumer preference were the colour, size, level of ripeness, softness, area of surface blemish, cleanliness, variety, source or region of production, weight and seasonality, etc of the fruits.

FINDINGS
Consumer Preference

Table 18: *Results of Estimated Hedonic Regression for Physical Commodity Characteristics Affecting Consumer Price and Preference for Banana and Sweet Orange Fruits in Kano Metropolis.*

Commodity	BANANA			SWEET ORANGE		
Variable	Coefficient	T-Ratio	P-Value	Coefficient	T-Ratio	P-Value
Constant (a)	1386.8***	7.43	0.000	1623.1***	13.26	0.000
Colour of Fruit						
Red	- 347.90*	-1.79	0.076			
Yellow Orange	-119.92^{NS}	- 1.61	0.506			
Orange				266.95***	5.27	0.000
Green Yellow	- 53.18^{NS}	- 0.71	0.482	51.35^{NS}	1.119	0.266
Size of Fruit						
Small	- 190.79*	-1.82	0.071	-249.18*	-1.85	0.067
Large	169.63*	1.69	0.094	-74.95^{NS}	-0.65	0.520
Degree of Ripeness						
Moderately Ripe	11.60^{NS}	0.10	0.917	-100.89^{NS}	-1.46	0.148
Very Ripe	129.46***	2.71	0.008	82.01*	1.93	0.057
Softness						
Moderately soft	339.93**	3.01	0.003	128.44^{NS}	1.40	0.164
Surface Blemish						
Trace/Light	- 56.26^{NS}	-109	0.280	-92.97^{NS}	-0.77	0.444
Medium				-119.79*	-1.71	0.090
Severe	-72.24^{NS}	0.54	0.589			
Cleanliness of Fruit						
Moderately Clean	-24.03^{NS}	-0.41	0.686	81.57^{NS}	1.11	0.272
Variety						
Red Cavendish	-52.81^{NS}	-0.27	0.785			
Parenta	27.80^{NS}	0.59	0.557			
Valencia				40.83^{NS}	0.03	0.411
Weight	278.20**	3.27	0.001	137.40***	4.01	0.000
Length of Fruit						
Short	-235.89*	-1.76	0.081			
Long	95.67*	1.99	0.050			
Cluster Size						
Small	-196.73*	-1.93	0.056			
Large	651.85***	3.99	0.000			
Monthly Dummies						
October	-278.90***	-3.83	0.000	-398.83***	-5.86	0.000
November	-348.08***	-4.78	0.000	-451.92***	-7.04	0.000
December	-199.97*	-2.56	0.012	-427.21***	-6.000	0.000
January	-267.97***	-13.62	0.000	-453.70***	-6.17	0.000
February	-100.03^{NS}	-1.33	0.187	-412.87***	-5.20	0.000
R-Square (R^2) =	0.464			0.692		
R-Square Adjusted =	0.398			0.641		

*** = Significant at 1%, ** = Significant at 5%, * = Significant at 10%, NS = Not Significant
Source: Field Survey, 2008/2009

Consumer Preference for Banana and Sweet Orange Fruits

The result for banana fruits generally showed significant consumer preference for colour, size, degree of ripeness, softness, weight, length and cluster size of banana fruits as shown in Table 18. Consumers and marketers preferred orange coloured, large size, ripe, soft, weighty, long banana fruits with large cluster size. They did not show sensitivity to surface blemish, cleanliness and variety of banana fruits sold.

The result for sweet orange generally, showed significant consumer preference levels for colour, size, degree of ripeness, surface blemish and weight of fruits as shown in Table 18. Specifically, consumers showed sensitivity and preference for orange coloured, medium size, very ripe, weighty fruits with light surface blemish. Small size and medium surface blemished fruits though significant at $P<0.1$, carried negative signs. This means that consumers preferred medium size orange fruits to large size ones (which are often with low level juiciness) and those with light surface blemish to those with medium surface blemishes as indicated by the results. Softness, cleanliness and variety of orange fruits were not statistically significant, even though they had positive signs. But they can however, have some influence on consumer choice because of their positive signs. For instance, some consumers prefer soft and clean orange fruits to hard and dirty ones which do not offer good attraction. Also some may prefer Ibadan Sweet or Washington varieties to others.

Sweet Orange Value Chain

Four marketing channels were identified but on the basis of the volume of the orange handled along the channel, as shown in Figure 26. The most important channel involved the movement of sweet orange from interregional wholesalers, who convey the product from the production zones to the local wholesalers, who sell to distant wholesalers or transporters, who convey the product to the urban bulking market in Na'ibawa within the metropolis. Commission agents and retailers are those directly involved in this channel. About 80% of the total orange move along these channels. The result on the marketing margin is presented in Table 19. Analysis of the marketing margin received by each of the market participants revealed that commission agents received a margin of 37.37%, local wholesalers, 24.65%, distant wholesalers, 22.5% and retailers' 15.40%. The size of the marketing margin is governed by the demand for and supply of marketing services. The commission agents' net margin is high because his demand for the supply of marketing services is low. Retailers demand for marketing services is high because they pay for transportation to the market where they sell, cost of losses other fixed cost and handling charges. Besides, the retailers handle small volumes for sell and so their unit cost tends to be high.

In summary, consumers preferred banana and sweet orange fruits with the above significant characteristics and are prepared to pay premium price for such fruits. Consumers and marketers preferred orange coloured, large size, ripe, soft, weighty, long banana fruits with large cluster size. For sweet orange, consumers showed sensitivity and preference for orange coloured, medium size, very ripe, weighty fruits with light surface blemish. In the absence or where these characteristics are not sufficiently found in a fruit, consumers will ask for discount or even totally abstain from purchasing. The most important participants in the sweet orange value chain are interregional wholesalers, the local wholesalers, distant wholesalers or transporters, commission agents and retailers. Analysis of the marketing margin received by each of the market participants revealed that commission agents received the highest margin (37.37%), followed by local wholesalers (24.65%) and distant wholesalers (22.5%). The retailers receive the lowest margin (15.40%).

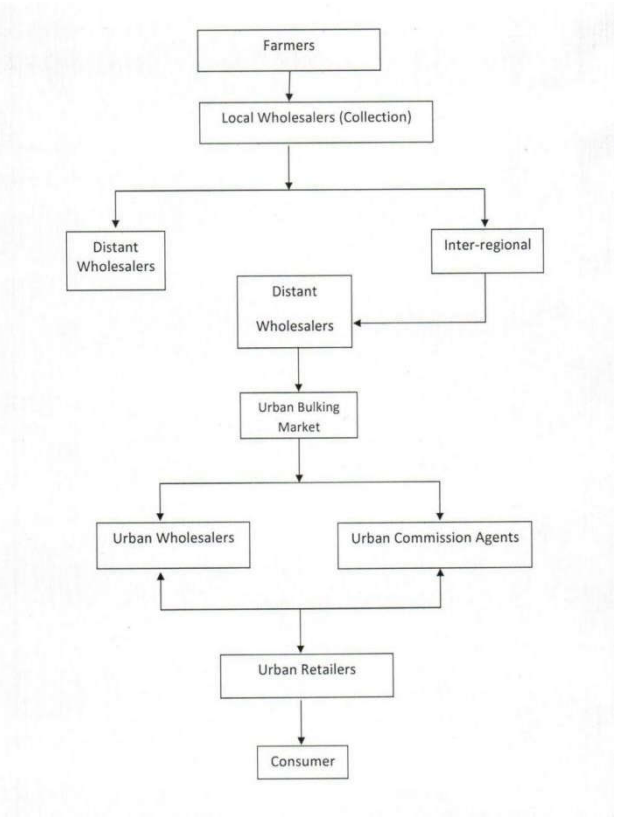

Figure. 26: *Marketing Channels for Sweet Orange Marketing in Kano Metropolis*

Table 19: *Marketing Margin in N/Bag for Sweet Orange Marketing in Kano Metropolis*

	Local wholesaler	Distant wholesaler	Commission Agent	Retailer	Total
Sales	3046.03	4467.51	6295.13	7282.53	22091.20
Purchase	1650.20	3046.63	4467.51	6295.13	15458.87
Marketing cost	520	620	500	440	2080
Total cost of marketing services	2170.23	3666.03	4967.50	6735.13	17538.86
Gross Margin	1395.83	1421.48	1827.62	987.40	5632.33
Net margin (profit)	875.83	801.48	1327.62	547.13	3552.33
Net Margin (%)	**24.65**	**22.5**	**37.37**	**15.40**	**100.00**

Source: *Field Survey, 2009*

In summary, consumers and marketers prefer sweet orange fruits that are orange coloured, medium size, very ripe and weighty with a light surface blemish and are prepared to pay the premium price for such fruits. In their absence or where these characteristics are not sufficiently found in a fruit, consumers will ask for a discount or even totally abstain from purchasing. The most important participants in the sweet orange value chain are inter-regional wholesalers, the local wholesalers, distant wholesalers or transporters, commission agents and retailers. Analysis of the marketing margin received by each of the market participants revealed that commission agents received the highest margin (37.37%), followed by local wholesalers (24.65%) and distant wholesalers (22.5%). The retailers receive the lowest margin (15.40%).

CONSUMER PREFERENCE AND VALUE CHAIN FOR POULTRY (CHICKEN) PRODUCTS IN THE KANO METROPOLIS, KANO STATE, NIGERIA

Poultry products (meat and eggs) play an important role in providing much needed animal protein to mankind. Poultry production also contributes to the national gross domestic product (GDP) in the provision of gainful employment and income to a sizeable proportion of the population. Poultry products are in demand in all parts of the world. Where there are no religious or cultural barriers, poultry meat usually takes preference over other meat types. It enjoys popularity in developed markets due to its lower price and perceived safety and health advantages compared to other meat

sources (FAS, 2001). Poultry egg has also attained industrial importance as a major ingredient in baking confectioneries and using albumen in making pharmaceutical products, shampoo and book binding (Akeeb, 1997). Poultry marketed as meat is classified according to kind, such as chicken, turkey and goose and **class,** such as broiler meat or roaster. Poultry birds are marketed live, dressed, processed or ready to cook while eggs are sold in trays.

Nigeria ranks first in Africa and tenth in the world with respect to livestock population. Before the outbreak of the Highly Pathogenic Avian Influenza (HPA1) in 2006, poultry production in Nigeria was estimated at around 150 million, with a large majority (85%) of local backyard breeds and a minority of exotic breeds (15%). Based on this, the poultry value chain can be divided into two distinct sub-value chains: traditional and commercial sectors. The commercial sector is comprised of commercial farms and the industrial sector (which is interwoven) while the traditional sector is made up mostly of backyard producers. While Commercial farms engage more in egg and also market their spent layers, backyard producers engage more in broiler production; with all their products channelled through weekly and daily markets to consumers (Hartwich et al., 2010). Despite the fact that poultry products play an important direct or indirect role in the livelihood of a greater portion of the Nigerian people, its marketing is still fraught with a lot of challenges, especially in Kano State, where eggs and chicken are still transported in open condition and in un-refrigerated vehicles. The entire chain of distribution and physical handling up to consumers is done in the open exposed to varying degrees of temperatures and other harsh climatic conditions. In addition, poultry producers cry of low economic returns for their products and consumers in the street cry of the high cost of poultry products (Maqbool *et al.,* 2005). Based on this, it is, therefore, necessary to study the poultry value chain in Kano Metropolis and ascertain the profitability of the various actors and factors consumers look for in their preference and purchasing decisions so as to enhance the productivity of the poultry sub-sector. This study was conducted in Fagge, Kumbotso and Tarauni Local Governments of Kano State.


Figure 27: *Poultry Production*


Figure 28: *Poultry Egg Marketing in Nigeria*

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Consumer Preference

Table 20, indicates consumer consumption pattern, rating and preference for poultry products (egg and meat) in Kano Metropolis. The result reveal that majority (33.3%) claim that they do consume poultry products on a weekly basis, 26.7% on a monthly basis and 20%,13.3% and 6.7% fortnightly, daily and yearly, respectively. This implies that consumption is based on the disposable income of individuals. On reasons for consumption, 56% revealed that they consume the products because of their taste and quality, 30% because of the relative lower price and 13.3% for health reasons. For the nutritional rating of poultry products, majority (40%) opined that they have very good nutritional values; 30% indicated good nutritional values, 20% had no opinion, 6.7% believe that it is, while 3.3% indicated poor values, respectively. On the form in which they prefer to consume poultry products, 70% prefer them cooked and boiled, 20% fried and 10% prefer them roasted respectively.

Table 20: *Consumer Consumption Pattern, Rating and Preference for Poultry Products (Egg and Meat) in Kano Metropolis*

Variable	Frequency	Percentage
Frequency of Consumption		
· Daily	4	13.3
· Weekly	10	33.3
· Fortnightly	6	20
· Monthly	8	26.7
· Yearly	2	6.7
	30	**100**
Reasons for Consumption		
· Taste and Quality	17	56.7
· Price Affordability	9	30
· Health Reason	4	13.3
	30	**100**
Nutritional Rating of Poultry Products		
· Very good	12	40
· Good	9	30
· Fair	2	6.7
· Poor	1	3.3
· No opinion	6	20
	45	**100**
Form in Which Poultry Productsare Preferably Consumed		
Roasted	3	10
Cooked and boiled	21	70
Fried	6	20
	30	**100**

Poultry Value Chain Analysis

Summary analysis of the cost and returns in the poultry value chains (birds and eggs) in Kano Metropolis are shown in Tables 21 and 22. It reveals that broiler meat production (for an estimated number of hundred 100 birds) is profitable with net returns of ₦3,970.00 and a benefit cost ratio (BCR) of 1.1 and value addition of ₦39.7 per bird for a single production cycle. The net returns for the processors of 100 broilers is ₦17,000 with BCR of 1.17 and an added value of₦170 per bird, while

broiler wholesalers and retailers have net returns of ₦5,800 and ₦11,500, BCR of 1.01 and 1.13 and a value addition of ₦58 and ₦115, respectively. This shows that broiler processors have the highest returns and added the highest value in the broiler value chain. On the other hand, Table 22 reveals that broiler egg production (for an estimated number of hundred 100 birds) is profitable with net returns of ₦50,000 with a benefit cost ratio (BCR) of 1.12 and a value addition of ₦500 per bird for a single production cycle. The net returns for the processors of 100 spent layers is ₦4,800 with BCR of 1.1 and an added value of ₦48 per bird, while egg wholesalers and retailers have net returns of ₦500 and ₦600, BCR of 1.01 and 1.01 and value addition of ₦5 and ₦6, respectively. This shows that egg producers have the highest returns and added the highest value in the egg value chain.

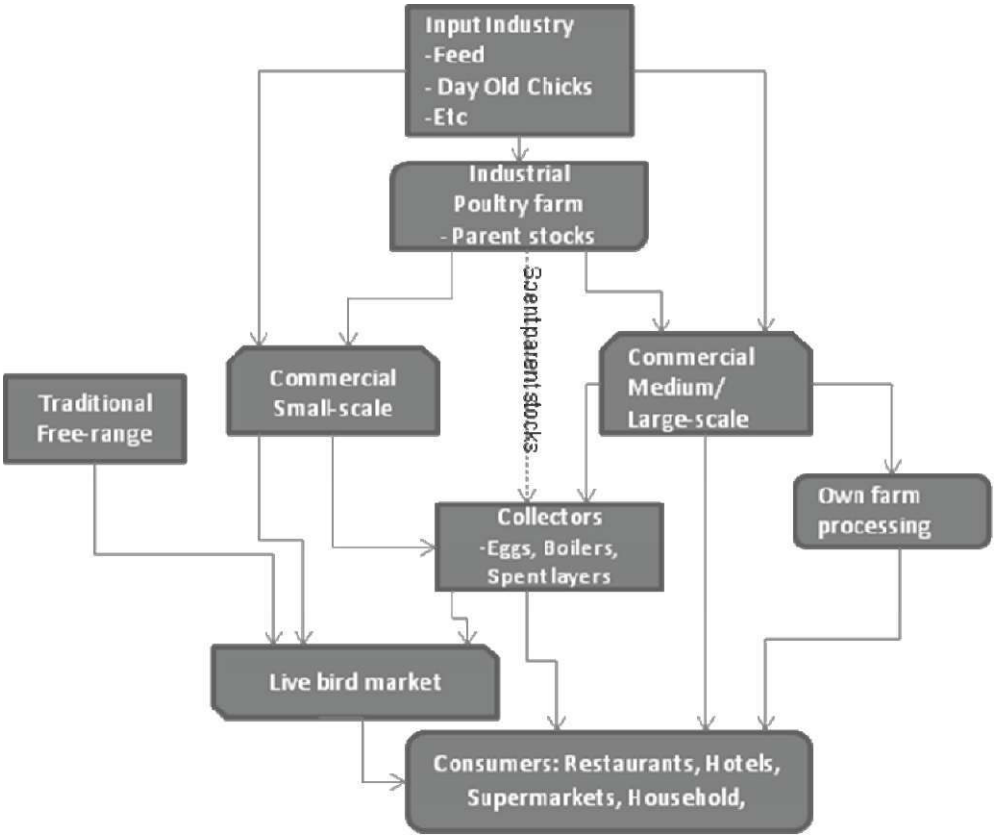

Figure 29: *Generalized Poultry Value Chain in Nigeria*

Table 21: *Summary of Cost and Returns for Broiler Production (100 birds), Processing (100 birds) and Marketing in Kano Metropolis*

Variable	Production (100 birds) (₦)	Processing (100 birds) (₦)	Marketing (100 birds)	
			Wholesalers (₦)	Retailers (₦)
Total Variable Cost (TVC)	70,800	102,800	83,700	88,000
Total Cost (TC)	76,030	103,000	84,200	88,500
Revenue	80,000	120,000	90,000	100,000
Gross Margin (TR – TVC)	9,200	17,200	6,300	12,000
Net Return (TR – TC)	3,970	17,000	5,800	11,500
Production/Marketing Efficiency (%)		165	119.05	129
Benefit Cost Ratio (BCR)	1.1	1.17	1.01	1.13
Value Added/bird (₦)	39.7	170	58	115

Table 22.: Summary of Cost and Returns for Egg Production (100 birds), Processing (100 crates) and Marketing (100 Crates) in Kano Metropolis

Variable	Production (₦)	Processing (₦)	Marketing	
			Wholesalers (₦)	Retailers (₦)
Total Variable Cost (TVC)	498,750	79,000	69,300	74,200
Total Cost (TC)	507,000	79,200	69,500	74,400
Revenue	557,000	84,000	70,000	75,000
Gross Margin (TR – TVC)	58,250	5,000	700	800
Net Return (TR – TC)	50,000	4,800	500	600
Production/Marketing Efficiency (%)	98.62	214.29	111.11	113.64
Benefit Cost Ratio (BCR)	1.12	1.1	1.01	1.01
Value Added/bird (₦)	500	48	50	60

In summary, the frequency of poultry product consumption by consumers is based on the disposable income of individuals while majority (56%) consume the products because of their taste and quality. On the form in which they prefer to consume poultry products, 70% prefer them cooked and boiled instead of fried or roasted. On

the value chain, broiler processors and egg producers have the highest returns (₦17,000 and ₦50,000) and added the highest values (₦170 and ₦500) respectively in the poultry value chain in Kano metropolis.

CONSUMER PREFERENCE AND VALUE CHAIN FOR CATTLE, SHEEP AND GOATS AND THEIR MEAT IN SELECTED STATES IN NORTHERN NIGERIA

The livestock and meat industry has been an important component of the Nigerian economy. Demand for food of animal origin in developing countries was expected to double by the year 2020 (Delgado et al., 1999). Enhanced by increases in urbanization, population and income growth, such demand will create markets for animal products and encourage the commercialization of livestock production. The extent of this commercialization depends on the consumption of the products by consumers. Meat consumption behavior is the deciding factor for the development of the livestock sector in general and small ruminants in particular. Consumer tastes and preferences are reflected in the market. These are revealed through purchase decisions and price premiums that consumers pay for both visible (Langyintuo et al., 2004) and intrinsic characteristics of meat. Cattle and indigenous sheep and goats are among the most important species of livestock, which contribute significantly to households' income, especially to the rural poor.

Consumer Preference for Live Animals

1) Cattle: Econometric Analysis of Characteristics Influencing Cattle Prices in Selected Livestock Markets in Yobe State, Nigeria

Table 23: *Summary of Estimated Hedonic Regression for Physical Characteristics Affecting Price in Ngalda Market*

Variable	Model I	Model II	Model III	Model IV
	-839.92	-1272.9	-839.92	-1119.9
White Fulani	(-1.970)*	(-2.295)*	(-1.970)*	(-2.560)*
	1793.1	125.11	1793.1	-53.459
Sokoto Gudali	(1.007)	(0.5571)	(1.007)	(-0.3012)
	1308.1	2434.3	1308.1	1413.4
Female Cattle	(2.397)*	(3.674)***	(2.397)*	(2.483)*
	-3436.6		-3836.6	-3368.6
Small Size	(-4.867)***		(-4.867)***	(-4.569)***
	7016.4		7016.4	5983.3
Big Size	(8.157)***		(8.157)***	(7.095)***
	-4522.3		-4522.3	
Short Face	(-3.480)**		(-3.480)**	
	2862.8	-492.20	2862.8	51.521
Short Horn	(1.797)*	(-0.2702)	(1.797)*	(0.3591)
	80.491	228.19	80.491	88.134
Height	(2.467)*	(7.596)***	(2.467)*	(2.592)*
	4168.3	-4482.3	4168.3	3783.2
Constant	(2.129)*	(-2.847)**	(2.129)*	(1.853)*
R^2	68.06%	42.08%	68.06%	64.86%
(R^2Adj)	(65.94%)	(39.74%)	(65.94%)	(62.84%)
DWP Value	1.44	1.37	1.44	1.31

Source: *Field survey, 2011*

***Significant at 1% ($p < 0.01$), **Significant at 5% ($p < 0.05$), *Significant at 10% ($p < 0.10$). Figures in parentheses are t-values.

This study was carried out to analyse buyers' preference of different breeds (Sokoto Gudali, White Fulani and Red Bororo) and their body characteristics in some selected livestock markets in Yobe State. Like in Potiskum Local Government, Ngalda in Fika Local Government and Ngalzarma cattle markets in Fune Local Government were purposively selected because they are the major distributing points for cattle in the state. A total of 390 buyers were selected from three markets on a weekly basis using systematic sampling by truncation for a period of 26 weeks.

Figure 30: *Red Bororo Bull*

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A greater percentage of the respondents (63.3%) preferred Red Bororo, 29.2% White Fulani and 7.4% Sokoto Gudali. The regression results in Table 23 indicates, that price, sex, colour of the ear, shape of the cattle face and type of horn are the factors that influence buyer preference. The hedonic regression generally shows that big carcass size and height are found to be statistically significant ($P < 0.01$) with a positive coefficient across all the three studied locations. For the Potiskum market, buyers were sensitive to the Red Bororo type of breed and height of cattle at statistically significant levels of 10% ($P < 0.10$) and 1% ($P < 0.01$), respectively. While results in Ngalda and Ngalzarma markets shows that female cattle, big carcass and height are also found to be statistically significant at 10% ($P < 0.10$), 1% ($P < 0.01$)and 1% ($P < 0.01$) levels, respectively.

In summary, it was concluded that the variable factors that mostly determined buyer preference and prices for cattle were Red Bororo type, carcass quality (big size cattle), sex (male cattle), short horn cattle, height and length of cattle, as shown in Table 23, meaning that for any unit increase in these variables, buyers would be willing to pay more premium price or ask for a discount if they are absent or poorly represented in the cattle.

2) Econometric Studies of Consumers' Preference for Goats Purchased in Wudil Livestock Market, Kano State, Nigeria

This study was carried out to identify and determine the effects of the physical characteristics of goat that influence consumer preference and, therefore, the price in Wudil Livestock Market. Time series data were collected for 20 weeks from 200 randomly selected goat buyers in the market using structured questionnaire supplemented by oral interviews.

Figure 31: Sokoto Red Goats

FINDINGS

Table 24: *Results of Estimated Hedonic Regression for Physical Characteristics Affecting Choice and Price for Goats Sold in Wudil Livestock Market, Kano State*

Variable	Coefficient	T-Ratio	P-Value
Constant (a)	4.533***	29.161	0.000
Breed (X_1)	0.010^{NS}	0.255	0.838
Sex (X_2)	-0.029^{NS}	0.602	0.548
Size (X_3)	0.421***	6.090	0.000
Weight (X_4)	0.399***	6.027	0.000
Height (X_5)	0.144*	1.848	0.066
Length(X_6)	0.172**	2.972	0.003
R-Square (R^2) = 0.571			
R-Square Adjusted = 0.557			

***Significant at 1% ($p < 0.01$), **Significant at 5% ($p < 0.05$), *Significant at 10% ($p < 0.10$).

The result of the descriptive analysis shows that the dominant breeds of goat sold in the market were Sokoto Red (65%), the Long-legged Sahel (20%) and the West African Dwarf (15%). The hedonic regression result in Table 24 shows that consumers show significant preference for size and weight of the goat at 1% (P< 0.01) each, length at 5%, (P<0.05) and height at 10% (P<0.1).
In summary, the study shows that consumers preferred the Sokoto Red breed of goat with good size, weight, length and height. This means that for any unit increase in these variables, they are willing to pay the premium price for the animal with these significant physical characteristics or otherwise ask for a discount when these characteristics are poorly represented or absent.

3) Econometric Investigation of Physical Factors Affecting Decision of Buyers to Purchase Sheep in Wudil Livestock Market, Kano State, Nigeria

Table 25: *Results of Estimated Hedonic Regression for Physical Characteristics Affecting Buyers' Decision to Buy Sheep Sold in Wudil Livestock Market, Kano State*

Variable	Coefficient	T-Ratio	P-Value
Constant (a)	6583.326*	2.460	0.015
Breed (X_1)	810.267*	2.328	0.021
Sex (X_2)	-1799.002***	-5.146	0.000
Size (X_3)	-2614.314***	-6.117	0.000
Weight (X_4)	-260.295*	-1.850	0.066
Height (X_5)	7650.471**	3.504	0.001
Length (X_6)	7343.167**	3.38	0.001
Skin Type(X_7)	204.764*	2.204	0.029
Eye Colour(X_8)	134.044^{NS}	0.368	0.713
R-Square (R^2) = 0.732			
R-Square Adjusted = 0.720			

***Significant at 1% (p < 0.01), **Significant at 5% (p < 0.05), *Significant at 10% (p < 0.10).

Sheep, like the goat is a small ruminant, which is an important component of the Nigerian livestock sub-sector. It has high adaptability to extreme climate and is mostly found in the Sahel-Sudan zone of Nigeria. It is estimated that over 22 million sheep exist in Nigeria where it contributes over 11% of the domestic meat supply (Dambazau, 2010). Sheep plays a very important role in the socio-economic and cultural life of smallholder farmers. During religious and cultural festivals, it also

constitutes a major source of meat, as many, particularly rams, are slaughtered to fulfill religious rites. The main breeds of sheep in Nigeria are the Yankasa, Uda and Balami.

Both farmers and consumers of sheep look for certain physical characteristics, which influence their buying decisions. If they find a good proportion of these characteristics in a sheep, they are willing to pay the premium price while they will ask for a discount if they do not find them. Based on this, a market valuation of physical characteristics of sheep that influence buyers decision in Wudil Livestock Market was conducted.

Figure 32: *Yankasa Ram*

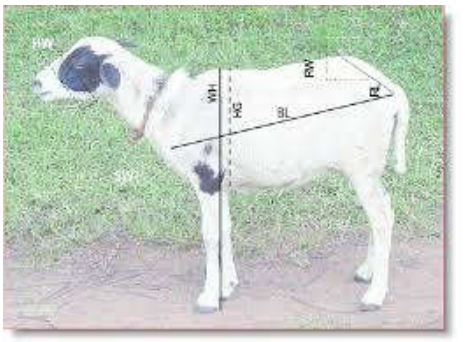

Figure 33: *Yankasa Sheep (Ewe)*

Figure 34: *Uda Ram*

FINDINGS

The study found out that the predominant breed of sheep sold in the Wudil Livestock market is the Yankasa breed, which constituted about 73.5% of the stock in the

market, followed by Uda (22.5%) and Balami (4%). Male sheep (rams) accounted for 58.5%, while many of the stock (both rams and ewe) were medium in size, average in height and length and had red and rounded eyes, convex short face and long tails. About 55.5% had different types and shapes of horn.

The results of the hedonic regression show that the breed ($P< 0.1$), sex ($P< 0.01$), size ($P< 0.01$), height ($P< 0.05$), length ($P< 0.05$), weight ($P< 0.1$) and skin type ($P< 0.1$) of sheep, as revealed in Table 25, are significant in influencing buyers in their purchasing decisions in the Wudil Livestock market. The predominant breed sold was the Yankasa breed with the positive coefficient indicating buyers' preference for it. However, the negative coefficient of sex indicates the possibility of price reduction for female sheep (ewe), since rams accounted for a larger percentage of the sheep sold in the market because the study was conducted close to the Sallah festival period. A similar observation was true for size, with small sized sheep being discounted by buyers. Premium price was demanded and paid for any unit increase in length, height and weight of sheep, as indicated by their positive coefficients. Buyers did not show any preference for eye colour.

In summary, the study showed that consumers preferred the male Yankasa breed and those sheep with good size, length, height and weight. This means that for any unit increase in these significant physical characteristics, buyers are willing to pay the premium price for such sheep or otherwise ask for a discount when these characteristics are poorly represented or absent.

VALUE CHAIN AND CONSUMER PREFERENCE FOR MEAT IN KANO METROPOLIS

Meat is the most valuable livestock product consumed by man as the first choice of protein (Tsegay, 2012). There are different kinds of meat depending on its source. For example, meat from cattle is called **beef**, that from sheep **(mutton)**, from goat **(chevron)** while that from birds, **(chicken)**. Meat can also be categorized based on its colour as red or white meat. Red meat is characterized a by high concentration of myoglobin while white meat is not. Red meat comes mostly from cattle, sheep and goat while poultry is the main source of white meat.

In Nigeria, meat, fish and animal products are the 4th most commonly consumed food group (88.9%) by households (about ₦1,359 per week). Nigerians consume about 360,000 tons of beef each year with most of the demand being met by pastoralists from the ethnic Fulani group (NBS, 2016). Apart from being used to prepare different

dishes and sauces across the country, fresh meat can be processed into ***suya (tsire), balangu, kilishi, danbun nama and ragadada*** in Northern Nigeria (Jibo, 2015). There is also the dried and smoked meat valued chain. Therefore, the meat industry offers vast employment opportunities in its value chain in Nigeria. Despite being a great source of employment for many, the industry is constrained by poor and arbitrary estimation in meat transaction due to non-use of good weights and measures in most markets and meat spoilage due to inadequate cooling technology orchestrated by inadequate electricity supply and poor handling. Based on this, a study was conducted to ascertain the profitability of beef, mutton and chevrons marketed along the value chain of wholesalers and retailers and also determine the factors that influence consumer preference for meat in the Kano metropolis. Five markets, namely: Sabon Gari, Kasuwar Rimi, Gama, Tarauni, Kurmi and Kano Abattoir together with Bank Road, Fagge-Dandali and Agadasawa meat spots, were purposively selected for study using 133 marketers and 50 meat consumers.

Figure 35: *Meat Marketing in Nigeria*

Table 26: *Regression Results for Estimation of Factors that Influence Consumers' Preference for Meat Types*

	VARIABLES								
Meat Type	**Coefficient**	**Taste**	**Softness**	**Red Colour**	**Toughness**	**Size of Fibrins**	**Marbleness**	**t-value**	**% of Preference**
Beef	-1.982	2.814***	0.468	1.286	1.282	0.485	1.925***	1.296	36
Mutton	-3.230	2.836*	2.103	0.157	0.092	0.264	----------	2.390	26
Chevron	-2.906	3.539***	0.901	0.771	0.266	0.173	----------	1.671	34
All of them									4

*significant at 10%, **significant at 5% and ***significant at 1%

In Table 26 , taste and marbleness are found to be significant for beef while taste alone is significant for mutton and chevron. The negative coefficients indicate that the lower the presence of these variables in any meat type, the lower the consumer preference for such meat type. Also, the consumers' preference for meat types reveas that they prefer beef (36%) to other meat types. This is followed by chevron (34%) and mutton (26%), respectively. Other factors that influence consumer preference for meat are affordability, availability and quality.

Figure 36: *The meat value chain in Kano Metropolis*

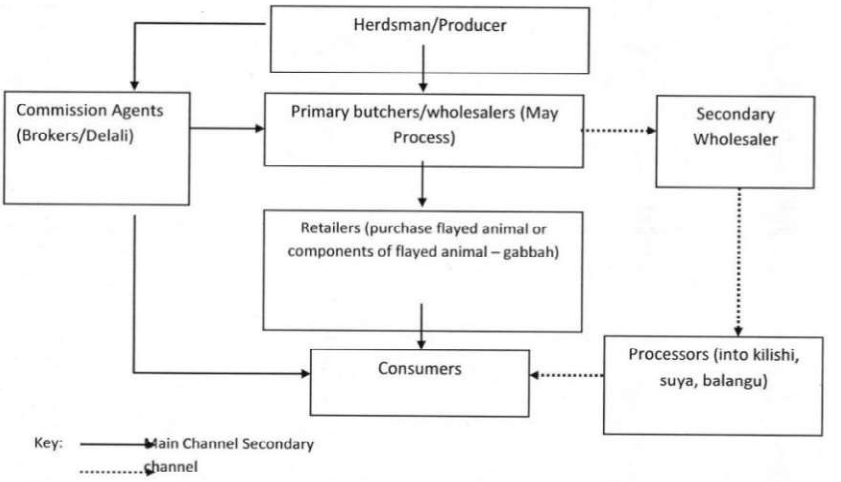

Table 27: *Summary Costs and Returns for Marketing of Beef, Mutton and Chevron (per head of animal) in Kano Metropolis*

Variable/Category of Seller	Beef (₦)	Mutton (₦)	Chevron (₦)
Wholesaler			
· Purchasing Price	49,950.81	9,183.33	7,057.33
· Marketing Cost	4,481.19	970	890
· Total Marketing Cost	54,432	10,153.33	7,947.33
· Revenue	67,281.51	11,555.29	9,126.98
· Net Return/head	12,849.51	1,401.96	1,179.65
· Marketing Efficiency (%)	386.74	244.53	232.54
· Benefit Cost Ratio (BCR)	1.24	1.14	1.15
· Value Added/Kg by Marketing	214.24	116.83	140.87
Retailer			
· Purchasing Price	67,281.51	11,555.29	9,126.98
· Marketing Cost	630.5	260.65	223.98
· Total Marketing Cost	67,912.01	11,815.94	9,350.96
· Revenue	74,237	13,820.2	10,701.15
· Net Return/head	6,324.99	2,004.26	1,350.19
· Marketing Efficiency (%)	113.1	185.56	172
· Benefit Cost Ratio (BCR)	0.09	1.17	1.14
· Value Added/Kg by Marketing	150.33	167.08	160.79

Table 27 is a summary of the costs and returns in meat marketing in Kano Metropolis. Wholesalers of beef, mutton and chevron have returns of ₦12,849.50, ₦1,401.96 and ₦1,179.65 respectively per head of animal. They also have a value addition of ₦214.24, ₦116.83 and ₦ 140.87 respectively per kg of animal head. Though all of them are profitable, beef marketing has the highest returns and value addition. On the other hand, the retailers of beef, mutton and chevron have returns of ₦6,3249, ₦2,004.26 and ₦1,350.19 respectively per head of animal. They also have a value addition of ₦150.33, ₦167.08 and ₦160.79 respectively per kg of animal head. Though all of them are profitable, beef marketing had the highest returns and mutton has the highest value addition per kg of animal head.

In summary, taste and marbleness were found to be significant in influencing consumer preference for beef while taste alone was significant for mutton and chevron. Though beef, mutton and chevron marketing are all profitable, beef marketing has the highest returns but mutton has the highest value addition per kg of animal head

ARTISANAL FISHERY VALUE CHAIN IN MAIDUGURI METROPOLIS BORNO STATE, NIGERIA

Fish is a popular, highly nutritious aquatic vertebra, which serves as a delicacy to most of Sub-Sahara Africa, providing over 18% of total animal protein intake worldwide, with a share as high as 40-60% in some West Africans states (FAO, 2002). Approximately, 200 million Africans rely on fish as an important part of their diet. Ten million households directly derive income from fish production, processing or trade (Adepegba O. 2008). Nigerians consume about 1.2 million tons of fish per year (FAO, 2007). Fresh and processed fish is widely marketed throughout the country, though a significant portion of fish is imported. Freshly frozen fish is also available in all the major cities of the country all year. Most fish are harvested by artisanal fishers in small amounts using basic technologies, such as dugout or plank canoes and various nets. Fish mongers/processors represent the first segment of the fish market chain buying fresh fish directly from fishers, as the latter land the fish at the shores in boats or canoes. Landing sites are scattered along rivers and lake shores.

Majority of inland fish harvests (60%) occur in three areas in Nigeria: Upper River Benue, Lake Chad and the Nguru-Gashua Wetlands and some rivers across various states (FAO 1997). Lake Chad, which is located in Borno , State used to be a major supplier of fish to Northern Nigeria before the insurgency. The marketing system involving fish in the state, however, suffers from various setbacks among which are poor storage, transportation and the quality of the fish. Due to poor and inadequate storage facilities, most of the processed fish cannot be stored for a long period of time. Most of the fishing communities have no access to electricity to freeze their products. Electricity itself is fast becoming a less reliable source of energy for fish processing and preservation (Akinola et al 2006). These problems can be addressed by critically looking at the detailed analysis of the linkages between the various stakeholders involved in the fishing, processing, marketing and final consumption of fish (fresh and smoked) in the study area. Based on this, a study was conducted before the peak of the insurgency to ascertain the value chain and consumer preference for artisanal fishing in Maidguri Metropolis. The specific objectives included determining the profitability of artisanal fishing, fish processing and marketing in the study area to ascertain the value added and marketing efficiency and consumer preference for fish.

Consumer Preference, Rate and Reason for Fish Consumption

Consumers are the final destination of artisanal fish in its value chain. Their major function in the chain is consumption, which is largely determined by some attributes of the commodity and its consumers as well. The rate/frequency and reason(s) for fish consumption by consumers in the Maiduguri metropolis are as shown in Table 28.

Table 28: *Consumer Preference, Rate and Reason for Fish Consumption*

Variable	Category	Frequency	%
Fish Consumption Frequency			
	Daily	6	15
	Weekly	12	30
	Fortnightly	8	20
	Monthly	10	25
	Yearly	4	10
	Total	40	100
Reason for fish Consumption			
	Price affordability	21	52.5
	Taste and quality	12	30
	Health Reason	7	17.5
	Total	40	100
Forms in fish is preferably consumed			
	Cooked and boiled	25	62.5
	Fried	9	22.5
	Roasted/Smoked	6	15
	Total	40	100

Source: *Field survey 2011*

Table 28 indicates the consumer consumption pattern, rating and preference for fish products in Maiduguri Metropolis. The result reveals that 30% of the consumers claim that they do consume fish products on a weekly basis, 25% on a monthly basis and 20%, 15% and 4% fortnightly, daily and yearly, respectively. This implies that fish consumption may be related to the disposable income of individuals. On reason behind fish consumption by the majority (52.5%) indicates that the relative lower price of fish meat is the main reason why they prefer fish to other meat sources. About 30% indicated that the taste and quality of fish meat is the reason behind the demand for dried and fresh fish, while 17.5% indicates health reasons as their main rationale, respectively. Then on the different forms in which fish products are consumed, 62.5% reveal that they derive high satisfaction when they consume fish in its cooked and boiled form, 22.5% prefers consuming it fried and 10% roasted (smoked) respectively.

Value Addition in the Fish Value Chain

Figures 37 and 40 present the actors and their functions in the fish value chain in Maiduguri, Borno State. There are two seasons: peak and off-peak. Fishermen have a profit of ₦575.4 and ₦1,141.5 during the peak and off-peak seasons respectively. Processors made a profit of ₦5050.1 and ₦4056.66 and added values of ₦4474.65 and ₦2,915.16 during the peak and off- peak seasons, respectively. Wholesalers had a profit of ₦9,000 and ₦1,955.33 during the peak and off- peak seasons, respectively and an added value of ₦3,949.9 during the peak season only. On the other hand, retailers make a profit of ₦12,935, ₦2,452 and added values of ₦3,935 and ₦497.47 during the peak and off- peak seasons, respectively. This means that they make the highest profit of ₦12,935 but the processors added the highest value of ₦4474.65 among the actors.

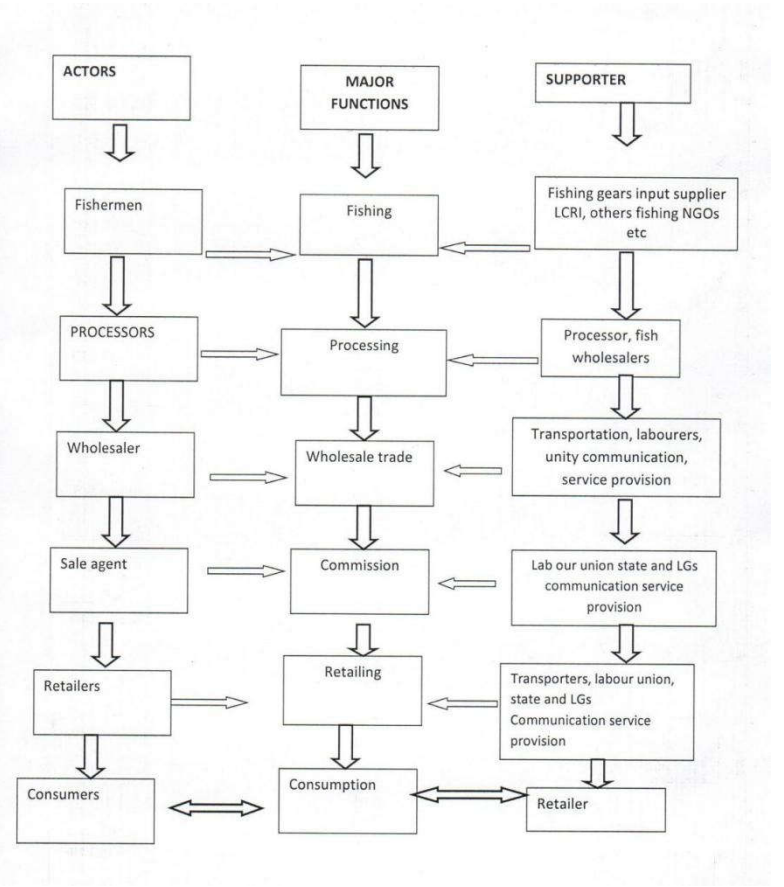

Figure 37: *Showing the Flow Chart of the Artisanal Fish Marketing*

Figure 38: *Different Types of Fish*

Figure 39: *Fish Marketing in Nigeria*

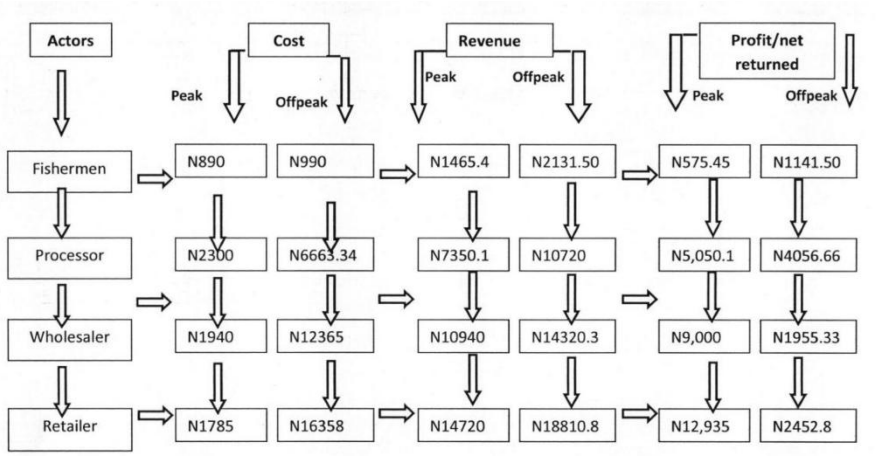

Figure 40: *Profitability Chart Showing the Profit/ Returns Obtained By the Various Actors along the Artisanal Fish Value Chain in Naira/12kg Box of Fish*

CONSTRAINTS

From this resume of consumer preference and value chain, it could be seen that Nigeria has an impressive array of agricultural commodities whose value addition potentials are yet to be fully harnessed. One major factor for this is the inability to fully understand what consumers prefer to find in these commodities and products. This lecture has just shed some light on some of them, which agropreneurs can utilize to advantage. Apart from this, farmers, processors and marketers are equally inundated with a myriad of problems. These include inadequacy and the high cost of input supplies, poor storage and processing facilities, inadequate credit facilities, poor market infrastructure, inadequate knowledge/access to local and international markets, poor extension services and a host of others. All these call for concerted efforts by all stakeholders in the agricultural sector that can lead to a transformation in the sector to growth, development and greatness.

CONCLUSION AND IMPLICATIONS

From the various studies carried on the consumer and his preferences for various agricultural commodities (both crops and livestock), it is clear that the consumer occupies a quintessential place in the development of any economy. For instance, for a crop like cowpea, which is an important economic and nutritional crop across the WCA region, large grain size is an important attribute considered by almost all consumers, although in some cases a portfolio of grain skin colour, eye colour and skin texture combinations is considered in some local markets. In terms of value chain for the crop, a gross margin of 30% has been reported for cowpea producers and 60% after 6 months of storage in some parts of Nigeria and Burkina Faso. This means that cowpea storage, especially during the off-season period, is very lucrative with an added margin of 30% after 6 months of production. In rice, the result for consumer preference showed that swelling capacity, taste, colour of grain, cleanliness and grain shape were all important determiners for choice and preferences for both local and imported rice consumed. The highest value was added during paddy trading and milling and the least was added during parboiling. The high value added in trading could be attributed to the fact that the various marketing functions in trading confer on the commodity the utilities of place, time and procession, which make it available at the right time and place for the consumer. In maize, majority of consumers prefer white maize because it is readily available in the market and has good processing quality, better taste, longer storage period and lower price than yellow maize. Also, most consumers prefer consuming maize in form of cooked flour (*tuwo* and other forms), some in boiled form and others because of price affordability and taste above other grains. Maize processors have the highest marketing efficiency

of 130.33% and added value of ₦91.04 per kg processed along the value chain. For processed cassava, most consumers prefer white to yellow garri because it is good for soaking while some others prefer the yellow for health reasons since the oil added to it is a source of Vitamin A. However, yellow garri processing has the highest level of value addition of ₦2,200 followed by white garri processing with ₦2,000 due to the health reasons stated above.

Tomato is consumed in fresh, dried and canned forms with almost all consumers preferring the fresh above others. However, the form of tomato consumed at different times of the year is influenced by seasonality.

For sweet orange fruits, consumers showed sensitivity and preference for orange colour, medium size and very ripe and weighty fruits with light surface blemish and are prepared to pay premium prices for such fruits. Analysis of the marketing margin received by each market participants revealed that commission agents received the highest margin of 37.37%, followed by local wholesalers (24.65%) and distant wholesalers (22.5%). Retailers receive the lowest margin (15.40%).

In the livestock sector, cattle, goat, sheep, poultry and fish constitute our main sources of meat and other related products. In poultry, majority of consumers consume the products because of their taste and quality and also prefer them cooked and boiled instead of fried or roasted. On the value chain , broiler processors and egg producers had the highest returns and added the highest values respectively in the poultry value chain in the area of study.

For live cattle, the attributes that mostly determine consumers' preference and prices are carcass quality (big size cattle), sex (male cattle), short horn cattle, height and length of cattle with Red Bororo breeds being preferred in the markets studied. For goats, consumers show more and significant preference for size, weight, length and height when purchasing them with Sokoto Red breeds being preferred by most consumers. Also, for sheep, buyers preferred male Yankasa breed and those sheep with good size, length, height and weight. For the meat of these three animals, taste and marbleness are significant in influencing consumer preference for beef while taste alone was significant for mutton and chevron. Though beef, mutton and chevron marketing are all profitable, beef marketing had the highest returns but mutton the highest value addition per kg of animal head.

For fish, majority of consumers indicated that taste and quality were the reasons behind their demand for dried and fresh fish, while others indicated health as their main reason. On the different forms in which fish products are consumed, majority revealed that they derived high satisfaction when they consume fish in its cooked and boiled form while others preferred consuming it in fried and roasted (smoked) forms, respectively. On profitability and value addition, the retailers of fish made the highest profit while the processors added the highest value among the actors.

The significance of all these studies is to showcase the attributes of these agricultural commodities that attract the preference of consumers as they make their purchasing decisions. It means that for any unit increase in the variables consumers show preference for, they are willing to pay the premium price for agricultural commodities that have them or otherwise ask for a discount when these characteristics are poorly represented or absent. The commodity attributes preferred by consumers, also form the basis for any value addition that is targeted at enhancing consumer patronage and satisfaction, which will further result in greater profitability and the welfare of farmers/producers.

Mr. Vice Chancellor Sir, having been in charge of this audience for the past 60 minutes or so as the 46th Inaugural Lecturer of this great University, I do hope I have succeeded in convincingly unveiling myriads of business opportunities in the Nigerian agricultural sector for by and large all the audience of today's lecture particularly for those who farm and those who have or are planning to do so in future. I also do hope that I have laid sufficient ground for reaching the climax of my professional career as a Professor of Agricultural Economics of this great University. My prayer to all and sundry is "***instead of saying agriculture let us do agriculture by adding value across the value chains of agricultural commodities we produce in order to meet what consumers need (consumer preferences) through a robust, responsive and effective price mechanism system (market integration)"***. These when properly addressed will undoubtedly enable Nigeria to articulately address all the gaps and challenges (chasms) of its agricultural development that will place it on the right pedestal of sustainable development for the overall benefit of all its citizens.

Based on the above presentation, it is recommended that in order to enhance farmers/producers productivity, profitability and welfare and, by extension, sustainable agricultural and economic development in Nigeria:

(1) Agronomic, breeding, marketing and research efforts by farmers, processors, marketers, government and private agencies should target the quality characteristics that consumers show sensitivity for in the various commodities.
(2) Government and private agencies should also provide efficient and technical extension services to disseminate the findings of studies of this nature to farmers, marketers and consumers to enhance better production, marketing and consumption decisions.
(3) Producers/marketers in their value addition regimes should take proper cognizance of the commodity attributes consumers show preference for so as to produce products that appeal to them and thus enhance their profitability and
(4) Entomologists, food scientists, post-harvest specialists and storage experts should develop and transfer improved storage technologies to reduce damage and thus, discounts of agricultural commodities.
(5) Judging from the relevance of the subject matter (consumer preference, market integration and value chain) of this lecture there lies the urgent and ardent need for specific and tailor-made policy promulgations and pursuance to enable the country as a whole to address agricultural development concerns.
(6) To make agricultural transformations in Nigeria more complete and comprehensive apart from addressing today's subject of presentation, government and private sector need to team up to address related issues of dealing with co-operative agriculture, market driven input supply scheme, out-grower scheme and development of economic corridor (infrastructure) for agroprenuers.
(7) The call for revamping of extension services to all agricultural clientele groups as well as improved budgetary allocation to the agricultural sector across all tiers of government is rather apt and compelling.
(8) Effort of research and development needs to be further strengthened especially those dealing with high yielding and high paid off technologies especially in areas of consumer preferences, market integration and value chain system development.
(9) Mainstreaming of Public Private Partnership (PPP) model will ensure sustained financial benefit and employment generation to all agricultural stakeholders in the short, intermediate and long term spectrums.
(10) Agribusiness model of development need to be further incorporated and aligned through developing and strengthening commodity value chain and value addition which in turn is central to moving farming household and/or enterprises into business of farming for profit making.

Mr. Chairman Sir, Distinguished Guest, Members of the academic community, ladies and gentlemen, I appreciate and thank you all for according me the privilege of your precious time to know how "***the chasms of agricultural development in Nigeria can be crossed through the empirical strength of consumer preference studies, market integration syntheses and value chains diagnoses"***.

Thank you and remain blessed.

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REFERENCES (From my Selected Publications)

Abdoulaye, T., B. Ayedun., **S. A. Musa.**, J. Lowenberg-DeBoer., D. Baributsa., S.Yakubu and A. I. Aminu: (2013).**Adoption of Purdue Improved Cowpea Storage(PICS) bag in Northern Nigeria. A case study of Jigawa, Kano and Katsina states.IN** (eds.) O. Boukar., O. Coulibaly., C. A. Fatokun., K. Lopez and M. Tamo.**Innovative Research along the Cowpea Value Chain.** Proceeding of the 5th World Cowpea Research Conference " Improving livelihoods in the Cowpea Value Chain through advancements in Science" held at Framissima Palm Beach Resort, SalyPortudal Senegal, between 27th September and 1st October, (2013).396-409.

Abdu Z. And **S. A. Musa** (2007)**. Socio-Economic Determinants of Soybean Production in Bauchi State:** The Case of Dass and Toro Local Government areas.**IN**(Eds.). Haruna, U.; S. A. Jibril; Y. P. Mancha and M. Nasiru **Consolidation of Growth and Development of Agricultural Sector.** Proceedings of the 9th Annual National Conference of the Nigerian Association of Agricultural Economist (NAAE)held at Abubakar Tafawa Balewa University, Bauchi. 5th-8th November, 2007. Vol.1:242-248.

Abdu Z., Ibrahim M. K. and **S.A. Musa** (2008)**. Economics of Groundnut Marketing in Biu Local Government Area of Borno State.** *Nigerian Journal ofManagement Technology and Development*. **2**(1): 23-28

Abdu, Z. and **S. A. Musa**.(2007)**Socio-Economic Determinants of Soybean Production in Bauchi State: A case of Dass and Toro Local Government Areas**. **IN**(eds.) U. Haruna., S. A. Jibrin., Y.P. Mancha and M. Nasiru. Proceeding of the 9thAnnual National Conference of NAAE, held at 1000 Seater theatre, Abubakar TafawaBalewa University, Bauchi, from 5thto 8thNovember, 2007.P242-248

Abdu, Z. Ibrahim M. K. and **S. A. Musa** (2009). **Economics of Groundnut Marketing in Biu Local Government Area of Borno State.** *Nigerian Journal of Management Technology (JOMATECH)*, **2**(1): 23-28.

Abdu, Z., Edewor, S. E., A. B. Mohammed and **S. A. Musa:** 579-581. **Socio-Economic Determinants of Beef Consumption in Bauchi Metropolis, Bauchi State. IN** (eds.) I.I. Bitto., F.G. Kaankuka., and S. Attah. Proceeding of the 37th Annual National Conference Nigerian Society for Animal Production (NSAP), held at the College of Animal Production, University of Agriculture, Makurdi, from 18th to 21st March, 2012.

Abdu, Z., S. E. Edewor, A. B. Mohammed and **S. A. Musa** (2012). **Socio Economic Determinants of Beef Consumption in Bauchi Metropolis, Bauchi State, Nigeria.IN**(Eds.). Bitto, I. I.; Kankuka, F. G.and S. Attah, **Sustainable**

Animal production for National Food Security and Poverty Alleviation. Proceedings of the 37th Annual Conference of Nigeria Society for Animal Production, held at College of Animal Science, University of Agriculture, Markudi, Nigeria. 18th-21st March 2012. 579-581.678-682.

Abdullahi, A., M.I. Daneji and **Musa, S. A.**.(2010)**Comparative Analysis of the Useof Various hermatic (Air-Tight) Storage Technologies of Cowpeas: Implication for Food Security in Kano State, Nigeria. IN** (eds.) Neils, J. S., D. Khobe., M. R.Jaafar Furo and K. N. Futuless. Proceedings of the 24th Annual Conference of FAMAN,held at the ADSU, Mubi, Nigeria, from 11th to 14th October, 2010.P90-94.

Continental Journal of Agricultural Economics, **1**(1): 14-19.

Fulgence Joseph Mishili, Joan Fulton, **Musa Shehu,** Saket Kushwaha, Kofi Marfo, Mustapha Jamal, Alpha Kergna and J. Lowenberg-DeBoer (2009). **Consumer Preference for Quality Characteristics Along the Cowpea value Chain in Nigeria,Ghana and Mali.** *Agribusiness: An International Journal*, **25**(1): 16-35.

Gizaki, L.J., Yakubu, S., Jibrin, S. A. and **Musa, S. A.** (2013). **Arable Crop Farmer's Coping Strategies to Civil Disturbances in Bauchi State**. *Journal of Technology and Educational Research*, **7**(3):

Gurama, A.U., S.A. Adebitan, I.I. Jalo and **S.A. Musa.,(1998): Effect of Varying Concentration of Galic (Allium Satium, L.) Bulb on Cowpea Scab Disease: IN** (eds.) Kushwaha, S., T.O. Oseni, B.M. Auwalu and I.S.R. Butswat. Proceeding of the 14th Annual Conference of FAMAN, held at ATBU, Bauchi, from 20th to 23rd September,1998.P.185-189:

Haruna, U., N. Murtala. ,**S. A. Musa** and A. Abba (2009). **Analysis of Cattle Marketing in Kano State: Empirical evidence for understanding its marketing chain and profitability**.*Journal of Agriculture and Agricultural technology*, **1**(1):24-30.

Ibro., G. J. Lowenberg-DeBoar and **M. Shehu:** (2013): **Potential for Enhancing the Participation of Women in the Cowpea Value Chain in Kano State, Northern Nigeria**. **IN**(eds.) O. Boukar., O. Coulibaly., C. A. Fatokun., K. Lopez and M. Tamo. **Innovative Research along the Cowpea Value Chain**. Proceeding of the 5th World Cowpea Research Conference " Improving livelihoods in the Cowpea Value Chain through advancements in Science" held at Framissima Palm Beach Resort, Saly, Portudal Senegal, between 27th September and 1st October, (2013).410-418.

Isa, H. K., Mohammed, A. B., **Musa, S.A.** and Abdu, Z. (2013). **Comparative Analysis for Cost and Return of Small Ruminants Marketing in Katsina State.***Journal of Applied Agricultural Research,* **5**(2)**:** 81-87.

Isa, H.K., Mohammed, A.B., **Musa, S. A.** and Abdu, Z. (2012). **Assessment of Socio-Economic Problems of Marketing Sheep and Goats in Katsina State.** *NigerianJournal of Management Technology and Development* **3**(1):8-15.

Kushwaha, S., **S.A. Musa.** B.B. Singh and J. Lowenberg-DeBoer (2000): **Problems Militating Against Effective Cowpea Marketing in Nigeria.** *Journal of Scientific Research,* **50**(2000): 201-210.

Kushwaha., S. **S.A. Musa**., J. Lowenberg-DeBoer and J. Fulton (2008). **Consumer Acceptance of GMO Cowpeas in Sub-Saharan Africa.** *Journal of International Food and Agri-business Marketing,* **20**(4): 1-17.

Langyintuo, A.S., J. Lowenberg-DeBoer., M. Faye., D. Lambert., G. Ibro., B. Moussa., A. Kerhna., S. Kushwaha., **S.A. Musa** and G. Ntoukam (2003): **Cowpea Production and Marketing in West and Central Africa.** *Field Crops Research,*.**82**(2003b): 215- 231

Lawal A. T., A. B. Mohammed and **S. A. Musa (2016) Hedonic Price Analysis of Characteristics Influencing Cattle Prices in Ngalda Livestock Markets in Yob eState, Nigeria.** *Journal of Agriculture and Sustainability* **9(1)**:43-57.

Lawal. A.T., **Musa. S.A.** and Mohammed. A.B., (2014). **Analysis of Factors Influencing Cattle Prices in Potiskum Livestock Markets, Yobe State, Nigeria.***Journal of Applied Agricultural Research.*

Malumfashi, A. I. **S. A. Musa**., S. Kushwaha and E. E. Oguche (2007). **Cost and Return Analysis in Catfish Farming: A case study of Federal Capital Territory,Abuja, Nigeria.** *Biological and Environmental Sciences Journal for the Tropics*,**5**(2):182-189.

Malumfashi, A. I., **Musa, S. A.,** Abdu, Z. And S.E. Ihiabe (2011). **Rural Urban - Labour Drift: An Analysis of Parameters for a Sustainable Maize production in Kogi State, Nigeria.** *Savannah Journal of Agriculture*, **6** (2): 19-24.

Malumfashi, A. I., **Musa, S. A.,** S. Idi and D.S. Habila (2011). **An Analysis of Factor Adjustment in Maize production: Imperatives for Sustainable Production in Kogi State.** *Savannah Journal of Agriculture*, **6**(2): 13-18.

Malumfashi, A. I., **S. A. Musa**., S. Mohammed and D. S. Habila (2008). **MeasuringProfitability among Potato Farmers in Vwang District of Jos South Local Government Area, Plateau State.** *Savannah Journal of Agriculture,* **1**(1): 53-61**.**

Malumfashi, A.I., **S. A. Musa,** S. Muhammad and D. S. Habila (2008). **Costs and Return Pattern in potato Production in Vwang District of Jos South Local Government Area, Plateau State.** *Nigerian Journal of Management Technology andDevelopment,* **2**(2):68-72.

Mohammed S. and **S. A. Musa:**(2013) **Economic Assessment of Rice Enterprises as Enterpreneurship Options in Northern Nigeria. IN** (eds.) S. Misra.,D. Awasthi and G. Batthini. Proceeding of the 10th Biennial Conference on Enterpreneurship Volume 11, held at Enterpreneurship Development Institute of India, Ahmedabad, Gujarat from (2013). P1011-1020.

Mohammed, A. B., Abdu, Z. and **Musa, S. A.** (2012). **Factors Affecting the Profitability of Kosai Vendors in Nigeria.** *Nigerian Journal of Management Technology and Development,* **3**(1):16-24.

Mohammed, A. B., H. A. Karare and **S. A. Musa** (2013). **Comparative Analysis of Cost and Return for Small ruminant Marketing in Katsina State.** *Journal ofApplied Agricultural Research (JAAR).* **5**(2):81:87

Mohammed, A. B., **Musa, S. A.,** Z. Abdu and Isa, H. K. (2013). **Effect of Age on the Profitablilty of Sheep and Goats Marketing in Katsina State, Nigeria**. *Biological and Environmental Sciences Journal for the Tropics(BEST),* **10**(2):255-259.

Mohammed, A. B., **Musa, S.A.** and Abdu, Z. (2013). **Analysis of Effective Prices of *Kosai* in Nigeria and Niger West Africa.** *Journal of Applied Agricultural Research,***5**(2): 21-29.

Mohammed, A. S. Kushwaha, M. M. Abubakar, S. A. Musa and Z. Abdu (2007). Impact of Institutional Credit on Small scale Maize Production in Southern Katsina, Nigeria. *Journal of Applied Science and Technology,* **3**(2):24-31.

Mohammed, A.B. Lawal A. T. and **Musa S. A. (2016) Econometric Analysis of Characteristics Influencing Cattle Prices in selected Livestock Markets in YobeState, Nigeria.** *Journal of Agriculture and Sustainability* **9(1)**:1-14.

Mohammed, S. R. M. Sani; B.M. Hamidu and **S. A. Musa,** 499-504. **Macro Economic Policy Framework and Nigeria's Agricultural Output: A case study of Structural Adjustment Programme (SAP). IN** (eds.) E.A. Aiyedun. P.O. Idisi and J. N. Nmadu.Proceeding of the 10th Annual National Conference of NAAE, held at 750 seater lecture theatre, Main Campus, University of Abuja, Abuja, from 7th to 10th October,2008.

Mohammed, S., S. Idi., M. I. Malumfashi and **S. A. Musa (**2004) **Commercial Banks and Agricultural Funding in Gombe State**. **IN** (eds.) Okuneye, P. B. and G.O. Evbuomwan. Proceeding of the 7th Biennial Congress of African

Farm Management Association (AFMA), held at Corporate Headquarters, Central Bank of Nigeria(CBN), Abuja, Nigeria, from 19th to 21st October,.**P.**298-309.

Mohammed. A.B., Lawal. A.T. and **Musa. S.A.** (2014). **Economics of Physical Attributes Influencing Cattle Prices in Ngalzarma Livestock Markets, Yobe State,** *Journal of Agriculture And Sustainability.*

Mohammed. A.B., Lawal. A.T. and **Musa. S.A. (2015). Economics of Physical Attributes Influencing Cattle Prices in Ngalzarma Livestock Markets, Yobe State,** *Journal of Agriculture And Sustainability* **7(1)**:72-86**.**

Musa , S. Muhammad and M. L. Mahmoud (2011). **Descriptive Analysis of Fuel Wood Marketing in Bauchi Metropolis, Nigeria**. *Journal of Technology and Educational Research*, **4**(3): 53-58.

Musa, S A., A. I. Malumfashi and J.C. Ezeamagu (2008). **Revitalizing Rice Production in Dass Local Government Area of Bauchi State Through Improved Profitability and Efficiency in The Use of Rice Production Inputs.** *Savannah Journal of Agriculture,* **1**(1): 62 69

Musa, S. A. (2008). **Effects of Credit Policies on Institutional Agricultural Credit Supply in Nigeria.** *Nigerian Journal of Management Technology and Development,***2**(2):34-37

Musa, S. A. and T. daouda (2011).**The Impact of natural Resources Management Project of Boboye in Niger Republic: The case of Kobe Beri and Kobedeye rural communities**. *Journal of Technology and Educational Researches.*

Musa, S. A., A Review on Opportunities of Profitable-Non-chemical Storage Technology for small holder Cowpea farmers in Nigeria. NAAE, Proceeding, IFE2012.

Musa, S. A., A. B. Mohammed and A. A. Adomi (2013). **Comparative EconometricAnalysis of Characteristics Affecting Consumer Preference for Banana andSweet Orange Fruits in Kano Metropolis, Nigeria.** *Biological and EnvironmentalSciences Journal for the Tropics, (BEST).***10**(2):238-244.

Musa, S. A., A. B. Muhammed and A.T. Lawal., (2012). **Hedonic Price Analysis of Characteristics Influencing Cattle Prices in Ngalda Livestock market, Yobe State.**NAAE, Proceeding, IFE 2012.

Musa, S. A., A. I. Hamisu and S. A. Yakubu.(2010)**Performance of Agricultural Credit Guarantee Scheme Fund (ACGSF) in Kano State. IN** (eds.) Nmadu, J. N.,M.A. Ojo., U.S. Mohammed., K.M. Baba., F.D. Ibrahim and E.S. Yila. Proceeding o**fthe 11th Annual National Conference** of the NAAE, held at

the FUT, Minna, NigerState, from 29th November to 3rd December, 2010.P114-120.

Musa, S. A., A. I. Malumfashi, S. Muhammad and D.S. Habila (2008). **Resource-Use Efficiency of Irish Potato Production System in Jos South Local Government Area of Plateau State.** *Nigerian Journal of Management Technology and Development,* **2**(2):23-26.

Musa, S. A., A. I. Malumfashi. and Agada, G.O.(2007)**Marketing Impediments,Causes and Solutions in Some Selected Agricultural Commodities in Olamaboro LGA, Kogi State. IN** (eds.) U. Haruna., S. A. Jibrin., Y.P. Mancha and M. Nasiru. Proceeding of the 9th Annual National Conference of NAAE, held at 1000 seater theatre, Abubakar Tafawa Balewa University, Bauchi, from 5th to 8th November, 2007.P.213-216.

Musa, S. A., A. M. Bakori and A. A. Adomi. **Econometric Analysis of Characteristics Affecting Consumer Preference for Sweet Orange Fruits in Kano Metropolis, Nigeria.** *Medwells Journal*, **47**(3): 147-156.

Musa, S. A., A. O.Kyafi and M.S. Suleiman**.**.(2010)**Analysis of Soya Bean marketing in Kuje Area Council of Federal Capital Territory, Abuja, Nigeria. IN** (eds.) Nmadu, J. N., M.A. Ojo., U.S. Mohammed., K.M. Baba., F.D. Ibrahim and E.S.Yila. Proceeding of the 11th Annual National Conference of NAAE, held at the Federal University of Technology (FUT), Minna, Niger State, from 29th November to 3rd December, 2010.P153-157

Musa, S. A., Abdullahi, A. and M.S. Abubakar**.**.(2010)**An assessment of NigerianAgricultural Insurance Corporation in Bauchi state. IN** (eds.) Neils, J. S., D.Khobe., M. R. Jaafar Furo and K. N. Futuless. Proceeding of the 24th AnnualConference of FAMAN, held at the ADSU, Mubi, Nigeria, from 11th to 14th October,2010.P312-315

Musa, S. A., and T. Yacouba (2011). **Economic Analysis of Cowpea Storageamong Middlemen in Sokoto Metropolitan Market.** *Journal of Technology and Educational Researches.*

Musa, S. A., Bakori, A. B., And Adomi, A. A. (2012) **Econometric Analysis of Characteristics affecting Consumer Preference for Banana Fruits in Kano Metropolis, Nigeria.** *Medwell Journal* **7(2)**:74-80

Musa, S. A., G. G. Bala and A. A. Adomi (2012). **Marketing of Dogs ain Dawaki-Kanke Local Government Area of Plateau State.** *Savannah Journal of Agriculture*,**7** (1):1-9.

Musa, S. A., G. G. Bala and A. A. Adomi.(2010)**Economic Analysis of Dog Marketing in Dawaki-Kanke Local Government Area of Plateau State. IN**(eds.)Nmadu, J. N., M.A. Ojo., U.S. Mohammed., K.M. Baba., F.D.

Ibrahim and E.S. Yila.Proceeding of the 11th Annual National Conference of NAAE, held at the FUT, Minna,Niger State, from 29th November to 3rdDecember, 2010.P225-230.

Musa, S. A., H. I. Eze., V. A. Tenebe and Y. M. Mairiga (2003). **Exploratory and Statistical Investigations of Investment Practices of Informal Self-Help Groups in Katagum Local Government Area, Bauchi State**, *Journal of Agriculture,Business and Technology*, **1**(1):91-99.

Musa, S. A., H.I. Karare and A. M. Bakori.(2011)**Marketing of Sheep and Goats in Katsina State, Nigeria. IN** (eds.) Erhabor, P.O., C. I. Ada-Okungbowa., C.O. Emokaro and M.O. Abiola. Proceedings of 12th Annual Conference of NAAE, held at Banquet hall, University of Benin, Edo State, from November 12th to 16th, 2011.P 441-447.

Musa, S. A., I. M. Jibo and M. I. Daneji. 2011). **Costs and Returns Analysis of Mutton Marketing in Kano Metropolis**.**IN**(eds.) Erhabor, P.O., C. I. Ada Okungbowa.,C.O. Emokaro and M.O.Abiola. Proceedings of 12th Annual Conference of NAAE, held at Banquet hall, University of Benin, Edo State, from November 12th to16th , 2011.P 333-338

Musa, S. A., I. M. Jibo and M.I. Daneji (2011).**Costs and Return Analysis of Beef Marketing in Kano metropolis, Nigeria.** *Journal of Technology and Educational Researches.*

Musa, S. A., I. Tafida and J. Gloria.. **Assessment of Women Participation in Amaranthus and Okro Production in Jos North Local Government Area, Plateau State. IN** (eds.) M.C. Madukwe. Proceeding of the 14th Annual National Conference ofAgricultural Extension Society (AESON), held at the Federal University of Technology, Minna, 21stth to 24th April,, 2009.P 80-88

Musa, S. A., I. Tafida and M.O.Lovely. 20-24. **Problems and Prospects of Information and Communication Technology (ICT) in Crop Production: A case study of Minjibir Local Government Area, Kano State. IN** (eds.) Neils, J. S., D.Khobe., M. R. Jaafar Furo and K. N. Futuless. Proceeding of the 24th AnnualConference of FAMAN, held at the Adamawa State University (ADSU), Mubi,Nigeria, from 11th to14th October, 2010.

Musa, S. A., Isa, H. K., Mohammed, A. B. and Abdu, Z. **Profitability ofSheep and Goats Marketing in Katsina State, Nigeria. In:** Bitto, I. I., Kaankuka, F.G and Attah, S. (eds.) Proceedings of the 37th Annual Conference Nigerian Society for Animal Production, University of Agriculture, Makurdi. 18th 21th March, (2012).

Musa, S. A., M. Yusuf and A.A. Adomi.(2010)**Comparative analysis ofInstitutional and Non- Institutional Sources of Farm Credit in Dass**

Local Government Area of Bauchi State. IN(eds.) Nmadu, J. N., M.A. Ojo., U.S.Mohammed., K.M. Baba., F.D. Ibrahim and E.S. Yila. Proceeding of the 11th AnnualNational Conference of NAAE, held at the FUT, Minna, Niger State, from 29thNovember to 3rdDecember, 2010.P.56-59.

Musa, S. A., Mohammed, A. B. and Lawal, A. T. (2014). **Buyer Preference Analysis for Cattle in Livestock Markets of Yobe State, Nigeria.** : 81-85 **In:** Izham Ahmadand Nur Azura Adam (eds). Agricultural Innovation. Proceedings of InternationalAgriculture Congress 2014. Pullman Putrajaya Lakeside, Putrajaya. Organised byFaculty of Agriculture, Universiti Putra Malaysia. 25 -27 November, 2014.

Musa, S. A., S. A. Danbazau and M.S, Suleiman.(2011). **Econometric Investigation of Physical Factors Affecting Decision of Buyers to Purchase Sheep in Wudil livestock Market, Kano State, Nigeria**. **IN** (eds.) Erhabor, P.O., C. I. Ada Okungbowa., C.O. Emokaro and M.O. Abiola. Proceedings of 12th Annual Conference of NAAE, held at Banquet hall, University of Benin, Edo State, from November 12th to 16th, 2011.P 322-326

Musa, S. A., S. Kushwaha, B. M. Auwalu and A. Mustapha (2007). **The Performance of Agricultural Credit Guarantee Scheme Fund in Nigeria from 1978-1994.***Savannah Journal of Agriculture,* **2**(1):67-77

Musa, S. A., S. Mohammed and M.M. Lawal (2011). **Analysis of Fuel Wood Marketing in Bauchi State, Nigeria.** *Journal of Technology and Educational Researches,* **4**(2): 53-58.

Musa, S. A., S. Mohammed., S. Idi, and G. James.(2007)**Women's Participation in Production of Amaranthus and Okro in Jos North L. G. A. of Plateau State. IN**(eds.) U. Haruna., S. A. Jibrin., Y.P. Mancha and M. Nasiru. Proceeding of the 9thAnnual National Conference of NAAE, held at 1000 seater theatre, Abubakar TafawaBalewa University, Bauchi, from 5thto 8th November, 2007.P277-282

Musa, S. A., Tafida, I. and Folashade G.P. (2008). **Assessment of Women Participation in Agricultural Recommended Practices in Imo State,** Nigeria,*Bayero Journal of Interdisciplinary Studies*, Bayero University, Kano, Nigeria.

Musa, S. A.,and S. Mohammed (2012). **Analysis of Cowpea Marketing Margin inSelected Urban Markets in Nigeria.** NAAE, Proceeding IFE, 2012.

Musa, S.A. and S. Kushwaha (2007): **Structural Analysis of Cowpea Markets inNigeria.** *Savannah Journal of Agriculture*, **2** (1). 59-66

Musa, S.A., H.M. Bello and S. Kushwaha,(1996): **Contribution of Livestock Marketing to Sustainable Rural Development in Kano State: A Case**

Study of Wudil Local Government Area. IN (eds.) Bello, H.M., K.M. Baba and U.B.Kiogywom. Proceeding of 9th Annual Conference of Nigerian Rural SociologicalAssociation (NRSA), held at Usmanu Dan-Fodiyo University, Sokoto, from 9thto11thSeptember, 1996.P. 217-221

Musa, S.A., Isah, H. K. Mohammed, A. B. and Z. Abdu(2012)**Profitability of Sheep and Goats Marketing in Katsina State, Nigeria. IN** (eds.) I.I. Bitto., F.G.Kaankuka., and S. Attah. Proceedings of the 37th Annual National Conference of NSAP,held at the College of Animal Production, University of Agriculture, Makurdi, from 18th to 21stMarch, 2012.P 678-682.

Musa, S.A., S. Kushwaha, B.M. Auwalu and A. Mohammed,(1998): **An Analysis of Agicultural Credit Policies and other Variables for Increased Agricultural Production in Nigeria: IN** (eds.) Kushwaha, S., T.O. Oseni, B.M. Auwalu and I.S.R.Butswat. Proceeding of the 14th Annual Conference of Farm Management Association of Nigeria (FAMAN), held at the Abubakar Tafawa Balewa University (ATBU),Bauchi, from 20thto 23rdSeptember, 1998.P.234-240

Musa,S. A., A. B. Muhammed and A.T. Lawal(2012). **Buyers Preference Analysis for Cattle in Livestock Markets of Yobe State, Nigeria.** Proceeding of the 3rdInternational Conference on Agriculture and Animal Science (CAAS 2012), held at Bangkok, Thailand, from 24th to 25th November, 2012.P.81-85

Mustapha, A., Musa, S. A. and Suleiman, A.:(2015) **Rice Parboiling as a Source of Livelihood for Women Along the Rice Value Chain in Kano State**, Nigeria. **IN**(eds.) Adamu, I. Tanko, Kabir Mustapha Umar., and Abdulwahab Saliu Shaibu. **Climate Change and Food Security in the African drylands.** Proceedings of the 1stInternational Conference on Dry lands, held at the Centre for Dryland Agriculture,Bayero University, Kano, 8th 12thDecember, 2015. 1-6.

Mustapha, U. M., Kuswaha, S., **Musa, S. A**., Abdulrahman, S. and Nasiru, M(2007). **Econometric Analysis of Factors that Determine Cowpea (Vigna Unguiculata(L.) Walp) Market Value in Bauchi Metropolis, Bauchi State**.**IN** (eds.) U. Haruna., S. A. Jibrin., Y.P. Mancha and M. Nasiru. Proceeding of the 9th Annual National Conference of Nigerian Association of Agricultural Economists (NAAE), held at 1000 seater theatre, Abubakar Tafawa Balewa University, Bauchi, from 5th to 8th November, 2007. P177-184.

Mustapha., A. **S. A. Musa** and A. Suleiman. 193-196. **Socio-Economic Characteristics of Rice Value Chain Actors in Kano State, Nigeria.**Proceeding of the 46th Annual Conference of Agricultural Society of

Nigeria (ASN), held at the Faculty of Agriculture, Bayero University, Kano from 5th to 9th November,2012

Ndnitsa, M. A., **Musa, S. A.** and Umar, I.S. (2011). **Impact of Microfinance Institutions' Microsoft-Credit Program on Poverty Alleviation Through Agricultural Finance Intermediation to maize Farmers in Niger state, Nigeria.** *Savannah Journal of Agriculture*, **6** (2): 82-92.

Ndnitsa, M. A., **Musa, S. A.** and Umar, I.S. (2011). **Ratio Performance Analysis and Factors Affecting Repayment Rate of Microfinance Institutions' Credit Program to maize farmers in Niger State, Nigeria.** *Savannah Journal of Agriculture*, **6** (2):99-112.

Sani, R. M., **Musa, S. A.,** Daneji, M. I., Yakasai, M. T. and Ayodele, O. (2007**). Costsand Returns Analysis in Poultry Production in Bauchi Metropolis Areas**.

Tahirou, A., A. Bankole., **S. A. Musa** and A. Musa (2013). **Economic Efficiency of Crop Residue Production in Kano State, Nigeria.** *International Journal ofSustainable Agriculture.*

Tiri, G. D., **S. A. Musa** and E. A. Ojoko. 134-138. **Analysis of the Structural characteristics of Sweet Orange Markets in Kano Metropolis.** Proceeding of the 46th Annual Conference of Agricultural Society of Nigeria (ASN), held at the Faculty of Agriculture, Bayero University, Kano from 5th to 9th November, 2012.

Yakubu, S., Gizaki, L.J., Yakubu, M. A. and **Musa, S.A**. (2013). **Economic Analysis of Purdue Improved Cowpea Storage (PICS) in Jigawa State**, **Nigeria**. *Biological and Environmental Journal for the Tropics,* **10**(3):

Yakubu, S., Gizaki, L.J., Yakubu, M.A. and **Musa, S.A**. (2013). **Economic Analysis of Groundnut Production in Some selected Farms in Katagum Local Government Area of Bauchi State**. *Biological and Environmental Journal for the Tropics,* **10**(3):

Yakubu, S., Mohammed, B. S., Ibrahim, A. G. and **Musa, S. A.** (2014). **Hedonic Price Analysis of Consumer Preferences for Banana: A Case Study of Bauchi Metropolis**. *Journal of Technology and Educational Research,* **7**(3):

Yaro A. M. and **S. A. Musa**.:(2015). **Investigating Co-integration Relationship among Major Gum Arabic Markets in Kano State**. **IN** (eds.) A. B. Mohammed., S.A. Abdullahi., A. I. Magashi., Z. Abdu., A. M. Yaro., A. Suleiman and A. U. Shu'aib. **Agricultural Projects and National Development.** Proceedings of the 16th Annual National Conference of NAAE, held at FACMS Lecture theatre, Kano University of Science and Technology, Wudil, from 19th - 22nd October, 2015.488-492

Yaro, A. M., Abdullahi, S. A., Shuaib, A. U., Ismaila, I. S. and **Musa, S. A**.(2015)**Structural Analysis of Gum Arabic Markets in Kano State**.**IN** (eds.) Adamu, I. Tanko., Kabir Mustapha Umar., and Abdulwahab Saliu Shaibu. **Climate Change andFood Security in the African drylands.** Proceedings of the 1st International Conference on Dry lands, held at the Centre for Dryland Agriculture, Bayero University, Kano, 8th 12thDecember, 2015.265-269.

Yaro, A. M., **Musa, S. A.**, Abdullahi, Ismaila, I. U., Umar, U. S. and Umar, A. F.:(2014) **Evaluation of Constraints Affecting Gum Arabic Marketing in Kano State**.**IN** (eds.) O. Y. Ogunsanwo., A. O. Akinwole., I. O. Azeez., V.A. J. Adekunle and N. A. Adewole. **Sudano-Sahelian Landscape and Renewable Natural Resources Development in Nigeria.** Proceedings of the 37th Annual Conference of the Forestry Association of Nigeria, held at Federal University of Technology, Minna, Niger State, from 19th-14th November,2014. 604- 614.

Yusuf, S. R., M. Sarkin- Fulani.,B. I. Ahmed and **S. A. Musa** (2007). **Common Ailments Associated with Insecticides Application on Stored Cowpea at Dawanau Grains Market In Kano State**. *Savannah Journal of Agriculture,* **1**(1): 64-67.

OTHER REFERENCES

Adegeye , A. and Dittoh, H. (1985), Essentials of Agricultural Economics. Impact Publishers 251 pp.

Akinola, O. A. Akinyemi, A. A. and Bolaji B. O. (2006) Evaluation of Traditional and Solar Drying System Towards Enhancing fish Storage and Preservation in Nigeria: a Case study of Abeokuta Local Government area. Journal of Fisheries International 1 (2-4) 144-149

Adepegba O. B. (2008). Improving Fish Processing and Marketing in Nigeria (Paper Presented at National Stakeholder Workshop in Inland Captive Fisheries Development pp.2

Agricultural transformation on agenda (ATA) 2013) Agricultural Transformation Agenda of Nigeria: Support Programme Phase 1 (ATASP-I) Strategic Environmental and Social Assessment Nigerian Federal Ministry of Agriculture and Rural Development (FMARD) 29 pp

Akeeb, S. (1997) Problems of Poultry Production in Nigeria. Paper Presented at Workshop Organization by the Nigerian Society for Animal Production (NSAP). Ogun State Nigeria

Apata, O. M. and Apata, G. (2003), Marketing of Citrus (sweet orange) in Some Selected Markets in Ibadan Metropolis in Fasina, A. A Olufolaji, A. O. and Umeh, V. C. (eds) The Role of Horticulture in Economic Development of Nigeria, Proceeding pf 21st Annual Conference of Horticultural Society of Nigeria (Hortson) November 10-13th 2003th, pp.180-185

Arshad, F. (1990) The Integration of Palmoil Market in Peninsular Malaysia Indian Journal of Agricultural Economics vol. 45, Vol, pp. 20-30

Berhanu, K. (2012) Market Access and Value Chain Analysis of Dairy Industry in Ethiopia: the Case of Wolaita zone Ph.D. Dissertation in Agriculture (Agricultural Economic), Haramaya University, Ethiopia 301pp.

Baributsa D. Lowenberg –Deboer, J. Murdock, L., and Moussa, B. (2010) Profitable Chemical Free Cowpea Technology for Smallholder Farmer in Africa: Opportunity and Challenges. A Paper Presented at the 10th International Working Conferences on Stored Product Protection Dakar, Senegal, July 2010 16pp.

Braun, Von J. (2006), Rising Food Prices: What should be Done? Euro Choices 7 (2), 31-35

Central Bank of Nigeria (2009) 2009 Annual Economic Report. Central Bank of Nigeria Publication pp101-200

Danbazau, S. A. (2010), Econometric Investigation of Physical Factors Affecting Decision of Buyers to Purchase Sheep in Wudil Livestock, Market, Kano State, Nigeria. B.Sc. Thesis, Kano University, of Science and Technology, Wudil, Kano

Delgado, C. Rosegrant, M. Steinfeld, H. Ehui, S. and Courbi, C. (1999) Livestock to 2020 the Next Food Revolution. Food, agriculture and the Environment Discussion Paper 28. IFPRI. Washington D.C

Fabe, A. Grote, U. and Winter, E. (2009), Value Chains Analysis methodologies in the Context of Environmental and Trade Research. Research Gate.

Fama, E. F. (1983) Agency Problems and Theory of the Firm.

Federal Ministry of Agriculture and Rural Development (FMARP) 2012) Repositioning Agriculture to Drive Nigeria's Economy FMARD Document, Abuja, Nigeria 28pp.

Food and Agriculture Organization (FAO) (1997). Aquaculture Development. FAO Technical Guidelines for Responsible Fisheries No. 5 Rome, FAO 40pp.

Food and Agriculture Organization (FAO) (2002). The State of World Fisheries and Aquaculture. FAO. Rome, 16pp.

Food and Agriculture Organization (FAO) (2005), Adding Value: Structure, Co-Ordination and Support of Links in the Chain the Potato Sector. FAO. Rome, 108, pages

Food and Agriculture Organization (FAO) (2006), Report of the International Rice Commission FAO, Chiclayo, Peru 64pp

Food and Agriculture Organization (FAO) (2007), The State of World Fisheries and Aquaculture for 2006, FAO Rome, 180pp.

Foreign Agricultural Service (FAS) (USDA) (2001) United States Development Agency Annual Report on Poultry and Products. 22pp

Hartwich, S. J. Conran, J. G. Bannister, J. M. and Lindqvist, J. K. (2010), Calamid Fossil Palm Leaves and Fruits (Arecaceae: Calamoideae) from Late Eocene Southland, New Zealand Australian Systematic Botany 23 (2): 131-140

Horowitz, J. (1981), Identification and Diagnosis of Specification Errors in the Multinomial Logit Model. Transportation Research B15:223-232

Ilu, I., Frank, A. and Annatte, I. (2016) Review of the Livestock Meat and Milk Value Chains and Policy Influencing Them in Nigeria. FAO and ECOWAS. Available at http://www.fao.org/3/a-i5259e.pdf

Kaplinsky, R. (1999), Globalization and Unequalization: What can be Learned From Value Chain Analysis. Journals of Development studies 37 (2): 117-146

Kibbeh, M. Haefele, S. and Fagade, S. O. (2003) Challenges and Opportunities for Improving Irrigated Rice Productivity in Nigeria WARDA, Abidjan. 22pp.

Kohls. R. L. and Uhl, J N. (1980). Marketing of Agricultural Products (5th Edition). Collier Macmillan, London, 612 pp.

Kresic, G., Herceg, Z., Lelas, V. and Jambrak, A. R. (2010), Consumer's Behaviour and Motives for Selection of Dairy Beverages in Kvarner Region: A Pilot Study, Mije Karstvo 60 (i) 50-58.

Ladd, G. and Survannunt, V. (1976), A. Model of Consumer Goods Characteristics. American Journal of Agricultural Economic; 58: 504-511

Lancaster, K. (1966), A. New Approach to Consumer Theory. Journal of Political Economic 74 (1966): 132-157

Langyintuo, S. A., Lowenberg, Deboer, J., Faye, M., Lambert, D. Ibro, G., Moussa, S. A. and Ntoukam , G. (2003). Cowpea Supply, and Demand in West and Central Africa. Field Crops Research 82: 215-231

Languyintuo. S. A. Ntoukam, G. Murdock, L.L. and Lowenberg, Deboer, J. (2004), Consumer Preference for Cowpea in Cameroon and Ghana. Agricultural Economics 30 (3): 203-213

Lutz, C. H. M. (1994). The Functioning of the Maize Market in Benin: Spatial and Temporal Arbitrage on the Market of a Staple Food Crop. Ph.D. Thesis, University of Amsterdam, the Metherlands, 312pp.

Maqbool, A. Sarwar, M. N. and Bakhsh, K. (2005), Modernization of Poultry Farming. Economic and Business Review (the Daily Dawn) 3 Jam, 2005

Marwa, T. Bashir, A., Azwardi, M., Adam, M. and Thamrin, K. M. H. (2017). Market Integration of Agricultural Products. Journal of Economics and Business Administration. Vol. 5 (2): 69-82.

Malkiel, B. (1987), Efficient Market Hypothesis in: Eatwell, J., Milagate, M., Newman, P. (eds). The New Palgrave Dictionary of Economics, Macmillan, Press, London, pp. 120-122

Mohammed, A. B. (2007), Econometric Analysis of Cowpea Processing and Utilization in Nigeria. Unpublished Ph.D. Dissertation Department of Agricultural Economics and Extension, Abubakar Tafawa Balewa University, Bauchi, Nigeria pp.153-285

Musa, S.A. (2003). Marketing of Cowpea in Nigeria: Econometric Studies of Quality Factors and Market Integration. A Ph.D Dissertation, Department of Agriculture Economics and Extension, Abubakar Tafawa Balewa University, Bauchi, Nigeria. P.396

National Bureau of Statistics (2016). Integrated Surveys on Agriculture and General Household. Survey Panel, (LSMs). P.93

Newbery, D.M. and Stiglitz, E.J, (1984). Pareto Inferior Trade. Review of Economic Studies. 51(1): 1-12

Nigeria National Committee on Irrigation and Drainage (NINCID)(1999). Committee Report, Abuja Nigeria.

Ojo, S.O. (2003). Productivity and Technical Efficiency of Poultry Egg Production in Nigeria. International Journal of Poultry Egg in Nigeria. International Journal of Poultry Science, 2(6):459-464.

Olukosi, J.O. and Ogunbile, A.O. (20005). Introduction to Agricultural Production Economics. Principles and Applications. 2nd Printing , Agitab Publishers, Zaria, Nigeria. Pp 97-108.

Otoo, M, Fulton,J., Ibro, G. and Lowenberg- Deboer,J. (2011). Women Entrepreneurship in West Africa: The Cowpea Street Food Sector in Niger and Ghana, PICS Programme. Pp.46

Papazoglou, M. P. (2000). Integration Value Chains and Their Implications from a Business and Technology Stand Point. Decision Support Systems, Vol. 29 (4): 323-342

Porter, M.(1985). Competitive Advantage. The Free Press, New York. Pp.11-15

Price Water Coopers (2017). Transforming Nigeria's Agricultural Value Chain. Pp.295

Rao, K. M. (2005). A textbook of Horticulture. Macmillan India Ltd., New Delhi, 295pp

Ravallion, M. (1986). Testing Market Integration. American Journal of Agricultural Economics 68(1): 102-109.

Richardson, H.W. (1978). The State of Regional Economics: A survey Article. International Regional Science Review 3(1): 1-48

Sexton, R.J., Kling, C.L and Carman, H.F.(1999). Market Integration, Efficiency of Arbitrage and Imperfect Competition: Methodology and Application to U.S Celery. American Journal of Agricultural Economics 73(3): 568-580.

Shepherd ,R.(1989). Factors Influencing Food Preferences and Choice., In: Shephered(Ed): Handbook of Psychophysiology of Human Eating. Pp.3-24, John Wiley and Sons Ltd, Chichester, U.k.

Soriano, D.R.(2002). Customers' Expectation Factors in Restaurants: The Situation in Spain. International Journal of Quality and Reliability Management. 19:1055-1067

Steptoe, A. Pollard, T.M and Wardle, J. (1995). Development of a Measure of the Motives underlying the selection of Food: The Food Choice Questionnaire Appetite. 25(3) 267-284.

Tsegay, H.(2012). Consumer Perception and Preference of Meat types in Harare and Haramaya Province, Ethiopia. Journal of Microbiology, Biotechnology and Food science 2(3): 959-969.

United Nation Conference on Trade and Investment (UNCTAD)(2007). UNCTAD ANNUAL REPORT: Thinking Development, Advancing Solution. New York. 38pp.

United States' Agency for International Development (USAID)(2009). Nigerian Rice Value Chain Analysis. USAID, Abuja, Pp33.

Voh, J.P., Ahmed, B., Olufajo, S., Dike, M., and Ishaku, F. (2001). Adoption of Improved Cowpea Technologies in the Savanna Ecology of Nigeria. A Report of Survey Conducted on PEDUNE/PRONAF Project in Nigeria, Institute of Agricultural Research, Ahmadu Bello University, Samaru, Zaria, Nigeria. Pp.39