
**REVEALED PREFERENCE ANALYSIS OF
CONSUMERS' SWITCHING BEHAVIOUR
TOWARDS RICE BRANDS IN NIGERIA**

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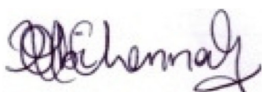
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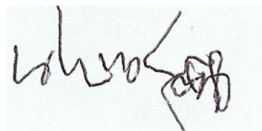


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Prof. Lloyd J.S. Baiyegunhi
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Date: 23 January 2018

DECLARATION 2 – PUBLICATIONS

The following publications (submitted, in press and accepted) form part of the research presented in this thesis.

Publication 1 – Chapter 2 of this thesis

Obih, U. and Baiyegunhi, L.J.S. (2017). A review of factors influencing domestic demand-supply gap and high import bills for rice in Nigeria: Implications for development of rice sector. *Africagrowth Agenda*, 14(3): 18-21.

Publication 2 – Chapter 3 of this thesis

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Publication 3 – Chapter 4 of this thesis

Obih, U. and Baiyegunhi, L.J.S. (2017). Implicit price estimation of quality attributes influencing rice prices and choice decisions of consumers in Nigeria. *Journal of Agribusiness and Rural Development*, 3(45): 639-653

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Author contributions

All the papers were conceived by Obih, U. The data collection, analysis and writing up of all above-listed papers were also done by Obih, U. with technical advice and guidance from Prof. Baiyegunhi, L.J.S at every stage of producing the papers.

ABSTRACT

Rice is the world's most important staple food crop consumed by over 4.8 billion people in 176 countries, representing more than half of the world population (Bruntrup, 2006). It has been an important food commodity for most people in sub-Saharan Africa particularly West Africa. Nigeria with a current population of more than 170 million people had in the 1960s an average a per capita annual rice consumption of 3kg which increased to an average of 18 kg during the 1980's, reaching 22 kg in the late 1990's (Akpokodje et al, 2001). Current annual per capita consumption is estimated at 29kg. Despite the country's huge potentials in rice production, her inability to cover cultivable land area coupled with low yield of 4-5 MT/hectare has been attributed to low domestic production of 2.53 million MT per annum. However, the annual rice consumption in Nigeria which is about 4 million MT shows there is a consumption gap of about 1.5 million MT, which is today filled in by importation. Nigeria still ranks third in the group of major rice importing countries in the world and the highest rice importer in Africa. Studies have shown that the gap between the domestic demand and supply of rice in Nigeria continues to widen annually leading to steady increase in import volumes which has been attributed mainly to burgeoning population, rapid urbanization, ease of preparation that fits easily into urban lifestyle of workers, and its general availability among food vendors and restaurants located in work places, especially urban areas.

Past Nigerian governments had over the years acknowledged that this large import bills were not only a huge drain on foreign exchange earnings but also a big threat to the growth of the domestic rice industry. Governments had over the years implemented various rice importation policy measures which basically aimed at protecting local rice brands from unfavourably competition with the imported brands. These policy measures included oscillating import tariffs, several quantitative restrictions measures (import licensing, import quota) and outright ban. Government has also established various programmes and schemes to boost local rice production which attracted many local and foreign investors into massive and expanded investments in rice paddy production and modern processing mills. With the expansion of cultivated land area and improvements in processing, polishing and packaging, many local rice brands with improved physical quality attributes that can compete favourably.

Despite the improvements in the quality attributes of local rice brands, consumers still prefer imported rice brands based on their already established perception that imported rice brands

possess better after-cook physical attributes such as bright-white colour, separate, even and long grains. This could partly explain the reasons for consumers' preference inertia for imported rice brands, as consumers seem to be more likely influenced by the after-cook physical attributes of rice grains than nutritional and safety attributes. This preference behaviour may be suggesting consumers' willingness to pay more for imported rice brands. However, recent studies have reported that consumers may no longer be seeing local rice brands as inferior goods. Therefore, previous studies seem to indicate that rice consumers switch their purchases between local and imported rice brands. Although, there has not been ample empirical evidence in literature to explain these brands-switching behaviours among rice consumers, but it may be an indication that, with recent quality improvements, local rice brands are beginning to gain consumers' acceptability and can be preferred in the market more than the imported brands if proper domestic marketing strategies/policies are put in place.

Several studies such as Erenstein et al. (2003), Lancon et al (2004), Odusina (2008), Adeyeye et al (2010), Akaeze (2010), Bamidele et al (2010), Emodi and Dimelu (2012), Gyimah-Brempong et al (2012), and Ogundele (2014) have opined that breaking the current consumers' preference inertia for imported rice brands and encouraging consumers' preference switch to local rice brands requires simultaneous implementation of supply-side (rice production, processing and import restrictions) policies and demand-side (strategic marketing) policies in a complementary manner. While there may be adequate information to guide the government and policy makers in designing effective supply-side policies, there is dearth of empirical information on consumer behaviour for designing effective demand-side policies. Thus, there is the need to influence consumers towards consumption of local rice brands by addressing some important knowledge gaps on consumers' brand-switching behaviours such as: (a) the underlying reasons for consumers' choice of rice brands based on their differences in price and quality; (b) determination of how much value (in monetary terms) consumers pay on each quality attribute of rice; (c) identification of the various marketing factors that could be included in the value reorientation and sensitization programmes and policies aimed at switching consumption towards local rice brands; and (d) the maximum prices consumers are willing to pay for imported rice brands beyond which they can switch consumption preference to local rice brands.

The broad objective of this study was to analyse brand switching behaviours of rice consumers in the Federal Capital Territory (FCT), North Central Nigeria. A sample of 460 households was

selected across the six area councils of the FCT using the three-stage random sampling method. Using a structured questionnaire, data were collected on the consumer households' socioeconomic characteristics, their desirability and preference of rice quality attributes, and market prices they paid for imported rice brands, level of perception of the quality attributes, market prices they buy and maximum prices they are willing to pay for imported rice brands, and acceptability of local rice brands, and consumers' responses to the marketing functions of millers and marketers of local rice brands in Nigeria. Different econometric techniques (such as Binary logistic regression, Hedonic pricing model, Kendall concordance test) were used to analyse the data.

This study reveals that Nigeria's self-sufficiency in rice production requires increasing the domestic paddy rice supplies through the provision of cheap funding to smallholder rice farmers, upgrading the milling capacity of small-scale rice millers, improving the efficiency of the rice marketing system and enhancing consumers' perception and acceptability of local rice brands. The development of Nigeria's rice industry requires a multi-dimensional approach involving a blend of research, policies and strategies among key value chain actors and institutions on production, processing and marketing.

The results show that the estimated coefficients of price, household head's age, household's income and general perception were positive and statistically significant (at 5%) for the probability of household's preference and willingness to pay (WTP) for imported rice brands. The findings of this study indicate that consumers' inertia against preference and WTP for imported rice persists because of the negative price-quality differentials gap between local and imported rice brands. There is need for synergy between public policy makers and marketing managers in designing and implementing import restriction and strategic marketing policies in a flexible and complimentary manner that ensures sustenance of a wide price differential between local and imported rice brands while improving the quality and image of the local brands to narrow consumer's perception of the quality differential between these two sets of brands. This could be a crucial step towards breaking the consumers' inertia against preference for imported rice brands. Also, there is need to integrate the role of price-quality differentials into the theoretical models of consumer behaviour for food products. This will help to provide useful insights into the understanding of consumer's choice behaviour towards two or more brands of a food product with almost similar quality attributes but of different price regimes.

The results also show that the household respondents paid an average price of ₦10,416 (about \$53)¹ and ₦7,567 (about \$38) for a 50kg bag of imported and local rice brands respectively. Quality attributes contribute about 48-52% of the prices consumers paid for rice. High swelling capacity, whiter after-cook colour, neatness, and grains separateness mostly influence market prices of imported rice in Nigeria as consumers would pay an average of additional ₦326 (about \$1.65), ₦320 (about \$1.60), ₦158 (about \$0.80) and ₦122 (about \$0.61) respectively on these quality attributes to avoid local rice. These findings present rice breeders, processors and marketers with investment challenges as well as opportunities. Modern rice processing and polishing that integrates artificial ageing technology is needed to enhance the swelling capacity, colour, neatness and grain separateness of local rice for increased consumers' acceptability, price and competitiveness. This will enhance consumers' acceptability, price and competitiveness of the local rice, increase the earnings and thereby incentivizing local rice breeders, farmers, processors and marketers in developing appropriate policies and rice improvement programmes.

The results of household's pre-purchase responses show that the local rice industry in Nigeria need more improvements in providing marketing functions that enhance the promotion and distribution of local rice brands than those that enhance the pricing and product improvement. This is an indication that local rice brands are beginning to gain consumers' acceptance and can compete favourably with imported rice brands both in price and quality. Therefore, it is imperative for marketing managers to specifically direct their efforts on quality control and NAFDAC certification for local rice brands. Campaign programmes need to be designed and implemented to promote the functional and image attributes of local rice brands. This needs to be supported by efficient distribution system that ensures the availability of local rice brands in major markets and sales outlets across Nigeria.

¹ US1\$ = ₦200 in 2004

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LIST OF ACRONYMS

ABP	Anchor Borrower Programme
ADP	Agricultural Development Programme
AGIS	Abuja Geographical Information System
AMA	American Marketing Association
AMAC	Abuja Municipal Area Council
BOA	Bank of Agriculture
BOI	Bank of Industry
BVN	Bank Verification Number
CACS	Commercial Agricultural Credit Scheme
CARD	Coalition for African Rice Development
CBN	Central Bank of Nigeria
CGCM	Consumer Goods Characteristics Model
CPC	Consumer Protection Council
CPD	Conditions Precedent to Drawdown
CRG	Credit Risk Guarantees
DCM	Discrete Choice Model
DFO	Development Finance Officer
DMB	Deposit Money Bank
FAO	Food and Agriculture Organization
FCDA	Federal Capital Development Authority
FCT	Federal Capital Territory
FGN	Federal Government of Nigeria
FMARD	Federal Ministry of Agriculture and Rural Development
FMI	Federal Ministry of Information
GPS	Global Positioning System
IDP	Interest Drawback Payment
IRM	Integrated Rice Mill
MABC	Marker Assisted Back Crossing
MARS	Mean Attribute Ranking Scores
MIP	Marginal Implicit Price
MMM	Marketing Mix Model
MSMEDF	Micro, Small and Medium Enterprises Development Fund
MWTP	Mean Willingness to Pay
NAFDAC	National Agency for Food and Drug Administration and Control
NAIC	Nigeria Agricultural Insurance Corporation
NCR	National Collateral Registry
NCS	Nigeria Customs Service
NERICA	New Rice for Africa
NIRSAL	Nigeria Incentive-based Risk Sharing System for Agricultural Lending
NOA	National Orientation Agency

NPC	National Population Commission
OLS	Ordinary Least Square
PMT	Project Management Team
RP	Revealed Preference
RUFIN	Rural Financing
RUM	Random Utility Model
SHF	Smallholder Farmer
SON	Standard Organization of Nigeria
SP	Stated Preference
USAID	United States Agency for International Development
USDA	United States Department of Agriculture
VIF	Variance Inflation Factor
WTP	Willingness to Pay
WARDA	West African Rice Development Association

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Finally, I am most grateful to the Almighty God for His love and grace over my life.

DEDICATION

This thesis is dedicated to my beloved family

CHAPTER 1

INTRODUCTION

1.1 Background to the study

Rice is the world's most important staple food crop consumed by over 4.8 billion people in 176 countries, representing more than half of the world population (Bruntrup, 2006). It has been an important food commodity for most people in sub-Saharan Africa particularly West Africa. Nigeria with a current population of more than 170 million people had in the 1960s an average a per capita annual rice consumption of 3kg which increased to an average of 18 kg during the 1980's, reaching 22 kg in the late 1990's (Akpokodje et al, 2001). Rice consumption in Nigeria has greatly increased since 1970s at annual growth rate of about 10% which has been adjudged the highest in West Africa (Akande et al, 2007), reaching 28.23kg per capita per annum in 2013 (FAO, 2013).

Nigeria has huge potentials in rice production as the country has land area of between 4.6 - 4.9 million hectares for rice production out of which only 35 percent (1.7 million hectares) is cultivated and this cultivable area is spread over five ecologies, namely: rain-fed upland, rain-fed lowland or shallow swamp, irrigated rice, deep-water or floating rice and tidal mangrove swamp" (Ezedimma, 2005). This was confirmed by Akande (2002) who noted that, in 2000, "only about 1.6 million hectares were cultivated to rice". The inability to cover this huge cultivable land area coupled with low yield of 4-5 MT/hectare has been attributed to low domestic production of 2.53 million MT per annum Akande (2002). According to USDA (2016), the annual rice consumption in Nigeria which is about 5 million MT while supply is 2.7 million MT, this shows there is a consumption gap of about 2.3 million MT, which is today filled in by importation from Far East and South-East Asia, and to some extent by some cross-border trade with neighbouring countries. Nigeria still ranks third with Iraq (after Philippines and China) in the group of major rice importing countries in the world (Awe, 2006).

Studies have shown that the gap between the domestic demand and supply of rice in Nigeria continues to widen annually. For instance, Akpokodje et al. (2001) shows that 300,000 tons of rice was imported in 1995 and this figure rose to 687,925 tons in 1998. In terms of import bills, whereas Nigeria spent only about \$100,000 on rice importation in 1970, by 1998, the value of rice imports had risen to \$259 million. Also, Ezedimma (2005:1) states that: *in 1999, the value of rice imports was US\$259 million and this increased to US\$655 million in 2001 and US\$756*

million in 2002. This steady increase in import volumes has been attributed mainly to burgeoning population, rapid urbanization, ease of preparation that fits easily into urban lifestyle of workers, and its general availability among food vendors and restaurants located in work places, especially urban areas (WARDA, 2003). Out of the 11% annual increase in rice consumption, only 3% is due to population increase while the rest could be attributed to urbanization and changing consumer preference for imported rice brands. Most urban residents prefer to consume imported rice brands (WARDA, 2003). With the growing rural-urban migration and consequently, increasing urban population, rice import bills have steadily increased as rice consumption is shifting more towards imported rice brands.

Past Nigerian governments had over the years acknowledged that this large import bills were not only a huge drain on foreign exchange earnings but also a big threat to the growth of the domestic rice industry. They also acknowledged the need to meet the short-term domestic rice demands which exceeded domestic supply in terms of quantity and quality (Erestein et al, 2004). Thus, various successive governments were caught up in a dilemma of encouraging increased domestic production through protection of domestic producers while at the same time meeting the immediate food needs of households through importation (Okoruwa and Ogundele, 2006). In attempts to achieve a balance between these two contrasting objectives in the rice subsector, governments had over the years implemented various rice importation policy measures which basically aimed at protecting local rice brands from unfavourable competition with the imported brands. These policy measures included oscillating import tariffs, several quantitative restriction measures (import licensing, import quota) and outright ban (WARDA, 2003).

Since 2009, The Federal Government of Nigeria (FGN) has reiterated commitment to boost domestic rice production and processing. Government increased the import tariff on rice from 5% to 50 % in 2012, 100% by 2013, and possibly place a total ban on rice importation in future. Currently, government through the Nigeria Customs Service (NCS) has banned importation of rice through the land borders to enforce payment of import duties and levies for imports through the seas. These are policy measures aimed at protecting the domestic rice industry and to boost domestic rice supply. In 2009, the FGN through the Central Bank of Nigeria (CBN) established the Commercial Agricultural Credit Scheme (CACS) which was funded by N200 billion bond issuance by FGN. The CACS scheme was aimed at providing cheap funds at single digit interest rate to medium and large-scale agribusinesses firms as well as State Governments for onward

disbursement to farmers. To further boost domestic food production, government, in 2011, launched the Nigeria Incentive-based Risk Sharing System for Agricultural Lending (NIRSAL) with the aim of encouraging commercial banks to lend to the agricultural sector on a risk sharing basis. Under the NIRSAL scheme, government through the CBN provides Credit Risk Guarantees (CRG) up to 75% of commercial banks' loans, and pays up to 40% Interest Drawback Payment (IDP) to farmers across the 36 States of Nigeria and the Federal Capital Territory. The NIRSAL programme also provides various percentages of CRG and IDP along the entire agricultural value chain depending on the risk perception level.

Smallholder farmers (SHFs) who cultivate 1-5 hectares of land produce for more than 80% of grains in Nigeria. To further boost grain (rice, maize, soybean, etc.) production and provide reliable inputs for millers/processors, in 2015 the FGN launched the anchor borrower programme (ABP) to further encourage commercial banks to lend to smallholder farmers (SHFs) at 9% interest rate. Under the ABP, the CBN provides the banks with 50% CRG.

Government import restriction intentions, coupled with the establishment of CACS and NIRSAL programmes has attracted many local and foreign investors into the agricultural industry, leading to massive and expanded investments in rice paddy production and modern processing technologies. Currently, many new modern rice mills are being established while others are being expanded as government is encouraging the establishment of about 100 modern rice mills across the country by the end of 2015 (FMI, 2012). With the expansion of cultivated land area and improvements in processing, polishing and packaging, many local rice brands with improved physical quality attributes that can compete favourably with imported rice brands are now available in the urban markets in Nigeria.

1.2 Research problem

Before 2010, rice processing in Nigeria was carried out using rudimentary technologies. The finished product was often characterized by the presence of stones, dirt, odour and chaff/husk. Consumption of local rice was mostly among the rural dwellers and the urban poor. Most of the urban consumers and high-income groups rarely buy local rice and have developed negative perceptions about the quality of local rice. Today, various local rice now has known brand names due to tremendous improvements in physical attributes, especially in the removal of odour, stones and dirt, but consumers still prefer imported rice brands based on their already established perception that imported rice brands possess better after-cook physical attributes

such as bright-white colour, separate, even and long grains (Lancon et al 2003; Adeyeye et al, 2010). The long term negative perception against the quality of local rice brands appears to have a strong effect on rice consumers' buying behaviours.

Urban consumers especially do not seem to attach importance to claims by domestic rice millers that local rice brands are better than imported brands in terms of freshness, taste, aroma, safety and nutrient content (The Nation; 2011). For instance, there are reports that some imported rice consumed in Nigeria have been stored in silos (perhaps stored with chemicals) for up to ten years before they are imported into Nigeria (Punch, 2012). It appears that these claims on the nutritional and safety superiority of local rice brands over the imported brands have not been effectively promoted and managed by government and local rice millers/marketers to reverse the negative perception and attitudes of consumers on local rice brands. This could partly explain the reasons for consumers' preference inertia for imported rice brands (Akaeze, 2010), as consumers seem to be more likely influenced by the after-cook physical attributes of rice grains than nutritional and safety attributes. Besides, it seems some urban consumers may have developed loyalty to some imported rice brands which they claim possess these desirable physical attributes. This preference behaviour may be suggesting consumers' willingness to pay more for imported rice brands, as studies by Akaeze (2010) and Kassali et al (2010) have shown that habit persistence and perceived quality differences both play an important role in explaining consumer preference for imported rice in Nigeria. Persistent preference for imported rice brands implies that rice importation and the market share of imported rice brands will continue to rise soon if nothing urgent is done. Besides, consumers' high-quality perception appears to be responsible for higher prices of imported rice brands above the prices of local rice brands. Consumers' negative perception and attitude have largely accounted for the unsustainably low prices of local rice brands. Unsustainably low prices coupled with high production cost of local rice brands have been responsible to the closure of many local rice mills in the past, as millers/processors could not cover their operational costs.

The Federal Government of Nigeria (FGN) have in the last three decades attempted to discourage rice importation by imposing various import restriction policies such as import tariffs, import quota and outright ban (Akpokodje et al, 2001; Erenstein et al, 2003). However, these policies have not been effective in achieving the objective of reducing the volume of imported rice in Nigeria due to smuggling, porous borders, invoice under-reporting, compromise of customs officials and import duty waivers granted to government cronies (Emodi and Madukwe, 2008). There have been reports of rice importation during the ban

periods, an indication that imported rice brands will always find their ways into Nigerian markets (Akinlade et al, 2011; Gyimah-Brempong et al, 2012). For instance, local sources say that around 8,000 bags (400 tons) of rice are smuggled into the country every day through waterways between Nigeria and Benin Republic (Oryza, 2012). According to a report by Gyimah-Brempong et al, (2012), Nigeria spent N356billion in 2010 and N75billion in 2011 in legal importation of rice. Illegal importers evade duties and deprive local processors of business, at a cost of more than USD230 million per annum. This huge drain on foreign exchange could be saved given the recent massive investments in rice production and processing if consumption preference were in favour of local rice brands. If import restriction policies (such as high tariff as currently the case) are effectively enforced, the resultant effect will always be higher prices of imported rice brands. The problem remains that most urban consumers may still be willing to pay higher prices for imported rice brands due to their current preference inertia for imported rice brands (Akaeze, 2010) if nothing is done to improve consumers' perception and encourage the consumption of local rice brands.

Longtau (2000) had reported that Nigerians like the local rice because of its taste and sometimes even its aroma; and with good processing, it can favourably compete with imported rice. Recent studies by Adeyeye et al (2010), Bamidele et al. (2010), Obih (2010) and Ogundele (2013) have reported that consumers may no longer be seeing local rice brands as inferior goods with the possibility of higher demand for local rice brands at tariff regime of 80-100% if the desirable quality attributes of local rice brands are improved. In addition, PrOpCom (2007) have reported that a significant proportion (49.0%) of rice consumers utilized both imported and domestic rice. Therefore, previous studies seem to indicate that rice consumers switch their purchases between local and imported rice brands. Although, there has not been ample empirical evidence in the literature to explain this brand's switching behaviour among rice consumers, but it may be an indication that, with recent quality improvements, local rice brands are beginning to gain consumers' acceptance and can be preferred in the market more than the imported brands if proper domestic marketing strategies/policies are put in place.

Many authors have opined that breaking the current consumers' preference inertia for imported rice brands and encouraging consumers' preference switch to local rice brands requires simultaneous implementation of supply-side (rice production, processing and import restrictions) policies and demand-side (strategic marketing) policies in a complementary manner (Erenstein et al., 2003; Lancon et al, 2004; Odusina, 2008; Adeyeye et al, 2010; Akaeze, 2010; Obih, 2010; Bamidele et al, 2010; USAID, 2010; Emodi and Dimelu, 2012;

Gyimah-Brempong et al, 2012; Ogundele, 2014). While there may be adequate information to guide the government and policy makers in designing effective supply-side policies (CARD, 2010), there is a dearth of empirical information on consumer behaviour for designing effective demand-side policies.

Most of the previous studies on rice consumers' behaviours had focused mostly on the determinants of rice demand and the influence of consumers' socioeconomic characteristics on the demand for rice (Oduşina, 2008; Kassali et al, 2010; Erhabor and Ojogho, 2011; Emodi and Madukwe, 2011; Ogundele, 2014). The following recent studies conducted in Nigeria have suggested some strategies for switching consumption preference to local rice brands.

- i). Ogundele (2014) in his study on the 'factors influencing consumers' preference for local rice', suggested that *policies and programmes for the development of Nigeria rice sector, should in addition to enhancing physio-chemical characteristics of rice, include value reorientation and sensitization of people on the nutritional qualities of local rice.*
- ii). Gyimah-Brempong *et al* (2012) concluded that: *to meet the ATA goals of rice self-sufficiency, (a) consumers must be persuaded to accept and consume locally produced rice; and (b) proper branding and marketing is key for acceptance to take place.*
- iii). Oyakhilomen (2014) recommended that *huge investment on rice value chain with emphasis on local rice processing should be pursued by government and other stakeholders in the rice subsector to ensure that the quality of locally produced rice is improved to make local rice highly competitive with foreign rice and thereby encourage shift in consumer preference from imported rice to locally produced rice.*

Thus, there is the need to influence consumers towards consumption of local rice brands by addressing some important knowledge gaps on consumers' brand-switching behaviours such as: (a) the underlying reasons for consumers' choice of rice brands based on their differences in price and quality; (b) determination of how much value (in monetary terms) consumers pay on each quality attribute of rice; (c) identification of the various marketing factors that could be included in the value reorientation and sensitization programmes and policies aimed at switching consumption towards local rice brands; and (d) the maximum prices consumers are

willing to pay for imported rice brands beyond which they can switch consumption preference to local rice brands.

1.3 Research questions

The literature on consumers' switching behaviours between local and imported rice brands in Nigeria is still scanty. The influence of consumers' socioeconomic characteristics, local rice millers/marketers' strategies, consumers' peculiar factors and the value consumers attach to rice quality attributes on rice consumers' buying behaviours have not been adequately addressed in literature. Thus, findings from previous studies have not provided sufficient information on buying behaviours of consumers regarding switching between local and imported rice brands, thereby leaving important knowledge gaps in literature that could be bridged by providing answers to the following pertinent research questions:

- i.) do the differences in the prices and qualities (price-quality differentials) of local and imported rice brands indicate possible tendency of consumers' preference switch from imported to local rice brands?
- ii.) what factors are responsible for consumers' preference and willingness to pay for imported rice brands?
- iii.) how much monetary value do consumers pay for each of the quality attributes of imported rice brands?
- iv.) what marketing functions are millers and marketers of local rice brands using to influence consumers' buying decisions?
- v.) what are the prospects, impacts and challenges threatening the sustainability of ABP in supporting the SHFs increase their output of paddy rice?

1.4 Objectives

The broad objective of this study was to analyse brand switching behaviours of rice consumers in Nigeria. Specifically, the objectives of the study are to:

- i.) investigate how price-quality differentials explain the reasons for consumers' inertia against preference and willingness to pay for imported rice brands;
- ii.) identify the factors responsible for consumers preference and willingness to pay for imported rice brands;
- iii.) determine the monetary values consumers pay for each of the quality attributes of imported rice;

- iv). identify the marketing functions millers and marketers of local rice brands need to adopt to influence consumers' buying decisions
- v). describe the prospects, impacts and challenges threatening the sustainability of ABP in supporting the SHFs increase their output of paddy rice?

1.5 Rationale for the study

Government policy direction aimed at achieving self-sufficiency in rice production has since 2012 attracted massive investments of over \$US1.6billion (CARD, 2015) in Nigeria's domestic rice industry especially in expanded farm production and modern processing mills. However, if strategic marketing policies for local rice brands are not implemented alongside these massive investments in rice production and processing, consumers' preference inertia for imported rice brands will likely cause a glut of local rice brands in the Nigerian markets, further depressing already low prices, and providing disincentives to local rice farmers, millers/processors and marketers. To avert policy and investment failures in the rice sector that may follow, it has therefore become imperative for government and processors/distributors of local rice brands to formulate strategic policies targeted at providing competitive marketing and pricing advantage, promoting the image and quality of local rice and overturning consumers' negative perception and attitude towards local rice brands. However, formulating such strategic marketing policy framework requires useful information on why and how rice consumers make purchase decisions and switch brands, given the wide range of local and imported rice brands in Nigerian markets.

Recent studies have shown that such useful information can be provided by studying brand switching behaviours of consumers using the revealed preference method (Abarajithan and Ragel, 2011; Wan et al, 2011; Olearius et al, 2011). Available literature on rice consumption in Nigeria shows there is dearth of information on brands-switching behaviours of rice consumers and factors responsible for such consumption behaviours (Oduşina, 2008; Kassali et al, 2010; Erhabor and Ojogho, 2011; Emodi and Madukwe, 2011; Johnson et al, 2013; Ogundele, 2014). To the researcher, this suggests that a study on consumers' switching behaviours towards local and imported rice brands in Nigeria is both timely and needful as it will provide government and rice processors the insights required to formulate demand-side policy framework for improving the perception; promote demand and consumption of local rice brands, as well as adding to the already existing literature on consumer behaviours.

1.6 Expected outcomes and policy relevance of the study

This study will provide some insights on rice consumers' behaviour, consumption economics and by extension contribute in improving the existing model of consumers' behaviour towards food products. It has been designed to contribute in the in-depth understanding of consumers' analysis of price-quality relationships of two or more brands of food products as underlying determinant of consumers' choice and purchase decisions for utility maximization. This has some practical implications for marketing managers who may use the extended model from this study as a framework to designing effective marketing plans, policies and programmes that enhance the demand for local rice brands. The insights gained could also be applied in other food and non-food products.

The recommendations of this study can serve as a strategic tool for measuring the impact of government policies and programmes towards self-sufficiency in rice production through improved market demand and supplies for local rice brands in Nigeria. Impact-based policies and programmes are driven by research-based information on the behaviours of actors in the market place especially including consumers, marketers and producers. This study is expected to provide empirically-based evidence of consumers' willingness to pay (WTP) higher prices and the maximum price consumers are willing to pay on imported rice brands to avoid local rice brands. This is with a view of assisting the government in designing import restriction policies that will negatively impact on the prices and image of imported rice brands. Empirical results from this study is expected to suggest that consumers' preference for imported rice brands will persist if they derive significantly higher consumer surplus from consumption of imported rice brands than from local rice brands.

Information from this study will stimulate further interest and studies in the field of production economics. This is based on the premise that the behaviours producing firms are somewhat influenced by consumers' choice and buying behaviour. Producers, processors and marketers of local rice brands will have a better understanding of consumers' preference switch to local rice brands and what need to be done especially in quality improvements to consolidate such preference switch. It is expected that this study will provide rice breeders, farmers, processors, marketers/distributors and research centres some insights on how much value (in monetary terms) each rice attribute worth. Consumers attach value to rice quality attributes and pay higher prices for quality attributes that are more important to them (Sonata and Rasa, 2010). Thus, information on how and why rice consumers in Nigeria value rice attributes is important

as it will help in designing effective marketing and pricing strategies capable of attracting and retaining consumers and increasing the market share and profitability of local rice brands.

1.7 Organization of the thesis

The remainder of this thesis is divided into six chapters, five of which constitutes separate Journal articles (i.e., Chapters 2-6).

Chapter 2 is specifically devoted for literature reviews. The chapter attempts to define and provide empirical studies on various concepts and constructs that form the crux of this study such as brand switching, consumer perception of food quality attributes of food products, consumer behaviour models. The theoretical and conceptual frameworks of consumers' preference and willingness to pay, as well as hedonic price models are described in this chapter. The chapter concludes by reviewing the factors influencing domestic demand-supply gap and high import bills for rice in Nigeria. These factors form the basis for the remaining four Journal articles of chapters 3-6 of this thesis.

In Chapter 3, the underlying reasons for consumers' preference and willingness to pay higher prices for imported rice brands were analysed. Firstly, it reviews literature including the theoretical framework of consumer behaviour as conceptualized by Millock et al (2002) to identify the existing gaps in theory and the factors influencing consumers' preference willingness to pay for food products. This provided the basis upon which the relevant explanatory variables were identified. Secondly, it discusses the use of binary logit model to estimate and identify the determinants of consumer households' preference and WTP for imported rice brands. Thirdly, the chapter analyses the differences in the market prices and quality attributes of local and imported rice brands (in monetary terms), as perceived by consumers, and used these differences to establish the underlying reasons for consumers' inertia against preference and WTP for imported rice brands. This is followed by a detailed discussion of the research findings. Finally, the chapter presents the conclusions and policy implications these research findings upon which recommendations were made.

In Chapter 4, the implicit prices of quality attributes influencing rice prices and choice decisions of consumers in Nigeria were determined. Firstly, it reviews literature on hedonic modelling of quality attributes of food products and to identify the various quality attributes of imported rice brands desired by consumers. These formed the explanatory variables included in the hedonic model. Secondly, it estimates the Kendall coefficient of concordance to determine how well

consumers agreed in their rankings of the 13 quality attributes of imported rice brands identified. Thirdly, having established that the Kendall coefficient of concordance is significant, the implicit price of each quality attribute of imported rice was estimated to identify precisely how much consumers pay for each quality attribute of imported rice brand. This is followed by a detailed discussion of the research findings. Finally, the chapter presents the conclusions and implications of these findings for rice breeders, farmers, processors and policy makers.

In Chapter 5, the marketing functions influencing consumers' acceptability of local rice brands in Nigeria were investigated. This chapter starts with an abstract and introduction with brief literature review on the theoretical framework of marketing mix models. This is to identify the relevant explanatory variables that constitute marketing managers functions. Secondly, it uses the binary logit model to estimate consumers' acceptability of local rice brands based on the marketing functions being provided rice marketers. This is followed by a detailed discussion of the research findings. Finally, the chapter presents the conclusions and implications of these findings for the processors and marketing managers of local rice brands and policy makers.

In Chapter 6, a field evidence of financing smallholder rice farmers (SHRFs) under the anchor borrowers programme (ABP) for increased paddy rice production in Nigeria was provided. This chapter comprises of an abstract, introduction, objectives and general model of the ABP. It also discusses the impact of ABP, the challenges threatening the success and sustainability of ABP in Nigeria, as well as key lessons learnt from the 2016 ABP. The chapter concludes by suggesting the way forward in improving and sustaining ABP to make its expected impact of supporting SHRFs in Nigeria.

Finally, Chapter 7 provides a general summary and conclusions drawn from the all study results. It also provides the policy implications and recommendations on how to switch consumers' preference to local rice brands based on the findings of the study. Lastly, the chapter provides recommendations for further research that were drawn from field observations, scope and limitations of the study.

CHAPTER 2

LITERATURE REVIEW²

2.1 Introduction

Padberg and Westgren (1979) described a consumer as a social being, and based on theory his/her behaviour is a complex which can be analysed from a multidisciplinary approach with contributions from different social sciences such as; economics, psychology, anthropology, geography, nutrition and medicinal sciences. They consider consumer behaviour as being driven by three factors: emotions, motive and attitude. A consumer's higher emotion about a product leads to a stronger motivation which in turn leads to change in attitude towards the product and hence the probability or tendency of behaviour changes (purchase). The evolvement of rice consumption can be described as follows; the stronger the health concern, the stronger the health motive in nutrition and safety attributes and the more positive the health image of local rice brands and hence the higher the probability of purchase. Consumers in urban Nigeria are not left out since they are also social beings.

Consumer behaviour refers to all activities involving, acquiring, consuming and disposing products/services and the procedures to incur decision-making before and after these activities (Engel et al., 1995). According to Solomon (1995), Consumer behaviour is the study of the series of mental and psychological processes involved when individuals or groups select, purchase, use, or dispose of products, services, ideas, or experiences to satisfy needs and desires. Foxall (1987) explains consumer behaviour from the marketing context. He defines consumer behaviour as the patterns of aggregate buying which include pre-purchase and post-purchase activities. Pre-purchase activity might consist of the growing awareness of a need or want, and a search for and evaluation of information about the products and brands that might satisfy it. Post-purchase activities include the evaluation of the purchased item in use and the reduction of any anxiety, which accompanies the purchase of expensive and infrequently bought items. Rowley, (1997) identified two aspects for analysing consumer behaviour which includes, the decision-making process associated with consumer buying and the factors which affect the buying process.

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Consumer behaviour itself emerged as a distinct field of study in the 1960s. Solomon (1995) reported that during the process of evolution of the field of consumer behaviour, researchers drew on various disciplines, ranging from psychophysiology to literature. Researchers from diverse disciplines have approached consumer issues from different perspectives. In addition to the many disciplinary orientations, perspectives on consumer behaviour are broadly differentiated by their emphasis on internal influences (drawing on theories from psychology) and on external influences (drawing on theories from sociology). Furthermore, methodological inclinations and fundamental assumptions about the unit of analysis - the consumer, differ radically between perspectives. Thus, varying perspectives present different views of aspects on consumption (as emphasized from the consumer's perspective), research orientations (as emphasized from the researcher's perspective), and focus (micro/individual or macro/social) on consumer issues.

Studies on consumer behaviour as a sub-discipline of marketing aims to identify how consumer research can be put to use in marketing practice, regards the field of consumer behaviour as an applied social science. Accordingly, the value of the knowledge generated should be evaluated in terms of its ability to improve the effectiveness of marketing practice. According to this perspective, marketing management inevitably rests upon some conception of how consumers behave and of the consequences their reactions to product, price, promotion, and distribution strategies are likely to have for the attainment of corporate goals. In affluent, competitive economies, successful marketing depends above all on matching the marketing mix, which results from the integration of these strategies with the willingness of consumers to buy and in doing so more effectively than one's rivals. The consumer-oriented management, which results from such matching, is a response to the enormous discretion exercised by purchasers in these economies. Moreover, the choices made by consumers have consequences not merely for competing companies within a given, traditionally-defined industry; because of the high levels at which discretionary income is running, companies are increasingly forced to compete across the conventional boundaries of markets and industries (Foxall 1987). The growing competition among producers and distributors of local and imported rice brands in a developing economy like Nigeria has necessitated a look at how marketing strategies are employed and their impact on rice consumers' buying behaviours.

2.2 Factors influencing consumer's behaviour

There are many factors influencing consumers' decision-making process. These factors are classified and structured in various ways in the literature. For example, Brown (2006) divides these factors into inner and outer factors distinguishing three basic categories: *personal, psychological and social factors* to which Kotler (2002) adds the *cultural factors* as the independent category. The next group of factors can be labelled as *situational/peculiar factors*; it means factors forming the environment of the concrete decision-making situation. Because the subject of the analysed inquiry are factors belonging to groups of personal, psychological and situation factors, in the hereafter text the attention is devoted only to them.

- i). *Personal factors*: these are factors unique for each consumer. Above all, data such as age, sex, and place of domicile, occupational and economic conditions, personality and self – consciousness can be found here (Horská and Sparke, 2007).
- ii). *Psychological factors*: These include motivation, perception, skills and knowledge, positions, personality, style of life (Brown 2006). *Perception* means the adaption of reality. It is the process of selection, processing and interpretation of input data from the environment to make them purposeful (Brown 2006). *Personality* is created by inner characteristics and by behaviour. This makes a person unique. Personal characteristics influence the way how people behave. It is, however, difficult to find a reliable connection between the individual personality and the behaviour type.

Consumers' *skills and knowledge* are connected to learning and pre-destinate changes of behaviour. Therefore, to cause changes of consumer behaviour concerning the concrete product, it is necessary to give the adequate information. Learning process can come through a simple association between the impulse and the reaction to it, or through the complicated set of rational activities. *Motive* means the inner driving force that orients human/consumers' activities towards meeting the needs or achievement of the definite aim. In every decision-making process several motives play role, not only one. In case of need of measuring or analysing, there is one questionable thing that motives often work only on the subconscious level (Brown 2006). Knowledge and positive or negative feelings influence humans' perception and consequently decision making and behaviour. People learn their bearings through experience and interaction with other people. The eventual changes of positions are conditioned by consumers'

personality and his style of life. Consumer generally refuses information that is in conflict with his positions; eventually he modifies them to reach correspondence.

- iii). *Situational factors*: These can notably influence purchase decision. Social and physical environment of the purchase place, time influences and the previous states fall into this group (Berkowitz et al. 1992).

2.3 Concept of brand switching

Before reviewing the concept of brand switching, there is need to review the concept 'brand'. A brand is a distinguishing name and/or symbol, intended to identify a product or producer (Aaker, 1991). The American Marketing Association (AMA, 2010) defined brand as "...a customer experience represented by a collection of images and ideas; often, it refers to a symbol such as a name, logo, slogan, and design scheme. Brand recognition and other reactions are created by the accumulation of experiences with the specific product or service, both directly relating to its use, and through the influence of advertising, design, and media commentary. A brand often includes an explicit logo, fonts, colour schemes, and symbols, sound which may be developed to represent implicit values, ideas, and even personality". Brand is the image of a product in a market.

According to Broyles and Schumann (2004), there are two aspects of a brand, the experiential aspect and the psychological aspect. The experiential aspect refers to all previous experiences that a consumer has had with the brand in the past. The psychological aspect refers to the perceived image of a brand, something subjective and symbolic. Therefore, processors and distributors of local rice brands needs to realize that brand development and identity are important to penetrate the minds of consumers and to be re-recognized. In a nutshell, a brand is not just a representation of a product or a service; it is a symbol of the company itself, and that is where the core of positive brand-switching lies.

Brand switching also known as brand jumping is the process whereby a consumer chooses to switch from routine use of a brand to the use of a different brand of similar product. According to Paurav (2009), when there is a drop in brand loyalty or customer choosing other brands for their use then brand switching has occurred. When consumers switch from one brand to another, building a picture of likely brand switching behaviour occurs. Consumption of established brands is often driven by consumers' fluctuating desires, not mainly by changed perceptions. When a consumer switches brands, it's because his or her fluctuating desires

temporarily alter how important it is that he or she perceives the benefits of one brand compared to another. Once a product has been used, a consumer's perception of it rarely changes, but desires for the perceived benefits of competing brands often fluctuate and it's this that creates brand switching. In many cases, brand use itself is what causes a consumer's desires to fluctuate. The consumer may perceive different brands to be superior on different desirable attributes and this result in his or her switching around within a set of brands rather than using a single brand. The consumer may temporarily satisfy certain desires by using one brand but simultaneously deprive themselves of other satisfactions they could have received from a competing brand. As consumers' desires fluctuate relative to their fixed perceptions of brands, a consistent process of brand choice (brand switching) results over time. Observed brand switching between local and imported rice brands among urban consumers in Nigeria has been attributed to consumers' perceived benefits derivable from quality attributes from the two brand categories. Consumers are more likely to buy the brands they perceive possesses higher benefit.

Several reasons may be responsible for the brand switching behaviours of many consumers especially in the food and beverage industry. Umeshanand (2008) outlined the factors responsible for brand switching to include: (a) inconsistent brand positioning of the product and brand; (b) low research and development which do not provide improvisation in product quality and standards; (c) customers finding it uncomfortable if quality of products starts falling; (d) unavailability of product brand and variant which customers demand for; (e) uniqueness and variety in other brands; (f) price escalation or availability of other brands at competitive price; and (g) kleptomaniac customers who are not advocates of brand loyalty, but after consumption and taste of every kind of products and utility possession.

Chaarlas and Rajkumar (2012) posited that, if a consumer's tendency to switch can be estimated, the market can be modelled to indicate future market share and the relative positioning of the competing brands. It of obvious importance to determine consumers' switching tendency for local rice as this will provide useful insight into the market shares of local rice brands especially in the future. This is on this basis that the impact of government policies and programmes on self-sufficiency in rice can be measured.

2.4 Dynamics of consumers' brands switching and market share movement

The Nigeria rice market is composed of two broad competing brands of local and imported rice. As shown in Figure 2.1, each purchasing act, viewed in a dynamic perspective, can be described in terms of three origins and three destinations.

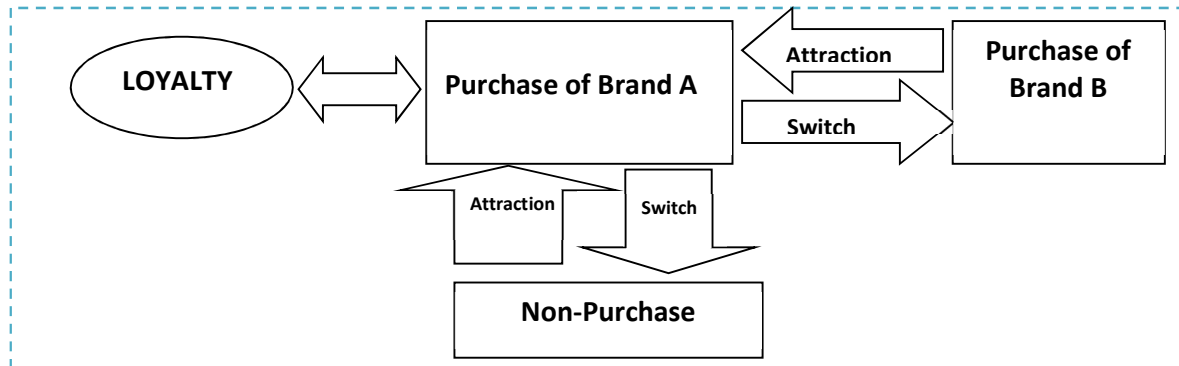


Figure 2.1: The brand switching dynamics of rice consumers
Source: Lambin (2007)

For each brand, the loyalty rate is the percentage of buyers who, having purchased brand A in the previous period ($t-1$), continue to buy brand A in the current period (t). The attraction rate is the percentage of buyers who, having purchased a competing brand in period $t-1$, purchase brand A in period t . These percentages/proportions, known as transition probabilities which can be estimated through survey, is useful to rice marketers in: explaining market share movements over time; describing the underlying competitive dynamics; and formulating predictions on market developments if the observed transition probabilities will remain unchanged within a reasonable planning horizon (Lambin, 2007).

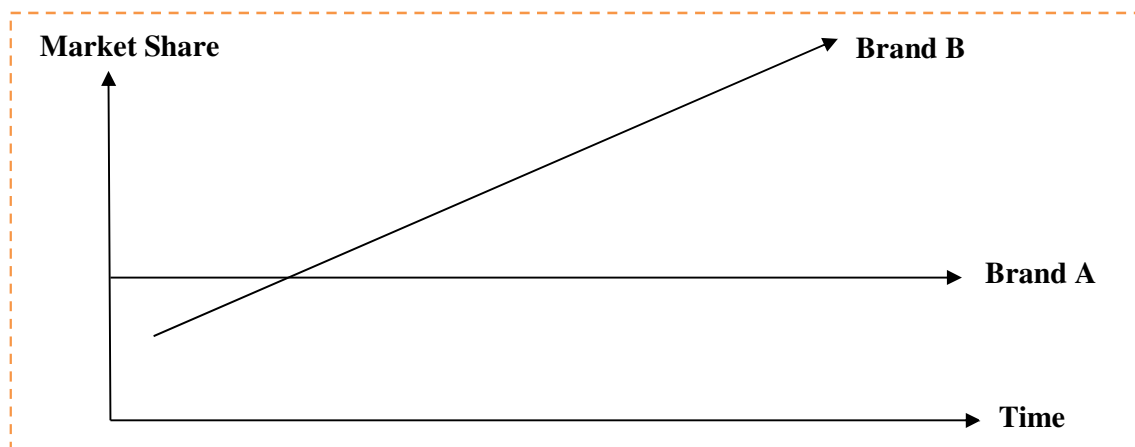


Figure 2.2: The dynamics of market share movements
Source: Lambin (2007)

The stability of brand A's market share can be interpreted in two very different ways. It is either a fixed number of consumers buy the same quantity of brand A at regular intervals, or the number of consumers dropping brand A is equal to the number of consumers switching to brand A. The entry rate therefore compensates exit rate exactly. Based on aggregate market data, it is not possible to decide which the true state is. Similarly, one could give the following explanations for brand B's growth. Brand B has a fixed number of loyal buyers to whom new buyers are added at a regular pace; in this case, entry rate is higher than exit rate. The number of brand B's buyers remains unchanged, but some of them are purchasing an increased quantity per buying occasion.

2.5 Random utility theory of brand-switching behaviour of consumer

Random utility theory assumes that consumers as economic agents seek to maximize their expected utility subject to the choice set they are given. The individual's utility is considered a random variable because the researcher has incomplete information (Manski, 1977). Let utility be the sum of observable and unobservable components, $U_{jt} = V_{jt} + \varepsilon_{jt}$, where U_{jt} is the latent, unobservable utility for the j^{th} alternative in choice scenario t ; V_{jt} is the observable, systematic and deterministic portion of utility determined by the attributes; and ε_{jt} is the random component of utility, independently and identically distributed over all alternatives and choice scenarios. The probability that alternative j will be selected is the probability that the added utility from this selection is greater than (or equivalent to) choosing another alternative presented in the choice experiment. The utilities associated with each alternative are not directly observable because they include an unobserved component. Therefore, the probability of selecting alternative j is given by:

$$P(j) = P(v_j + \varepsilon_j \geq v_k + \varepsilon_k), \forall j \neq k \in N \quad [2.1]$$

where N is the total set of alternatives available to the participant (Boxall and Adamowicz, 2002). The resulting probability that alternative j is selected can be expressed as:

$$P(j) = \frac{e^{\mu\beta X_j}}{\sum_{k \in N} e^{\mu\beta X_k}} \quad [2.2]$$

where μ is a scale parameter which is inversely related to the variance of the error term (Lusk et al., 2003) and β is a vector of parameters (Boxall and Adamowicz, 2002). Assuming the systematic component of the total utility U_j is linear in parameters, the specification of the general model is given by:

$$V_j = \beta_1 x_{j1} + \beta_2 x_{j2} + \dots + \beta_n x_{jn}, \quad [2.3]$$

where x_{jn} is the n th attribute for alternative j , and β_n is a vector of parameters associated with the n th attribute of the j^{th} alternative. Multinomial logit models assume that homogeneous preferences exist for the product attributes. This implies that multinomial logit models assume that all respondents share the same coefficients for a given attribute, an assumption of consumer homogeneity across preferences.

Random Utility models are used to predict probabilities of choices being made and they attempt to relate the probability of making a choice to various explanatory factors. Probabilities must be between zero and one. Estimation of parameters to maximize the probability of the choice $Y_i = 1$ by use of a linear probability model and ordinary least squares (OLS) is not acceptable due to the return of probabilities outside the unit interval. In addition, the use of a linear probability model results in heteroscedastic errors and therefore, t-tests of significance are not valid. Under relatively general conditions, the maximum likelihood estimator is consistent, asymptotically efficient and asymptotically normal. For these reasons, it is preferable to use either a logit or probit model. Different random utility models are obtained by specifying different distributions for the unknown component of utility, ε_{in} , and deriving functions for the choice probabilities (Ben-Akiva and Lerman, 1985; Train, 1986). If the random term is assumed to have a logistic distribution, then the above represents the standard binary logit model. However, if it is assumed that the random term is normally distributed, then the model becomes the binary probit model (Maddala, 1993; Ben-Akiva and Lerman, 1985).

However, recent literature such as Lusk et al. (2003), Alfnes (2004) and Tonsor et al. (2005) suggest that consumers possess heterogeneous preferences and therefore employing a model that allows heterogeneous preferences is appropriate. A common method of evaluating preference heterogeneity is estimation of random parameters logit (RPL) models (also called mixed logit). The RPL model allows for random taste variation within the surveyed group of consumers. The RPL is free of the independence of irrelevant alternatives assumption and

allows correlation in unobserved factors over time (Revelt and Train, 1998; Train, 2003; Tonsor et al., 2005). By using the RPL, we can directly estimate the heterogeneity in consumer preferences across the evaluated attributes. The random utility of the consumer (U) underlies the RPL model. Following Tonsor et al. (2005), the utility of attribute j for ith individual in choice set t in the RPL model is generally presented as follows:

$$U_{ijt} = v_{ijt} + [\mu_{ij} + \varepsilon_{ijt}], \quad [2.4]$$

where v_{ijt} is the systematic portion of the utility function, μ_{ij} is an error term which is distributed normally over consumers and alternatives (but not choice sets), and ε_{ijt} is the stochastic error, independently and identically distributed over all consumers, attributes, and choice sets. A panel set of data is described here, in which the cross-sectional element is consumer i and the time-series component is choice scenario t (Alfnes, 2004; Tonsor et al., 2005). In the random parameter logit model, the probability of consumer i choosing alternative j in choice set t is $P(U_{it} \geq U_{ikt})$, overall possible k attributes. Assuming that v_{ijt} is linear, the utility function can be expressed as:

$$v_{it} = \beta_{i1}x_{1it} + \beta_{i2}x_{2it} + \dots + \beta_{ij}x_{ijt} \quad [2.5]$$

where x_{ijt} is the j^{th} attribute for choice set t , and β_j is a vector of preference parameters associated with the attribute of the j^{th} alternative of the i^{th} consumer (Alfnes, 2004; Tonsor et al., 2005).

2.6 Consumer decision-making procedures and models

Mowen (1987) defines consumer decision making as a process in which a consumer purchasing products or services evaluates two or more programmes and makes a choice before and after purchase. Nicosia (1966), Engel et al. (1968) and Howard and Sheth (1969) earlier proposed the three major ‘comprehensive’ models for consumer decision making. These models attempted to trace the psychological state of individual consumers from the point at which they become aware of the possibility of satisfying a material need by purchasing and consuming a product to their final evaluation of the consequences of having done so. Engel et al. (1986) suggested that high involvement with a product results in an extended problem-solving process, which starts with problem recognition, followed by an information search, alternative evaluation, purchase, and post purchase activities. This process is aided by an active

information processing sequence involving exposure, attention, comprehension, yielding/acceptance, and retention. The choice determined by the outcome of the information process-aided decision sequence may have satisfying or dissonant outcomes.

Festinger (1957) first introduced the theory of cognitive dissonance for the consumer, which influence future purchasing. Engel and Blackwell (1982) also pointed out that environmental influences may affect the decision sequence acting on the consumer's motivation and intention, and that unpredictable factors (such as non-availability of the desired brand or insufficient funds) may result in modification of the actual choice made by a consumer. This model assumes that observed consumer behaviour is preceded by intrapersonal psychological states and events (attitude-intention-purchase sequence). Moreover, the model depicts these psychological events as outputs of the processing of information, taking for granted that consumers seek and use information as part of their rational problem solving and decision-making processes. Thus, one of the main criticisms of the extended problem-solving models is that they assume that consumers are complex and rational decision makers (Olshavsky and Granbois, 1979). Ehrenberg (1988) criticized these models because they cannot be precisely tested. The relationships between concepts are poorly specified and they lack agreed methods for measuring the concepts. It is argued that while, consumers for some purchases follow these steps in decision-making, and such a process is not an accurate portrayal of many purchase decisions (Olshavsky and Granbois, 1979).

Researchers recognize that decision makers possess a repertoire of strategies. A consumer evaluates the effort required to make a choice, and then he or she chooses a strategy best suited to that level of effort required. The sequence of events is known as constructive processing. This process allows consumers to tailor their degree of cognitive "effort" to the task in hand (Bettman and Zins, 1977). Thus, the limited problem solving and habitual decision-making models, as described below, were developed to account for behaviour in purchase situations where consumers are not highly involved and therefore do not undertake a rigorous problem-solving approach.

Given the shortcomings of the earlier models and focusing on the procedure of a consumer decision-making, the "Engel, Kollat, and Blackwell (EKB)" model considers internal/external factors and their interactions (Engel et al., 1968). This model comprises four principal parts, input, information processing, decision process and variables influence decision process. In 1993, Rice (1993) modified the EKB model by including a feedback loop. Foxall (2005) also

suggested the importance of the post purchase evaluation and that the post purchase evaluation is crucial due to its influences on future purchase patterns. Yoon and Uysal (2005) suggested that managers should establish a higher consumer satisfaction level to create positive post-purchase consumer behaviour to improve and sustain destination competitiveness. A framework for analysing rice consumers’ decision-making processes should therefore incorporate consumers’ post-purchase experiences.

2.7 Theoretical framework of consumer willingness to pay

A simple theoretical framework, which has been used by some authors (Millock et al, 2002; Bonti-Ankomah and Yiridoe, 2006) to analyse consumer behaviour towards food products, is shown in Figure 2.3. Consumers decide whether to buy a product or not based on three main aspects: knowledge, attitude and intention. Knowledge about products and their benefits influences their willingness to pay for the products. Knowledge of people is affected by type and quality of information made available to consumers. Advertisement, quality packaging, labelling and certification play pivotal role in knowledge enrichment. Once a consumer is ready to buy, the next step is to see how much he or she is willing to pay for the product. Purchase behaviour reflects the real WTP and the consumer gains positive or negative experiences, which will reversely affect consumers’ WTP in future. Knowledge and awareness have respectively direct and indirect effects on attitudes toward consumer to choose the products, and the willingness to pay a price premium, so they are important factors determining the demand. Thus, awareness and knowledge about the food product are critical in the consumer willingness to pay more for the product.

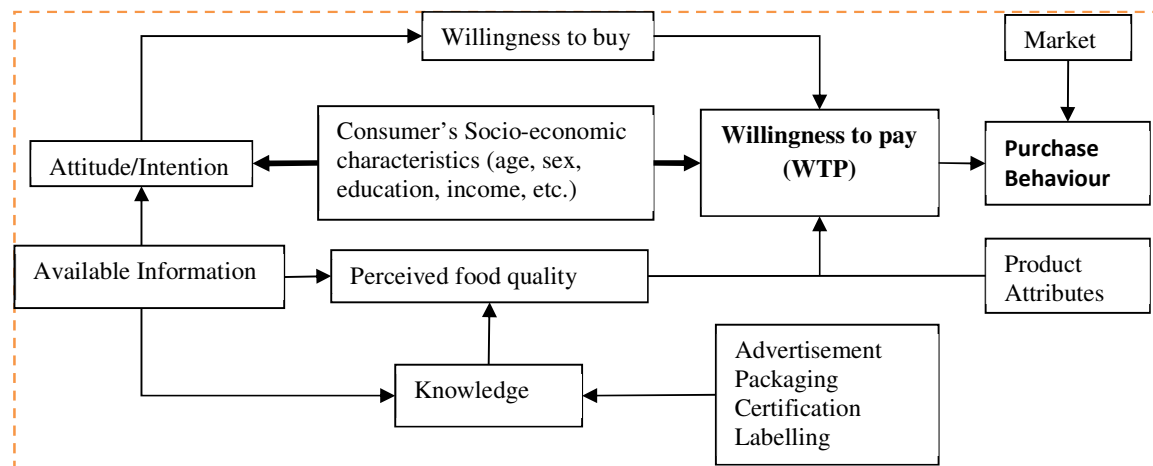


Figure 2.3: A framework for consumer behaviour towards food products (Millock et al, 2002)

The market price of a brand influences consumer's brands switching behaviour in two ways-- directly and indirectly. Research findings have shown that there is direct positive relationship between quality and price (Sproles, 1977; Riesz, 1978). Most consumers directly believe and perceive higher price as a true reflection of higher quality and therefore their tendency to switch preference (or not) in favour of those brands with higher prices (if affordable). On the other hand, consumer's brands switching behaviour is directly influenced by the brands prices depending on the consumer's income level. A consumer who likes a rice brand may not buy it simply because he/she considers it too expensive and may therefore go for a cheaper brand. Price therefore is the last and most important factor that directly determines consumer's brands switching behaviours (Kassali et al, 2010; Saeed et al, 2011). Switching behaviour reflects the real consumer behaviour because the consumer gains positive or negative post-purchase experiences, which will reversely affect his preference switching or inertia in future.

2.8 Categories of food consumers

Consumer's peculiar or personal factors are included as one of the determinants of consumer purchase behaviours. The relative importance of rice quality attributes differs between consumers. Generally, the processes of food choice and quality perception are characterized by individual differences. During shopping, consumers are often exposed to various kinds of quality attributes, and in the way they prepare and eat their meals, with resulting differences in the quality experienced during consumption as well as general perception about the food. Furthermore, the purchase motives driving the food choice and quality perception process will differ between consumers. To take account of these differences, it is useful to distinguish between different categories of food consumers. We categorize consumers according to their different ways of shopping for food, ways of preparing meals, eating situations, ways of weighting quality dimensions and purchase motives for food, i.e. their food-related lifestyle (Brunsø and Grunert, 1998), which we define as the general pattern of how consumers use food to fulfil basic motives or attain life values.

The uninvolved food consumer: Food is not a central element in the lives of these consumers. Consequently, their purchase motives for food are weak, and their interest in food quality is limited mostly to the convenience aspect. They are also uninterested in most aspects of shopping, do not use specialty shops, and do not read product information, limiting their exposure to and processing of food quality cues. Even their interest in price is limited. They have little interest in cooking, tend not to plan their meals, and snack a great deal. Compared

to the average consumer, these consumers are single, young, have part- or full-time jobs, average to low-level incomes, and tend to live in big cities.

The careless food consumer: In many ways, these consumers resemble the uninvolved food consumer, in the sense that food is not very important to them, and, except for convenience, their interest in food quality is correspondingly low. The main difference is that these consumers are interested in novelty: they like new products and tend to buy them spontaneously, at least if they do not require a great effort in the kitchen or new cooking skills. The careless food consumer is in general, as the uninvolved food consumer, young and often lives in big cities. However, in contrast to the uninvolved, these consumers are more educated and they lie in the upper income brackets.

The conservative food consumer: For these consumers, the security and stability achieved by following traditional meal patterns is a major purchase motive. They are very interested in the taste and health aspects of food products, but are not particularly interested in convenience, since meals are prepared in the traditional way and regarded as part of the woman's tasks. The conservative food consumers have the highest average age and they are the least educated. Households are on average smaller, and household income is in general lower than that of the other segments. These consumers tend to live in rural areas.

The rational food consumer: These consumers process a lot of information when shopping; they look at product information and prices, and they use-shopping lists to plan their purchases. They are interested in all aspects of food quality. Self-fulfilment, recognition and security are major purchase motives for these consumers, and their meals tend to be planned. Compared with the average food consumer, this segment has a higher proportion of women with families. The level of education and income in this segment differ from country to country, but they tend to live in medium-sized towns and a relatively large proportion of these consumers do not work.

The adventurous food consumer: While these consumers have a somewhat above-average interest in most quality aspects, this segment is mainly characterized by the effort they put into the preparation of meals. They are very interested in cooking, look for new recipes and new ways of cooking, involve the whole family in the cooking process, are not interested in convenience and reject the notion that cooking is the woman's task. They want quality, and demand good taste in food products. Self-fulfilment in food is an important purchase motive. Food and food products are important elements in these consumers' lives. Cooking is a creative and social process for the whole family. The adventurous food consumer is in general from the

younger part of the population, and household size is above average. The adventurous food consumers have the highest educational level and have high incomes. They tend to live in big cities.

2.9 Consumer value perception

Perception can be defined as an event the roots of which are to be found beyond the restricted confines of awareness and often closely intertwined with the observers' private world of memories and emotional experience (Uwe et al., 1983). Katona and Strumpel (1978) noted that attitudes and perception are closely related. Both these concepts tend to affect one's perceptions and shape one's behaviour. According to Lai et al. (2009), value is at the heart of consumers' perception when pursuing an exchange. Similarly, Park et al. (2006) observed that the consumer's attitude and decision to return or maintain current product brand is always influenced by the extent to which he perceives receiving 'value for money'. Hence, it was concluded that there is strong link between perceived value and future intention (Kuo et al., 2009).

Generally, value perception can be defined as a judgment or a valuation by the customer of the comparison between the benefits or utility obtained from a product, service or relationship, and the perceived sacrifices or costs (Zeithaml, 1988). According to Eggert and Ulaga (2002), customer's value perception in the marketplace is "the trade-off between the multiple benefits and sacrifices of a supplier's offering, as perceived by key decision-makers in the customer's organization, and taking into consideration the available alternative supplier's offerings in a specific use situation. This definition has three important elements. Firstly, it notes that value has multiple components, secondly, it acknowledges the subjectivity of value perceptions, and thirdly, the importance of competition is identified. Ulaga and Eggert (2006) advanced the trade-off notion and focused on the multidimensional nature of benefits and sacrifices rather than tangibles.

First, the multiple benefits refer to a mixture of product/service attributes and/or technological support (Monroe, 1990). Roig et al. (2006) who noted that there are two approaches to the conceptualization and dimensionality that could be identified in the investigation of perceived value support this observation. The first approach defines perceived value as a construct configured by two parts, one of benefits received (economic, social and relational) and another of sacrifices made (price, time, effort, risk and convenience) by the customer. Thus, it is argued that value for the consumer results from the personal comparison of the benefits obtained and

the sacrifices made. Dodds (1991) who noted that customer perceived value is not only a take factor (i.e., the benefits that a purchaser obtains from the vendor's contribution) but also a give factor (i.e., the buyer's costs of receiving the offering) further support this argument. In addition, service is also a logical driver of perceived value (Parasuraman and Grewal, 2000). Sellers provide outstanding sales services to increase the benefits perceived by the buyer and to decrease the buyer's sacrifices, monetary and non-monetary costs, such as money, time, effort, and mental stress (Dodds, 1991; Parasuraman and Grewal, 2000). Thus, for the customer to buy the product, it has to be endowed with value, either by incorporating benefits or by reducing the sacrifices to the customer, setting a price that the latter can afford (Dodds, 1991).

Second, customers' perceived value is subjective, not objective, in nature (Kortge and Okonkwo, 1993). This means that different customers may have a variety of perceived values for the same product/service. (Roig et al., 2006) observed that value is only perceived by customers, and cannot be determined objectively by the seller. Only the customer is able to perceive whether a product offers value. The benefits component, or what a consumer receives from the purchase, includes the perceived quality of the product offered and a series of psychological benefits (Zeithaml, 1988). These psychological benefits are encapsulated in the affective dimension that captures emotional and social aspects of the individual. The affective dimension on the other hand is categorised into an emotional dimension (relating to feelings or internal emotions) and a social dimension (relating to the social impact of the purchase).

Third, customers' perceived value is closely tied with competition in the market place. Competitors generate sustainable competitive advantage by means of bringing a better trade-off between utilities and sacrifice in a merchandise/service. The quality of product is a fundamental element in the perception of perceived value, as it is the most difficult thing for competitors to imitate and the base on which differentiation and competitive advantage are sustained (Parasuraman and Grewal, 2000).

Studies have emphasized on the need for marketers to be concerned on how customers perceive and evaluate the value of product brands and the after-sales services they offer (Boshoff and Gray, 2004; Ulaga and Eggert, 2006; Naidoo and Leonard, 2007) if they are to effectively compete for market share.

2.10 Food quality types that influence consumers' perception and attitudes

Consumers' perceptions are often influenced by four different types of food quality as identified by Grunert (1997). It is important to review the distinction between objective and subjective quality, which is important when discussing the perception of food quality from a consumer point of view.

- i). *Product-oriented quality*: This covers all the aspects of the physical product that together give a precise description of the specific food product. Examples of product quality may be fat percentage and muscle size of meat, cell content in milk, starch content in potatoes, and alcohol strength of beer, etc.
- ii). *Process-oriented quality*: This covers the way the food product has been produced. For instance, without pesticides, without growth inhibition, by organic production, according to regulations about animal welfare, etc. Descriptions based on these aspects provide information about the procedure used to make the product, and these aspects may not necessarily have any effect on the product's physical properties but may contribute in consumers' buying decisions.
- iii). *Control-oriented quality*: This can be defined as the standards a product has to meet in order to be approved for a specific quality class. Example is the standard for the weight of eggs for various size classifications, the EUROP classification of meat, etc. Quality certification schemes like ISO 9000 deal mainly with quality control. Quality control therefore deals with the adherence to specific standards for product and process-oriented quality, irrespective of at which level these have been defined. We can say that product-oriented quality and process-oriented quality deal with the level of quality, whereas quality control deals with the dispersion of quality around a predetermined level.
- iv). *User-oriented quality*: This is a subjective quality perception from a user point of view. A user can be the end-user or an intermediate user in the food chain (e.g. a retailer). Product-oriented quality, process-oriented quality and quality control can also be said to constitute objective quality, since they can be ascertained by measuring and documenting aspects of the product and the production process, and several such measurements of the same product or production process will be identical within the limits of measurement error. User-oriented quality can be said to constitute subjective

quality, since it can be measured only at the end-user, and can differ for the same product between users.

The four types of food quality are interrelated. Specifically, user-oriented quality is affected by all three types of objective quality. However, these inter-relationships are by no means clear (Steenkamp and van Trijp, 1991), and user-oriented quality can also be influenced by factors that are not characteristics of the product itself, such as the purchase situation, type of retail outlet, price, brand, etc. Much of the discussion on quality in the food industry is concerned with product and process-oriented quality and quality control, while the consumer evaluates and pays for subjectively perceived quality. The amount a consumer is willing to pay for a product depends on this subjectively perceived quality, which is related to, but not the same as, objective quality. Improvements in objective quality, which have no effect on consumers' perceived quality, will have no commercial effect, and hence no positive effect on the producer's competitive situation.

2.11 Marketing mix: A tool for influencing consumers' perception

The roles of marketers' strategies in remaining competitive has emphasized in literature. According to Kotler (2000), marketing mix is one combinational marketing strategy tool used by one company to deliver marketing purposes and control variables in a target market. There are four types of variables (4P) in marketing mix:

- i). *Product*: supply of a competitive product combination for new products continuously developed to satisfy consumers' requirements and excellent product capabilities referred to as a robust and essential support of marketing operation.
- ii). *Price*: a profitable price made by one enterprise to match segmentation, targeting and positioning, correspond to another marketing mix, create enough attraction and competition, and make an enterprise's marketing strategy or purpose substantially fulfilled with lots of internal/external factors evaluated. Price cognitions and price affect mediate the effect of price increase on consumer behaviour (Klaus et al., 2009).
- iii). *Place*: a system designed by an enterprise which considers its location and other essential factors affecting marketing mix, analyses customers' requirements, constructs purposes, and evaluates and ensures major programmes for one essential place.

iv). *Promotion*: extra short-term, occasional and attractive incentives supplied to specific consumers by promoters for expectably specific responses (for example, free trial or purchase) taken by consumers. However, the concept that the firms can determine the four Ps as the elements of marketing strategy is obsolete (Clemons, 2008). Consumer perception over the price determines what the consumer is willing to buy. Highly successful high-margin consumer products are largely based on word-of-mouth and “word-of-mouse” promotions (Riedl et al., 2002).

Most of the well-known imported rice brands in Nigeria have been popular partly because of the aggressive advertising and promotions that emphasizes the brands’ quality attributes. Therefore, Van Der Waladt et al. (2007) suggested that marketing and advertising managers should strategically place their product prominently in promotion to obtain the desired impact. However, attaining such desired impact also requires that factors influencing the marketing strategies should include variables in consumers’ perception (Chiliya et al., 2009).

2.12 Revealed versus Stated preference methods of estimating consumer behaviour

A key area of competition analysis is an assessment of how consumers may likely to respond to changes in the qualities of products, which are available to them in the market, and how their behaviour may change if the alternatives available were to change. In many situations, the analyst would wish to look at the revealed trends in market behaviour though this is not always feasible. As a result, a significant literature has been developed around survey methods for estimating individuals’ willingness-to-pay (WTP) in the absence of revealed market variation. These methods are now widely used for both developing optimal pricing strategies and in the forecasting of responses to price changes and for modelling demand functions. At the highest level, the literature classifies the different methods for estimating WTP into revealed and stated preference methods as shown in Figure 2.4.

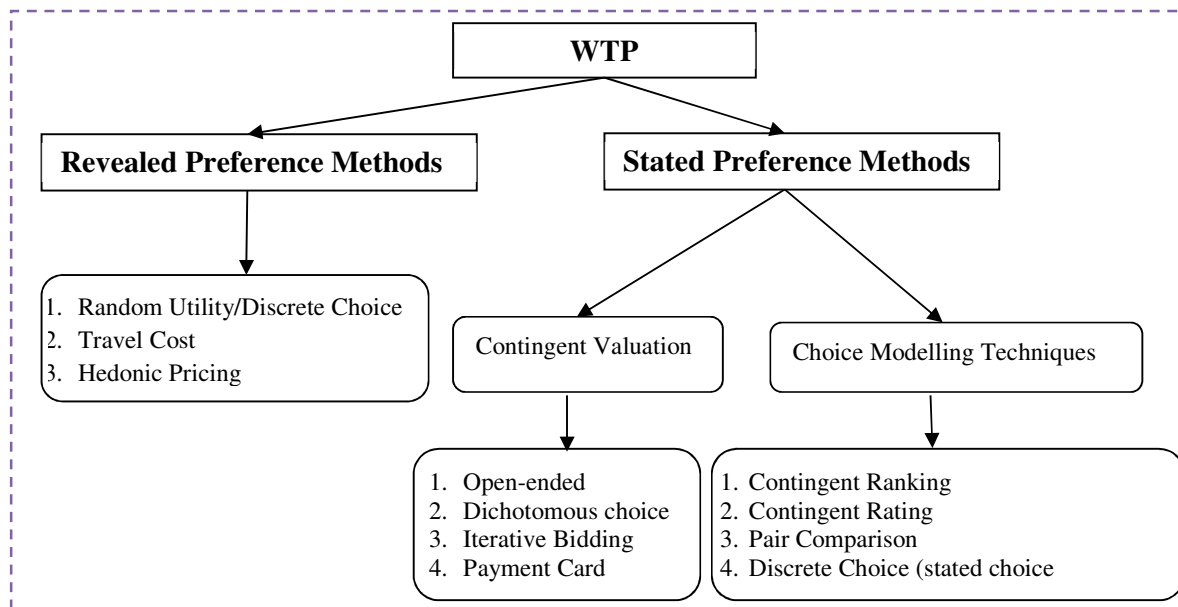


Figure 2.4: Classification of the different methods of estimating WTP
Sources: Kjaer (2005)

Revealed preference methods (RP) refer to the observation of preferences revealed by actual market behaviour and represents real-world evidence on the choices that individuals exercise. In some cases, however, the behaviour that is of interest to the analyst may not be observable or currently available. In such cases, it is necessary to make judgments about potential impacts in the absence of real-world evidence on how individual consumers may respond. Stated preference (SP) methods allow examination of such hypothetical situations. Stated preference data are mainly used when revealed preference (actual choices) data are unavailable or markets do not currently exist for the attributes. However, this study focuses on revealed preference approaches as rice brands are traded in the market.

Some key differentiating characteristics of revealed and stated preference methods are shown in Table 2.1. A prerequisite for using RP methods is that there must be an active market for the good or service in question and hence an observable market demand curve (Kjaer, 2005). Also, compared to stated preference (SP) methods that can capture total economic value, RP methods merely capture “use value” (Kjaer, 2005); that is, it is possible within SP methods to also quantify option and non-use value.

Table 2.1: Comparing revealed and stated preference methods

	VALUATION METHOD	
	Revealed Preference	Stated Preference
Approach	Consumer preference revealed through their actions in real markets	Consumers are asked to state their preferences for hypothetical scenarios/alternatives that comprise a set of attributes and different levels of these attributes
Direct Methods	Competitive market price (observation of market prices)	Contingent valuation (directly asking individuals their WTP)
Indirect Methods	<ul style="list-style-type: none"> • Travel cost method • Hedonic pricing method • Random Utility/Discrete choice 	Discrete choice experiment (estimation of WTP by use of price variable)
Applicable Goods	Real goods	Hypothetical and real goods
Disadvantage	<ul style="list-style-type: none"> • Limited to supply information regarding values of goods that have been experienced • Limited number of cases where non-market values/goods exhibit a quantifiable relationship with market goods • Choice sets, attributes of choice options and individual characteristics are not controlled and/ designed <i>a priori</i> but rather occur/co-occur. 	<ul style="list-style-type: none"> • Observed preference may not reflect actual behaviour • Absence of incentive for consumers to provide accurate responses • Incentive for respondent to behave strategically • Overall costly evaluation (more complicated to design and analyse, and costlier to undertake survey as shown material often required for more complex choice task) • Vulnerable to violation of economic decision making
Advantage	<ul style="list-style-type: none"> • External validity is maximized because the choices observed are real market choices in which consumers have committed money, time and/or resources • Low-cost evaluation 	<ul style="list-style-type: none"> • Provide preferences and information that are otherwise impossible to reveal when actual choice behaviour is restricted in some way

Source: Kjaer (2005)

A common issue with RP data is the high degree of collinearity among attributes in market data, making it difficult or impossible to predict the effect of independent variation in an attribute (Kroes and Sheldon, 1988). Using SP methods, it is possible to overcome multicollinearity issues because the analyst has the flexibility to tailor the survey and construct hypothetical situations to elicit the desired information and avoid collinearity among attributes.

On the other hand, SP data is also subject to biases that arise from the hypothetical nature of the SP method. Specifically, respondents have no incentive to make a choice in an SP experiment in the same way, as they would do in the real situation (Wardman, 1988). In addition, aspects of market choice context, such as search costs, do not exist or are not part of SP experiments. Moreover, few well-designed survey steps should be followed to minimise the impact of several experimental design issues.

Finally, there are analytical issues to consider when comparing SP with RP. For example, the experimental alternatives in an SP task are defined by the attributes presented, while in RP data there may be attributes observed (or perceived) by the consumer but unobserved by the analyst, and these will be transferred into choice model error terms (Keane, 1997, Kjaer, 2005). The following are the RP methods that this study will apply.

i). Hedonic Pricing Method

It may be possible to estimate the value placed on different rice brands by examining how the prices of various rice brands vary with different attribute levels they possess once all other aspects that may influence rice prices have also been taken into consideration. The main disadvantage with hedonic pricing is multi-collinearity between prices and explanatory variables, example, poorer quality rice brands tend to be found in rural markets or markets where majority of buyers are low-income people. Finally, the key prerequisite for such analysis is to have a functioning market in which it is believed that prices are truly set by the market.

ii). The Travel Cost (TC) Method

This is a non-market valuation technique that was developed for use in environmental valuation and has also been applied to value recreational demand (e.g. fishing, hunting, boating and forest visits) (Bateman et al., 2005). Like hedonic pricing, the travel cost method seeks to place a value on non-market goods by using consumption behaviour in the market, where travel cost is a measure of the preferences for the good. This is typically applied in situations where there is a desire to estimate a willingness-to-pay value for a service or good which is available at a constant price.

iii). Random Utility/Discrete Choice Model

Another approach for modelling consumer preferences and indirectly estimating WTP is through discrete choice analysis. Random utility-based discrete choice models have been

developed in this context to both predict individuals' behaviour and to draw inferences about welfare change on the bases of observed choices (McFadden, 1980; Ben-Akiva and Lerman, 1985). The choice underlying the random utility model is the actual choice of the good or service under investigation. It is assumed that individuals make trade-offs among costs and good or service characteristics. Analyses of these choices allow the estimation of the benefits of the characteristics of the good or service.

According to Ken (2001), discrete choice holds many advantages over traditional conjoint analysis. The following advantages of Discrete Choice Models of RP methods place them above the traditional conjoint analysis such as the SP methods.

- i. It is a more realistic exercise for individuals to indicate which product they would purchase rather than rating/ranking since this is what they do in the marketplace.
- ii. In discrete choice, individuals can be given the option to select "none" of the products, thus indicating that they do not find any of the products appealing.
- iii. Discrete choice allows for much more complex statistical modelling to be performed, which often yields better information (e.g., interactions, alternative-specific effects, cross-effects, etc., can be accommodated).
- iv. As with traditional conjoint analysis, the utilities that come from discrete choice can be used to develop market simulators and can also be used to examine whether different segments exist using either latent class analysis or Hierarchical Bayes.

2.13 Factors influencing consumers' perception, preferences and willingness to pay

Many factors influence consumer's perception, preference and willingness to pay premium price on a product. These factors, apart from having direct influence on the consumer purchase decision, also have indirect influence through their interaction with one another (interaction effect). However, the levels of influence of these factors differ. Several studies have attempted to explain the roles each of these factors play as explained below.

- i). *Consumer Socio-economic Characteristics*: Segmentation and profiling of consumers by socio-economic characteristics is a common method, because data are easy to obtain and measure (Myers, 1996). However, many studies conclude that the influences of socio-economic features on consumption behaviour are either insignificant or contradictory (Jain and Kaur, 2006; Doran, 2009; Verain *et al.*, 2012). Socio-economic factors are therefore considered insufficient to describe consumer behaviour, and it is

recommended that they be complemented by psychographic characteristics of consumers (Dagevos, 2005; Doran, 2009; Verain *et al.*, 2012).

Consumer's socio-economic factors such as age, occupation, gender, marital status, income and education level play vital role in determining consumer's purchase decisions. According to Bamidele et al (2010) and Fakayode et al (2010), the major factors that significantly influence household preferences for either a combination of local and imported rice or the imported rice only to the local rice were the income of the head of household, household size and the educational status of the heads of household, the price per unit kilogramme of rice, however, was not a significant factor. Based on gender, studies have shown that male and female in aspects of their consumer behaviour, from the products they tend to buy to their responses to advertising and product positioning (Buttle, 1996). Laroche and Saad (2000) who concluded that women appeared to have a lower threshold for elaborating on message cues, and thus made greater use of such cues when judging products support this finding.

In a study on the influence of consumers' socio-economic characteristics on rice consumption in South Eastern Nigeria, Emodi and Madukwe (2011) observed that sex, age, marital status, education and household size were statistically significant in influencing consumers' decision to consume rice in the study area. They also found that women and youth were more involved in rice consumption than their male counterparts were. Martin and Bush (2000), who noted that, apart from direct consumption, women as mothers, support their findings and role models still play the dominant role in influencing the teenagers' lifestyles and consumption patterns. While gender and age are important determinants of buying decisions, educational level can influence consumption of processed food among adults especially when accurate and consistent messages are conveyed through various media and/or on food packages (Kearney et al., 2000; Srinivasan, 1994). In contrast, nutrition knowledge and good dietary habits are not strongly correlated. Education is related to lifestyle and job type, which may in turn influence consumer's food preference. Socioeconomic status of household decision makers is of paramount importance in analysing consumers' behaviours especially to important staple food such as rice.

- ii). *Price*: Consumers, if left to use their personal judgments, may be unable to make clear quality comparison among brands of the same product. For this reason, consumers

either engage in information search about the brands of a product, or base their purchases on market signals. Earlier literature on consumer behaviour has that many consumers follow market signals of quality such as advertising (Wiggins and Lane, 1983), brand popularity (Smallwood and Conlisk, 1979) and price (Farrell, 1980). In some cases, market signals are unlikely to reveal all the information consumers need about a product's attributes as contained in its various brands. Consumers' preference for different brands depends on the combinations of attribute levels of the various brands.

In the rice industry for example, the total quality attributes of a rice brand are reflected in the prices consumers pay (Goodwin et al, 1996). The price consumers are willing to pay for each quality attribute reflects the level of utility derived and the relative importance consumers attach to such attribute, as it has been shown in literature that consumers pay higher prices for attributes that are more important to them (Monroe, 1973; Abansi et al., 1990; Goodwin et al, 1996; Sonata and Rasa, 2010) thereby suggesting that consumers perceive higher prices as indicators of better quality. Even when it has been confirmed that there is very weak relationship between price and quality (Gerstener, 1985), price is still a critical overriding factor that influences customers' buying intentions especially in developing countries where higher prices reflect social class due to the wide gap in purchasing power of the rich and poor (Saeed et al, 2011). Sahay and Sharma (2010) found that consumers in developing countries do compare price irrespective of how strong the brand relationship is. However, this report conflicts with the findings of Lancon et al. (2003) who revealed that consumers in West Africa are much less sensitive to changes in rice prices compared to other local cereals. Consumers select the type of rice they purchase based on different criteria, price being only one of them. Therefore, higher prices may reflect a high demand for superior quality, the high production cost associated with high quality or dishonesty of sellers who find it profitable to cheat by conveying false market signals to buyers (Gerstener, 1985).

- iii). *Quality Attributes:* Attributes can be defined as the elements or features that an object possesses (Mowen, 1993). Peter and Olsen (1994) categorized attributes into concrete or abstract where concrete or physical attributes refer to the most objective, tangible characteristics of a product and can be assessed base on some criteria such as colour, shape, texture, etc., while the abstract or pseudo-physical attributes are intangible and

subjective characteristics that are not easily measured (Aaker et al, 1992). Early researchers' views product attributes as the physical properties of a product that were quantitatively and objectively measurable (Wu and Wu, 1998). However, later literature has expanded to include all evaluative criteria, such as price, brand name, etc. or subjective criteria's such as quality, style, benefit or value (Grapetine, 1995; Jamal and Goode, 2001). Other authors have also considered the intrinsic and extrinsic cues as evaluative criteria consumers employ when making a purchase decision (Forney et al., 1999; Liefeld et al., 2000).

Belch and Belch (1995) noted that it is based on quality attributes that a marketer differentiates and creates its own brand different from those of competitors. This is because marketers have found that a product's attribute performs a major role in determining the brands that consumers will consider and give serious attention when making a purchase decision (Kotler, 2002). As consumers are becoming more aware of the quality attributes of different products found in the market, they tend to choose products that closely match their tastes and preferences. The consumer behaviour model postulated by Lancaster (1966) shows that products are consumed for the characteristics they possess, other than the product itself, and are associated with consumer preferences/utility. A rice variety has a higher probability of being purchased if it contains little to no foreign matter, very few broken grains, has white grain, short grains and cooks fast. When consumers are satisfied with grain quality they are prepared to pay a premium for that variety. This presents evidence of price differentiation based on grain quality characteristics. These results are consistent with findings by Abansi et al. (1990) and Anang et al. (2011) that products such as rice which has multiple brands differentiate price according to quality attributes. For example, a study conducted by Adeyeye et al (2010) on consumer preference for rice consumption in Nigeria indicated that most Nigerians prefer imported rice because of its long and slender grains ease of preparation, cleanliness, acceptable odour and high amylase content, as opposed to some local rice varieties which contain dirt, grits and sometimes foul odour. They recommended placing emphasis on good processing methods as a way of improving consumer acceptance of local rice. Due to poor processing methods, local rice brands are less differentiated by urban consumers and are often defined with reference to the imported rice types (Lancon et al, 2003).

A study by Mhlanga (2010) empirically analysed the relationship between price and product attributes towards consumers choice for rice in Benin. Using the hedonic pricing approach and discrete choice modelling at the household level, the study found that consumers are willing to pay more for rice with less impurities, less broken grain, with long grains, cooks fast, white (compared to off white or yellow/brown) and sticky tender grains. The results also suggest that urban consumers pay higher premiums for better quality rice compared to rural consumers. The research findings demonstrated that consumers are highly responsive to rice quality characteristics and are willing to pay higher prices on perceived desirable attributes of rice. Each variety of rice found in the market has its own distinct characteristics determined by either genetics or postharvest handling or both. Consumers are faced with trade-offs in their purchasing decisions, choosing one variety from another means the consumer has to forego desirable characteristics of the alternative.

- iv). *Consumer Awareness of Food Safety and Nutrition*: The consumption habits and behaviours of urban consumers especially in developing countries are rapidly changing. Due to changing lifestyle and the increasing demand of urban jobs, preference for easy-to-cook and ready-to-eat food is fast rising among consumers in urban areas. Brown et al (2000) suggests the need for effective nutritional education for consumers as it has become increasingly apparent that their general food habits and behaviour pays little attention on the nutritional and safety attributes of food they consume. Other authors have found that consumers' buying behaviours are vastly influenced by awareness of the product they buy (Ramasamy *et al.*, 2005; Li et al, 2003). Kamenidou (2002), in a study on the purchasing and consumption behaviour of Greek households towards three processed peach products, revealed that households' perceptions of products' healthiness significantly influenced their purchasing decision. When consumers perceive a product to be safer and of higher nutritional/health benefit, they will be more willing to pay premium price (Li et al, 2003). This is consistent with Makatouni (2002) and Bonti-Ankomah and Yiridoe (2006) who in their separate studies found that apart from physical attributes, rice nutritional and safety attributes could influence consumer purchase behaviours especially now that urban consumers are becoming more conscious of food safety and nutrition. It appears that the level along the marketing chain, which the consumer buys, tends to reveal their food safety and nutritional concerns. This view is supported by Rees (1992) who found that consumers were

responding to messages about safety and healthy eating and were more concerned about the way in which food was produced and want safe, 'natural', high quality food at an appropriate price.

Food safety and nutritional concerns has been found to be strongly associated with modernization. Young people are now more interested on issues of food sustainability and behaviours (organic, short chain, food control) (Bissonnette and Contento, 2001) such that consumers are increasingly becoming aware of the greater pleasure from eating better quality, organic food (Soper, 2007). As people become more conscious of food safety and nutrition, the role of communication in public enlightenment becomes imperative. The food, health and environment are closely linked because communication tends to promote the "good food" in relation to its ability to respect the environment and ensure a healthy choice (Lea, 2005). Such communication, which often comes from various sources, must be consistent. This is because knowledge about health does not lead to direct action when individuals are unsure how to apply their knowledge. Furthermore, information disseminated on nutrition comes from a variety of sources and is viewed as conflicting or is mistrusted, which discourages motivation to change (De Almeida et al. 1997).

- v). *Brand Image and Loyalty*: Brand consciousness influences the purchasing behaviour of the consumers (Assael, 1987). Miller and Layton (2001) suggest that consumers stay with a brand to be assured of the consistent quality of the product they buy. The consumers who are brand conscious are less likely to desert current brands in favour of others or to try new products (Rose, 1995). In a study, Kumar et al. (1987) examined the factors influencing the buying decisions of respondents for various food products in India. They found brand image to be more important than the origin of the product, since the consumers were attracted by the brands. People have been found to recognize brands early in life. Vincent (2006) studied brand consciousness among children and revealed that children start to recognize product brands at an early age, and this influences family buying behaviour. These findings were helpful for parents in making purchase decisions of durable goods for the family.

Brand loyalty is very important in consumer decision-making process and some of the factors that significantly influence brand loyalty includes price of the preferred brand, efficiency of the preferred brand and influence of advertisement (Padmanabhan, 1999).

Only when the price of a brand is comparatively low, the consumers would naturally prefer to buy such a brand, otherwise consumers would continue to purchase the same brand they are used to. Low and Lamb (2000) concludes that well-known brands tend to exhibit multi-dimensional brand associations, consistent with the idea that consumers have more developed memory structures for more familiar brands. Consumers might be willing to expend more energy in processing information regarding familiar brands compared to unfamiliar brands. Once consumers are familiar with a particular brand, they are likely to develop brand loyalty and usually purchased the same brand name (Kamenidou, 2002). This assertion was expanded by Fournier (1998) who suggested that consumers form relationships with highly used brands and that the relationships remain strong and durable over time through positive feelings such as: affective and socio-emotive attachments (love/passion and self-connection), behavioural ties (interdependence and commitment), and supportive cognitive beliefs (intimacy and brand partner quality). However, Sahay and Sharma (2010) noted that operationalization of all these dimensions of brand relationships and how they influence brand switching have not been examined.

Studies such as Mazursky et al., (1987) and Fournier (1998) have found that consumers switch brand due to either the extrinsic motives (price) or intrinsic motives (desire to try out a new brand). Extrinsic motives to switch brands have been observed to be common among the experienced consumers as compared to the consumers with limited purchase experience (Mazursky et al., 1987). Even with the level of satisfaction, the consumers may change their repurchase decisions in the presence of the high switching barriers like interpersonal relationships, switching cost, and competitor's attractiveness (Jones, et al., 2000). Studies have shown that young consumers may change their loyalties towards a brand depending on the situation and the role they play. When they are independent, they also like to experiment with new brands whereas more serious and responsible roles may make them switch over to the brand used by their parents (Bravo et al., 2007). However, brand relationships and their impact on brand switching intentions is yet to be examined in this stream of literature (Sahay and Sharma, 2010).

Kim-Hyunah *et al.* (2005) examined the relationship among brand equity factors (brand awareness, brand image, brand preference and brand loyalty) and concluded that brand awareness has positive effect on brand image and brand preference, and recommended that the contract food service companies should focus on improving brand awareness

as a brand strategy. They also found that brand preference and brand image had significant positive effects on brand loyalty and therefore recommended that companies should strive to strengthen brand loyalty through building brand preference and brand image. Quality and image of the brand have been found to be the most important factors influencing brand preference (Gaur and Waheed, 2002; Sanjaya and Waheed, 2002). Vincent (2006) elicited that quality was an important factor that draws consumer towards branded products. Branded products were accepted as good quality products. People do not mind paying extra for branded products, as they get value for money. In addition, brand choice and store loyalty were found to affect the brand loyalty of the consumer (Singh and Singh, 1981).

- vi). *Information and Mass Media Advertising*: Many researchers have focused on marketing strategies rather than pure advertising. Consequently, there is limited research regarding the relationship between consumer switching behaviour and advertising (Barchard, 1990). However, based on previous studies, effective advertising can add value, capture the attentions of the customers, and enhance customers' loyalty (Hite and Fraster, 1988; Cengiz et al., 2007). Furthermore, professional service advertising is positively associated with customers' expectation of benefits and guides their purchasing behaviour. The perceived information and quality are the genuine factors able to raise consumer's WTP, especially the intellectual consumers (Ramasamy et al., 2005). Television, the most popular media and primary channel for advertising products, attracts consumer's attention by interesting, intuitional and repeating visual signals and consolidates consumers' confidence in food brands and distinguished producers. Hence, the consumer who gains food safety information from television tends to pay more (Lusk et al, 2004). Consumers' buying behaviours are vastly influenced by awareness and attitude towards the product and commercial television advertisements has been found be the most important source of information, followed by displays in retail outlets (Ramasamy et al., 2005). Consumers tend to recall faster what they see and hear. As Narang (2006) observed, a buyer does not stick to one brand because of his ability to recall different brand names when he goes for purchase, especially if he has learnt about the brands through repetitive advertising. Frequent adverts have been found effective in promoting brand recall especially when a product is associated with style and trend that it appeals to consumers and the brand name developed as a fashion statement (Narang, 2006).

- vii). *Buying/Carrying Convenience and Product Availability*: Kubendran and Vanniarajan (2005) in their study on consumption pattern of households found that urban consumers preferred mostly branded products compared to rural consumers. This is because in most urban areas, there are after-sales services for branded products such as delivery of goods to the consumers' homes. They also found that most significant factors influencing consumers' buying decisions were accessibility, regular supply, door delivery and the mode of payment. This is consistent with the findings of Shanmugsundaram (1990) who reported that carrying convenience and regular availability both play important role in influencing consumers' buying decisions especially for those products that are not delivered to the consumer doors-step such as food products.
- viii). *Market Retailer Information*: Market is a place acquaintance meet and possibly foster social and business relationships. Personal relationships built between retailers and consumers developed trust, which in turn leads to customer loyalty. Customers are more loyal and would likely buy from a store that offers warm and friendly services. Such customers are more likely to be influenced by information provided by the retailers. Two separate studies conducted in India by Gaur and Waheed (2002) and Sanjaya et al. (2002) support this assertion on consumers' buying behaviour for branded fine rice. These studies found that retailers were ranked as the prime source of information that influenced consumer buying decisions and the family members as the next important source of information about the branded fine rice. Retailers can provide valuable information on prices, quality, nutritional and safety, etc. that can influence consumer's decision on which brand of rice to buy. Because of these reasons, Krueckeberg (1990) recommended that retail employees be more closely associated with obvious service strategies, and that services be made more obvious and predominant in the promotion and advertising of the retail food store. The role of retailers well equipped with marketing information and strategies will go a long way in improving the customer base of local rice millers/distributors. Shivkumar (2004) reported that consumers, irrespective of their income groups, were mainly influenced to purchase by the retailers' recommendations. Services provided by retailers create an image of *helpfulness* to the customer, and helpfulness creates distinction. Obvious services and the perception of helpfulness should improve and create satisfactions for the retail food store customer.

Obvious services will provide an opportunity to make retail employees more significant to the customer (Krueckeberg, 1990).

- ix). *Country of Origin*: Literature suggests that country of origin is a key explanatory variable of willingness to pay a price premium; it influences product preferences directly and indirectly through perceived quality (Loureiro, 2000). According to Opoku and Akorli (2009) in their study on Ghanaian consumers' attitudes toward local and imported products, they found that rice consumers place highest value on brand name and country of origin, followed by price, taste and quality. Due to experiences with locally produced goods, most consumers in developing countries now prefer imported goods, which they perceive, are of higher quality. However, this perception may not always be true especially for food products given health and safety concerns. There are reports of imported rice being stored for many years before exporting them to developing countries including Nigeria (Punch, 2012).
- x). *Marketing Strategies*: Abarajithan and Ragel (2011) found that marketers' promotional, distributional and product mixes significantly influenced customers' switching tendency while pricing strategies had moderate influence on customers' switching tendency. Several studies have found a positive relationship between consumer purchase behaviour and food labelling (Kim et al., 2006; Chang and Li, 2005; Zhou and Peng, 2006). Olearius et al (2011) examined consumers' switching behaviour in retailing of dairy products in Germany. They found that switching behaviour is widely influenced by amongst other things, by percentage of private label products, percentage of special offers and price consciousness. Retail chains systematically used private label products and special offer prices to convince consumers to switch to their chain. Pricing, labelling and aggressive promotions of local rice brands could have positive impact on consumers' buying decisions.

2.14 Consumer behaviour and price-quality attributes relationships

Brand switching of consumer is based on variety seeking behaviour, motivations, curiosity and price motive (Hans and Trijp, 1996). The effect of quality variability on prices has been examined in earlier theoretical models by Griliches (1971), Rosen (1974), Palmquist (1984), Hager (1983), and McConnell and Phipps (1984). Price-quality relationships are often built using hedonic technique. For over seven decades, hedonic modelling techniques has been

applied in agricultural studies which includes Waugh (1929), Ladd and Martin (1976), Perrin (1980), Ethridge and Davis (1982), Carl, Kilmer, and Kenny (1983), and Wilson (1984).

The essence of analysing price-quality relationships is because the satisfaction of consumer needs is profitable for company when it delivers for customers a product that possesses the best-perceived price-quality relationship. It is important to note that the value of the complex of the product attributes is more important than the value of individual product attribute, distinguishing it from the others (Green and Srinivasan, 1978). Consumers appear to use a product's price as a measure of the product's quality. Empirical studies such as Monroe and Krishnan (1985) and Olson (1977) have shown that when consumers have some uncertainty concerning a product's quality, the consumer often assumes that a higher product price indicates a higher level of quality. Some authors including Sproles (1977) and Riesz (1978) have found negative relationships between product quality ratings publicized by consumer unions/protection councils and the actual brand prices of such products.

Brijball (2003) evaluated the level of importance consumers attach to specific product attributes and the perceived relationship between price and quality. His findings indicated that quality followed by price is important general evaluative criteria but their importance diminishes when other product attributes are included. Furthermore, only 25% of the respondents perceived price and quality as having a one to one relationship. Also, consumers' biographical profiles do not impact on the level of importance attached to price but age and income were found to influence the importance attached to quality. In a study conducted by Sarwade (2002), price was found to influence consumer-purchasing decisions more than the product quality. It is very interesting to find out that the company image and brand image were not totally considered by the households.

Following the works of Green and Srinivasan, (1978), Sonata and Rasa (2010) in their study on the price-quality relationship using conjoint analysis, estimated the relative importance of each rice attribute by the relative rank between maximum and minimal levels within limits of utility attribute. Their findings indicated that more than 50% of the respondents indicated expiry date and preservatives as very important indicators of product attributes while more than 70% of the respondents found the price, package size, additives, the organic product and the country of producer as important attributes. Shugan (1983) in his study on consumer and market behaviour arrived at the following conclusions:

- i). prices reflect levels of quality even with limited competition;
- ii). the quality-price relationship is non-linear;
- iii). prices reflect levels of quality even when some consumers do not behave in a rational economic manner;
- iv). consumers using price as a surrogate measure of quality encourage companies to raise the level of product quality;
- v). competition does not destroy the relationship between price and quality;
- vi). companies with high quality products spend more on advertising than companies offering lower quality products;
- vii). when different qualities of the product are important, price can only be used as a measure of the quality desired by the market. In other words, a consumer can only use price as a measure of quality if the consumer's values are reflected by other consumers in the market.

2.15 Applications of hedonic price models in valuing of rice quality attributes

Most previous studies have used the Hedonic price approach to measure product attributes from the consumers' perspective. Hedonic Price Function is a behavioural expression relating the price paid for a product to the characteristics of its contents. As Ethridge and Davis (1982) noted, the approach is useful where "underlying products are measurable, but their impact is not necessarily obvious". Ladd (1982) provides an excellent review of the economic theory behind the goods' characteristic model. Literature review has shown that product attributes play crucial role in determining consumers' switching behaviours, hence the need to measure how much consumers value each attribute. Ladd and Martin (1976); Ladd and Suvannunt (1976), Ethridge and Davis (1982), Brorsen *et al.* (1984) among others, have successfully extended previous theoretical models of consumer goods characteristics to agricultural products. These studies used hedonic price approach in their analysis of product attributes.

A hedonic price model reveals useful information regarding the value of the attributes of a commodity. Hedonic price approach seeks to analyse the contribution of product attributes within the total product value and to compose such a combination of product attributes that would satisfy the consumer needs best. Seeking to achieve the set objectives the utility coefficients of separate product attributes of different levels and relative importance of products attributes must be calculated. Finding out the data enables quantitative measuring of consumer preference in his product choice. Level utility is a digital notation of value that is attached to

and corresponds with the separate level of each attribute. The aim of calculation of utility levels is to identify which product modifications will have the most positive (or negative) effect on giving preference or which modifications will lead to maximization of preferences. Value part may be positive and negative, low or high. The larger digital value, the more important is part of value. In case the utility is positive, the level of attribute positively influences the decision regarding consumer preferences. Whereas when utility is negative then this level of attribute causes harm.

The Hedonic price modelling approach uses the implicit marginal price method which has been applied in many agricultural studies. For instance, Ekanem and Sundquist (1993) estimated the implicit marginal prices for the attributes of hybrid seed corn. Their findings indicated that prices that farmers paid for hybrid seed corn were significantly related only to the moisture content and the root lodging characteristics of the resulting crop. Surprisingly, price of hybrid seed and yield were not significantly related because the hybrid seed variety was not widely known to farmers. Estes (1986) estimated marginal implicit prices for selected green pepper quality attributes using conventional linear regression techniques within a hedonic framework. His findings indicated that cooler product temperatures and larger sized fruit were important physical attributes valued by wholesale buyers operating on Atlanta Farmers' Market during the 1985 summer period.

Most of the studies on rice consumers' preferences and the effect of qualitative attributes on the price were carried out outside Nigeria, among them are, Unnevehr (1986), the study examined consumer's demands for rice quality in three countries of Philippines, Indonesia and Thailand. Using a linear hedonic function, the result showed that Indonesian consumers prefer significantly well-shelled and perfectly white rice and, they prefer their own native and traditional varieties for consumption. In Philippines, all characteristics of grain enjoyed the importance except for gel consistency and grain shape. In Thailand, the characteristics of grain shape and rice factory quality (grain whiteness) and qualities such as being tasty and having low Amylose, and being aromatic enjoy high importance. Abansi et al. (1990) used hedonic pricing method to evaluate rice consumers' preferences in Philippines. The findings showed that the texture and softness of rice after cooking, have the highest effect on the price and the price paid by both groups of urban and rural consumers was sensitive against qualitative characteristics. The deference between the preferred traits was also significant among classes with different incomes.

Pant (2009) used the hedonic method to evaluate the price of different species of rice in Nepal. The results showed that variables such as taste, odour, and medicinal uses, had positive and significant relationships with the price. Anang et al. (2011) examined the consumers' preferences for rice by different brands and the effect of different qualitative traits on the prices of these rice species. The results showed that the traits of cooking quality, cooking time, taste and odour have the most effect on the price. Also, the result revealed that consumers have higher willingness-to-pay for the traits of odour, taste and production location and they are inclined to pay less for rice with external wastes. Abazari et al (2012) analysed effective factors on rice consumers' preferences using hedonic pricing method in a study on the relationship between the price paid by consumers in Mazandaran province of Iran and some traits of rice and some social- economic variables. The result showed that rice consumers preferred some species of rice which have slender appearance, stretching after cooking, and softness after cooking and are aromatic, and are willing to pay higher prices for some rice with these traits.

2.16 Review of factors influencing domestic demand-supply gap and high import bills for rice in Nigeria

Rice (*oryza sativa*) is a staple food consumed by more than 90.8% of urban and 79.9% of rural households in Nigeria (Johnson *et al*, 2013). Recent data from USDA (2016) shows that the country's annual demand for rice is estimated at 5million metric tons while average domestic supply of milled rice is 2.7million metric tons per annum. This gives consumption gap of about 2.3 million metric tons per annum that is being filled by imports. Thus, consumers generally classify rice brands in Nigerian markets as either 'local' or 'imported'. Despite declining consumption and imports since 2013, demand-supply gap has remained stable at average of 2.5million tons per annum (USDA, 2016). Several studies on rice in Nigeria have attempted to explain the reasons for this demand-supply gap and the country's inability to close this gap despite huge investments (of over \$US1.6billion) in the rice sub-sector since 2010 (Johnson *et al.*, 2013; CARD, 2015; Opeyemi *et al.*, 2015; Alfred and Adekayode, 2014). Nigeria needs to redirect and prioritize its rice development efforts (Biekpe, 2012) to become self-sufficient in rice production and reduce the huge drain of about US\$6million daily on her foreign exchange earnings due to rice importation. This article aims to review empirical literature on rice studies with a view to identifying the underlying factors responsible for the domestic demand-supply gap and high rice import bills in Nigeria. It is believed that this article would provide direction for further studies on rice in Nigeria.

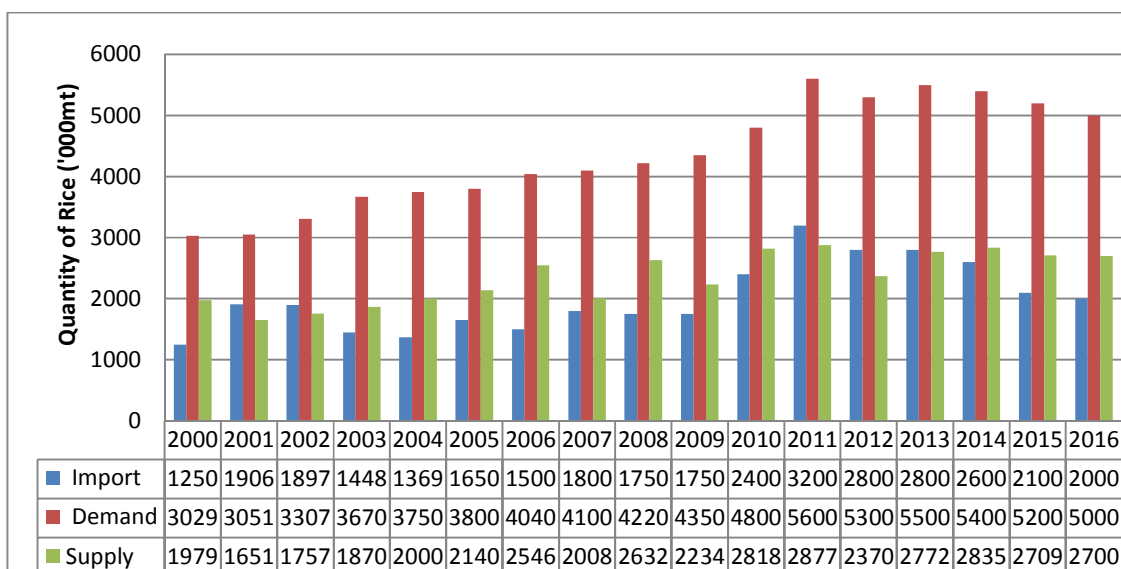


Figure 2.5: Trends of Nigeria's milled rice demand, supply and Import (2000 – 2016)

Source: USDA 2016

The key factors influencing domestic demand-supply gap and high import bills for rice in Nigeria include:

- i). *Low domestic supply of paddy rice:* According to Opeyemi *et al* (2015), non-availability in the market all year round is one of the major factors that affect the demand for locally milled rice in Nigeria. Thus, the only way Nigeria can attain self-sufficiency in rice production is to achieve average paddy output of at least 8.4million tons per annum. This requires the expansion of current cultivable land of 2.3million hectares and increasing current average yield of 1.56tons per hectare (USDA, 2016). Studies in Nigeria have confirmed that smallholder rice farmers (SHRFs) who produce 80-90% of domestic paddy rice (Sahel, 2015) can achieve this expansion if given the needed support.

However, one major factor identified to hinder the capacities of SHRFs in expanding their output, yield and productivities is inability to access cheap funds from banks (Nouman *et al.*, 2013). Banks perceive lending to SHRFs as high risk because their farming business is unstructured due to poor functioning of value chains (Augustine *et al.*, 2013), relatively long gestation, seasonality and exposure to unpredictable weather conditions (Philip *et al*, 2009). The transaction cost of lending to SHRFs is high, loan monitoring is difficult because SHRFs are often many, residing in remote rural locations, and are distantly dispersed (Okello, 2012). Also, SHRFs cannot afford the

high interest rate and type of collateral acceptable to banks (Okojie et al, 2010). To address these challenges led to the establishments of bank of agriculture (BOA) and various government intervention programmes such as Agricultural Credit Guarantee Scheme Fund (ACGSF), Nigeria Incentive-based Risk Sharing System in Agricultural Lending (NIRSAL), Rural financing (RUFIN), and recently the Anchor Borrower Programme (ABP). However, these institutions and programmes have not been able to make the expected impact in funding SHRFs because of the unwillingness of banks to fully participate (Adegbite, 2009) due to low levels of loan recovery (Oladeebo, 2008) arising from inefficient institutional system of loan administration, monitoring and recovery (Nmadu *et al.*, 2013). All these explain the reasons why in the last 10 years, banks' lending to agriculture as a percentage of total lending in Nigeria's economy has been below 5% (CBN, 2017). Therefore, to achieve sustainable expansion in domestic output of paddy rice, there is need for banks, relevant government institutions, value chain actors and researchers to synergize their efforts focusing on developing an efficient, value chain-based and rural-driven institutional framework of financing SHRFs that addresses the concerns of both the banks and SHRFs.

- ii). *Low milling capacity and poor-quality output of domestic rice mills:* In the last four decades, there have been large number of active small-scale rice mills; representing more than 60-70% of Nigeria's total milling capacity and producing at milling rate of 55-60%; however, their final products tend to be of lower quality because of limited modern equipment (USDA, 2016). To address this situation, the government and private sector have since 2010 invested over \$1.67billion in the establishment of more than 43 medium to large scale integrated rice mills (IRMs) with total milling capacity of about 2.3million metric tons per annum (CARD, 2015). Although, local rice brands produced by IRMs have been found to be comparable to imported rice brands in terms of quality such that consumers are indifferent in choosing between local and imported rice on the basis of physical quality attributes (Alfred and Adekayode, 2014), there are evidences that more than 70% of these IRMs are operating below 30-40% capacity partly due to inadequate domestic supply of paddy as earlier explained (USDA, 2016) and partly due to challenging business environment such as erratic power supply, frequent machine breakdowns, regulatory issues, etc. (Opeyemi *et al.*, 2015). It can be concluded that, apart from inadequate domestic production of paddy rice, Nigeria also lack the capacity to produce high quality milled rice to meet domestic demand. Therefore, there is need

for the government to establish a special rice development fund aimed at financing the small-scale rice mills to import modern rice milling machines and upgrade the quality of their output. However, there is also the need for a comparative assessment of the overall output efficiency and profitability of large number small-scale (modular) rice mills vis-a-vis few number of large scale integrated rice mills (IRMs).

iii). *Inefficient rice marketing system*: According to PrOpCom (2007), majority of local rice marketers in Nigeria do not add value to milled local rice through de-stoning, sorting, branding and repackaging, as the market is characterised by inadequate infrastructure, inconsistent measuring techniques, unscrupulous traders and high transport costs. The local rice market provision of quality is fraught with difficulties because producers cannot credibly signal the quality of local rice brands, thus consumers' choices are predicated on the perceived average quality in the market, which leads to market failures (Rutsaert et al, 2011). As noted by Schmitt (2009), experiential appeals are important in enhancing consumers' brand preference. However, the extrinsic attributes of local rice brands do not deliver to consumers' memorable experiences like the utilitarian value of intrinsic quality attributes (Brakus *et al.*, 2009). Thus, packaging, labelling, branding and promotional campaigns could be used to indicate the quality and market differentiation of local rice provided it is noticeable and appealing to consumers (Verbeke and Roosen, 2009). Therefore it has become imperative for development banks, quality improvement, regulatory and enlightenment agencies such as Bank of Agriculture (BOA), Bank of Industry (BOI), Standard Organization of Nigeria (SON), National Agency for Food and Drug Administration and Control (NAFDAC), Consumer Protection Council (CPC) and National Orientation Agency (NOA) to partner and enhance the capacities of the local rice processors and marketers in upgrading the extrinsic quality attributes and experiential appeals of local rice brands while at the same time enhancing consumers' perception and acceptability of local rice brands. Thus, there is urgent need to develop a workable and efficient institutional framework of partnership to achieve this objective.

iv). *Consumers' perception of price-quality differentials of local and imported rice in Nigeria*: Quality attributes have been identified to be of central importance for competitiveness in West Africa's rice markets (Tomlins et al., 2005) due to their influence on consumers' purchase decisions. Empirical studies on rice consumption in Nigeria have concluded differences in quality attributes as the major reason for

consumers' preference for imported rice brands (Gyimah-Brempong et al, 2012; Johnson et al, 2013). Consumers prefer the clean, high swelling, white and long-grain imported rice, as local rice is often associated with inconveniences caused by large percentage of foreign matter, low levels of postharvest grading and sorting and the high workload and time spent on sorting and cooking (Lançon and Benz, 2007). Despite higher organoleptic attributes such as taste, aroma and freshness of local rice (Demont et al., 2012); consumers apply a high price differential between local and imported rice (Lançon and Benz, 2007). In making purchase decisions, consumers consider rice quality attributes in relation to its own price (Thanasuta and Metharom, 2015). It is therefore imperative to conduct studies to determine the monetary values consumer attach to each and all the quality attributes of both local and imported rice brands in Nigeria, and comparing these values with their prevailing market prices. This will help to provide the underlying reasons for consumers' preference for imported rice brands and guide local rice producers (breeders, farmers and processors) on the economic incentives of their quality improvement programmes, as the additional monetary value of an improvement in each quality attribute of local rice to the retail price would be estimated.

Nigeria's self-sufficiency in rice production requires increasing the domestic paddy rice supplies through the provision of cheap funding to smallholder rice farmers, upgrading the milling capacity of small-scale rice millers, improving the efficiency the rice marketing system and enhancing consumers' perception and acceptability of local rice brands. The development of Nigeria's rice industry requires a multi-dimensional approach involving a blend of research, policies and strategies among key value chain actors and institutions on production, processing and marketing.

CHAPTER 3

WILLINGNESS TO PAY AND PREFERENCE FOR IMPORTED RICE BRANDS IN NIGERIA: DO PRICE-QUALITY DIFFERENTIALS EXPLAIN CONSUMERS' INERTIA?³

3.1 Abstract

In Nigeria, consumers' persistent preference and willingness to pay higher prices for imported rice despite recent improvements in the quality attributes of local rice has been a drain on the country's Forex reserves and threat to the development of the domestic rice industry. This study attempts to explain this consumers' choice behaviour using a household data set collected from a survey of 460 rice consumers in the Federal Capital Territory (FCT), Nigeria. Two separate binary logit regression models were estimated for households' preference and willingness to pay (WTP) for imported rice. The result shows that price, household head's age, household's income and general perception are statistically significant variables explaining household's preference and WTP for imported rice brands. Further result from this study also indicates that consumers' inertia against preference and WTP for imported rice persists because of the negative price-quality differentials gap between local and imported rice brands. Implications of these findings for the effective management of Nigeria's rice marketing policies are discussed.

Key words: Preference and willingness to pay (WTP), imported rice brands, price-quality differentials, consumers' inertia, Nigeria

3.2 Introduction

The rice industry plays an important role in Nigeria's economy. This is because rice (*Oryza sativa*) is the most important staple food crop, as about 85% of households in Nigeria consume rice, and each household spends an average of 6% of its total income on rice, the highest amongst all staples in both urban and rural areas (Johnson et al, 2013). The per capita rice consumption is estimated at 35kg per annum, and gives a total of 5.2 million metric tons of milled rice consumed in Nigeria per annum (Gyimah-Brempong et al, 2012). The country's domestic rice production which is estimated at 3 million metric tons per annum gives a

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consumption gap of about 2.2 million metric tons per annum which is being filled by imports (Johnson et al, 2013). Consumers generally classify rice brands in Nigerian markets as either 'local' or 'imported'. Nigeria is among the top five rice importing countries in the world. Past Nigerian governments had acknowledged that high import bills of over \$6million daily (Johnson et al, 2013) were not only a drain on foreign exchange earnings but also a threat to the growth of the domestic rice industry. Since 2010, the Nigerian government has put in place some programmes and policies to discourage rice importation and encourage domestic production. These included: (a) increased import tariff on rice from 5% to 50 % in 2012, and 100% in 2013; (b) ban on importation of rice through the land borders; (c) establishments of Commercial Agricultural Credit Scheme (CACS) to provide cheap fund to agribusinesses, and the Nigeria Incentive-based Risk Sharing System for Agricultural Lending (NIRSAL) programme to encourage commercial banks' lending to the agricultural sector on risk sharing basis. These policies and programmes have so far attracted many investors leading to massive and expanded investments in paddy rice production and establishments of many modern rice processing mills. Domestic rice production has been stimulated and increases annually by more than 5% (Seck *et al.*, 2010). A study by Africa rice research centre (AfricaRice) indicate that rice production, processing, polishing and packaging in Nigeria have tremendously improved since 2010, and there are many local rice brands with improved quality attributes (AfricaRice, 2012).

Despite improvements in the physio-chemical quality attributes of local rice, there is still steady increase in quantity of imported rice consumed in Nigeria due to burgeoning population, increased consumers' incomes, changes in tastes and preferences, rapid urbanization, ease of preparation that fits easily into urban lifestyle of workers, and better physical attributes (Erhabor and Ojogho, 2011). Consumers still prefer imported rice brands based on their already established perception that imported rice brands possess better after-cook physical attributes such as bright-white colour, separate, neat, even and long grains (Lancon et al 2003; Adeyeye et al, 2010; Johnson et al, 2013). According to Erenstein et al. (2003), the fundamental cause of this preference for imported rice is the intrinsic nature and pedigree of the paddy grain found in Nigeria. The visual presentation (a factor that matter the foremost in valuation of rice by the market) of rice milled from such a paddy grain does not match up to its imported kin in terms of grain-shape, neatness, colour and percentage of broken grains. Thus, the local consumer applies a rather heavy differential to the price of locally milled rice vis-à-vis imported rice

(Lançon and Benz, 2007). This differential can be above ₦2,500 (about \$13)⁴ per 50kg bag of rice (Akpan et al., 2014). The long term negative perception against local rice has become a persistent habit that is strongly responsible for consumers' inertia against preference and willingness to pay (WTP) higher prices for imported rice brands to avoid local rice (Akaeze, 2010).

Previous empirical studies on rice consumption in Nigeria such as Adeyeye et al (2010), Bamidele et al (2010), Alfred and Adekayode (2012), Kassali et al (2012), Gyimah-Brempong et al (2012), and Johnson et al (2013) were limited to explaining quality differentials as the reason for consumers' preference for imported rice brands. However, several studies have found that, when making purchase decisions, consumers do not consider product quality in isolation, but in comparison to its price (Bornemann and Homburg, 2011; Sahay and Sharma, 2010; Akdeniz et al., 2013; Thanasuta and Metharom, 2015). It therefore seems that these previous empirical studies have not adequately explained the underlying reason on how consumers with brand preference mind-set make purchasing decisions when faced with two or more brands of food products with almost similar quality attributes but different market prices. This has left a knowledge gap in consumer behaviour literature which this study aims to fill by determining how consumers' comparative analyses of price and quality differentials of local and imported rice brands influence their choice behaviour. This is with a view to providing some insight useful for rice marketing managers and government in designing appropriate marketing policy measures for breaking the current consumers' inertia against preference for imported rice brands. Specifically, this study seeks to:

- i). determine the factors influencing consumer's preference for imported rice brands, and provide empirical evidence of this choice behaviour;
- ii). assess how market price and consumers' perceived quality differentials determine consumers' inertia against preference for imported rice brands in Nigeria

3.3 Factors influencing consumers' preference and WTP for food quality attributes

Many studies that have used various methods such as choice experiments and contingent (Goldberg and Roosen, 2005), stated choice experiment (Travisi and Nijkamp, 2004), conjoint analysis (Ara, 2003), survey rankings and ratings (Quagraine, 2006), travel cost (Gonzalez and Loomis, 2006), and experimental auction method (Yue *et al.*, 2006) to estimate willingness to

⁴ (US\$1 = N200 in 2014)

pay (WTP) as a measure of monetary value of quality attribute of food products as perceived by consumers. Value perception can be defined as a judgment or a valuation by the consumer of the comparison between the benefits or utility obtained from a product, and the perceived sacrifices or costs (Zeithaml, 1988). The price consumers are willing to pay for each quality attribute reflects the level of utility derived and the relative importance attached (Sonata and Rasa, 2010). The higher the level of a desirable attribute in an alternative food product, the higher the utility associated with that alternative and more likely the consumer is willing to pay higher price for it (Bennet and Blamey, 2001).

This study follows evidence from literature that consumers' purchase choice decisions are based on price-quality relationships (Monroe, 2003; Krutulyte et al, 2009; Akdeniz et al., 2013; Thanasuta and Metharom, 2015). Consumer's perception of product's quality has often been measured by determining consumer's willingness to pay (WTP) premium price for the product (Chern and Chang, 2009). The value of WTP often creates a gap between consumer's perceived quality and the market price of the product (Zeithaml, 1988). WTP largely reflects the product's quality as perceived by the consumer; while market price largely reflects the product's quality from the producer's perspective (Zeithaml, 1988). Previous empirical studies have included market price as explanatory variable in determining consumers' utility and hence WTP (Hanemann, 1984; Chern and Chang, 2009). WTP is the additional price consumer pays to reflect preference for a brand of a product to avoid another brand (Chern and Chang, 2009). Therefore, comparing the differences between the market prices and consumers' perceived qualities could provide some insights on how consumers make decisions when choosing a brand from alternative brands of a product (Hanemann, 1984).

3.4 Theoretical and conceptual framework

The theoretical framework by Millock et al (2002) has been adopted by some authors such as Zeng and Wei (2005), Bonti-Ankomah and Yiridoe (2006) in analysing consumers' behaviours towards food products. This framework identifies consumer's purchase behaviour as a relationship between consumer's willingness to pay (WTP) premium price and the market price of the product. Product price is determined by the market, while consumer's WTP is determined by consumer's socioeconomic characteristics, attitude/intention and perception of the product's quality attributes. Consumer gains knowledge of the product through advertisement and available information which in turn influence consumer's perception of the product and the quality attributes of the product. The framework of Millock et al (2002) guided our choice of

explanatory variables influencing consumer's WTP. However, one limitation of this framework is that it explains consumers' behaviours from the point of only one product. It answers a consumer's typical question of whether a product's quality worth its market price. However, in real market situations, a consumer is often faced with choice decisions on which brand to buy among two or more alternative brands of similar products with almost the same quality attributes but varying market prices (Zeithaml, 1988; Chern and Chang, 2009). In this study, it is assumed that, at the point of purchase, a rational consumer often makes a quick comparative analysis of the differences in the prices and quality attributes of two or more brands of a product before deciding the brand to buy. This comparison could be the underlying reason for the consumers' choice behaviours. Based on this assumption, the framework of Millock et al (2002) has been modified by including price-quality differentials as the underlying determinant of consumers' choice decisions between two or more alternative brands of rice (Figure 3.1).

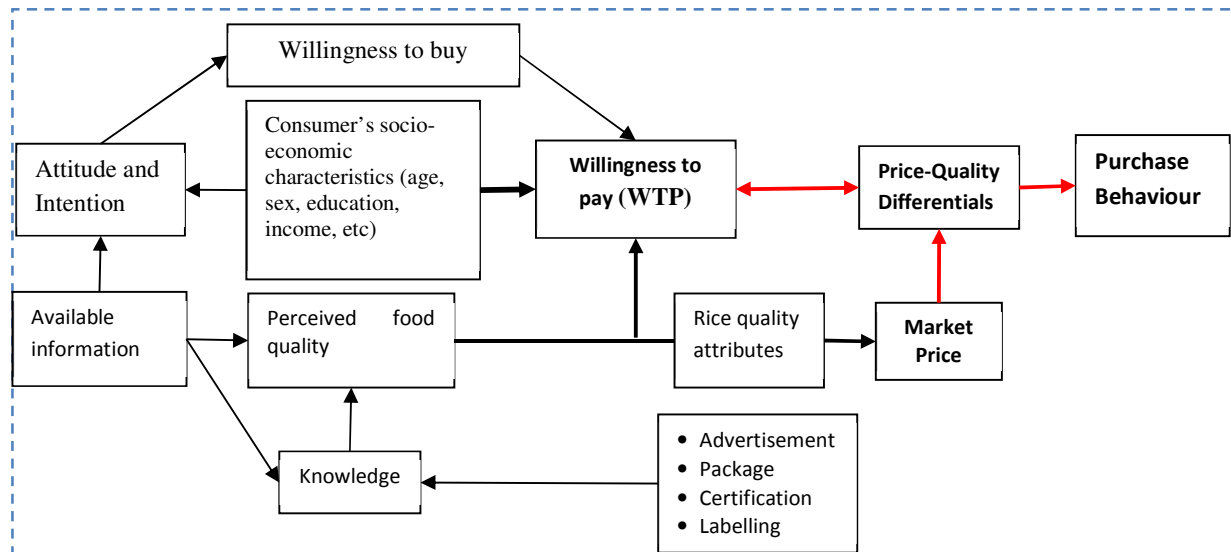


Figure 3.1: Conceptual framework for consumers' behaviours toward local and imported rice brands

Source: Adapted and modified from Millock et al (2002)

3.5 Methodology

3.5.1 Study area and data

This study was conducted in the Federal Capital Territory (FCT) located in the North Central Nigeria. It lies within latitudes 7 25' and 9 25'N and longitude 5 45' and 7 39'E. It is geographically located in the savannah vegetation and at centre of the country with a landmass of 7,315km². FCT is characterized by alternating dry and wet seasons with a mean annual

rainfall that varies from 1100 to 1600 mm and temperature of between 12 °C and 33 ° C. The FCT has six area councils namely Abuja Municipal Area Council (AMAC), Bwari, Gwagwalada, Kwali, Kuje and Abaji. The seat of federal government, its agencies and diplomatic offices are in AMAC which has the highest infrastructural development and resident to most of the politicians, wealthy Nigerians and diplomats. The other area councils are satellite towns with lesser infrastructural development and resident to mostly civil servants, farmers, artisans and traders. Thus, FCT has urban, semi-urban and rural resident living together within the territory (AGIS, 2014). The choice of FCT for this study is justified because it is resident to multi-class Nigerians of different socioeconomic statuses, tribe and culture who have varying demand strength and consumption behaviours. Besides, virtually all imported and local rice brands can be found in the major markets in the six area councils of the FCT (AGIS, 2014).

FCT has a total population of about 3.5 million people (NPC, 2013) out of which at least 70% (2.45 million people) are rice consumers who constitute our target population of about 490,000 households (based on average of 5 people per household). Following the method used by Yamane (1967), this household population gives a sample size of 400 household respondents which is considered adequate for interview and data collection. To cover wider geographical area of the FCT-Abuja, a three-stage random sampling method was used in selecting a total of 460 respondent households as follows: AMAC (76)⁵, Kuje (77), Gwagwalada (77), Abaji (77), Kwali (76) and Bwari (77). Sampling frames were obtained from the Federal Capital Development Authority (FCDA) and Abuja Geographical Information System (AGIS).

Data collection was done in 2014 with the use of a structured questionnaire administered to a cross section of 460 household respondents selected from the six areas councils of the FCT. Jury's method was used to test questionnaire content validity, while the test-retest method was used to evaluate questionnaire reliability. Data were collected on the consumer households' socioeconomic characteristics, level of perception of the quality attributes, market prices they buy and maximum prices they are willing to pay for imported rice brands.

⁵ Values in parenthesis denotes the number of households interviewed in the area council surveyed

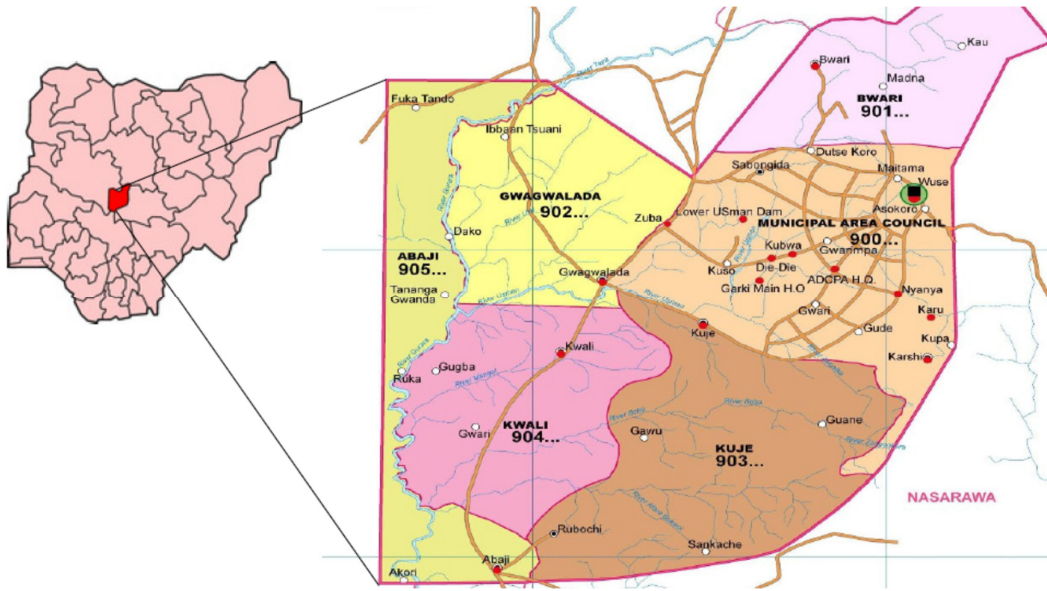


Figure 3.2: Map of Nigeria showing the FCT and the six area councils surveyed
 Source: AGIS (2014)

3.5.2. Empirical framework of the study

Consumers' preference and WTP can be estimated using the basic concept of random utility modelling (RUM) (McFadden, 1987; Haab and McConnell, 2002). Random utility modelling 'RUM' is an econometric approach based on utility theory which states that, among a set of J number of alternative products, a rational consumer will prefer the alternative j that provides the highest utility U_j (McFadden, 1987). RUM allows for the parameterization of the probability of preferring alternative j among J alternatives. The conceptual framework for RUM is based on Lancaster (1966) which assumes that the utility (V) a consumer derives from a product can be decomposed into two components namely: deterministic component (U), which is observable and often associated with the product price; and random error component (ε), which represents the unobservable characteristics affecting the consumers' choice. Thus, faced with local and imported rice brands, and assuming a linear representation, the utility function of i^{th} consumer household for alternative of a rice brand j can be represented as:

$$V_{ij} = U_{ij} + \varepsilon_{ij}. \quad [3.1]$$

The utility derived from any of the two alternative rice brands depends on the quality attributes (U) of such a brand (as reflected in the brand's price), consumer household's socioeconomic characteristics and general perception of the brand's quality affecting households' decision. A consumer household facing two alternative rice brands chooses the brand associated with

higher utility (Hensher et al., 2005). If V_j and V_k denote the utility a consumer household derives from consuming imported and local rice brands j and k respectively, and if imported rice is associated with higher utility, then $V_j > V_k$. If Y_i denotes the i^{th} consumer household's preference for imported rice, then:

$$Y_i = (V_j > V_k) \rightarrow (U_{ij} + \varepsilon_{ij}) > (U_{ik} + \varepsilon_{ik}) \rightarrow U_{ij} - U_{ik} > \varepsilon_{ik} - \varepsilon_{ij} \rightarrow U_{ij} > \varepsilon_{ij} \text{ for all } j \neq k \quad [3.2]$$

The presence of the error component ε_{ij} in equation (3.2) implies that predicting i^{th} consumer household's preference for imported rice cannot be made with certainty. Therefore, the consumer household's behaviour becomes one of probabilistic choices. Hence the probability that i^{th} consumer household will choose imported rice over the local rice is if the difference in the deterministic components of their utilities exceeds the difference in the error components (McFadden, 1980), and this can be expressed as:

$$P_r(Y_i = 1) = U_{ij} - U_{ik} > \varepsilon_{ik} - \varepsilon_{ij} \rightarrow U_{ij} > \varepsilon_{ij} \quad [3.3]$$

Equation (3.3) implies that the distribution of the error term, ε_{ij} determines the explicit distribution of this probability.

According to McFadden (1980) and Ben-Akiva and Lerman (1985), a typical assumption is that the error term ε_{ij} is independently and identically distributed (IID) with a type I extreme value distribution specified as follows:

$$F(\varepsilon_{ij}) = \exp[-\exp(-\varepsilon_{ij})] \quad [3.4]$$

where F denotes the cumulative distribution function and the error term ε_{ij} is normally distributed with zero mean and constant variance σ^2 . The distribution of the error term ε_{ij} as shown in equation (3.4) implies that the probability of i^{th} consumer household choosing imported rice j is expressed in terms of the logistic distribution (McFadden, 1980) as follows:

$$\Pr(Y_{ij} = 1) = \frac{\exp^{U_{ij}}}{1 + \exp^{U_{ij}}} \quad [3.5]$$

$$\text{where; } U_{ij} = \beta_0 + \beta_j X_i \text{ and } -\infty < U_{ij} < +\infty \quad [3.6]$$

Equation (3.6) is a binary equation of i^{th} consumer household choosing imported rice j ; X_i is a vector of explanatory variables that influence i^{th} household's purchase decisions such as price, a reflection of quality attributes (Bornemann and Homburg, 2011), household's socioeconomic characteristics and general perception of quality attributes of imported rice brands; β_i is the vector of estimated coefficients of all the explanatory variables; exp is the base of natural logarithms. The error term is assumed to follow logistic distribution; hence equation (3.5) is the standard binary logit model (Maddala, 1993; Ben-Akiva and Lerman, 1985). This is a discrete choice model that is estimated by the Maximum Likelihood technique, and is useful for modelling choice behaviour.

The results of binary logit model are interpreted in terms of the odds ratios, that is, the ratios of the probability of choosing one outcome category over the reference category. These ratios are defined as:

$$L_n \left(\frac{P_{ij}}{P_{ik}} \right) = X_i (\beta_j - \beta_k) = X_i \beta_j \quad \text{if } k = 1 \quad [3.7]$$

where; P_{ik} is the probability of i^{th} household choosing local rice, and L_n is natural logarithm. A positive parameter (odd ratio) indicates that the relative probability of i^{th} consumer household choosing imported rice over the local rice increases relative to the probability of choosing local rice over the imported rice; and otherwise for negative a parameter. Following Latvala (2010), if $\Pr (Y_{ij} = 1) > 0.5$, consumers prefer the imported rice brand; and otherwise if $\Pr (Y_{ij} = 1) \leq 0.5$.

Assuming the market price P_{ij} that i^{th} consumer pays for imported rice j rises to a new price level P_{imax} , and if the consumer is willing to pay this price increase to keep deriving the same level of utility U_{ij} as previously, the linear utility functions for imported rice at the market price P_{ij} and at higher price P_{imax} are expressed in equations (3.8) and (3.9) as follows:

$$U_{ij} = \beta_{0j} + \beta_1 P_{ij} + \beta_{2j} X_i + \varepsilon_{ij} \quad [3.8]$$

$$U_{ij} = \beta_{0j} + \beta_1 P_{imax} + \beta_{2j} X_i + \varepsilon_{2ij} \quad [3.9]$$

$$\beta_{0j} + \beta_1 P_{ij} + \beta_{2j} X_i + \varepsilon_{ij} = \beta_{0j} + \beta_1 (P_{ij} + WTP_{ij}) + \beta_{2j} X_i + \varepsilon_{2ij} \quad [3.10]$$

where $P_{imax} = (P_{ij} + WTP_{ij})$ and is the maximum price that i^{th} household can pay for imported rice.

Since not all the β_{0j} 's and β_{2j} 's are identifiable, and equations (3.8) and (3.9) provide the household with the same level of utility since it is assumed that consumer's choice behaviour does not consider changes in price, so normalization rule was adopted such that β_{0j} 's and β_{2j} 's in equation (3.8) equal to zero (Greene, 2000; Chern and Chang, 2009). Solving equation (3.10) for WTP_{ij} , gives:

$$WTP_{ij} = \frac{\beta_{0j} + \beta_{2j}X_i + (\varepsilon_{ij} - \varepsilon_{2ij})}{\beta_1} \quad [3.11]$$

Taking the expected value of the WTP_{ij} , the expected willingness to pay higher price for imported rice to remain at the same level of utility and avoid local rice, is expressed as:

$$E(WTP_{ij}|X_i) = \frac{\beta_{0j} + \beta_{2j}X_i}{\beta_1} \quad [3.12]$$

where; WTP_{ij} is i^{th} household willingness to pay for increase in the price of imported rice; X_i is a vector of explanatory variables that influence i^{th} household's purchase decisions; β_{2j} is the vector of estimated coefficients of all the explanatory variables; β_1 is the coefficient of P_{imax} . Following the same procedure in equation (3.5), the probability that i^{th} consumer household is willing to pay a higher price P_{imax} for imported rice j to remain at the same level of utility U_{ij} can be expressed in terms of the logistic distribution (McFadden, 1980) as follows:

$$\Pr(WTP_{ij} = 1) = \frac{\exp^{U_{ij}}}{1 + \exp^{U_{ij}}} \quad [3.13]$$

$$\text{where; } U_{ij} = \beta_0 + \beta_j X_i \text{ and } -\infty < U_{ij} < +\infty \quad [3.14]$$

All the explanatory variables X_i remain as previously defined except that the market price P_{ij} is replaced with P_{imax} in equation (3.14). Following Latvala (2010), the decision rule is that: if $\Pr(WTP_{ij} = 1) > 0.5$, consumer prefers the imported rice brand; and otherwise if $\Pr(WTP_{ij} = 1) \leq 0.5$.

3.5.3 Explanatory variables used in this study

The explanatory variables hypothesized to explain consumers' preference and willingness to pay premium price for imported rice brands were identified based on the theoretical framework and on past empirical work on consumers' behaviours toward food products (Millock et al, 2002; Zeng and Wei, 2005; Bonti-Ankomah and Yiridoe, 2006). The explanatory variables were classified into three categories: price, household socio-economic characteristics, and the

strength of consumers' general perception of the quality attributes of imported rice such as neatness, duration of cooking, after-cook colour, aroma, taste, grain shape, swelling capacity, stickiness, and texture. The definitions for the variables used in the analysis are presented in Table 3.1.

Table 3.1: Definitions and measure of variables included in the binary logit model

Variable	Definition	Measure	Expected Sign ⁶
Dependent variables			
Preference	Whether consumer is buying imported rice at market price higher than price of local rice.	Yes = 1; No = 0	
WTP_{ij}	Whether <i>i</i> th consumer is willing to buy imported rice <i>j</i> even if its current market price is raised.	Yes = 1; No = 0	
Explanatory variables			
Price			
P_{ij}	Retail market price of imported rice <i>j</i> paid by <i>i</i> th household	Per 50kg bag (in Naira)	+
P_{imax}	Maximum price that <i>i</i> th household agrees it can pay for imported rice brands	Per 50kg bag (in Naira)	+
Socioeconomic characteristics			
Age	How old the household head is.	Number of Years	+/-
Gender	Sex of the household head	Male =0; Female=1	+/-
Education	Level of formal training received by household head	Number of years spent in school	+/-
Income	Level of earnings of household head	Monthly salary or income (in Naira)	+
Household size	Number of people living and feeding together in same house	Number of people	+/-
Marital status	Marital state of household head	Single=1; Married=2; Divorced=3	+/-
Household Perception	Consumer's general level of perception about quality attributes of imported rice brands	Strong=3; moderate=2; weak=1	+

Source: Computed from field survey data, 2014

3.6 Results and discussion

This study was carried out to provide some insights on the underlying reasons for consumers' inertia against preference and willingness to pay for imported rice brands. It was assumed that differences in the prices and perceived qualities of local and imported rice brands could explain

⁶Based on a priori expectations

this consumer's purchasing behaviour. Price, household's socioeconomic characteristics and perception of rice quality attributes factors that could influence consumers' preference and WTP for rice brand.

3.6.1 Household socioeconomic characteristics

The socio-economic characteristics of the respondents are presented in Table 3.2 and the sampled household heads of 35% are male and 65% are female, and the majority (93%) of them are married, while 7% are single. The average age of household head is 47 years, while the average number of years spent in formal schooling is 16 years indicating that household heads are educated. The average household size is 5, with most household heads receiving average monthly income of N88,350 (about \$441) indicating that household live on an average of about \$10 per day, which is well above the national monthly minimum wage of N18,000 (about \$90).

Table 3.2: Socio-economic characteristics of households in the survey

Characteristics	Category	No of respondents	Percentage	Mean
Gender	Male	163	35.4	N/A
	Female	297	64.6	
Age (years)	25-35	20	4.30	47.27
	36-46	72	15.4	
	47-57	223	48.5	
	58- 68	145	31.5	
Education Level (Number of years spent in formal Schooling)	1- 6} primary	74	16.2	15.78
	7-12} secondary	82	17.8	
	13-18} tertiary	267	58.0	
	19- 24} post-graduate	37	8.00	
Marital Status	Single	31	6.70	-
	Married	427	92.80	
	Divorced	2	0.50	
Household Size	2-4	119	25.90	4.87
	5-7	268	58.30	
	8-10	73	15.80	
Household	20-120	260	56.5	
Monthly Income (N'000)	121-221	128	27.8	N88,350
	222-322	54	11.7	
	323-423	18	3.9	

Source: Field survey data, 2014

3.6.2 *Distribution of households according to their preferences and WTP for imported rice*

Generally, consumers in Nigeria classify rice as ‘local’ and ‘imported’ (Akpan et al, 2014). The distribution of households by their preference and willingness to pay (WTP) for imported rice brands in the six area councils (locations) surveyed is presented in Table 3.3.

Table 3.3: Percentage distribution of households by their preference and WTP for imported rice

Location	Preference		WTP	
	Yes	No	Yes	No
AMAC	97	3	38	62
Abaji	93	7	55	45
Kwali	95	5	53	47
Gwagwalada	97	3	51	49
Kuje	97	3	58	42
Bwari	94	6	57	43
Pooled average	95.5	5	52	48

Source: Field survey data, 2014

In all the six locations, imported rice brands were mostly chosen, as 92% of the consumer households interviewed expressed preference while 52% are willing to pay higher price for imported rice brands. Preference for imported rice brands is highest (97%) in AMAC, Kuje and Gwagwalada, these are locations nearest to the city centre, Abuja. Abaji, the farthest satellite town from Abuja has the lowest percentage (93%) of households who preferred imported rice. WTP is highest among 50% of households in Kuje but lowest (38%) among households in AMAC. The above descriptive analysis shows that people residing in urban areas with higher infrastructural development, population density, income level and economic activities are more likely to express higher preference for food products they perceived to possess better quality attributes.

3.6.3 *Determinants of household preference and WTP for imported rice*

Two binary logistic regression models, each for consumers’ preference and WTP for imported rice brands, were estimated using SPSS version 20.0 and the results are presented in Tables 3.4. The two estimated binary models gave correct predictions of 80% and 96% of households’ preference and willingness to pay for imported rice respectively. Therefore, the models with independent variables are significantly better models and are supported by the existence of a relationship between the independent variables and the dependent variable.

Table 3.4: Parameter estimates of the determinants of household preference and WTP for imported rice --binary logit model

Variables	Preference		WTP	
	B	Exp (β)	B	Exp (β)
Price	0.001 (0.0001) ***	0.00001	0.005 (0.001) ***	1.005
Gender	-0.180 (0.271)	0.835	0.509 (0.667)	1.664
Age	0.025 (0.016)	1.026	0.095 (0.043) **	1.099
Education	0.012 (0.031)	1.012	0.022 (0.075)	1.022
Income	0.0001 (0.0001)	1.000	0.0003 (0.0001) *	1.000
Household size	0.017 (0.084)	1.017	0.268 (0.202)	1.308
Marital status	1.061 (0.501)	1.292	1.027 (1.822)	2.793
Household perception	1.061 (0.163) ***	2.889	0.852 (0.390) **	2.345
Constant	-15.719 (1.995) ***		-49.097 (11.407) ***	0.00001
No of observations	460		460	
-2 Log Likelihood	248.873***		94.656***	
Nagelkerke R ²	0.56		0.62	
H-L Test	0.066		1.000	
VIF	2.272		2.631	
Correctly predicted	80%		96%	

Note: Values in parenthesis are standard errors; *** Denotes statistically significant at the 1% probability level; ** Denotes statistically significant at the 5% probability level; *Denotes statistically significant at the 10% probability level

Source: Computed from field survey data, 2014

In the two models estimated, the Nagelkerke's R² are 0.56 and 0.62; the *Hosmer and Lemeshow* (H-L) tests show significance values greater than 0.05 while the Chi-square tests of 2 Log Likelihood are significant at 1%. These indicate there is no significant difference between observed and model-predicted values, implying a moderately strong relationship between the predictors and the prediction. Therefore, the two estimated binary models provide quite good fits and strong explanatory power. In this study, there is absence of multi-collinearity in the two estimated models because the variance inflation factors (VIFs) for all the variables included in the two models were less than 10 (Menard, 1995).

The coefficients of estimated parameters of the binary logit model only provide the direction of the effect of the independent variables on the dependent (response) variable (Table 3.4) and

do not represent the actual magnitude of change or probabilities. Therefore, the marginal effects from the binary model, which measures the expected change in probability of a choice being made with respect to a unit change in the independent variable, are reported as the $\exp(\beta)$ in Table 3.4. Estimated coefficients for household's choice of imported rice brands are compared with local rice as the base reference choice.

The estimated coefficient for household head's age is positively and statistically significant for the probability of household willingness to pay higher prices for imported rice brands (Table 3.4), implying that an increase in the age of household head is more likely to influence the household to choose imported rice brands over local rice. The marginal effects suggest that a year's increase in the age of the household head is likely to increase his/her choice of imported rice brands by 9.9% relative to local rice (Table 3.4). The reason could be that the older the household head is, the more likely he/she has over the years developed stronger negative perception on poor quality attributes of local rice, and has built his/her taste around imported rice brands. This is consistent with the findings of Akaeze (2010) that consumption of imported rice brands is more of a mind-set and habitual persistence. It also suggests that consumers' negative attitude (a mind-set) against local rice is stronger among older people who, in the past 1-2 decades, has had bad experience in consuming local rice such as presence of chaff, impurities, uneven grains, long cooking duration, etc. (Campbell *et al.*, 2009).

The estimated coefficient for household income is positive and statistically significant for the probability of household's willingness to pay higher prices for imported rice brands (Table 3.4). This implies that an increase in household income increases the probability of household's willingness to pay for imported rice brands. However, the marginal effect suggests that an increase in income is not likely to influence a household's willingness to pay for imported rice brands over the local rice. A possible explanation is that a household may prefer imported rice over local rice but may not be willing to spend additional portion of her income to pay for any increase in the price of imported rice brands. This suggests that not all the consumers who prefer imported rice have the WTP. Thus, preference is a mere expression of wish, while WTP is preference backed by ability to pay. This may indicate increasing consumers' acceptability and competitiveness of local rice in the market. This is consistent in part with a recent study by Alfred and Adekayode (2014) who found that a large percentage of Nigerians consume local rice. Some of the socioeconomic variables describing the respondents, such as gender, household size, education and marital status included in the binary logistic model were not statistically significant for influencing consumer's preference and willingness to pay higher

prices for imported rice brands. This non-significance of socio-economic characteristics a typical phenomenon in studies focused on consumer choice (Enneking, 2004).

The estimated coefficient for price is positive and statistically significant for the probability of household's preference and willingness to pay for higher price for imported rice brands (Table 3.4). This implies that an increase in the price of imported rice is likely to increase the probability of household's preference and willingness to pay a higher price for imported rice. This is because higher prices often lead to higher quality perceptions (Raghubir and Corfman, 1999). The marginal effect suggests that an increase in market price increases the odds of surveyed household's preference and willingness to pay higher price for imported rice brands over the local rice by 0.001% and 0.5% respectively (Table 3.4). This indicates that price increase has stronger effect on WTP than on preference. A possible reason could be household's belief that increased prices of imported rice brands reflects improved quality, and this belief is being reinforced by the perception that imported rice brands have always had better quality attributes than local rice brands. This supports previous finding of Shiraia (2015), that appeal leads to favourable price perceptions and purchase intentions when the product price is high. Also, previous report by Campbell *et al.* (2009) show that consumers tend to set minimum quality standards and are unlikely to shift from imported rice to local rice just because the price of the former has risen, instead they tend to shift to lower-quality but cheaper imported rice.

Consumer household's general perception has a coefficient which is positive and statistically significant for the probability of household's preference and willingness to pay for imported rice brands (Table 3.4). This implies that an increase in the household's general perception of quality of imported rice is likely to increase the probability of household's preference and willingness to pay for imported rice. The marginal effect suggests that an increase in household's general perception from moderate to strong increases the odds of surveyed household's preference and willingness to pay for imported rice brands over the local rice by 288.9% and 234.5% respectively (Table 3.4). This indicates that consumer's perception of the quality attributes of food product could be the highest determinant of consumer's preference and willingness to pay (Akaeze, 2010; Thanasuta and Metharom, 2015). This could be because households' general perception reflects the total importance attached to the quality attributes of the food product (Raghubir and Corfman, 1999; Chiliya *et al.*, 2009).

3.6.4 Consumers' preference and WTP for imported rice brands

In this study, consumers' preferences and willingness to pay (WTP) increased prices for imported rice brands were determined by estimating their respective probabilities relative to local rice and the results across the six locations surveyed are as shown in Table 3.5.

Table 3.5: Estimated probabilities of household's preference and WTP for imported rice

Household Behaviour	Probabilities of Preference and WTP	Location (Area Council)						$Pr_{overall}$
		AMAC	Abaji	Kwali	Gwagwalada	Kuje	Bwari	
Preference	$Pr_{wtpmean}(Y=1) < 0.5$	0.036	0.062	0.026	0.070	0.051	0.029	0.046
	$Pr_{wtpmean}(Y=1) > 0.5$	0.964	0.938	0.985	0.930	0.949	0.971	0.956
	$Pr_{overallmean}(Y=1)$	0.509	0.444	0.452	0.479	0.512	0.458	
WTP	$Pr_{pmean}(Y=1) < 0.5$	0.288	0.217	0.222	0.225	0.292	0.209	0.242
	$Pr_{pmean}(Y=1) > 0.5$	0.712	0.783	0.778	0.775	0.707	0.791	0.758
	$Pr_{overallmean}(Y=1)$	0.673	0.627	0.652	0.675	0.708	0.668	

Note: $Pr_{pmean}(Y=1)$ is mean probability of household's preference of imported rice over the local rice
 $Pr_{wtpmean}(Y=1)$ is mean probability of household's WTP for imported rice over the local rice
 $Pr_{overallmean}(Y=1)$ is overall mean probability across the six locations or within each location

Source: Computed from field survey data, 2014

Table 3.5 shows that probabilities of household's preference and WTP for imported rice brands vary across the six locations surveyed. The results show that, on average, the probability that a household prefers imported rice brands over the local rice is 95.6%, while the probability that a household does not prefer imported rice brands over the local rice is 4.6%. Similarly, the probability that a household is willing to pay increased price for imported rice brands in order to avoid the local rice is 75.8%, while the probability that a household is not willing to pay increased price for imported rice brands in order to avoid the local rice is 24.2% (Table 3.5). The overall implication is that, while many households may prefer imported rice brands over the local rice, but not as much may be willing to pay increased price on imported rice brands to avoid local rice. This is consistent with the theory of demand in which higher price leads to lower demand. It also agrees with a recent study by Alfred and Adekayode (2014) whose findings show that large percentage of Nigerians were indifferent in their preference of local and imported rice brands. This is an indication that consumers are beginning to accept local rice as a perfect substitute for imported rice brands.

3.6.5 Consumers' inertia against preference and WTP for imported rice brands

In this study, consumer's inertia against preference and WTP for imported rice brands was measured by the difference between price and quality differentials of local and imported rice brands as presented in Table 3.6 for the six locations surveyed. The MWTP (mean WTP) is a

measure of the monetary value of household's WTP based on her perception of the difference in the quality attributes of local and imported rice brands.

Table 3.6: Estimated price-quality differentials for local and imported rice

Location	Price differential (P_{mdiff}) ⁷	Quality differential (MWTP) ⁸	Price-Quality differentials Gap ($P_{\text{mdiff}} - \text{MWTP}$) ⁹	Behaviour of household against preference for imported rice brands
AMAC	3,872	5,855	-1,983	Inertia
Abaji	3,738	2,608	1,130	No inertia
Kwali	3,771	3,016	755	No inertia
Gwagwalada	3,989	5,315	-1,326	Inertia
Kuje	4,195	5,281	-1,086	Inertia
Bwari	3,905	3,771	134	No inertia
Overall	3,911	4,307	-396	Inertia

Note: All the figures are monetary values expressed in Naira (1US\$ = N200 in 2014).

Source: computed from field data, 2014

The results in Table 3.6 revealed that, with higher negative price-quality differentials gap, consumers' inertia against preference and WTP for imported rice brands is stronger among households residing in the more developed locations (AMAC, Gwagwalada and Kuje) with proximity to Abuja, the FCT city centre. Consumer households residing in locations such as Bwari, Kwali and Abaji that are farther away from the city centre and with lower economic activities, seems not to see the market price differential as a true reflection of quality differential between local and imported rice brands. Generally, there is negative price-quality differentials gap between local and imported rice brands, and this could be a possible reason for the persistence of consumer's inertia against preference and WTP for imported rice brands in Nigeria. This differential gap of N396 (US\$2) per 50kg bag which is lower than N2,500 (US\$13) by Akpan et al (2014) indicates a possible growth in consumers' acceptability and competitiveness of local rice in Nigeria.

3.7 Conclusions and implications

The results of this study have shown that age and income of household heads are important determinants of consumer preference and willingness to pay for imported rice brands. Older household heads especially those who earn higher incomes are more likely to perceive imported

⁷ P_{mdiff} denotes the price differential. It is the difference between the average retail market prices of local rice and the maximum price consumer is willing to pay for imported rice brands.

⁸MWTP denotes the mean WTP. It is the monetary value of consumer's willingness to pay (WTP) increased price as a reflection of additional importance attached to his/her preference.

⁹Consumer inertia exists if $P_{\text{mdiff}} - \text{MWTP}$ is negative; and positive otherwise.

rice as superior to local rice in terms of quality. They would therefore still prefer and be willing to pay increased price of imported rice since they can afford it. This study also confirms that market price and consumer's perception of food quality play vital role in influencing consumer's choice of rice. For the fact that consumer households perceive higher prices of imported rice brands as a reflection of better quality attributes, rising prices of imported rice brands often reinforce preference and willingness to pay for imported rice brands. Therefore, there is need for simultaneous implementations of import restriction policies (such as high import tariffs, levies, duties, taxes to raise the market prices of imported rice brands) and domestic marketing policies that promote a positive image of the improved quality attributes while reversing the negative perception of consumers towards local rice. This could be a crucial step towards breaking the consumers' inertia against preference for imported rice brands.

The difference between the prices of local and imported rice brands is lower than the difference between the qualities attributes of these two brands as perceived by consumers. This negative price-quality differential gap is the reason for the persistence of consumers' inertia against preference and willingness to pay for imported rice brands. Rice consumers in Nigeria compare price and quality differentials before making a choice between local and imported rice brands. There is need for synergy between public policy makers and marketing managers in designing and implementing import restriction and strategic marketing policies in a flexible and complimentary manner that ensures sustenance of a wide price differential between local and imported rice brands while improving the quality and image of the local brands to narrow consumer's perception of the quality differential between these two sets of brands.

Economic theory assumes consumers are rational and would always like to maximize utility. The finding of this study implies that, when a rational consumer is to make a choice between two or more brands of a product of almost similar quality attributes, preference or willingness to pay for a brand is likely dependent on his/her perceived quality differential being higher than market price differential. There is need to integrate the role of price-quality differentials into the theoretical models of consumer behaviour for food products. This will help to provide useful insights into the understanding of consumer's choice behaviour towards two or more brands of a food product with almost similar quality attributes but of different price regimes.

CHAPTER 4

IMPLICIT PRICE ESTIMATION OF QUALITY ATTRIBUTES INFLUENCING RICE PRICES AND CHOICE DECISIONS OF CONSUMERS IN NIGERIA¹⁰

4.1 Abstract

Consumers' preference for imported rice brands in Nigeria has been largely due to differences in the quality attributes of local and imported rice brands. This paper presents the findings of a study conducted in the Federal Capital Territory (FCT), Nigeria to determine the relative importance and prices consumers pay for rice quality attributes, which in turn influence their utilitarian attitudes and decisions to purchase rice. Hedonic model was estimated using 2014 dataset collected from a survey of 460 rice consumer households. The results showed that 42%, 63%, 71%, 65% and 79% of the household respondents ranked grains' high swelling capacity whiter colour, neatness, aroma and long shape as the first to fifth most preferred quality attributes respectively, and paid an average price of ₦10,416 (\$53) and ₦7,567 (\$38) for a 50kg bag of imported and local rice brands respectively. Quality attributes contribute about 48-52% of the prices consumers paid for rice which was higher than the 25-34% obtainable in other countries. It was found that high swelling capacity, whiter after-cook colour, neatness, and grains separateness mostly influence market prices of imported rice in Nigeria as consumers would pay an average of additional ₦326 (\$1.65), ₦320 (\$1.60), ₦158 (\$0.80) and ₦122 (\$0.61) respectively on these quality attributes to avoid local rice. These findings present rice breeders, processors and marketers with investment challenges as well as opportunities of which the implications for designing quality improvement and marketing policies and programmes for the development of Nigeria's rice industry were discussed.

Keywords – Marginal implicit price; quality attributes; rice brands; Nigeria

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4.2 Introduction

Rice (*Oryza sativa*) is the most widely consumed staple food by over 170 million people in Nigeria. The per capita rice consumption is estimated at 35kg per annum, and gives a total of 5 million metric tons of milled rice consumed in Nigeria per annum (USDA, 2016). Despite suitability of Nigeria's ecological conditions, the country's domestic rice production estimated at 2.7 million metric tons per annum has left a consumption gap of about 2.3 million metric tons per annum (USDA, 2016) which is being filled by imports (Johnson et al, 2013). There is no doubt that rice importation has been a multi-million-dollar business in Nigeria. It is estimated that the import bills of over US\$6million daily (Johnson et al, 2013) Nigeria pays were not only a huge drain on the country's foreign exchange earnings but also a threat to the growth of the domestic rice industry. Various fiscal and protectionist policy measures by the government to stem huge importation seem to be ineffective as the demand and availability of imported rice brands in Nigeria's domestic markets continued to rise over the years (Gyimah-Brempong et al, 2012; Hiroyuki et al, 2012).

In the last seven years, the Nigerian government has put in place some programmes and policies to discourage rice importation and encourage domestic production such as increased import tariff on rice; ban on importation of rice through the land borders; and the establishment of commercial agricultural credit support scheme (CACS). These policies and programmes have so far attracted many investors leading to massive and expanded investments in paddy rice production and establishments of several modern large-scale rice processing mills. Many improved local rice varieties such as NERICA (New Rice for Africa), FAROs 44, 54 and 58 have been adopted (DontsopNguezet et al, 2012). Domestic rice production has been stimulated and increases annually by more than 5% (Seck *et al.*, 2010). In the last five years, rice production, processing, polishing and packaging in Nigeria have tremendously improved and there are many local rice brands with improved quality attributes (AfricaRice, 2012). Despite improvements in the physio-chemical quality of local rice, the demand for imported rice brands continues to rise. Several studies have pointed to better quality attributes as one of the major reasons responsible for higher prices and consumers' preference for imported rice brands (Tomlins et al, 2005; Gyimah-Brempong et al, 2012; Hiroyuki et al, 2012; Johnson et al, 2013).

In Nigeria markets today, several brands of imported rice that possess different levels of quality attributes desired by consumers are sold. Popular among these brands and their countries of origin include: Caprice (Thailand), Stallion (Thailand), Crystal (India), Elephant Gold

(Thailand), Peacock (Thailand), Golden penny (Thailand/America), Tomato Gold (Thailand), Double Bull (India), Mama Gold (Thailand), Turkey Gold (Thailand), Royal Umbrella (Thailand), Family Pride (India), Salsa Rice (America), Unity Rice (India), and Sarina (India). These imported rice brands possess desired intrinsic quality attributes such as good aroma, taste, bright colour, high swelling capacity, separated grains, strong texture (does not easily soak), neatness, and long grains.

Quality attributes are used by breeders, processors and marketers to differentiate and determine prices of food crop varieties (Hussein et al, 2015). Recent studies have emphasized rice breeding programmes, which uses genetic and molecular techniques, such as marker assisted backcrossing (MABC) to develop rice varieties that possess intrinsic quality attributes that are appealing to consumers (Hasan et al, 2015; Wendy et al, 2016). There is an evidence of strong correlation between physio-chemical attributes, palatability, genetic traits and rice eating quality (Mi-Young et al, 2011). Though some research findings such as Tomlins et al (2005), Gyimah-Brempong et al (2012), and Hiroyuki et al (2012) have shown that, among other factors, quality attributes are a major determinant of consumers' preference and market values of rice brands. It is important to understand consumers' own perceptions and preferences of quality attributes as consumers usually will be making purchasing decisions based on these beliefs (Rijswijk and Frewer, 2008). However, there is no clear empirical evidence to substantiate how much consumers pay to reflect the importance they attach to these quality attributes. Consumers who are the final buyers of food products such as rice often pay retail prices, but there is limited published research to link these rice quality attributes to consumer's preference at retail level. Therefore, the relationship between the retail prices consumers pay for rice brands and the quality attributes associated with such brands has not received adequate attention in the rice marketing research literature in Nigeria.

Imported rice brands are sold at prices higher than the prices of local rice brands. Previous studies have recommended that producers (breeders, farmers and processors) of local rice need to invest in rice varieties and improved processing technologies that enhance the quality attributes of local rice to make them competitive with imported rice brands (Tomlins et al, 2005; Hiroyuki et al, 2012). It is important for these local producers to know the additional value (in monetary terms) an improvement in each quality attribute of local rice would attract to the total price consumers pay for similar but desirable quality attributes of imported rice brands. These producers could make better strategic choices if the benefit (implicit price) associated with improvement in a quality attribute of local rice is greater than the relative costs

incurred (Oczkowski, 1994). This will justify the economic incentives these producers would derive from embarking in such breeding and processing programmes. This study is unique because it attempts to estimate marginal implicit prices of rice quality attributes from the consumers' perspective. Therefore, the findings of this study would help local rice producers (breeders, farmers, and processors), marketers and policymakers to set their research and development priorities and strategically target rice varieties with quality attributes that attract higher consumers' preference pricing. Therefore, the primary objectives of this study were to:

- i). identify key quality attributes and their effects on the retail market price of imported rice brands in Nigeria;
- ii). estimate the marginal implicit prices of rice quality attributes paid by consumers in urban, semi-urban and rural areas;
- iii). determine the economic incentives for quality improvement of local rice.

4.3 Theoretical model

Hedonic price model has been the most widely used technique to empirically estimate the prices of quality attributes of agricultural commodities. Hedonic price functions have been used in the pricing of milk and in estimating implicit quality prices for cotton (Wilson, 1984). Other agricultural commodities explored by hedonic techniques include tomatoes, eggs, rice, wheat, feeder cattle, boars and cucumbers (Waugh, 1928; Ladd, 1982; Dalton, 2004). Product quality and hedonic price models have also been explored to the consumer or retail level and have as their theoretical foundation consumer utility maximization, as developed independently by Houthakker (1952), Theil (1965), and later by Lancaster (1966). The applications of hedonic modelling to agriculture at both the consumer and producer levels were mostly done by Ladd and Martin (1976), Ladd and Suvannunt (1976), Ladd (1982) and Wilson (1984). Based on the hedonic technique, Ladd and Suvannunt (1976) developed the Consumer Goods Characteristics Model (CGCM). Several studies such as Eastwood et al (1986), Chiou et al (1993) and Goodwin et al (1995) have used the CGCM in analyzing the monetary values associated with the quality attributes of agricultural commodities. This model assumes that consumers of an agricultural commodity such as rice have a demand, not just for the rice as a food product, but for the bundle of intrinsic quality attributes it possesses such as colour, aroma, taste, shape, texture, neatness, swelling capacity, etc. The basic premise of the CGCM is that consumers buy a product based on the utilities that are derived from the quality attributes that the product possesses. Hence, the total utility a consumer enjoys from buying a product depends on the

total number of the product's quality attributes purchased. Consumers cannot buy the quality attributes they need from the market; they can only buy the products which provide those quality attributes. Therefore, the price consumer pays for a product is the sum of the marginal values of the product's quality attributes.

The CGCM is the most logical model for this study which aims at estimating the prices consumers pay for quality attributes of various brands of imported rice. There are at least 15 different brands of imported rice in Nigeria markets. The theoretical development supposes n brands of imported rice where each of the first m intrinsic quality attribute is provided by several brands (Ladd and Suvannunt, 1976). Also, it is assumed that each rice brand is unique because it has a quality attribute it provides more than any other brand. Following Jordan et al (1985), total consumption of each quality attribute is then expressed as a function of the quantities of rice brands consumed and of consumption input-output coefficients as follows:

$$X_{Tj} = f_j(Q_1, Q_2, \dots, Q_n; x_{1j}, x_{2j}, \dots, x_{nj}) \text{ for } j = 1, 2, 3, \dots, m \quad [4.1]$$

$$X_{Tm+i} = f_{m+i}(Q_i, x_{im+1}) \text{ for } i = 1, 2, 3, \dots, n \quad [4.2]$$

where X_{Tj} is the total amount of the j^{th} quality attribute provided by all the n rice brands; x_{ij} is the quantity of the j^{th} quality attribute provided by one unit of i^{th} brand; Q_i is the quantity of i^{th} brand consumed; m is the total number of quality attributes of each i^{th} brand; while n is the total number of rice brands. Equation (4.2) depicts the uniqueness of each rice brand because it possesses more quantity of a quality attribute that could influence consumer's purchase behaviour than other brands. According to equation (4.2), each i^{th} rice brand provides the consumer with larger quantity ($m+1$) of a quality attribute more than any other rice brand (Ladd and Suvannunt, 1976), hence x_{im+1} . Thus, a household's total utility function is:

$$TU = f(X_{T1}, X_{T2}, \dots, X_{Tm}, X_{Tm+1}, \dots, X_{Tm+n}) \quad [4.3]$$

From equation (4.3), a consumer household is to maximize total utility subject to a budget constraint, $I = \sum P_i Q_i$ where I is the household income. Differentiating equation (4.3) gives the first order conditions:

$$\Sigma \left(\frac{\partial TU}{\partial X_{Tj}} \right) \left(\frac{\partial X_{Tj}}{\partial Q_i} \right) + \left(\frac{\partial TU}{\partial X_{Tm+i}} \right) \left(\frac{\partial X_{Tm+i}}{\partial Q_i} \right) - \left(\frac{\partial TU}{\partial I} \right) P_i = 0 \quad [4.4]$$

It is assumed that the utility a consumer derives from the consumption of rice is independent of all the utilities obtained from other possible goods purchased subject to the budget. The amount a consumer allocates for the purchase of rice is independent of the other purchases. Solving for P_i in equation (4.4) gives the hedonic price function where one unit of each brand of rice supplies one unit of its quality attribute as follows:

$$P_i = \Sigma \left(\frac{\partial X_{Tj}}{\partial Q_i} \right) \left(\frac{\partial E}{\partial X_{Tj}} \right) + \left(\frac{\partial E}{\partial X_{Tm+i}} \right) \quad [4.5]$$

where P_i is the unit price of i^{th} brand paid by consumer household, $\left(\frac{\partial X_{Tj}}{\partial Q_i} \right)$ is the marginal yield of j^{th} quality attribute of the i^{th} brand of imported rice, E (assumed to be equal to income I) is the total expenditure on all the brands, and $\left(\frac{\partial E}{\partial X_{Tj}} \right)$ is the marginal rate of substitution between expenditure and the j^{th} quality attribute or the marginal implicit price (MIP) a consumer household paid for j^{th} quality attribute.

According to Ladd and Suvannunt (1976), equation (4.5) shows that for each rice brand consumed, the price paid by the consumer equals the sum of the marginal monetary values of the brand's quality attributes. The marginal monetary value of each quality attribute equals the quantity of the quality attribute obtained from the marginal unit of the brand consumed multiplied by the marginal implicit price (MIP) of the quality attribute. Therefore, MIP_{ij} of each j^{th} quality attribute of i^{th} brand of imported rice equals the product of the mean market price of i^{th} brand (\bar{P}_i) and marginal yield of j^{th} quality attribute (β_j) divided by the mean quantity of the j^{th} quality attribute (\bar{j}). Thus, equation (4.5) could be rearranged thus:

$$MIP_{ij} = \frac{\beta_j \bar{P}_i}{\bar{j}} \quad [4.6]$$

4.4 Methodology

4.4.1 Study location and data

This study was conducted in the Federal Capital Territory (FCT) located in the North Central Nigeria. The FCT has six area councils namely Abuja Municipal Area Council (AMAC),

Bwari, Gwagwalada, Kwali, Kuje and Abaji. The degree of infrastructural and socio-economic development of these six area councils is directly dependent on their level of proximity to Abuja, the FCT capital. Abuja is in AMAC and is the most developed area council in terms of infrastructure and socio-economic activities. The seat of federal government, its agencies and diplomatic offices are in Abuja (AMAC) and resident to most of the politicians, wealthy Nigerians and diplomats. In this study, AMAC is categorized as urban area. Kuje, Bwari and Gwagwalada are three area councils closer to Abuja, share some degree of development and are hence categorized as semi-urban. The other three area councils Bwari, Kwali and Abaji are satellite towns farthest from Abuja with the least infrastructural development and predominantly rural. Majority of residents are civil servants, farmers, artisans and traders. The choice of FCT for this study is purposive because it has multi-class and multi-cultural consumers of different socioeconomic characteristics who have varying degrees of purchasing power and consumption behaviours. Virtually all local and imported rice brands can be found in the major markets in these six area councils.

Data were collected using a structured and validated questionnaire. Jury's method was used to test questionnaire content validity, while the test-retest method was used to evaluate questionnaire reliability. Questionnaire was primarily administered to the household heads during the face-to-face interview while other household members contributed in providing answers to the questions raised during the interviews. Data were collected on the consumer households' socioeconomic characteristics, their desirability and preference ranking of rice quality attributes (on a 1-13 scale), and market prices they paid for imported rice brands.

4.4.2 Explanatory variables included in the hedonic model

For this study, 13 quality attributes of rice were identified and defined based on past empirical studies (Jordan et al, 1985; Goodwin et al, 1996) as shown in Table 4.1. Following established procedure by Goodwin et al (1996), each household respondent was asked to rank all the 13 quality attributes in a Likert scale of 1 to 13 such that no two or more quality attributes were ranked equally. The choice of direct ranking of quality attributes on 1 to 13 was adopted to reduce the effect of multi-collinearity since the sample size is sufficiently large (Wooldridge, 2006).

Table 4.1: Definitions and measure of explanatory variables included in the hedonic model

Quality Attribute	Value = 13	Value = 1
Colour	Brown/yellow; not desirable	Very white; very desirable
Grain texture	Soft; not desirable	Hard, very desirable
Aroma	No aroma; not desirable	Very aromatic; very desirable
Neatness	Very dirty; not desirable	Very neat; very desirable
Grain separateness	Poorly separated; not desirable	Well separated very desirable
Flavour/Taste	No taste; not desirable	Very tasty; very desirable
Grain shape	Short & fat; not desirable	Long & slender; very desirable
Grain brokenness	Much; not desirable	None; very desirable
Cooking duration	Very long; not desirable	Very short; very desirable
Swelling capacity	Very low; not desirable	Very high; very desirable
Perceived nutrient level	Low; not desirable	High; very desirable
Perceived freshness	Low; not desirable	High; very desirable
Perceived storage with chemicals	High; not desirable	Low; very desirable

Note: Quality attribute values were ranked on a Likert scale of 1 to 13 such that no two or more attributes were ranked equally

4.4.3 Consumers' preference ranking of rice intrinsic quality attributes

Thirteen rice intrinsic quality attributes identified includes after-cook colour, grain texture, aroma, neatness, separate grains, taste/flavour, grain shape, grain brokenness, duration of cooking, swelling capacity, nutrient level (as perceived by the consumer), freshness (as perceived by the customer), and storage with chemical (as perceived by the consumer). Following the Kendall procedure, each household respondent was asked to rank all the 13 attributes in a scale of 1 (most preferred) to 13 (least preferred) such that no two attributes are ranked equally. The choice of Kendall method of direct ranking was adopted to reduce the effect of multi-collinearity among variables since the sample size is sufficiently large; and to avoid dummy variable trap that could arise when too many dummy variables describe a given number of groups (Mhlanga, 2010). Kendall's Concordance test was used to confirm the degree of agreement among respondents in their rankings of the 13 set of rice quality attributes. This confirmation is imperative because hedonic price modelling of quality attributes of a good often make use of respondents' rankings. The total rank score computed is then used to calculate the coefficient of concordance (W) as shown in equation (4.7).

$$W = \left[\frac{12 \left[\sum T^2 - \frac{(\sum T)^2}{n} \right]}{nm^2(n^2 - 1)} \right] \quad [4.7]$$

where

W = coefficient of concordance

T = sum of ranks of the 13 rice quality attributes ranked in order of preference

m = number of respondents (number of household consumers interviewed)

n = number of rice quality attributes being ranked

The coefficient of concordance (W) can be tested for significance in terms of the F-distribution. The F-ratio is given by:

$$F_{cal} = \frac{(m-1)*W}{(1-W)} \quad [4.8]$$

The numerator and denominator degrees of freedom for equation (4.8) are $(n-1) - \frac{2}{m}$ and

$m - 1 \left[(n-1) - \frac{2}{m} \right]$ respectively. The primary aim of obtaining the F-ratio is to test the null hypothesis that the respondent households did not significantly agree on their preference rankings of the rice quality attributes.

4.4.4 Estimating the implicit prices of the quality attributes of imported rice

The observed market price of a product is the sum of implicit prices paid for each of its quality attribute (Rosen, 1974). Given that Kendall's concordance coefficient is significant, implicit prices can be estimated by employing a hedonic price model which is a regression model capable of expressing the observable price of any product as a function of its quality attributes (directly or indirectly observable). In the simplified empirical model used for this study, the price (P_i) that a consumer household paid for i^{th} brand of imported rice depended on the quality attributes that such brand possesses. This model can be expressed linearly as:

$$P_i = \beta_0 + \sum_{j=1}^n \beta_j X_j + \varepsilon_i \quad [4.9]$$

where X_j represent consumers' preference ranked values of j^{th} quality attributes of imported rice brands as described in Table 4.1; and ε_i is the error term. The usual hedonic method is to

obtain the parameter estimates (β_j) of equation (4.7) using the ordinary least squares (OLS) technique by regressing (P_i) on all their quality attributes X_j and choosing the best fitting functional form (Goodwin et al, 1995).

4.5 Results and discussion

4.5.1 Consumers' preference ranking of rice quality attributes

Table 4.2 shows the ranking of the 13 identified quality attributes of imported rice brands in their order of preference by the surveyed consumer households. Kendall concordance coefficient (W) of 0.7934 is found to be significant at 1% alpha level and therefore confirmed that household consumers in the FCT-Abuja were 79.34% in agreement with one another on their preference rankings of quality attributes of imported rice brands. This indicates a strong preference ranking of rice intrinsic quality attributes by the consumers. About 42%, 63%, 71%, 65% and 79% of the household respondents ranked grains' high swelling capacity, whiter colour, neatness, aroma and long shape as the first to fifth most preferred quality attributes respectively, with their Mean Attribute Ranking Scores (MARS) of 1.66, 1.90, 2.85, 4.08, 5.05 respectively (Table 4.2). Perceived nutrient level, cooking duration and perceived chemical storage appear to be the quality attributes that are of least importance to consumers. These preference rankings are consistent with the findings of several other studies (Abansi et al, 1992; Dalton, 2004; USAID, 2009; Demont et al, 2012; Sudha et al, 2013).

Table 4.2: Consumers' preference ranking of quality attributes of imported rice

Quality attributes	Preference rank (1 = most preferred; 13 = least preferred)													Mean rank	Std. Dev.
	1	2	3	4	5	6	7	8	9	10	11	12	13		
Colour	116 (25)	292 (63)	47 (10)	2 (0.4)	-	1 (0.2)	-	1 (0.2)	-	-	-	1 (0.2)	-	1.90	0.833
Grain	-	-	1	-	-	11	130	261	55	-	1	-	1	7.80	0.765
Texture	-	-	(0.2)	-	-	(2.4)	(28)	(57)	(12)	-	(0.2)	-	(0.2)	-	-
Grain Separateness	2 (0.4)	-	1 (0.2)	-	1 (0.2)	105 (23)	238 (52)	101 (22)	10 (2.2)	1 (0.2)	1 (0.2)	-	-	7.01	0.889
Swelling capacity	193 (42)	243 (53)	22 (5)	-	-	-	-	1 (0.2)	1 (0.2)	-	-	-	-	1.66	0.732
Neatness	18 (3.9)	81 (18)	326 (71)	31 (6.7)	-	1 (0.2)	1 (0.2)	1 (0.2)	-	1 (0.2)	-	-	-	2.85	0.771
Taste & Flavour	1 (0.2)	-	-	1 (0.2)	-	-	2 (0.4)	131 (29)	264 (57)	57 (12)	2 (0.4)	-	2 (0.4)	8.82	0.823
Grain Shape	-	1 (0.2)	3 (0.6)	41 (8.9)	361 (79)	46 (10)	3 (0.6)	2 (0.4)	2 (0.4)	-	1 (0.2)	-	-	5.05	0.668
Grain Brokenness	-	-	1 (0.2)	-	79 (17)	310 (64)	64 (14)	4 (0.8)	1 (0.2)	-	-	1 (0.2)	-	5.99	0.681
Cooking Duration	1 (0.2)	-	-	-	-	-	-	-	-	7 (1.5)	103 (22)	263 (57)	86 (19)	11.91	0.853
Aroma	-	-	68 (15)	301 (65)	85 (18)	4 (0.9)	-	-	2 (0.4)	-	-	-	-	4.08	0.686
Perceived Nutrient level	-	-	-	-	-	2 (0.4)	1 (0.2)	-	11 (2.4)	122 (27)	197 (43)	104 (23)	23 (5)	10.98	0.965
Perceived Freshness	-	-	2 (0.4)	1 (0.2)	-	1 (0.2)	1 (0.2)	-	72 (16)	286 (62)	78 (17)	5 (1.1)	14 (3)	10.06	0.993
Perceived Chemical Storage	1 (0.2)	1 (0.2)	-	-	-	-	-	-	-	1 (0.2)	73 (16)	163 (35)	221 (48)	12.27	1.027

Note: Values in parenthesis are percentages of household respondents

Source: Field survey data 2014

4.5.2 A hedonic model of the effects of quality attributes on retail prices of rice

The model summary of Ordinary Least Square (OLS) regression of market price of imported rice brands against the 13 quality attributes is as shown in Table 4.3. In spite of the low R² of 0.308, the F-value of 15.249 show that the estimated model's overall goodness of fit is adequate and significant (Louviere *et al*, 2000), therefore the parameter estimates of the linear function can reliably be used for further analysis. In this study, there is absence of multi-collinearity in the estimated model because the variance inflation factor (VIF) for all the variables included in the model was less than 10 (Menard, 1995).

Table 4.3: Parameter estimates of the effects of quality attributes on the price of imported rice

Model	Unstandardized		Standardized Coefficients ¹¹	t-value	Sig
	Coefficients				
	β	Std. Error	β		
Constant	39209.24	3330.53		11.77	0.000
Colour	-370.73	94.41	-0.187	-3.92	0.000***
Grain Texture	220.28	98.84	0.098	2.23	0.026**
Grain Separateness	-544.73	90.58	-0.282	-6.01	0.000***
Swelling capacity	-367.74	108.41	-0.156	-3.39	0.001***
Neatness	-324.73	102.21	-0.146	-3.18	0.002**
Taste/Flavour	-125.89	88.46	-0.060	-1.42	0.155
Grain Shape	-247.41	115.19	-0.096	-2.15	0.032**
Grain Brokenness	-273.24	116.89	-0.108	-2.34	0.020**
Cooking Duration	-665.91	85.89	-0.330	-7.75	0.000***
Aroma	-311.07	106.14	-0.124	-2.93	0.004***
Perceived Nutrient level	-743.22	77.38	-0.417	-9.60	0.000***
Perceived Freshness	-167.80	76.73	-0.097	-2.19	0.029**
Perceived Chemical Storage	-112.25	86.18	-0.067	-1.30	0.193
R	0.555				
R ²	0.308				
Std. Error of Estimate	1451.590				
Durbin-Watson	2.063				
F-value	15.24				
Significance	0.000***				
VIF	1.445				

** denotes significant at 5%; *** denotes significant at 1%

Source: Computed from field survey data, 2014

Although, price has been a major factor in the household consumers' choice of rice variety (Sar *et al.*, 2012), quality attributes appear to exert more influences on consumers' buying decisions because they in turn influence price. As shown in Table 4.3, there is a significant relationship between the market price consumers pay and the quality attributes of rice such that 30.8% variation in prices could be explained by these 13 quality attributes. These are quality attributes whose implicit prices contribute significantly in determining the overall prices of rice in the market. Taste and perceived storage with chemicals are the two quality attributes that did not significantly influence the price consumers paid for imported rice brands. This could be attributed to the fact that rice consumers do not easily appreciate the taste of rice because the staple is consumed either with stew or cooked as jollof. Stew or jollof rice is prepared with the addition of seasonings such as *Maggi*, *Knorr*, *Royco*, *Aji no moto*, etc that are readily available

¹¹ The negative signs of estimated coefficients which are due to respondents' ranking of quality attributes in reversal order (1= most desirable; 13= least desirable) is inconsequential since the primary purpose is to compute the MIPs. Since ranking involves consumer's assigning of categorical values to the quality attributes such that the degree of weight consumer attaches to one attribute over the other is not measurable, it is more logical to use the standardized coefficients in estimating the MIPs, as it gives a better comparison of how strongly each quality attribute (based on household respondents' ranking) contribute to the price consumer pays and ensures that the sum of the estimated MIPs is less than or equal to the market price of rice.

in the local market. The taste and flavour of these seasonings which consumers buy to enhance the taste of stew or jollof rice overtakes the natural taste of the rice. Thus, consumers may not appreciate the taste of ordinarily boiled white rice. Also, this result seems to suggest that many rice consumers in the FCT-Abuja do not perceive that imported rice brands have been stored in silos with chemicals for a long time as claimed by local rice millers (Punch, 2012) justifying consumers' low ranking of the taste attribute. This supports the findings of Lloyd *et al* (2014) that despite limited vitamins contained in rice after a long period of storage, rice retains much of its sensory quality due to the presence of minerals and other stable macronutrients which makes it possible for consumers to accept it suitable for use.

4.5.3 Estimated marginal implicit prices of rice quality attributes

Estimated standardized coefficients in Table 4.3 were used to calculate the marginal implicit prices (MIP) for quality attributes based on responses of the surveyed households. The linear functional form was used in this study and the MIP of the i^{th} quality attribute for j^{th} brand was estimated using equation (4.6). Marginal implicit prices (MIPs) of quality attributes of local and imported rice brands across the six area council locations (urban, semi-urban and rural) surveyed are as shown in Table 4.4. The results of estimated MIPs indicate that the MIPs vary widely between local and imported rice brands due to differences in their market prices, but vary slightly across the six area councils surveyed. Consumers paid an average price of ₦10,416 (\$53)¹² and ₦7,567 (\$38) for a 50kg bag of imported and local rice brands respectively. The quality attributes contribute about 48-52% of the prices consumers paid for rice. This indicates that Nigeria consumers pay price premiums for quality attributes of rice that are higher than the 25-34% obtainable in other countries (Demont *et al*, 2012). It also indicates that the rice brand possessing quality attributes least desired by consumers could sell as low as 50% of the price of rice brand that has the quality attributes most desired by consumers. From the consumers' perspective, the three quality attributes with MIPs that contribute highest to the price of rice are colour, swelling capacity and neatness.

¹²US\$1 = ₦200 in 2014

Table 4.4: MIPs of quality attributes of local and imported rice brands across locations

Quality attributes	Pooled		Urban ¹³		Semi-urban		Rural	
	Local	Imported	Local	Imported	Local	Imported	Local	Imported
Colour	857	1,180 (11.33)	1,106	1,549 (14.53)	764	1,064 (10.11)	865	1,166 (11.40)
Grain Texture	96	132 (1.27)	96	134 (1.25)	95	133 (1.26)	97	130 (1.27)
Grain Separateness	317	436 (4.19)	312	437 (4.09)	324	451 (4.29)	308	415 (4.06)
Swelling capacity	833	1,147 (11.01)	804	1,125 (10.55)	847	1,179 (11.20)	825	1,113 (10.88)
Neatness	421	580 (5.57)	416	583 (5.46)	417	581 (5.52)	429	578 (5.66)
Taste & Flavour	53	72 (0.70)	51	71 (0.66)	54	75 (0.71)	52	70 (0.69)
Grain Shape	146	202 (1.94)	147	206 (1.93)	147	204 (1.94)	145	196 (1.91)
Grain Brokenness	138	190 (1.82)	142	199 (1.87)	137	190 (1.81)	137	185 (1.81)
Cooking Duration	215	297 (2.85)	211	295 (2.77)	219	305 (2.90)	211	285 (2.79)
Aroma	237	326 (3.13)	238	333 (3.12)	234	326 (3.10)	239	322 (3.15)
Perceived Nutrient level	291	401 (3.85)	292	408 (3.83)	292	407 (3.86)	289	390 (3.81)
Perceived Freshness	74	102 (0.98)	71	100 (0.93)	75	105 (1.00)	74	99 (0.97)
Perceived Chemical Storage	43	59 (0.57)	41	58 (0.54)	44	62 (0.59)	41	55 (0.54)
Mean price of rice	7,567	10,416	7,616	10,664	7,556	10,491	7,584	10,227

Note: MIPs were estimated in Naira (₦) based on the price of 50kg bag of rice. MIPs of local rice brands were estimated based on the assumption that consumers' preference ranking of rice quality attributes remains constant irrespective of the rice variety or brand (Sars et al, 2012). Values in parenthesis are percentages of MIPs to mean price of rice paid by consumers.

Source: Computed from field survey data, 2014

Brightly white grain is the quality attribute of rice valued most by the surveyed consumers. This is because for every 50kg bag of imported and local rice brands, consumers paid the highest MIP of ₦1,180 (\$6) and ₦857 (\$4.5) for white grain colour respectively (Table 4.4). This is consistent with the findings of Goodwin *et al* (1992) that grain colour has the second highest MIP after flavour. Consumers in urban areas tend to prefer and hence pay more for rice brands of whiter grains than consumers in rural areas. Rice varieties of whiter grains are graded higher and sell at better prices, which make some producers and wholesalers strive to whiten their milled rice through blending and mixing of different rice varieties (Wedgwood and Duff, 1992). A possible explanation could be that consumers preferred and paid more for brightly-

¹³ AMAC is urban area; Gwagwalada, Kuje and Bwari are semi-urban areas; while Kwali and Abaji are rural areas.

white but highly polished imported rice grains due to their perception that such grains are neater, and any dirt, chaff or stone can easily be seen and removed thereby making cooking preparations easier (Dalton, 2004). This also implies that rice consumers in the FCT may not have been adequately sensitized, and hence not aware of the nutritional implications of highly-polished rice grains, which contain mostly starch and very little vitamins and minerals, hence nutrients that are beneficial to health are lower in well-milled rice than in partially milled and brown rice (Roy *et al*, 2008). This is consistent with previous findings that lack of education on nutritional and health issues associated with highly polished (brightly white) rice have been found to be one major reason for consumers' preference of brightly-white rice over brown rice (Demont *et al*, 2012; Sudha *et al*, 2013).

High swelling capacity is another quality attribute of rice highly valued by the consumers that strongly influence consumers' buying decisions because of its economic implication (Wedgwood and Duff, 1992). For every 50kg bag of imported and local rice brands, consumers paid MIP of ₦1,147 (\$5.7) and ₦833 (\$4) for swelling capacity respectively (Table 4.4). This agrees with the findings of Abansi *et al* (1992) that volume expansion is the second most important rice quality attribute after price. The result across locations indicated that consumers in semi-urban and in rural areas, who are predominantly low-income groups, spent higher percentage of price of imported rice brands on swelling capacity than those in the urban areas. This finding is consistent with Demont *et al* (2012); Sar *et al* (2012); and Sudha *et al* (2013) who in their separate studies found that low income consumers preferred to buy rice brands that possess higher swelling capacity because they spend less to obtain more quantity. The possible explanation of this consumers' economic behaviour is that low income consumers are likely to prefer quantity to other quality attributes of rice to feed their entire family (Abansi *et al*, 1992). This high swelling capacity of imported rice brands could be due to lower moisture content arising from long period of storage and ageing (Unnevehr, 1992; Maranan *et al*, 1992) as length of storage has been found to significantly increase water absorption, volume expansion and elongation ratios which give a better cooking performance and eating quality (Butt *et al*, 2008). Therefore, both natural and artificial ageing has the potentiality of improving rice cooking quality (Faruq *et al*, 2015). This implies that lower swelling capacity of local rice brands could be attributed to the fact that natural ageing does not take place as consumption takes place within few weeks of harvest.

Neatness is a very important quality attribute that influences consumers' choice and preference for rice brands. Consumers would always prefer rice brands that are very neat, free of foreign matter (dirt, chaffs, stone, etc.). For every 50kg bag of imported and local rice brands, consumers paid MIP of ₦580 (\$2.7) and ₦421 (\$2.25) respectively (Table 4.4). Imported rice brands are well-processed with the use of modern processing technologies that enhance neatness and ensure complete removal of dirt, chaff, stones, and other impurities. This finding supports USAID (2009) that neatness of rice grains makes cooking preparations easier and this could be a plausible reason for the high demand for imported rice brands especially among the urban consumers who value convenience due to their busy work schedules. According to Wedgwood and Duff (1992), there are different levels of rice grains cleaning operations which determine the degree of grain neatness, but also attract additional labour cost, and this may have accounted for the differences in the MIPs of neatness and market prices of local and imported rice brands. Seck *et al* (2010) reported that some of these levels of grain cleaning operations which are absent in cottage rice mills found in rural areas are responsible for the presence of impurities in local rice especially those consumed in rural areas.

Consumers would always prefer rice brands that the grains are not sticky after cooking. For every 50kg bag of imported and local rice brands, consumers paid MIP of ₦436 (\$2.18) and ₦317 (\$1.59) for after-cook separate grains (that is, grains that are non-sticky after cooking) respectively (Table 4.4). After-cook separateness of rice grains is an important determinant of consumers' purchasing decisions. Rice brands imported into Nigeria have high level of after-cook separateness. High amylose content is partly responsible for grain stickiness, but this decreases as the rice grain ages (Butt *et al*, 2008). Therefore, imported rice brands perhaps have lower amylose content which could explain its high level of grain separateness. This is also an indication that imported rice brands may have been stored for a long period of time before being imported into Nigeria as long storage period of milled rice provides ample time for decrease in the amylose content which gives a better cooking performance and eating quality (Butt *et al*, 2008). The findings of this study were consistent with previous studies such as Dalton *et al* (2004) and Abansi *et al* (1992) who found that consumers' most commonly cited reasons for buying rice were volume expansion, grain whiteness, tenderness and cleanliness. Modern rice varieties are whiter and aged thereby providing a better physical and cooking quality attributes which consumers are prepared to pay higher prices for (Maranan *et al*, 1992). While urban consumers would be willing to pay more for neatness; rural consumers would be willing to pay more for higher swelling capacity.

4.5.4 Economic incentives for quality improvement of local rice brands

The development of Nigeria’s rice industry largely depends on improving the quality attributes of local rice to compete favourably with those of imported brands. Producers of local rice would like to know for each quality attribute to be improved upon, the economic benefit or incentive which could be in the form of additional price consumers are willing to pay. Figure 4.1 shows the differences in MIPs (marginal implicit prices) of quality attributes of local and imported rice brands that largely explain the differences in the retail market prices of these two sets of brands.

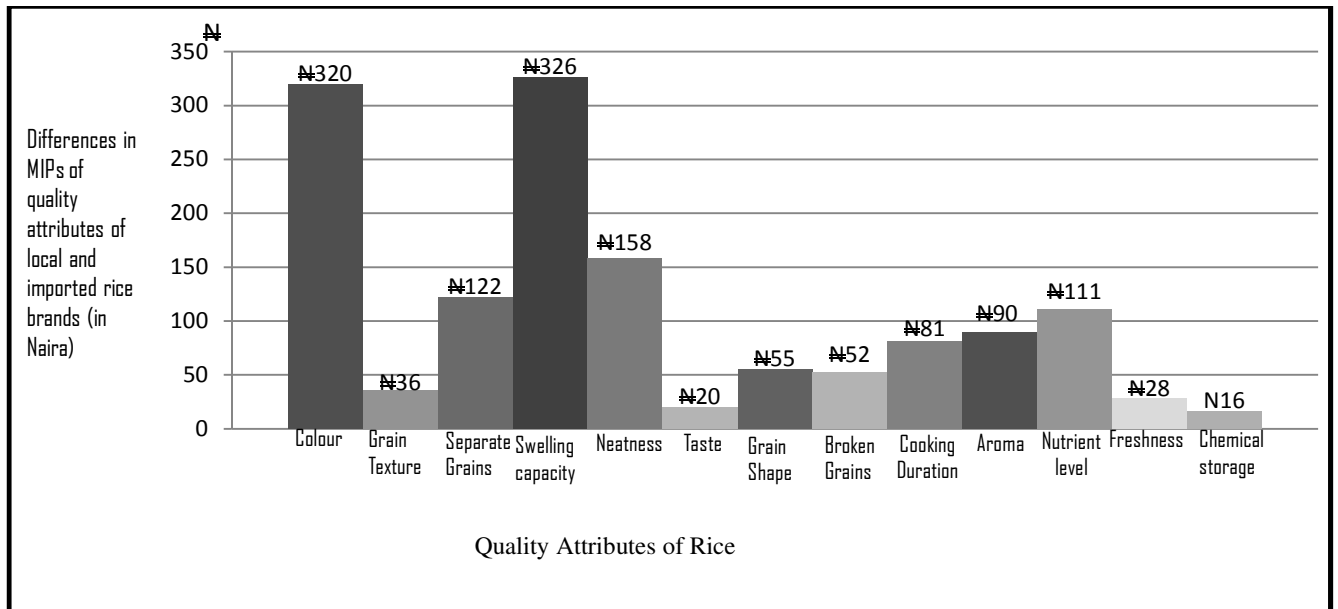


Figure 4.1: Mean MIPs consumers pay for quality attributes of imported rice brands above the mean MIPs they pay for quality attributes of local rice brands

Source: Computed from field survey data, 2014

For this study, this economic incentive for quality improvement of local rice was estimated as the difference between the MIPs of local and imported rice brands. Figure 4.1 shows the additional MIPs consumers paid for preferring the quality attributes of imported rice brands. There is a slight difference between the MIPs of colour and swelling capacity, but wider differences with the MIPs of the other quality attributes. For every 50kg bag, consumers would pay an average of additional ₦320 (\$1.60), ₦326 (\$1.65), ₦158 (\$0.80) and ₦122 (\$0.61) on colour, swelling capacity, neatness and grain separateness respectively (Figure 4.1) should these quality attributes of local rice be improved to the level they can compete favourably with those of imported brands. Therefore, rice quality improvement programmes in Nigeria should

focus on these four attributes for higher prices and economic benefits. However, further studies are needed to ascertain per unit cost of improvement of each quality attribute.

4.6 Conclusion and policy implications

Quality attributes contribute about 48-52% of the prices consumers pay for rice in Nigeria. High swelling capacity, whiter after-cook colour, neatness, and grains separateness mostly influence market prices of imported rice as consumers would pay an average of additional ₦326 (\$1.65), ₦320 (\$1.60), ₦158 (\$0.80) and ₦122 (\$0.61) respectively on these quality attributes to avoid local rice. In summary, it can be concluded from this study that:

- i). Estimation of consumers' cost of preference for quality attributes could be an effective approach to determining consumers' buying behaviours since payments for goods reflects actual purchase decisions.
- ii). Consumers pay higher prices for physical quality attributes than they pay for nutritional/safety quality attributes. Hence consumers' buying decisions are likely to be influenced more by the physical than nutritional/safety intrinsic quality attributes especially when there is limited information/education.
- iii). Rice intrinsic quality attributes exert significant influence on the retail prices of rice, and by extension, consumers' buying decisions;
- iv). Consumers prefer rice brands that possess the intrinsic quality attributes of high swelling capacity, brightly white after-cook colour, neatness, non-sticky grains, and low grain brokenness by paying the highest prices for these attributes;
- v.) Investments in Nigeria's rice industry need to be focused largely on breaking the current consumers' inertia against preference for imported rice brands through improvements in the quality of local rice.

The findings of this study have crucial implications for the consumption and production of important food staple such as rice in a developing country like Nigeria. It is imperative that breeding, processing and marketing strategies for local rice brands target improvements in both physical and nutritional/safety intrinsic quality attributes but with emphasis on physical attributes. Modern rice processing and polishing that integrates artificial ageing technology is needed to enhance the swelling capacity, colour, neatness and grain separateness of local rice for increased consumers' acceptability, price and competitiveness. This will enhance consumers' acceptability, price and competitiveness of the local rice, increase the earnings and thereby incentivizing local rice breeders, farmers, processors and marketers in developing

appropriate policies and rice improvement programmes. Marketers of local rice brands need to invest more in branding to provide packages and labels that contain clear and detailed description of cooking procedures that will minimize the production of after-cook starch. The marketing strategies of local rice distributors need to include aggressive campaigns that sensitize consumers on the negative nutritional and health issues associated with eating highly polished (brightly white) rice that are mostly of imported origin and create awareness of some important and desirable quality attributes local rice brands possess of which consumers may not be aware of.

CHAPTER 5

MARKETING FUNCTIONS INFLUENCING CONSUMERS' ACCEPTABILITY OF LOCAL RICE BRANDS IN NIGERIA¹⁴

5.1 Abstract

With average annual import bill of \$300million, Nigeria is the largest rice consuming and importing country in Africa and this has been attributed to the poor quality of locally produced rice. Despite huge investments of over \$1.65billion made by government and private sectors in the last six years in rice processing which has led to drastic improvements in the quality of local rice brands, consumer's preference for imported rice brands persists. Several studies have recommended prioritizing the implementation of consumer demand-focused domestic marketing policies and programme to encourage consumer's acceptability of local rice brands. This study therefore attempts to provide some insight, from consumer's perspective, on the areas local rice marketing managers need to improve their functions. Binary logistic model was estimated using a 2014 dataset collected from a survey of 460 rice consumer households in the Federal Capital Territory (FCT) of Nigeria. Results showed empirical evidence of consumers' acceptability of local rice brands in Nigeria and the need for improvements in marketing functions that enhance the promotion and distribution of local rice brands. Implications of these findings for the development of Nigeria's rice marketing policy are discussed.

Key words: Consumer's acceptability, local rice brands, marketing functions, Nigeria

5.2 Introduction

Rice (*Oryza specie*) is the most widely accepted and consumed staple food by both the urban and rural populace in Nigeria (Johnson et al, 2013) as 82% of Nigerians eat rice at least once in a day (Ogundele, 2014). Before 2010, about 71% of rice processed in Nigeria was by small scale cottage mills of 10-300kg/hour capacity. Majority of these mills which were mostly sited in major paddy rice producing areas of Lafia, Ekiti, Niger, Taraba, Ebonyi, Benue, and Kaduna

¹⁴This chapter has been submitted for publication as: Obih, U. and Baiyegunhi, L.J.S. (*Under Review*). Marketing functions influencing consumers' acceptability of local rice brands in Nigeria. *Journal of Agribusiness and Rural Development*.

were obsolete processing equipment and lacked modern milling accessories such as de-stoners, polishers, colour sorters, etc. (Lancon et al, 2003; PROPCOM, 2007). Consequently, the locally produced rice was of poor quality due to the presence of stones, husk, impurities, large number of uneven and broken grains, etc. (Campbell *et al.*, 2009). Local rice marketing system was characterized with many challenges such as low product specialization, high degree of price differentiation, poor packaging, grading and standardization (Ogundele, 2013). All these factors led to consumer's preference for imported rice brands. Rice importation in Nigeria which has been rising since the last two decades has been a drain on the country's foreign exchange reserves as Nigeria spends an average of US\$300million annually to import rice (Johnson et al, 2013). Studies have recommended, as a panacea to huge import bills, improvements in the quality of local rice brands to compete favourably with imported brands (Tomlins et al, 2005; PROPCOM, 2007; Gyimah-Brempong et al, 2012; Ogundele, 2014).

In the last six years, Nigerian government adopted an import substitution strategy, and huge investments were made by both government and private sectors in rice production and processing. Government's implementation of Commercial Agricultural Credit Support Scheme (CACS) provided cheap intervention funds that encouraged and attracted private sector participation in the development of the rice sector. A report by CARD (2015) indicated that about US\$1.67billion has been invested in the establishments of medium to large scale integrated rice processing mills in Nigeria since 2010. More arable lands have been opened up for rice farming, improved seeds developed, disseminated and adopted by farmers, while more than 35 modern rice mills have been established across the country leading to increased rice output with annual growth rate of more than 5% (Seck *et al.*, 2010) and availability of high quality local rice brands¹⁵ in Nigerian markets (CARD, 2015). Despite these improvements in output and quality of local rice brands, available literature shows that consumers generally preferred imported rice brands (Adeyeye et al, 2010; Campbell *et al.*, 2009; Erenstein et al., 2003).

Recent studies have recommended prioritizing the implementation of marketing policies and programmes arising from consumer demand-focused research as a strategy for the development of Nigeria's industry (USAID, 2009; Bamidele et al, 2010; Ogundele, 2014). Designing such

¹⁵In Nigeria, rice brands are generally categorized into two, local and imported rice brands. However, the local rice brands are further categorized into two major groups depending on whether it is produced by cottage or medium/large scale industry. This study focuses and refers to the local rice brands produced by medium/large scale rice processing industries where there have been substantial public and private investments in recent times.

policies and programmes at micro and macro levels requires that policy makers should have insights on consumers' view of the functions of the local rice marketers. There are evidences in literature supporting the role of marketer's functions in influencing consumer's acceptability of food products (Kotler and Keller, 2013; Nundkumar and Singh, 2016). However, information, from the consumers' perspective, on the functions of local rice millers and marketers appears scanty as little research has been done on this subject in Nigeria. Some studies which have attempted to provide some insights on rice marketing functions in Nigeria, have only done so from the millers and marketers' perspective (PROPCOM, 2007; Bashorun, 2009). To the authors' best of knowledge, there is no empirical evidence, from consumers' perspective, of the effect of marketing functions on consumers' acceptability of local rice brands. This study has therefore become imperative since the success of marketing managers is dependent on understanding of factors affecting consumer's pre-purchase needs and reconciling them with the interest of marketing companies (Jairo, 2008). Consumers are one of the main drivers of marketing strategies because they can respond to the company's action either positively by purchasing its products or negatively by boycotting its products (Porter and Kramer, 2006). This study will shed some light on the areas local rice marketing managers need to improve their functions to adequately complement and consolidate the private and public sectors' huge investments in production and processing for a sustainable development of Nigeria's rice industry.

5.3 Theoretical and conceptual framework

According to McCarthy (1964), marketing mix is a combination of all the factors which a marketing manager can use to satisfy the target market. These factors are generally grouped into four, otherwise known as the 4Ps of marketing functions. Studies have shown that two of the 4 Ps, pricing and product are considered more important than the other two – place (physical distribution) and promotion (McDaniel and Hise, 1984; Kurtz and Boone, 1987; Kellerman et al, 1995). The theory of a firm's choice of marketing programme is based on the marketing mix model (MMM) and its associated switching of marketing functions to optimize or satisfy a profit function (Grönroos, 1994; Palmer, 2004). The MMMs are econometric models developed to explain the response of sales or market share to expenditures on marketing functions variables (Tellis, 1988b). The choice of an optimal marketing mix is one of the greatest challenges facing marketing managers. The number of possible strategies of the marketing mix has been pointed out to be infinite, and it is not yet clear on which criteria a firm should use in choosing an optimum marketing mix (McCarthy, 1964). Therefore, since different marketing

programmes exert different degree of influence on consumers (Kurtz and Boone, 1987; Kellerman et al, 1995), it becomes imperative for marketing managers to prioritize relevant investments in these marketing programmes (Martensen and Mouritsen, 2016).

MMMs follow a top down approach and are used by marketing managers to measure productivity and returns, and for optimizing expenditures on marketing functions on the basis of sales made (Wolfe and Crotts, 2011). These models are designed from producer's (firm's) perspective to provide valuable information on consumer and market responses to the marketing functions by analysing past data so that consumers' responses can be predicted, upon which future marketing functions can better be planned (Tellis and Zufryden, 1995). Relying on historical sales data to plan future sales is not based on knowledge of consumer's pre-purchase needs and thus may not significantly reveal consumers' true responses to marketing functions. MMMs have been criticised for being production-oriented instead of customer-oriented (Popovic, 2006). Lauterborn (1990) had earlier suggested that each of the marketing mix variables should be seen from the consumer's perspective. Moller (2006) also criticized the MMMs for regarding customers as passive and not considering customer behaviour thereby de-personifying marketing activities. These criticisms therefore indicate the need for a bottom-up approach which uses consumer's pre-purchase responses in modelling the impact of marketing functions on consumers' acceptability of a product. Consumer's acceptability of a product is generally reflected in consumer's increased frequency of purchase and consumption of such product (Tomlins et al, 2007) which ultimately leads to increased market demand and sales.

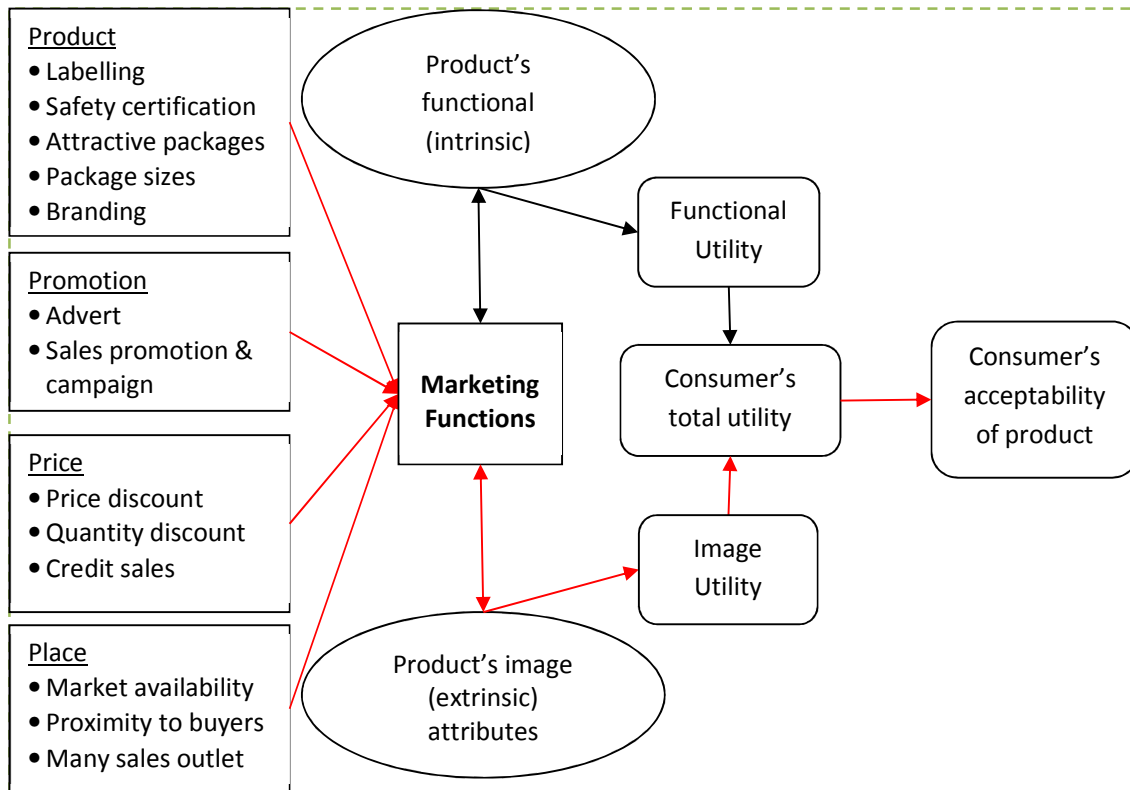


Figure 5.1: Conceptual framework of marketing functions influencing consumer's acceptability of a product.

Source: Author's

This study was guided by the conceptual framework shown in Figure 5.1. This framework is based on Myers and Shocker (1981), which indicates that marketing functions (such as adverts, sales promotion, price and quantity discounts, branding, labelling, packaging, warranty, convenience, etc.) influence consumer's purchase behaviour because they enhance the consumer's perception of the benefits (utility) derivable from the product's attributes. According to this framework (Figure 5.1), every product possesses both functional and image quality attributes (Michaut et al., 2002; Hogg et al., 2000). Functional attributes are intrinsic or inherent and provide functional meanings for the product (Allen et al., 2002) because they possess observable characteristics that offer benefits (functional utility) to consumers (Addis and Holbrook, 2002). Consumer's perception of these functional attributes could be influenced (indirectly) by the functions of marketers (Blijlevens et al, 2009). On the other hand, image attributes are external to the product because they provide symbolic meanings (Meenaghan, 1995) that are related to visual and promotional aspects of the product (Eckman and Wagner, 1994). Marketers often and directly create these image attributes by offering various types of

marketing functions (Blijlevens et al, 2009) to provide the consumer with image utility. Marketing functions therefore influence both the functional and image utilities to determine consumer's total utility which in turn determines consumer's acceptability of a product (Figure 5.1).

Since utility is measured with error, consumer's acceptability of a product brand, which of course is a choice, can be modelled probabilistically rather than in a deterministic framework (Swait et al., 1993). Choice model has been used to provide some insights into the transformation between a consumer's utility for a product and choice on a given occasion (Kamakura and Russell, 1993). Therefore, modelling households' acceptability of rice brands is considered under the general framework of consumer theory (Lancaster, 1966), which suggests that consumers derive utility not from a product but from the attributes embedded in the product. This study follows evidence from literature that households accept a product based on the utilities derivable from its functional and image attributes (Sethuraman and Tellis, 1991; Gilaninia *et al*, 2013). However, some studies such as Meenaghan (1995), Eckman and Wagner (1994), and Michaut et al. (2002), have found that consumers are more likely to be influenced by the image attributes than by the functional attributes of the product. In this study, therefore functional utility is assumed to be constant, and that the individual household is assumed to be faced with two sets of alternative rice brands (local or imported) in a choice situation and must accept (frequently choose) the alternative brand associated with higher image utility (Michaut *et al.*, 2002). Thus, i^{th} household acceptance (ACC_i) of j^{th} rice brand is a function of image utility MU_{ij} being derived:

$$ACC_i = f(MU_j) \quad [5.1]$$

If MU_j and MU_k denote the image utility i^{th} consumer household derives from a set of marketing functions (Z) being offered by the millers and marketers of local and imported rice brands j and k respectively, and if local rice is associated with higher image utility, then $MU_j > MU_k$. If ACC_{ij} denotes the i^{th} consumer household's acceptance of local rice brand j , then:

$$ACC_{ij} = MU_{ij} > MU_{ik} = MU_{ij} - MU_{ik} > \varepsilon_{ik} - \varepsilon_{ij} = MU_{ij} > \varepsilon_{ij} \text{ for all } j \neq k \quad [5.2]$$

5.4 Explanatory variables used in the binary logit model

The explanatory variables hypothesized to explain consumer households' response to the marketing functions of local rice millers and marketers were identified based on the theory and on past empirical work on marketing mix model. The explanatory variables were classified into two, price and marketing functions. The definitions for these variables used in the analysis are presented in Table 5.1.

Table 5.1: Definitions and measure of variables in the binary logit model

Variable	Description	Expected Sign ¹⁶
Dependent variable		
Acceptability (ACC)	Has the frequency of your purchase of local rice increased in the last two years? Yes = 1; 0 if otherwise	
Explanatory variables		
Price	What is the retail price (Naira) of a 50kg bag of local rice?	+
Marketing functions		
<i>Product</i>		
Labelling	Do local rice brands have informative label? Yes = 1; 0 if otherwise	+/-
NAFDAC ¹⁷ certification	Does NAFDAC certification matter? Yes = 1; 0 if otherwise	+/-
Attractive packages	Are the packages attractive? Yes = 1; 0 if otherwise	+/-
Package sizes	Are there many package sizes for local rice brands? Yes = 1; 0 if otherwise	+/-
<i>Promotion</i>		
Advert	Are the mass media main information sources about local rice brands? Yes = 1; 0 if otherwise	+/-
Sales promotion	Are sales promos being offered for local rice brands? Yes = 1; 0 if otherwise	+/-
<i>Price</i>		
Price discount	Are price discounts being offered? Yes = 1; 0 if otherwise	+/-
Quantity discount	Are quantity discounts being offered? Yes = 1; 0 if otherwise	+/-
Credit sales	Are credit sales being offered? Yes = 1; 0 if otherwise	+/-
<i>Place</i>		
Ready availability of product	Are local rice brands readily available in market? Yes = 1; 0 if otherwise	+/-
Proximity of product	Are local rice brands found in shops near consumer's residence? Yes = 1; 0 if otherwise	+/-
Sales outlet	Are there are many sales outlets for local rice brands? Yes = 1; 0 if otherwise	+/-

¹⁶Based on a priori expectations

¹⁷ The National Agency for Food, Drug Administration and Control (NAFDAC) is an agency of the Federal Government responsible for food and drug safety certification and quality control in Nigeria.

5.5 Methodology

5.5.1 Study Area and Method of Data Collection

This study was conducted in the Federal Capital Territory (FCT) located in the North Central Nigeria. It lies within latitudes 7° 25' and 9° 25'N and longitude 5° 45' and 7° 39'E. It is geographically located in the savannah vegetation and at centre of the country with a landmass of 7,315km². FCT is characterized by alternating dry and wet seasons with a mean annual rainfall that varies from 1100 to 1600 mm and temperature of between 12 °C and 33 ° C. The FCT has six area councils namely Abuja Municipal Area Council (AMAC), Bwari, Gwagwalada, Kwali, Kuje and Abaji. The seat of federal government, its agencies and diplomatic offices are in AMAC which has the highest infrastructural development and resident to most of the politicians, wealthy Nigerians and diplomats. The other area councils are satellite towns with lesser infrastructural development and resident to mostly civil servants, farmers, artisans and traders. Thus, FCT has urban, semi-urban and rural resident living together within the territory (AGIS, 2014). The choice of FCT for this study is justified because it is resident to multi-class Nigerians of different socioeconomic statuses, tribe and culture who have varying demand strength and consumption behaviours. Besides, virtually all imported and local rice brands can be found in the major markets in the six area councils of the FCT (AGIS, 2014).

FCT has a total population of about 3.5 million people (NPC, 2013) out of which at least 70% (2.45 million people) are rice consumers who constitute our target population of about 490,000 households (based on average of 5 people per household). Following the method used by Yamane (1967), this household population gives a sample size of 400 household respondents which is considered adequate for interview and data collection. To cover wider geographical area of the FCT-Abuja, a three-stage random sampling method was used in selecting a total of 460 respondent households as follows: AMAC (76)¹⁸, Kuje (77), Gwagwalada (77), Abaji (77), Kwali (76) and Bwari (77). Sampling frames were obtained from the Federal Capital Development Authority (FCDA) and Abuja Geographical Information System (AGIS).

Data were collected was conducted in 2014 using a structured and validated questionnaire. Jury's method was used to test questionnaire content validity, while the test-retest method was used to evaluate questionnaire reliability. Questionnaire was primarily administered to the household heads during the face-to-face interview while other household members contributed

¹⁸ Values in parenthesis denotes the number of households interviewed in the area council surveyed

in providing answers to the questions raised during the interviews. Data were collected on the consumer households' socioeconomic characteristics and acceptability of local rice brands, and consumers' responses to the marketing functions of millers and marketers of local rice brands in Nigeria.

5.5.2 Empirical model for the study

Consumer households' acceptability of food product can be estimated within the binary logit framework (Pambo et al, 2016). In this study, binary logit model was used to analyse the effect of marketing functions on households' acceptability of local rice brands in Nigeria. The model has been commonly applied to analyse discrete choice data. It is suitable for this study because it allows for analysis on if there has been increase in the frequency of household's purchase of local rice brands. Hence, this study specifies a binary logit model (discrete choice method) as the statistical model of probability that i^{th} consumer household accepts local rice brand j $\Pr(ACC_{ij} = 1)$ because it possesses higher image utility MU_{ij} and can be expressed in terms of the logistic distribution (McFadden, 1980) as follows:

$$\Pr(ACC_{ij} = 1) = \frac{\exp^{MU_{ij}}}{1 + \exp^{MU_{ij}}} \text{ where } MU_{ij} = \beta_0 + \beta_j Z_i + \varepsilon_i \quad [5.3]$$

Z_i represents a vector of explanatory variables (including price and marketing functions of millers and marketers of local rice brands) influencing i^{th} household's decision to consume local rice brands more frequently; β_j is a vector of estimated coefficients; and ε_i is the error term. ACC_{ij} is the dependent variable representing the rice brand chosen by a household and takes the value of 1 if the household's frequency of consumption of local rice brand has increased or 0 if otherwise. Increased frequency of household's consumption of local rice brands is used as a reference. Following Latvala (2010), the decision rule is that: if $\Pr(ACC_{ij} = 1) > 0.5$, consumers accept local rice brands; and otherwise if $\Pr(ACC_{ij} = 1) \leq 0.5$.

The results of binary logit model are interpreted in terms of the odds ratios, i.e. the ratios of the probability of choosing one outcome category over the reference category. These ratios are defined as:

$$l_n \left[\frac{\Pr(ACC_{ij})}{\Pr(ACC_{ik})} \right] = Z_i (\beta_j - \beta_k) = Z_i \beta_j \text{ if } k = 1 \quad [5.4]$$

A positive parameter (odd ratio) indicates that the probability of a household's acceptability of local rice brands over the imported rice brands increases relative to the probability of a household's acceptability of imported rice brands over the local rice brands.

5.6 Results and discussion

5.6.1 Distribution of households according to their responses to marketing functions of local rice millers and marketers

The distribution of households by responses to the marketing functions of millers and marketers of local rice brands is presented in Table 5.2. There are wide gaps between the percentages of households with affirmative and non-affirmative responses. For instance, in AMAC, only 7% of the households affirmed that local rice brands have informative labels on their packages, while 93% of the households could not affirm if such service is being provided. In all the marketing functions investigated, households' affirmative and non-affirmative responses follow almost similar pattern.

Table 5.2: Percentage distribution of households' responses to marketing functions of local rice millers and marketers

Marketing functions provided by local rice millers and marketers	Households' locations and responses						
	Pooled	AMAC	Abaji	Kwali	Gwagwalada	Kuje	Bwari
Labelling	6 (94)	7 (93)	6 (94)	6 (94)	6 (94)	5 (95)	4 (96)
NAFDAC Certification	15 (85)	17 (83)	16 (84)	15 (85)	15 (85)	16 (84)	15 (85)
Attractive Package	15 (85)	12 (88)	18 (82)	17 (83)	13 (87)	14 (86)	18 (82)
Package Sizes	27 (73)	34 (66)	27 (73)	21 (79)	25 (75)	30 (70)	27 (73)
Advert	14 (86)	10 (90)	15 (85)	10 (90)	16 (84)	11 (89)	19 (81)
Sales Promotion	19 (81)	13 (87)	16 (84)	23 (77)	26 (74)	16 (84)	19 (81)
Price Discount	6 (94)	2 (98)	4 (96)	10 (90)	8 (92)	3 (97)	9 (91)
Quantity Discount	9 (91)	5 (95)	8 (92)	9 (91)	10 (90)	8 (92)	12 (88)
Credit Sales	6 (94)	7 (93)	5 (95)	8 (92)	6 (94)	3 (97)	5 (95)
Market Availability	18 (82)	4 (96)	26 (74)	13 (87)	40 (60)	5 (95)	23 (77)
Proximity	23 (77)	5 (95)	39 (61)	12 (88)	34 (66)	9 (91)	40 (60)
Sales Outlet	16 (84)	18 (82)	22 (78)	18 (82)	17 (83)	12 (88)	8 (92)

Note: Values in parenthesis are percentages of households with non-affirmative responses to the questions on marketing functions of local rice millers and marketers.

Source: Field survey data, 2014

The above descriptive analysis shows that, with the observed patterns in the data, there is a consensus among the consumer households that marketing functions are not adequately

provided by the millers and marketers of local rice brands in Nigeria. Given the evidence in literature that marketing functions impact consumer's behaviour, demand and sales of food products (Sethuraman and Tellis, 1991), it implies there is opportunity for switching the current consumption preference away from imported rice brands to local rice brands if adequate marketing functions are properly integrated into Nigeria's rice development policies and programmes.

5.6.2 Estimation of marketing functions influencing consumer households' acceptability of local rice brands

A binary logistic regression model for marketing functions influencing consumer's acceptability of local rice brands were estimated using SPSS version 20.0 and the results are presented in Table 5.3. The estimated binary model gave higher correct predictions of 62% of households' acceptability of local rice brands. In the estimated model, the Nagelkerke's R^2 is 0.125, the *Hosmer and Lemeshow (H-L)* tests show significance values greater than 0.05, while the Chi-square tests of 2 Log Likelihood are significant at 1%. These indicate there is no significant difference between observed and model-predicted values, implying a moderately strong relationship between the predictors and the prediction. Therefore, the estimated binary model provides quite good fit and strong explanatory power. The variance inflation factor (VIF) for all the explanatory variables is less than 10 indicating absence of multi-collinearity in the estimated model (Menard, 1995).

Table 5.3: Effects of marketing functions on households' acceptability of local rice brands:
Parameter estimates of binary logit model

Variables	Acceptability of local rice brands	
	<i>B</i>	Exp (β)
Price	0.0003(0.0002) ***	0.998
Labelling	-0.482(0.432)	0.617
NAFDAC certification	0.612(0.293) **	1.844
Attractive packaging	0.367(0.306)	1.443
Package size	-0.194(0.223)	0.823
Advertisement	-0.933(0.366) **	0.393
Sales promotion	0.857(0.311) ***	2.357
Price discount	0.061(0.496)	1.062
Quantity discount	-0.464(0.441)	0.629
Credit sales	-0.063(0.461)	0.939
Ready availability of product	0.823(0.266) ***	2.277
Proximity of product to consumers	-0.490(0.249) **	0.613
Sales outlets	0.741(0.295) **	2.098
Constant	2.407(1.397) *	11.097
No of observations	460	
-2 Log Likelihood	592.179***	
Nagelkerke R ²	0.125	
H-L Test	0.309	
VIF	1.142	
Correctly predicted	62%	

*Note: Values in parenthesis are standard errors; *** Denotes statistically significant at the 1% probability level; ** Denotes statistically significant at the 5% probability level; *Denotes statistically significant at the 10% probability level. Source: Computed from field survey data, 2014*

The coefficients of estimated parameters of the binary logit model only provide the direction of the effect of the independent variables on the dependent (response) variable (Table 5.3) and do not represent the actual magnitude of change or probabilities. Therefore, the marginal effects from the binary model, which measures the expected change in probability of a choice being made with respect to a unit change in the independent variable, are reported as the exp (β) in Table 5.3. Estimated coefficients for household's acceptability of local rice brands are compared with non-acceptability of local rice brands as the base reference choice.

The estimated coefficient for the NAFDAC certification of local rice brand is positive and statistically significant for the probability of household acceptability of local rice brands (Table 5.3). This implies that local rice brands that have NAFDAC certification are more likely to be accepted by consumer households than those without NAFDAC certification. The marginal

effect suggests that the likelihood for such household's choice of acceptance over rejection of the local rice brands increases by 184% (Table 5.3). A possible reason could be that consumers in the area are conscious of food safety and are aware of the importance of NAFDAC certification of food products. NAFDAC has in recent years stepped up the fight against fake food and drugs especially in major markets across Nigeria. This is consistent with the food safety theory; the demand for a food commodity is an increasing function of consumer's perceived safety of consuming such a commodity (Lee et al., 2004; Kim, 2003).

The estimated coefficient for advertisement in the mass media as consumer household's major source of information is negative and statistically significant for the probability of household acceptability of local rice brands (Table 5.3). This implies that the more households accept local rice brands based on the information they obtained, the less likely such information were obtained from the mass media. The marginal effect suggests that the likelihood for a household that depends on mass media as major information source to exhibit acceptance over rejection of local rice brands decreases by 39% (Table 5.3). A possible reason may be that households do not receive adequate mass media advertisement on local rice brands because millers and marketers incurred higher relative costs per unit time of airing such adverts, hence other means of communication such as word-of-mouth, retailers' information, etc. are being exploited by consumers in getting information. These alternative information sources may be ineffective perhaps due to their lower demographic coverage. Besides, mass media advertisement provides consumers with some image utility. This is consistent with Ramasamy et al. (2005) who found that commercial advertisements were the most important source of information, followed by displays in retail outlets.

The estimated coefficient for sales promotions is positive and statistically significant for the probability of household acceptability of local rice brands (Table 5.3). This implies that an increase in sales promotions of local rice brands is likely to increase the probability of household's acceptability of local rice brands. The marginal effect suggests that the likelihood for such household's choice of acceptance over rejection of the local rice brands increases by 235% (Table 5.3). A plausible explanation could be that sales promotions provide the consumer households the opportunity to purchase, know more and appreciate the improvements in the functional qualities of local rice brands over the imported rice brands. Frequent sales promotions are likely to afford consumers the opportunity to try new local rice brands, thereby enhancing the likelihood of increasing the purchase of local rice brands.

The estimated coefficient for '*ready market availability of local rice brand*' is positive and statistically significant for the probability of household acceptability of local rice brands (Table 5.3). This implies that an increase in the market availability of local rice brands is likely to increase the probability of household's acceptability of local rice brands. The marginal effect suggests that the likelihood for such household's choice of acceptance over rejection of the local rice brands increases by 227% (Table 5.3). A possible reason could be that, in a highly competitive market situation, consumers are more likely to purchase those products that are readily and always available in the market. This agrees with the findings of Azabagaoglu and Gaytancioglu (2009), and consistent with Says law, which states that supply creates its own demand.

The estimated coefficient for product proximity is negative and statistically significant for the probability of household acceptability of local rice brands (Table 5.3). This implies that the more households accept local rice brands, the less likely that such local rice were bought from shops nearest to the consumers' residence. The marginal effect suggests that the likelihood for a household that buys local rice from a nearby shop to exhibit acceptance over rejection of local rice brands decreases by 61% (Table 5.3). A possible reason may be that most households believe that food stuffs are cheaper and often prefer and buy their food stuffs including rice in major markets instead of from nearby corner shops in residential areas. This is consistent with the traditional foodstuff purchasing behaviours of most households in Nigeria.

The estimated coefficient for sales outlets of local rice brands is positive and statistically significant for the probability of household acceptability of local rice brands (Table 5.3). This implies that an increase in the sales outlet of local rice brands is likely to increase the probability of household's acceptability of local rice brands. The marginal effect suggests that the likelihood for such household's choice of acceptance over rejection of the local rice brands increases by 209% (Table 5.3). The reason could be that, in a highly competitive market situation, consumer households are more likely to buy rice brands that have higher number of sales outlets because such brands are likely to be readily available in the market. Besides, rice brands with high sales outlet could be evidence of efficient marketing system.

5.6.3 Household's acceptability of local rice brands

In this study, an attempt was made to determine consumers' acceptability of local rice brands by estimating the probability that a household's frequency of purchasing local rice brands has increased in the last two years due to the marketing functions of local rice millers and marketers,

as presented in Table 5.4. Following Latvala (2010), the mean probability of household's acceptability of local rice brands across the six locations ($Pr_{ACC\text{Pooledmean}}$) of 0.591 confirms that there is a general acceptability of local rice brands among rice consuming households in Nigeria. This is consistent with the results obtained from similar studies in other countries where import substitution is being applied as an economic development strategy (Doo Bong et al, 2012; Lee et al, 2004; Kim; 2003).

Table 5.4: Probabilities of household's acceptability of local rice brands across locations

Household Behaviour	Probabilities of Acceptance	Location (Area Council)						$Pr_{ACC\text{Pooled}}$
		AMAC	Abaji	Kwali	Gwagwalada	Kuje	Bwari	
Acceptability of local rice	$Pr_{ACC\text{mean}}(Y=1) < 0.5$	0.379	0.382	0.395	0.372	0.361	0.373	0.377
	$Pr_{ACC\text{mean}}(Y=1) > 0.5$	0.621	0.618	0.605	0.628	0.609	0.627	0.623
	$Pr_{ACC\text{Pooledmean}}(Y=1)$	0.569	0.589	0.622	0.627	0.577	0.563	0.591

Note: $Pr_{ACC\text{mean}}(Y=1)$ is mean probability of household's acceptability of local rice brands.

$Pr_{\text{pooledmean}}(Y=1)$ is pooled mean probability of household's acceptability of local rice in the six locations.

Source: Computed from field survey data, 2014

5.7 Conclusion and implications for rice marketing policy

Consumer households' data show that marketing functions of local rice millers and marketers are inadequate, but this presents marketing managers with the opportunities for increasing the household's acceptability and consumption of local rice brands. Household's pre-purchase responses show that the local rice industry in Nigeria need more improvements in providing marketing functions that enhance the promotion and distribution of local rice brands than those that enhance the pricing and product improvement. This is an indication that local rice brands are beginning to gain consumers' acceptance and can compete favourably with imported rice brands both in price and quality.

Therefore, it is imperative for marketing managers to specifically direct their efforts on quality control and NAFDAC certification for local rice brands. Campaign programmes need to be designed and implemented to promote the functional and image attributes of local rice brands. This needs to be supported by efficient distribution system that ensures the availability of local rice brands in major markets and sales outlets across Nigeria.

CHAPTER 6

FINANCING SMALLHOLDER RICE FARMERS: A FIELD-BASED EVIDENCE REVIEW OF ANCHOR BORROWERS' PROGRAMME (ABP) MODEL IN NIGERIA¹⁹

6.1 Abstract

One of the major reasons adduced for rising importation of rice in Nigeria is the persistent demand-supply gap arising from the country's inability to increase domestic output of paddy rice. The anchor borrowers' programme (ABP) was initiated to encourage banks to lend to smallholder farmers (SHFs) to boost paddy rice production. This paper presents the field experiences of SHFs, banks and rice millers who participated in the programme. ABP is a laudable programme but its sustainability is being threatened by the absence of synergic institutional framework. Implications on ABP guidelines and implementations for effective loan recovery are discussed.

Keywords: Anchor Borrowers' Programme, Smallholder farmers, Anchor, Central Bank of Nigeria, Deposit Money Banks, Nigeria.

6.2 Introduction

Rice (*oryza sativa*) is a major staple food in Nigeria; its consumption has no cultural, religious, ethnic or geographical boundary (Isa *et al.*, 2013). According to Johnson *et al* (2013), the commodity ranks first among all staple food items in terms of expenditures and second only to cassava in terms of quantity consumed. Considering the country's large population of over 170million people, high per capita annual consumption of 40kg (USDA, 2016) and general acceptability of rice, Nigeria is the largest consumer of rice in Africa. The country's estimated average annual demand for milled rice is 5.2 million tons, while the average national production of paddy is 3.8 million tons. Given the country's rice processing capacity and average recovery ratio of 62% (Ogunfowora, 2007), an annual average of 2.4 million tons of milled rice is

¹⁹ This chapter is a concept note included to demonstrate the efforts being made in Nigeria to ensure adequate supply of paddy rice to rapidly growing number of modern rice mills in Nigeria. It is not part of the main research work.

produced domestically (USDA, 2016). This gives average annual demand-supply gap of 1.9million tons of milled rice. To bridge this gap, milled rice worth US\$2billion is being imported annually into the country (Ayanwale and Amusan, 2012) and this has made Nigeria the largest importer of rice in Africa (FAO, 2012). Nigeria's dependency on rice imports is a huge drain on the country's foreign currency reserves, increases her vulnerability to global price shocks, threatens the growth of domestic rice industry and raises overall concerns about the country's food insecurity. Consequently, the country, like many other countries, has adopted the import substitution strategy by introducing various initiatives and programmes designed to promote domestic rice production to achieve self-sufficiency through import restrictions and investments to improve product output and quality.

The total annual demand for rice in Nigeria has been consistently declining since 2013 (Table 6.1). This is largely due to declining consumer purchasing power and rising market prices; both caused by current price inflation and currency devaluation. Output of milled rice has remained stable at average of 2.7million tons per annum while import has declined mainly due to stringent import restriction policy measures imposed by the government and scarcity of foreign exchange. Despite declining consumption and imports, demand-supply gap has remained stable at average of 2.5million tons per annum. Opeyemi et al (2015) found that non-availability in the market all year round is one of the major factors that affect the demand for locally milled rice in Nigeria. Thus, the only way Nigeria can attain self-sufficiency in rice production is to achieve average paddy output of at least 8.4million tons per annum, which is more than twice the current average annual paddy production in Nigeria. This requires the expansion of current cultivable land of 2.3million hectares and increasing current average yield of 1.56tons per hectare (USDA, 2016).

Table 6.1: Trends of Nigeria's milled rice demand, supply and Import ('000 mt) 2000 - 2016

Year	Demand	Supply (paddy)	Supply (milled)	Import	Demand-Supply Gap
2000	3029	3298	1979	1250	1050
2001	3051	2752	1651	1906	1400
2002	3307	2928	1757	1897	1550
2003	3670	3117	1870	1448	1800
2004	3750	3333	2000	1369	1750
2005	3800	3567	2140	1650	1660
2006	4040	4041	2546	1500	1494
2007	4100	3187	2008	1800	2092
2008	4220	4178	2632	1750	1588
2009	4350	3546	2234	1750	2116
2010	4800	4473	2818	2400	1982
2011	5600	4567	2877	3200	2723
2012	5300	3762	2370	2800	2930
2013	5500	4400	2772	2800	2728
2014	5400	4500	2835	2600	2565
2015	5200	4300	2709	2100	2491
2016	5000	4286	2700	2000	2300

Source: USDA, 2016

In the last four decades, small-scale mills have been very active; representing more than 60-70% of Nigeria's total milling capacity and producing at milling rate of 55-60%. However, their final products tend to be of lower quality because of limited equipment (USDA, 2016). Poor quality of locally milled rice has been identified as one of the major reasons for high import volume, as consumers prefer imported rice to local rice (Adeyeye et al, 2010; Johnson et al, 2013). To reverse this situation, the government and private sector have since 2010 invested a total of over \$1.7Billion in the establishment of more than 43 medium to large scale modern integrated rice mills (IRMs) (Anchors) with total milling capacity of over 2.3million metric tons per annum (Tables 6.2 and 6.3). Locally milled rice brands being produced by IRMs have been found to be comparable to imported rice brands in terms of high quality and packaging such that consumers are indifferent between local and imported rice on the basis of physical quality attributes (Alfred and Adekayode, 2014). Previous consumer-preference studies have shown that there is still an overall acknowledgment of higher organoleptic attributes such as taste, aroma and freshness which consumers prefer in favour local rice, but it is not the most decisive attribute in many cases ((Lançon *et al.*, 2003; Tetteh *et al.*, 2011; Demont et al., 2012). This implies that consumers' purchase of IRM-milled rice brands is based mostly on their availability and price. But, there are evidences that more than 70% of the IRMs are operating below 30% capacity due to inadequate domestic supply of paddy (USDA, 2016).

Table 6.2: List of functioning integrated rice mills (IRMs) (Anchors) in Nigeria

S/N	Name and Location	Capacity (tons per annum)	Investment level (\$USm)
1	Onyx Rice Mills Bida, Niger State	12,000	NA
2	Olam Nigeria Ltd, Doma LGA, Nasarawa State	105,000	120
3	JICA/FMARD/Nasarawa State ADP Incubation Rice Mill, Lafia	4,000	0.8
4	Conti Agro (Eko Rice Mill), Imota, Ikorodu, Lagos	13,200	5
5	Popular Foods Ltd, Lagos	210,000	22.5
6	Popular Foods and Mills Ltd, Kano	150,000	23.4
7	Mikap Nigeria Ltd, Makurdi	60,000	5
8	Al Umalau Nigeria Enterprise Ltd Jaling, Taraba State	9,000	3.5
9	Quarra Rice Mill, Tsaragi, Kwara State	24,000	NA
10	Gouria Rice Mill Ltd, Bauchi	5,000	0.75
11	Danmodi Food Processing Nig. Ltd, Jigawa State	12,000	1
12	Umza Rice Mill, Kano	75,000	10
13	Tara Agro Industry Ltd, Adani, Enugu State	42,000	12
14	Integrated Grains Processor Nig. Ltd, Enugu	12,000	0.5
15	Stine Industries Ltd, Amichi, Anambra State	132,000	40
16	Ebony Agro Industry Ltd, Ebonyi State	30,000	7
17	Modern Rice Mill, Ikwo, Ebonyi State	12,000	NA
18	Modern Rice Mill, Iboko, Ebonyi State	12,000	NA
19	Modern Rice Mill, Oso-Edda, Ebonyi State	12,000	NA
20	Labana Rice Mill, Kebbi State	100,000	36
TOTAL		1,031,200	287.6

Note: IRMs with capacity of less than 3,000 tons per annum were not included the Table 6.2

Source: CARD, 2015

Domestic paddy production in Nigeria is dominated by smallholder farmers (SHFs) who cultivate 1-2 hectares of farmland but account for more than 80% of the total paddy rice production, while large scale commercial farms with mechanization account for only less than 10% of cultivated areas and less than 20% of total production (FFI, 2016; GrowAfrica, n.d.).

There are various programmes the government initiated in the past such as the Agricultural Credit Guarantee Scheme (ACGS), Rural Financing (RUFIN), etc. aimed at assisting SHFs access credit from the formal sector. However, these programmes have not made expected impact in increasing farm output due to unwillingness of financial institutions in Nigeria especially the DMBs to fully participate (Adegbite, 2009). DMBs perceive lending to SHFs as

high risk because their farming business is unstructured due to poor functioning of value chains (Augustine *et al.*, 2013), relatively long gestation, seasonal and exposed to unpredictable weather conditions (Philip et al, 2009; IFC, 2012). The transaction cost of lending to SHF is high because individual loan amount is often small due low volume of business, and when cooperatives are involved, the SHFs are often many, residing in remote rural locations, and are distantly dispersed thereby making monitoring by DMBs more difficult (Okello, 2012). In addition to the high risk and transaction costs, SHFs cannot afford the type of collateral acceptable to DMBs to secure any credit extended to them (Okojie et al, 2010). These explain the reasons why in the last 10 years, DMB's lending to agriculture as a percentage of total lending in the economy has been below 5% (CBN, 2017).

Table 6.3: List of newly completed or expanded integrated rice mills

S/N	Name and Location	Installed Capacity (MT/Annum)	Investment level (\$USm)
1	Klysat Foods & Beverage Ltd, Hadejia, Jigawa State	52,000	3.4
2	3-Brothers Rice Mill, Hadeja, Jigawa State	30,000	10
3	Masco Agro Allied Ind. Ltd, Makurdi, Benue	70,000	2.2
4	Masco Agro Allied Ind. Ltd, Makurdi, Benue (Expansion Planned)	190,000	57
5	Popular Farms & Mills Ltd, Kano Expansion Planned	360,000	108
6	2nd Line Conti Agro (Eko Rice Mill), Lagos Expansion Planned	52,800	30
7	Dangote Rice Mills	NA	1,000
8	Pearl Universal Impex Ltd, Bida, Niger State	144,000	53
9	FMARD Approved Rice Mill Allocated to Elephant Group Ltd, Niger State	36,000	10
10	Elephant Group Ltd/Veetee Rice Mill, Ofada Ogun State	75,000	35
11	Elephant Group Ltd Rice Mill (Product of Satake of Netherland), in Kebbi State	54,000	55
12	Pemo Farms Ltd, Aviele, Auchu LGA, Edo State	30,000	9.3
13	Wacot Rice Mill, Lailaba Arugungu, Kebbi State	100,000	20
TOTAL		1,193,800	1,393

Source: CARD, 2015

Several studies have confirmed that smallholders' access to credit increases farm production efficiency and productivity leading to increased output, income and food security (Reyes et al., 2012; Nouman et al., 2013). To boost domestic paddy production, the Nigerian government launched the anchor borrowers' programme (ABP) in December 2015. ABP is designed to provide cheap and partially-secured loans to smallholder farmers (SHFs). This is to make

lending attractive to DMBs and agricultural loans accessible and cheaper to SHFs. Despite the importance of ABP in supporting smallholder farmers to access credit, empirical evidence arising from field experiences, which would guide agricultural policy makers and development practitioners in their efforts to fine-tune the ABP guidelines in order to make the programme more successful and sustainable, is sparse.

6.3 Objectives of study

The main objective of this paper is to help SHFs who are important segment of the population in Nigeria benefit from opportunities offered by the ABP. Specifically, this paper aims at:

- i). assessing the impact of ABP in boosting rice production in Nigeria;
- ii). identifying and describe challenges to the success and sustainability of ABP; and
- iii). Develop recommendations for enhancing the effectiveness of ABP guidelines and synergize the functions of participants in the ABP.

6.4 Methodology

The study was conducted with the support and collaboration of the staff of Development Finance Department of Central Bank of Nigeria (CBN), Deposit Money Banks (DMBs) and field officers of the rice millers (Anchors) who participated in the programme in 2015/2016 and 2016/2017 rice farming seasons. The study involved a review of the field experiences of CBN, participating DMBs and Anchors against the existing provisions of the ABP guidelines. In addition to drawing on the CBN's database, secondary data on agricultural activities were obtained from United States Department of Agriculture (USDA).

6.5 An overview of the anchor borrowers' programme (ABP) model in Nigeria

6.5.1 Introduction

The Central Bank of Nigeria (CBN) in line with its developmental function established the Anchor Borrowers' Programme (ABP) to create a linkage between anchor companies involved in the processing and small holder farmers (SHFs) of the required key agricultural commodities especially rice, wheat and sugar. ABP is funded with the N220 billion Micro, Small and Medium Enterprises Development Fund (MSMEDF) of CBN through the deposit money banks (DMBs) at a cost of 2% and maximum interest rate of 9% to SHFs and tenor equivalent to be the gestation period of the identified commodities (CBN, 2016). The implementation of ABP

is primarily supervised by the development finance office (DFO) in the Development Finance Department (DFD) of CBN in the various States across Nigeria.

The main thrust of ABP is to provide conditions that make it attractive for DMBs to lend to SHFs. This involves ensuring: (1) cheaper credit; (2) timely and reliable supplies of farm inputs; (3) improved capacity of SHFs through trainings on modern farming methods and practices; (4) guaranteed market for farm produce; and (5) provision of partial-collateral. The ABP model helps to structure agricultural value chain to minimize the credit risk DMBs face when lending to SHFs. ABP is targeted at boosting production of key agro-enterprise (wheat, sugar, rice, maize, fish, cotton, etc.), stabilize inputs supplies to SHFs and agro-processors (Anchors) and address the country's negative balance of payments on food. At harvest, the SHF supplies his/her produce to the agro-processor (Anchor) who pays the cash equivalent to the farmer's account.

6.5.2 Objectives of ABP

According to CBN (2016), the broad objective of the ABP is to create economic linkage between smallholder farmers and reputable large-scale processors with a view to increasing agricultural output and significantly improving capacity utilization of processors. Other objectives include: (a) increase banks' financing to the agricultural sector; (b) reduce agricultural commodity importation and conserve external reserves; (c) increase capacity utilization of agricultural firms; (d) create new generation of farmers/entrepreneurs and employment; (e) deepen the cashless policy and financial inclusion; (f) reduce the level of poverty among smallholder farmers; and (g) assist rural smallholder farmers to grow from subsistence to commercial production levels.

6.5.3 Implementation of ABP model

The implementation of ABP is coordinated by a project management team (PMT) comprising of the representative of all the stakeholders including the Central Bank of Nigeria (CBN), Deposit Money Banks (DMBs), representatives of smallholder farmers (SHFs), Agricultural Development Programme (ADP), Nigeria Agricultural Insurance Corporation (NAIC) under the chairmanship of the CBN representative (Head of Development finance officer, DFO). The implementation of the ABP is a collective responsibility of all the stakeholders involved. The ABP guideline prepared by CBN has clearly spelt out the various infractions and sanctions

(CBN, 2016). Figure 6.1 shows the process flow of implementation activities under the ABP model.

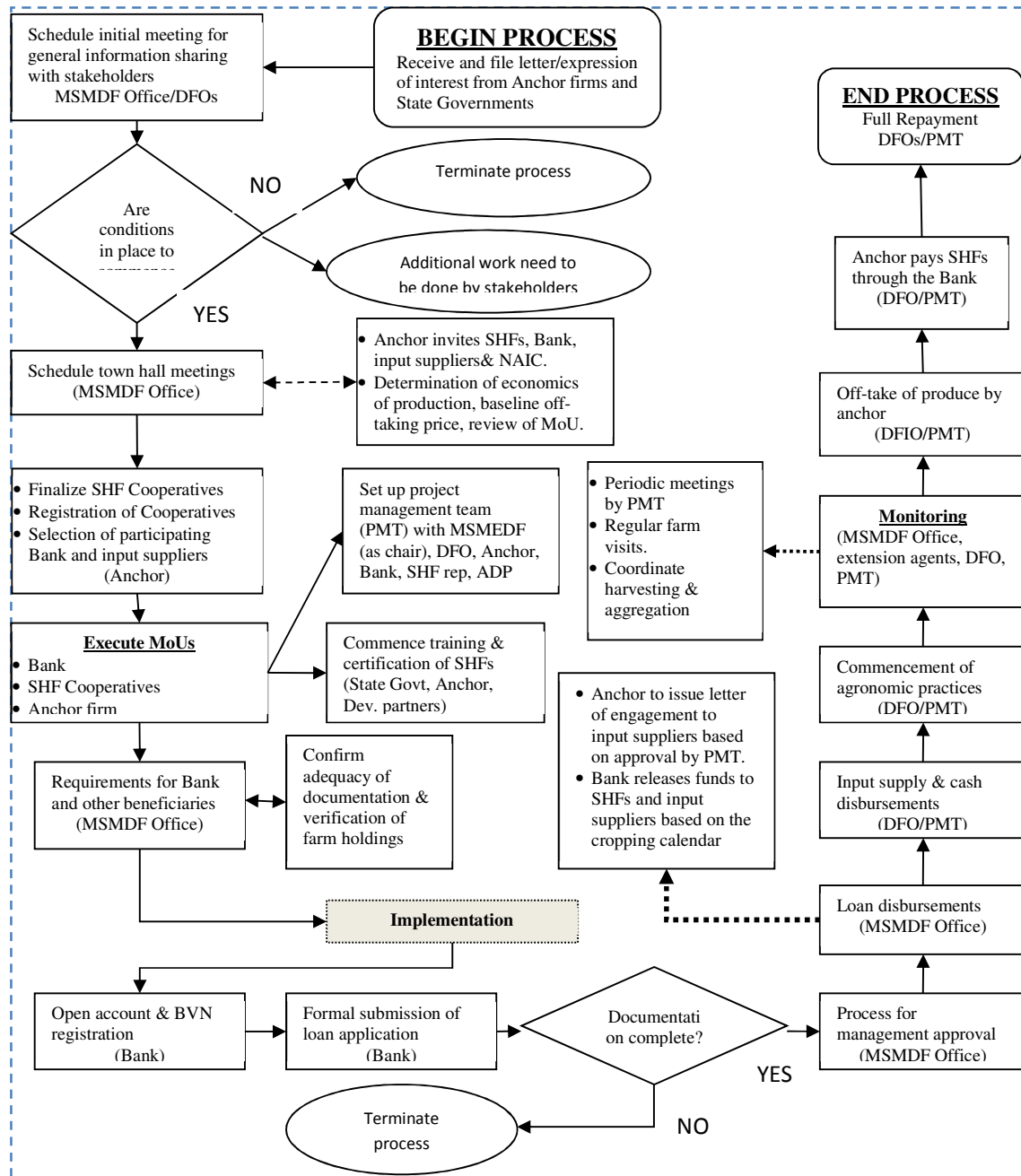


Figure 6.1: Anchor Borrowers' programme (ABP) process flow chart

Source: CBN (2016)

6.5.4 SHF eligibility and acceptable collaterals

Smallholder farmers (SHF) must be a registered member of a recognized cooperative group who holds between 1-5 hectares of farmland and can provide at least 5% of the loan amount

he/she requires. Such a farmer is issued certificate after undergoing a mandatory training covering farming as a business, improved agricultural practices and group management dynamics. Certificates issued at the end of the training constitute a requirement for farmers to access credit facility in kind and cash under the ABP. The cost of such training is borne by the participating anchor and/or State government. According to the ABP guideline (CBN, 2016), funds disbursed by DMBs under the ABP are secured by: (a) tripartite agreement signed by SHFs, DMBs and Anchor; (b) cross and several guarantees by farmers in cooperatives registered on the National Collateral Registry (NCR); (c) SHFs' equity contribution of at least 5% of loan amount; (d) CBN credit risk guarantee (CRG) of 50%; and NAIC insurance cover.

6.5.5 Risks and mitigating measures

The various risks envisaged in the ABP as well as the measures put in place to mitigate such risks have been outlined in Table 6.4.

Table 6.4: Risks and Mitigants in ABP

Risks	Mitigants
Poor farming techniques/low crop yield	Comprehensive farmer education/technical assistance
Credit officers not skilled in agric. financing	Value chain finance training for bankers
Effective monitoring of the process/project	PMT comprising all stakeholders will be put in place
Farmers have no stake in the programme	Equity contribution of 5% - 10% in place
No market for products	Off-takers in place with MOUs executed
Price variation	Guaranteed minimum Price by FMARD in place
Loss of crops due to natural incidences	NAIC Agric. Insurance is compulsory
Poor quality/fake inputs leading to low yields	PMT selects recognised agro dealers
Diversion of funds by farmers	Direct disbursement to agro dealers
Default by farmers/Side selling	SHFs are to be selected by the miller. Cross and joint guarantees by all members of the cooperative. Miller approves all disbursement requests by farmers. Use of extension workers

Source: CBN, 2016

6.6 Field evidence from the funding of smallholder rice farmers under the ABP model

6.6.1 Impact of ABP funding on boosting Nigeria's rice output

ABP was launched by the Federal Government on November 17th, 2015 in Kebbi State, North-west Nigeria. About 70,000 farmers benefitted from the pilot phase (2015/2016 dry season farming). According to a report by the CBN, as at February 2017, about ₦29billion (\$US83million²⁰) had been disbursed to over 125,963 smallholder farmers (SHFs) in 10 States who cultivated a total of 160,083 hectares at average of 1.2 hectares per farmer through 31 anchors (CBN, 2017). This implies that the ABP has so far added about 1,207,090 tons of paddy rice into the economy. There are additional 24 States that have submitted expression of interest to CBN to key into the programme for 2017 farming season. Under the ABP, the average productivity has increased to 5 tons per hectare because of quality inputs and best agronomic practices (CBN, 2017). This indicates a tremendous improvement in the average yield of paddy rice in Nigeria under the ABP given that previous statistics have shown yield of between 1.5 to 3 tons per hectare (Johnson et al, 2013). Studies support the hypothesis that access to credit increases the productivity and profit of smallholder farmers (Hazarika and Alwang; 2003; Foltz, 2004).

Table 6.5: Performance of ABP in 2015/2016 Dry season and 2016 Wet season for rice

Description	2015/2016 Dry season	2016 Wet season
No of SHF beneficiaries	73,941	125,963
No of hectares	81,335	160,083
No of Anchors	2	31
Total output of paddy	406,675	800,415

Source: CBN, 2017

6.6.2 Challenges threatening the success and sustainability of ABP in Nigeria

- i. *Delay in loan processing and disbursement:* This seriously affected the timing of farm operations which created agitations from the SHFs, Anchors and other stakeholders. Timeliness in loan disbursement is a major determinant of SHF loan repayment (Okorie, 1986). In some cases, inputs are supplied to farmers on time due to seasonality of farm operations, but funds are disbursed in arrears thereby making it compulsory for DMBs to disburse the fund to farmers for payment of inputs. Delays in loan disbursement were due to:

²⁰ \$US1 = N350

- (a) DMBs' large documentary and processing requirements. There is long checklist of documents that must be provided by SHFs to meet the conditions precedent to drawdown (CPDs). Nmadu *et al.*, 2013 has observed this as retrogressive bureaucracy that hinders the processing and disbursement of funds to SHFs. As earlier opined by Agnet (2004), this complex mechanism of loan processing and disbursement by DMBs is least understood by SHFs, and thus, limits their access to credit.
 - (b) Inability of SHFs to make 5% cash deposit as part of equity contribution as required by the ABP guideline.
- ii. *Lack of rural-driven institutional frameworks and manpower:* The PMTs, DMBs and Anchors do not have adequate personnel and institutional arrangements to drive the entire ABP exercise at the rural level including selection of farmers, verification of farms, effective monitoring, supervision and reporting of farm activities.
 - iii. *Lack of reliable data of farmers:* The farms' data on farm size hectare, soil fertility, etc with which DMBs work with were often provided by farmers' associations and ADPs. The reliability of these data cannot be vouched for.
 - iv. *Side-selling by SHFs:* Some of the SHFs side-sold their harvested paddy rice for various reasons including to:
 - (a) settle debt from other lenders due to late disbursement of ABP funds;
 - (b) obtain higher market prices being offered by Anchors that are not participating in the ABP;
 - (c) withhold sales at the harvest period to take advantage of increased market price during the off-season;
 - (d) express their dissatisfaction for non-receipt of ABP fund on time.

Previous study (GrowAfrica, n.d.) identified government interference, weak institutional linkages, lack of trust among the value chain actors (SHFs, Anchors, DMBs, etc.), poverty, etc. as other reasons for side-selling by SHFs.
 - v. *Inefficient logistic system and coordination:* There is poor coordination among the key participants and implementers of the programme including the PMT, DMBs, and Anchors leading to late supply/distribution of inputs to farmers, extension services provision and aggregation and supply of harvested paddy rice to anchors.

- vi. *Farm destruction:* There were few incidences of rice farm destructions by flood, drought, fire and nomadic herdsmen. There is poor channel of communication which made it difficult for farmers to report to NAIC within 24 hours as required. Hence, farmers experienced some difficulties in getting insurance compensation from NAIC. Presently, there is no insurance NAIC insurance cover against farm destruction by grazing animals.
- vii. *State governments' direct involvement in ABP:* State government participation in the mainstream of ABP programme as this creates a wrong impression to SHFs who see the loan as government's largess. It has been found that many SHFs have been insensitive, resolute and unresponsive in repaying loans obtained from DMBs (Oladebo 2008). These SHFs' attitudes become worse when there is impression that the loan is government fund. Several studies such as CBN (2005), Ben-Yami (n.d.) have confirmed that repayment rate of public credit is often low because majority of the SHFs erroneously believe that credit from the government is a grant that is not supposed to be repaid.
- viii. *Emergence of part-time farmers:* There were indications that artisans, civil servants and other people whose primary occupations were not farming participated in the programme in order to take advantage of the cheap funding and the credit risk guarantee provided under the ABP. These set of farmers have limited time to give attention to crops in the field.
- ix. *Farmers' insistence on on-farm payment for paddy:* Most SHFs especially those in remote locations preferred and insist on on-farm cash receipt of payment for paddy sold to the anchor. However, for security reasons, anchors do not have the capacity to carry cash in remote villages to make such payments.
- x. *Poor loan repayment:* It is only high loan recovery rate of at least 95% that can guarantee the sustainability of a financing programme such as ABP. Available evidence indicates that poor loan recovery has been a huge challenge threatening the success and sustainability of ABP in Nigeria. This is mostly due to the attitudes of farmers and side-selling as mentioned earlier.

6.6.3 Key Lessons from the 2016 ABP

Field experience of DMBs indicated that farmers in the more remote rural areas easily repaid their loans more than those in the Urban and semi-urban areas. Farmers in urban and semi-urban areas were mostly civil servants who are already indebted to other lenders. There was higher loan recovery from Farmers who owned just one hectare of farmland than those who owned more than one hectare. This agrees with the findings of Oke *et al.* (2007) and Kohansal and Manosoori (2009) who in their separate studies identified loan size as one of the factors that determine repayment. Majority of farmers who easily paid their 5% equity contribution easily repaid their loans also.

6.7 Concluding remarks and the way forward

ABP is a laudable programme capable of boosting SHFs productivities and making Nigeria self-sufficient in rice production. As earlier observed by Augustine *et al.* (2013), a public-private-based partnership (PPP) linkage programme can effectively improve the functioning of agricultural value chains, and ABP is such a programme that can enhance the functioning of rice value chain in Nigeria. Institutional frameworks that will enable the relevant stakeholders to perform their roles effectively need to be adequately put in place. A robust mechanism and system of incentivising SHFs who promptly repay loans need to be integrated into the ABP model as this has been identified to encourage SHFs' loan repayment (Olomola, 2001).

There is a need for CBN to engage DMBs in developing:

- (a). A simplified and standardized procedure for processing loan request under the ABP. There is need for a single package form that must capture all the requirements expected from farmers such as MoU, cross guarantees, acceptance of offer, etc. Also, DMBs need to develop and approve well in advance, an enterprise specific product paper for financing rice farming under the ABP to avoid the long bureaucracy of obtaining approvals before loan can be disbursed.
- (b). A well-articulated institutional framework to drive the ABP in the rural areas and provide real-time report to DMBs. An institutional framework for financing SHFs has been proposed for DMBs (Appendix C). This framework helps to effectively synergize and integrate the roles of government agencies, DMBs, traditional institutions and agency banking in driving formal lending, financial inclusion and banking services

delivery to SHFs in rural areas. It can provide a guide towards effective implementation of ABP model in Nigeria.

- (c) There is need for minimal involvement of State government in the ABP. The roles of the State government should be restricted to provision of rural infrastructure (feeder roads, culverts, bridges, dams, etc.), security, extension services, and establishment of mobile court to try farmers who have defaulted in loan repayment. DMBs and Anchors need to develop an effective enlightenment programme to educate SHFs that the ABP loan is neither government largess nor a grant. CBN activities need to be restricted more to loan administration and supervision with minimal direct interactions with SHFs who often perceive ABP loans as a grant on sighting CBN staffs whom they perceive as government officials.
- (d) DMBs need to commence loan processing early so that all issues are dispensed with and funds disbursed for payment and supply of inputs at the onset of the farming season. A clear action plan with specific deadlines should be drawn well in advance (3-4 months before the farming season commences) to guide all the relevant parties of the ABP accordingly.
- (e) The verification and compilation of SHFs data (farms location, sizes and soil fertility; farmers' bio-data, BVN, account numbers, etc.) should be a joint responsibility of the anchor and DMBs who are major and private stakeholders, hence are likely to generate more reliable data. Data on farms locations and sizes, soil fertility need to be physically verified and GPS coordinates and soil test results provided. Cases of farm location along flood plains could easily be identified and addressed.
- (f) There is need for collaboration between CBN and DMBs to strengthen agency banking programme to facilitate payment of paddy in rural areas. The agency banking platform need to be complemented with the establishment of paddy procurement centres in rural areas where there are clusters of rice farmers. Each centre has to be is equipped with weighing machine and the entire paddy harvested within the cluster farms are taken and weighed at the nearest procurement centre.
- (g) PMT need to be meeting constantly during the harvest period to conduct market price surveys, and to review off-taking prices agreed between SHFs and Anchors in line with prevailing market prices. In addition to the punitive measures and sanctions suggested

by CBN (2016), Paglietti and Sabrie (2013) opined the need to maintain transparent pricing process to overcome farmers' reluctance and distrust of contractual arrangements and partially avoid side-selling. With robust institutional framework in place, harvesting can be effectively monitored by Anchors and DMBs. With the integration of agency banking in the ABP, SHFs can receive prompt payment for paddy rice in their rural locations. Payments to SHFs for paddy rice should be the balance after the pre-determined principal and accrued interests have been deducted. These will help to minimize side-selling and enhance loan recovery.

CHAPTER 7

CONCLUSIONS, POLICY IMPLICATIONS AND FUTURE RESEARCH DIRECTIONS

7.1 Summary and conclusions

Rice (*oryza sativa*) is a staple food consumed by more than 90.8% of urban and 79.9% of rural households in Nigeria (Johnson *et al*, 2013). Nigeria with a current population of over 170 million people and average annual per capita consumption estimated at 29kg is the largest rice consuming nation in Africa. The country's average annual demand for rice is estimated at 5.2million metric tons (Gyimah-Brempong *et al*, 2012) while average domestic supply of milled rice is estimated at 3million metric tons per annum. This gives consumption gap of about 2.2 million metric tons per annum that is being filled by imports (Johnson *et al*, 2013). Nigeria still ranks third in the group of major rice importing countries in the world and the highest rice importer in Africa as it spends about \$US1billion annually on rice importation. To reverse this trend, the government and private sector had in the last 10 years invested over \$1.67billion in the establishment of medium to large scale integrated rice mills (IRMs) (Johnson *et al.*, 2013; CARD, 2015; Opeyemi *et al.*, 2015; Alfred and Adekayode, 2014).

Despite improvements in the quality attributes of local rice in the last 7 years, consumers' preference and willingness to pay higher prices for imported rice persists, and this has been a drain on Nigeria's foreign exchange (Forex) reserves and a threat to the development of the domestic rice industry.

To switch consumption away from imported rice to local rice brands, this study is set to achieve the following objectives:

- i). investigate how price-quality differentials explain the reasons for consumers' inertia against preference and willingness to pay for imported rice brands;
- ii). identify the factors responsible for consumers preference and willingness to pay for imported rice brands;
- iii). determine the monetary values consumers pay for each of the quality attributes of imported rice;

- iv). identify the marketing functions millers and marketers of local rice brands need to adopt to influence consumers' buying decisions; and
- v). describe the prospects, impacts and challenges threatening the sustainability of ABP in supporting the SHFs increase their output of paddy rice?

This study was conducted in the Federal Capital Territory (FCT) located in the North Central Nigeria. Data were collected in 2014 using structured questionnaire administered to 460 rice consumer households selected by multi-stage random sampling techniques. Datasets were analysed using descriptive statistics and estimation of binary logit and hedonic models.

The results show that there are factors responsible for the demand-supply gap and Nigeria's inability to close this gap. These factors include:

- i. *Low domestic supply of paddy rice:* Smallholder rice farmers (SHRFs) who produce 80-90% of domestic paddy rice (Sahel, 2015) can neither achieve expansion in cultivable area or increased yield due to their inability to access cheap funds from banks (Nouman *et al.*, 2013). Banks perceive lending to SHRFs as high risk because their farming business is unstructured (Augustine *et al.*, 2013), seasonal with relatively long gestation, unpredictable weather conditions (Philip *et al.*, 2009), high transaction costs, difficulty in loan monitoring, high interest rate and lack of acceptable collateral acceptable (Okojie *et al.*, 2010).
- ii. *Low milling capacity of domestic rice mills:* Although, local rice brands produced by IRMs have been found to be comparable to imported rice brands in terms of quality such that consumers are indifferent in choosing between local and imported rice on the basis of physical quality attributes (Alfred and Adekayode, 2014), there are evidences that more than 70% of these IRMs are operating below 30-40% capacity partly due to inadequate domestic supply of paddy (USDA, 2016) and partly due to challenging business environment such as erratic power supply, frequent machine breakdowns, regulatory issues, etc. (Opeyemi *et al.*, 2015). It can be concluded that, apart from inadequate domestic production of paddy rice, Nigeria also lack the capacity to produce high quality milled rice to meet domestic demand.
- iii. *Inefficient rice marketing functions:* According to PrOpCom (2007), majority of local rice marketers in Nigeria do not add value to milled local rice through improved

processing, branding and packaging and other marketing functions etc., as the market is characterised by inadequate infrastructure, inconsistent measuring techniques, unscrupulous traders and operational transport costs.

- iv. *Consumers' perception of price-quality differentials of local and imported rice:* Empirical studies on rice consumption in Nigeria such as Gyimah-Brempong et al, (2012) and Johnson et al (2013) observed that consumers have different perceptions about the quality attributes of local and imported rice, and this is largely the reason for consumers' preference for imported rice brands.

The findings of this study also indicate that consumers' inertia against preference and WTP for imported rice persists because of the negative price-quality differentials gap between local and imported rice brands. In other words, the differences in the market prices of local and imported rice brands is lower than the monetary value of consumer's perception of the differences in the quality attributes of these two sets of brands, and this could be the reason for consumer's persistent preference and willingness to pay for imported rice brands. The estimated coefficients of price, household head's age, household's income and general perception were positive and statistically significant (at 5%) for the probability of household's preference and willingness to pay (WTP) for imported rice brands.

The results of this study also show that high swelling capacity, whiter after-cook colour, neatness, and grains separateness mostly influence market prices of imported rice in Nigeria as consumers would pay an average of additional ₦326 (\$1.65), ₦320 (\$1.60), ₦158 (\$0.80) and ₦122 (\$0.61) respectively on these quality attributes in order to avoid local rice. These findings present rice breeders, processors and marketers with investment challenges and opportunities for designing quality improvement and marketing policies and programmes towards the development of Nigeria's rice industry.

This study provides evidence of local rice brands gaining consumers' acceptance and can compete favourably with imported rice brands both in price and quality if priority is given to provision of marketing functions that enhance the promotion and distribution of local rice brands than to those that enhance the pricing and product improvement.

Finally, the findings of this study have led to the modification and improvement of the theoretical framework of consumer behaviour towards food products as originally designed by

Millock et al (2002), by integrating price-quality differentials as the underlying determinant of consumer's choice behaviour when faced with multiple brands of a product.

7.2 Policy implications and recommendations

The development of Nigeria's rice industry requires a multi-dimensional approach involving a blend of research, policies and strategies among key value chain actors and institutions on production, processing and marketing. The findings of this study have given rise to a number of policy implications and recommendations for the government, private firms and researchers in the rice sub-sector of Nigeria's economy. These include:

- i. The need for the government to establish a special rice development fund aimed at financing the small-scale rice mills to import modern rice milling machines and upgrade the quality of their output;
- ii. To achieve sustainable expansion in domestic output of paddy rice, there is need for banks, relevant government institutions, rice value chain actors and researchers to synergize their efforts focusing on developing an efficient, value chain-based and rural-driven institutional framework of financing SHRFs that addresses the concerns of both the banks and SHRFs;
- iii. It has become imperative for development banks, quality improvement, regulatory and enlightenment agencies such as Bank of Agriculture (BOA), Bank of Industry (BOI), Standard Organization of Nigeria (SON), National Agency for Food and Drug Administration and Control (NAFDAC), Consumer Protection Council (CPC) and National Orientation Agency (NOA) to develop an efficient institutional partnership framework that enhances the capacities of the local rice processors and marketers in upgrading the extrinsic quality attributes and experiential appeals of local rice brands while at the same time enhancing consumers' perception and acceptability of local rice brands;
- iv. Public policy makers and marketing managers need to design and simultaneously implement import restriction policies (such as high import tariffs, levies, duties, taxes to raise the market prices of imported rice brands) and strategic marketing policies that promote a positive image of the improved quality attributes while reversing the negative perception of consumers towards local rice. These policies need to be flexible and

complimentary in order to ensure sustenance of a wide price differential between local and imported rice brands while improving the quality and image of the local brands to narrow consumer's perception of the quality differential between these two sets of brands;

- v. Modern rice processing and polishing that integrates artificial ageing technology is needed to enhance the swelling capacity, colour, neatness and grain separateness of local rice for increased consumers' acceptability, price and competitiveness. This will incentivize and encourage local rice breeders, farmer and processors to invest, as consumers are willing to pay for such improvements in these quality attributes;
- vi. The role of price-quality differentials need to be integrated into the theoretical frameworks and models of consumer behaviour for food products. This will help to provide useful insights into the understanding of consumer's choice behaviour towards two or more brands of a food product with almost similar quality attributes but of different price regimes.

7.3 Study limitations and suggested areas of further research

The limitations and approach used in this study has raised the need for further studies on this subject. These include:

- i. This major limitation of this study is the sample location which focused only on the Federal Capital Territory (FCT). Nigeria is country of large population in which different socio-economic statuses, cultures and environmental diversity influence people's way of life including their food choices and consumption pattern. Given scarcity of resources for field data collection, this study was conducted only in the FCT. However, the choice of FCT as the only area of study has limited the data and scope of this study. Therefore, there is need for more studies of this kind covering more areas in Nigeria and using larger sample sizes. Such studies are more likely to produce more accurate results that can be generalized about Nigeria;
- ii. There are several brands of imported rice which this study has aggregated as 'imported rice brands'. There is need for disaggregation and conducting a comparative analysis of consumers' pricing of the intrinsic quality attributes of each brand imported of imported rice. This will provide a better understanding of how consumers make their purchasing decisions;

- iii. Given the high number of small-scale rice millers in Nigeria that account for over 60% of milled rice, there is also the need for a comparative assessment of the overall output efficiency and profitability of large number small-scale (modular) rice mills vis-a-vis few number of large scale integrated rice mills (IRMs);
- iv. Having determined from this study the additional prices consumers pay for preferring quality attributes of imported rice brands, further studies are required to determine the additional cost implications of investing in breeding and processing programmes aimed at upgrading the current level of quality attributes of local rice brands to meet the level of imported rice brands as desired by consumers. This is necessary for the cost-benefit analysis of such investments in rice improvement programmes;
- v. To better understand rice consumers' purchase behaviours in Nigeria, there is need to have a detailed analysis of Nigeria's rice market. This is because studies have shown that consumer behaviour is not formed in isolation, rather it interacts with market behaviour to better understand consumer behaviour (Shugan, 1984).
- vi. There is need for further study on consumer response (after purchase) behaviours towards rice brands. This is important because consumers who are already satisfied and loyal to an imported rice brand may not easily switch to consumption of local brand.

References

- Aaker, D. A. 1991. *Managing Brand Equity*. New York: The Free Press.
- Aaker, D.A, Batra, R. and Myers, J.G. (1992). *Advertising management*. 4th edition. Prentice Hall, London.
- Abansi, C.L., Lantican, F.A., Duff, B. and Catedral, I.G. 1990. Hedonic model estimation: Application to consumer demand for rice grain quality. *Transactions of the National Academy of Science and Technology* 12:235-256.
- Abarajithan, W. and Ragel, V. 2011. The study of customer switching behaviour toward carbonated soft drink market. <http://dx.doi.org/10.2139/ssrn.1951780> (Accessed 20 November 2012)
- Abazari, A., Seyed-Mojtaba, M., and Seyed-Ali, H. 2012. Effective factors on rice consumers' preferences: A case study of urban consumers in Mazandaran province of Iran. *American Journal of Scientific Research*, 53(2012):70-79.
- Addis, M., and Holbrook, M.S. 2002. On the conceptual link between mass customisation and experiential consumption: An explosion of subjectivity. *Journal of Consumer Behaviour*. 1(1):50-66.
- Adegbite, D.A. 2009. Repayment performance of beneficiaries of Ogun State Agricultural and Multipurpose Credit Agency (OSAMCA) in Ogun State (2004-2007). *American-Eurasian Journal of Sustainable Agriculture*, 3 (1):117–125.
- Adeyeye, J.A., Navesero, E.P., Ariyo, O.J., and Adeyeye, S.A. 2010. Consumer preference for rice consumption in Nigeria. *Journal of Humanities, Social Science and Creativity Arts*, 5(1):26-36.
- AfricaRice. 2012. Boosting Africa's rice sector: A research for development strategy 2011–2020. Africa Rice Centre, Cotonou, Benin.
- AGIS, 2014, *AGIS deploys high resolution satellite imagery of the FCT*, Abuja Geographic Information System. <http://agis.fcta.gov.ng/> Access on 20th January 2016
- Agnet. 2004. Making farm credit work for the small-scale farmers. <http://www.agnet.org/library/nc/145b/> (Accessed 20 February 2017).
- Ajijola S., Usman J. M., Egbet O. A., Akoun, J. and Osalusi, C. S. 2012. Appraisal of rice production in Nigeria: A case study of North Central States of Nigeria. *Journal of Stored Products and Postharvest Research*, 3(9):133 – 136.

- Akaeze, H.O. 2010. Consumer preference for imported rice in Nigeria: Perceived quality differences or habit persistence? Unpublished M.Sc. Thesis, Department of Agricultural, Food and Resource Economics, Michigan State University.
- Akande, S. O. 2002. An Overview of the Nigerian Rice Economy. Mimeo, Nigerian Institute of Social and Economic Research, Ibadan, Nigeria.
- Akande, T., Cisse, Y. and Kormawa, P. 2007. Streamlining policies for enhancing rice production in Africa: Past experiences, lessons learnt and the way forward. *African Crop Science Journal*, 15(4): 223 – 235.
- Akdeniz, B., Calantone, R.J. and Voorhees, C.M. 2013. Effectiveness of marketing cues on consumer perceptions of quality: The moderating roles of brand reputation and third-party information. *Psychology and Marketing*, 30(1):76–89.
- Akinlade, R. J., Ogunsola, O. J., Balogun, O. L. and Carim-Sanni, A. 2011. Effect of policies on rice production, importation and consumption in Nigeria. *World Rural Observations*, 3:1 <http://www.sciencepub.net/rural> (Accessed 15 June 2015).
- Akpan, S.B. Ini-mfon, V. P. and Udoka, S.J. 2014. Analysis of monthly price transmission of local and foreign rice in rural and urban markets in Akwa Ibom State, Nigeria. *International Journal of Agriculture and Forestry*, 4(1): 6-18.
- Akpokodje, G., Lançon, F., and Erenstein, O. 2001. Nigeria's rice economy: State of the art. A USAID- funded project, West Africa Rice Development Association (WARDA) Bouake, Côte, d'Ivoire. [http://pdf.dec.org/pdf_docs/Pnadb851 .pdf](http://pdf.dec.org/pdf_docs/Pnadb851.pdf) (Accessed 10 October 2012).
- Alfnes, F. 2004. Stated preferences for imported and hormone-treated beef: Application of a mixed logit model. *European Review of Agricultural Economics*, 31:19–37.
- Alfred, S.D.Y. and Adekayode, A.B. 2014. Consumers' attitude towards local rice production in Ondo State, Nigeria. *Journal of Agricultural Extension and Rural Development*, 6(7):242-248
- Allen, M.M., Ng, S.H., Wilson, M. 2002. A functional approach to instrumental and terminal values and the value-attitude-behaviour system of consumer choice. *European Journal of Marketing*, 36 (1/2):111-135.
- AMA. 2013. American Marketing Association (AMA).
[http://www.marketingpower.com/ layouts/Dictionary.aspx?dLetter=B](http://www.marketingpower.com/layouts/Dictionary.aspx?dLetter=B) (Accessed 02 March 2013).
- Anang, B.T., Adjei, S.N., Adjetey, S. and Addy, A. 2011. Consumer preferences for rice quality characteristics and the effects on price in the Tamale metropolis, Northern Region, Ghana. *International Journal of AgriScience*, 1(2):67-74.

- Ara, S. 2003. Consumers' WTP for multiple attributes of organic rice: A case study in the Philippines. Paper Presented at the 25th International Conference of Agricultural Economists, August 16-22, 2003, Durban, South Africa.
- Assael, H. 1987. *Consumer behaviour and marketing action*, 3rd Edition, PWS-Kent publishing company, Boston, Massachusetts.
- Augustine, A., Jokthan, G., Zafari, I. and Bivan, G. 2013. Optimizing opportunities for sustainable development through organic agriculture in Nigeria. *IOSR Journal of Agriculture and Veterinary Science*, 4(1):07-11.
- Awe, O. 2006. Ban on rice importation depresses global trade. *Nigerian Punch*, May 20, 2006.
- Ayanwale, A.B. and Amusan, C.A. 2012. Gender analysis of rice production efficiency in Osun State: Implication for the agricultural transformation agenda. Paper presented at the 13th National Conference of the Nigerian Association of Agricultural Economists Obafemi Awolowo University, Ile – Ife, Nigeria, September 25th – 27th.
- Azabagaoglu, M.O. and Gaytancioglu, O. 2009. Analysing consumer preference to different rice varieties in Turkey. *Agricultura Tropica Et Subtropica*, 42 (3):118 – 125.
- Bamidele1, F.S., Abayomi, O.O. and Esther, O.A. 2010. Economic analysis of rice consumption patterns in Nigeria. *Journal of Agricultural Science Technology*, 12: (2010):1-11
- Barchard, D. 1990. Where only interesting customers need apply. *Financial Times*, 9 October.
- Basorun, J.O. 2009. Analysis of the relationships of factors affecting rice consumption in a targeted region in Ekiti State, Nigeria. *Journal of Applied Quantitative Methods*, 4(2):145-153
- Bateman, I.J., Lovett, A.A. and Brainard, S.J. 2005. *Applied environmental economics: AGIS approach to cost-benefit analysis*, Cambridge University Press, Cambridge.
- Belch, G.E. and Belch, M.A. 1995. *Introduction to advertising and promotion: An integrated marketing communication perspective*. 3rd Edition. Boston: Irwin.
- Ben-Akiva, M. and Lerman, S. 1985. *Discrete choice analysis*. MIT Press, Cambridge
- Ben-Akiva, M. and Lerman, S.R. 1995. *Discrete Choice Analysis: Theory and Application to Travel Demand*. MIT Press, Massachusetts, London: Cambridge.
- Ben-Yami, M. n.d. Integrated of traditional institutions and people's participation in an artisanal fisheries development project in south-eastern Nigeria. <http://www.fao.org/DOCREP/004/Y1290/y1290e0e.htm> (Accessed 17 February 2017).

- Berkowitz E.N., Kerin R.A., Hartley S.W. and Rudelius W. 1992. *Marketing*. 3rd edition. Irwin, Boston; ISBN 0-256-09182-X.
- Bernués, A., Olaizola, A. and Corcoran, K. 2003. Extrinsic attributes of red meat as indicators of quality in Europe: an application for market segmentation. *Food Quality and Preference*, 14:265-276.
- Bettman, J.R. and Zins, M.A. 1977. Constructive processes in consumer choice. *Journal of Consumer Research*, 4:75-85.
- Biekpe, N. 2012. Mismanaging development priorities in Africa. *AfricaGrowth Agenda*, 4(1): 4-7.
- Bissonnette, M. M. and Contento, I.R. 2001. Adolescents' perspectives and food choice behaviours in terms of the environmental impacts of food production practices: Application of a psychosocial Model. *Journal of Nutrition Education*, 33 (2):72-82.
- Blijlevens, J., Creusen, M. E. H. and Schoormans, J. P. L. 2009. How consumers perceive product appearance: The identification of three product appearance attributes. *International Journal of Design*, 3(3):27-35.
- Bonti-Ankomah, S. and Yiridoe, E.K. 2006. *Organic and Conventional Food: A Literature Review of the Economics of Consumer Perceptions and Preferences*. Organic Agriculture Centre of Canada, Toronto.
- Bornemann, T. and Homburg, C. 2011. Psychological distance and the dual role of price. *Journal of Consumer Research*, 38(3):490–504.
- Boshoff, C. and Gray, B. 2004. The relationships between service quality, customer satisfaction and buying intentions in the private hospital industry. *South African Journal of Business Management*, 35 (4):27-37.
- Boxall, P. C., and Adamowicz, W.L. 2002. Understanding heterogeneous preferences in random utility models: A latent class approach. *Environmental and Resource Economics*, 23:421–446.
- Brakus, J. J., Schmitt, B. H. and Zarantonello, L. 2009. Brand experience: What is it? How is it measured? Does it affect loyalty? *Journal of Marketing*, 73(3):52–68.
- Bravo, R., Fraj, E. and Martínez, E. 2007. Intergenerational influences on the dimensions of young customer-based brand equity. *Young Consumers*, 8(1):58-64.
- Brijball, S. 2003. The level of importance attached to price and quality in purchasing behaviour. *South African Journal of Industrial Psychology*, 29 (1):93-99.
- Brorsen, B.W., Grant, W.R. and Rister, N.E. 1987. A hedonic price model for rough rice bid acceptance markets. *American Journal of Agricultural Economics*, 66:164-169.

- Brown, K., McIlveen, H. and Strugnell, C. 2000. Nutritional awareness and food preferences of young consumers in Northern Ireland. *Nutrition and food Science*. 30 (4/5): 230-235.
- Broyles, S. A. and Schumann, D. V. 2004. *The comparative influence of brand equity's experiential and functional antecedents and its consequences on U.S. and Mainland Chinese consumers*. AIB-SE annual meeting, Knoxville, TN.
- Brunso, K. and Grunert, K. G. 1998. Cross-cultural similarities and differences in shopping for food. *Journal of Business Research*, 42:145-150.
- Bruntrup, M., 2006. The rice market in Senegal. *Agriculture and Rural Development*, 13 (1): 22.
- Butt, M.S., Anjum, F.M., Rehman, S., Nadeem, M.T., Sharif, M.K., and Anwer, M. 2008. Selected quality attributes of fine basmati rice: Effect of storage history and varieties. *International Journal of Food Properties*, 11(3):698-711.
- Buttle, F. 1996. SERVQUAL: review, critique, research agenda. *European Journal of Marketing*, 30(1):8-32.
- Campbell, R., Schiff, H., Snodgrass, D., Neven, D., Downing, J. and Sturza, D. 2009. Global food security response: West Africa rice value chain analysis. USAID microREPORT # 161. Washington, DC.
- CARD. 2015. Private sector investment in the rice sector in response to government policies in Nigeria. Paper presented at the 6th general meeting of the coalition for African rice development (CARD) November 18-19, 2015 Accra, Ghana. <https://riceforafrica.net/images/stories/PDF/S2-2EN.pdf> (Accessed 5 December 2015).
- Carl, E. K., Kilmer, R. L and Kenny. L. W. 1983. Evaluating implicit prices of intermediate products. *American Journal of Agricultural Economics*, 65(3):592-595.
- CBN. 2005. Microfinance policy, regulatory, and supervisory framework for Nigeria. <http://www.cenbank.org/out/Publications/guidelines/dfd/2006/microfinance%20policy.pdf> (Accessed 20 February 2017).
- CBN. 2016. Anchor Borrowers' Programme Guidelines. Development Finance Department, Central Bank of Nigeria, Abuja, Nigeria.
- <https://www.cbn.gov.ng/Out/2017/DFD/Anchor%20Borrowers%20Programme%20Guidelines%20-DEC%20%202016.pdf>(Accessed 12 February 2017).
- CBN. 2017. Anchor Borrowers' Programme (ABP). A report presented by ABP Unit of CBN during the meeting of CBN, Farmers and Anchors with the technical committee on food security held at CBN headquarters Abuja, Nigeria on 23rd February 2017.

- Cengiz, E., Ayyildiz, H., and Er. B. 2007. Effects of image and adverting efficiency on customer loyalty and antecedents of loyalty: Turkish banks sample. *Banks and Bank Systems*, 2(1):56-80.
- Chaarlas, I.J. and Rajkumar, R. 2012. Brand switching: A conceptual analysis. *Thavanijrmm*, 1(2):1-5.
- Chamhuri, N. and Batt, P.J. 2013. Understanding the relationship between perceived quality cues and quality attributes in the purchase of meat in Malaysia. *Journal of International Food and Agribusiness Marketing*, 25(3):187-208.
- Chang, X. Y. and Li, X. 2005. Empirical study of consumer perception of food safety of vegetables in Nanjing. *Consumption Economics*, 5:72-76.
- Chern, W. S. and Chang, C. 2009. Willingness to pay premium for foods produced in Taiwan and country of origin labelling: Results from auction experiment. Paper presented at the 19th Annual World Symposium of the International Food and Agribusiness Management Association (IAMA), Budapest, Hungary, June 20-21, 2009.
- Chiliya, N., Herbst, G., and Roberts-Lombard, M. 2009. The impact of marketing strategies on profitability of small grocery shops in South Africa townships. *African Journal of Business Management*, 3(3):70-79.
- Chiou, G.T., Chen, D.T. and Capps, O. 1993. A structural investigation of biotechnological impacts on cotton quality and returns. *American Journal of Agricultural Economics*, 75:467-78.
- Clemons, E.K. 2008. How information changes consumer behaviour and how consumer behaviour determines corporate strategy. *Journal of Management Information System*, 25(2):13-40.
- Dagevos, H. 2005. Consumers as four-faced creatures. Looking at food consumption from the perspective of contemporary consumers. *Appetite*, 45:32-39.
- Dalton, T.J. 2004. A household hedonic model of rice traits: Economic values from farmers in West Africa. *Agricultural Economics*, 31:149-159.
- De Almeida, M.D.V., Graca, P. and Lappalainen, R. 1997. Sources used and trusted by nationally-representative adults in the European Union for information on healthy eating. *European Journal of Clinical Nutrition*, 51:(S):8-15.
- Demont, M., Zossou, E., Rutsaert, P., Ndour, M., Van Mele, P. and Verbeke, W. 2012. Consumer valuation of improved rice parboiling technologies in Benin. *Food Quality and Preference*, 23(1):63-70.

- Demont, M., Rutsaert, P., Ndour, M., Verbeke, W., Seck, P.A. and Tollens, E. 2012. Experimental auctions, collective induction and choice shift: Willingness-to-pay for rice quality in Senegal. *European Review of Agricultural Economics*, 40(2):261-286.
- Dodds, W.B. 1991. In search of value, how price and store name information influence buyers' product perceptions. *Journal of Consumer Marketing*, 8(2):15-24.
- Dodds, W.B., Monroe, K.B. and Grewal, D. 1991. Effects of price, brand, and store information on buyers' product evaluation. *Journal of Marketing Research*, 28(3):307-319.
- DontsopNguezet, P. M., Okoruwa, V.O., Adeoti, A. I., and Adenegan, K.O. 2012. Productivity impact differential of improved rice technology adoption among rice farming households in Nigeria. *Journal of Crop Improvement*, 26(1):1-21.
- Doo Bong, H., Rodolfo M. N., Ji Yong, L., and Jong, M. Y. 2012. *Assessing Korean consumers' valuation for domestic and imported rice: Importance of country of origin and food miles information*. Paper presented at the Southern Agricultural Economics Association annual meeting, Birmingham, AL, February 4-7, 2012.
- Doran, C. J. 2009. The role of personal values in fair trade consumption. *Journal of Business Ethics*, 84(4):549-563.
- Duvenage, S.S., Schonfeldt, H.C. and Kruger, R. 2010. Food product attributes guiding purchasing choice of maize meal by low-income South African consumers. *Development Southern Africa*, 27(3):309-331.
- Eastwood, D. B., Brooker, J.R. and Terry, D.E. 1986. Household nutrient demand: Uses of characteristics theory and a common attributes model. *Southern Journal of Agricultural Economics*, 18(2):235-46.
- Eckman, M. and Warner, J. 1994. Judging the attractiveness of product design: The effect of visual attributes and consumer characteristics. *Advances in Consumer Research*, 21(1994):560-564.
- Eggert, A. and Ulaga, W. 2002. Customer perceived value, a substitute for satisfaction in business markets. *Journal of Business and Industrial Marketing*, 17(2/3):107-118.
- Ehrenberg, A.S.C. 1988. Repeat Buying: Theory and Applications, 2nd edition, Charles Griffin & Co. In: East, R. 1990. *Changing Consumer Behaviour*, Cassell Educational Limited.
- Ekanem, E. P. and Sundquist, W. B. 1993. *Estimating the implicit marginal prices for selected quality attributes of hybrid seed corn*. Staff paper series 93-16. Department of Agricultural and Applied Economics, University of Minnesota.
- Emodi, I. A and M.C. Madukwe 2008. A review of policies, acts and initiatives in rice innovation system in Nigeria. *Journal of Agricultural Extension*, 12(2):76-83.

- Emodi, A.I. and Dimelu, M. U. 2012. Strategies for enhancing rice innovation system in Southeast Nigeria. *British Journal of Management and Economics*, 2(1):1-12.
- Engel, J.F., Blackwell, R.D. and Miniard, P.W. 1995. *Consumer Behaviour*. Texas: Dryden Press.
- Engel, J.F., Kollat, D.T. and Blackwell, R.D. 1968. *Consumer Behaviour*. New York: Holt, Rinehart and Winston.
- Engel, J.F. and Blackwell, R.D. 1982. *Consumer Behaviour*. 4th edition, Dryden Press.
- Enneking, U. 2004. Willingness-to-pay for safety improvement in the German meat sector: the case of the Q&S label. *European Review of Agricultural Economics*, 31(2):205-223.
- Erenstein, O., Lançon, F., Osiname, O., and Kebbeh, M. 2004. Operationalising the strategic framework for rice sector revitalisation in Nigeria. Project report -The Nigerian Rice Economy. In: A Competitive World: Constraints, opportunities and strategic choices. Abidjan: WARDA -The Africa Rice Centre.
- Erhabor, P.O.I. and Ojogho, O. 2011. Demand analysis for rice in Nigeria. *Journal of Food Technology*, 9(2):66-74.
- Estes, E. A. 1986. Estimation of implicit prices for green pepper quality attributes using hedonic framework. *Journal of Food Distribution Research*. Journal Series of the North Carolina Agricultural Research Service, Raleigh, NC 27695-7601.
- Ethridge, D. E. and Davis, R. 1982. Hedonic price estimation for commodities: An application to cotton. *Western Journal of Agricultural Economics*, 7(2):293-300.
- Ezedinma, C. 2005. Impact of trade on domestic rice production and the challenge of self-sufficiency in Nigeria. Paper presented at a workshop on rice policy and food security in sub-Saharan Africa, Cotonou, Benin. 7-9 November 2005.
- Fakayode, S. B., Omotesho, O. A. and Omoniwa, A.E. 2010. Economic analysis of rice consumption patterns in Nigeria. *Journal of Agricultural Science Technology*, 12(2):135-144.
- FAO 2012. Food and Agriculture Organisation. Briefs on import surges - *Countries No. 5 Ghana: rice, poultry and tomato paste*.
- FAO 2013. Food and Agriculture Organisation. FAO database. <http://www.fao.org/faostat/en/#data> Accessed 20th January 2016.
- Farrell, J. 1980. Prices as signals of quality. Ph.D. Thesis, University of Oxford.
- Faruq, G., Zakaria, H. P. and Arash, N. 2015. Effects of ageing on selected cooking quality parameters of rice. *International Journal of Food Properties*, 18(1): 922-933.

- Festinger, L. 1957. *A theory of cognitive dissonance*. Row Peterson and Company. In: Westing, H.J. and Albaum, G. 1975. *Modern Marketing Thought*, 3rd edition: Collier Macmillan Publishers.
- FFI 2016. http://ffinetwork.org/about/stay_informed/releases/images/Rice_Nigeria.pdf (Accessed 20 February 2017).
- FMI 2012. Federal Ministry of Information report. <http://fmi.gov.ng/fg-ready-to-set-up-100-rice-mills-before-2015/> (Accessed 26 November 2012).
- Foltz, J. D. 2004. Credit market access and profitability in Tunisian agriculture. *Agricultural Economics*, 30(3):229-240.
- Forney, J. C., Pelton, W., Caton, S. T., and Rabolt, N. J. 1999. Country of origin and evaluative criteria: Influences on women's apparel purchase decisions. *Journal of Family and Consumer Sciences*, 91(4):57-62.
- Fournier, S. 1998. Consumers and their brands: Developing relationship theory in consumer research. *Journal of Consumer Research*, 24(4):343-373.
- Foxall, G.R. 1987. Consumer Behaviour. In: Baker, M.J. 1987. *The Marketing Book*. Heinemann Professional Publishing.
- Foxall, G. 2005. *Understanding Consumer Choice*. Baingstoke: Palgrave Macmillian.
- Gaur, S.S. and Waheed, K.A. 2002. Study of buying behaviour for branded fine rice. *Indian Journal of Marketing*, 32(7):3-8.
- Gerstner, E. 1985. Do higher prices signal higher quality? *Journal of Marketing Research*, 22(2):209-215.
- Gilaninia, S., Taleghani, M. and Azizi, N. 2013. Marketing mix and consumer behaviour. *Kuwait Chapter of Arabian Journal of Business and Management Review*, 2(12):53-58
- Goldberg, I. and Roosen, J. 2005. Measuring consumer willingness to pay for health risk reduction of salmonellosis and campylobacteriosis. Paper presented at the 11th Congress of EAAE. *The Future of Rural Europe in the Global Agri-Food System*. Denmark, 24-27 August 2005.
- Goodwin, H.L., Rodney, J., Holcomb, H. and Rister, M. E. 1996. Implicit price estimation of rice quality attributes for Asian Americans. *Journal of Agricultural and Applied Economics*, 28:(2)91-302.
- Goodwin, H.L., Holcomb, R, B. and Rister. M.E. 1995. A study of Asian-American rice demand. Work paper, Dept. of Agricultural Economics, Texas A&M University, June 1995.

- Gonzalez, M. J. and Loomis, B. J. 2006. Testing welfare measurement gains of combining stated and revealed preferences method using count data models. Paper presented at AAEA Annual meeting, Long Beach, California, July 23-26, 2006.
- Grapentine, T. 1995. Dimensions of an attribute. *Marketing Research*, 7(3):18-27.
- Green, P. E. and Srinivasan, V. 1978. Conjoint analysis in consumer research: Issues and outlook. *Journal of Consumer Research*, 5(2):103-123.
- Greene, W.H. 2000. *Econometric Analysis*, 4th edition. Upper Saddle River, NJ: Prentice Hall, 2000.
- Griliches, Z. 1971. *Price indexes and quality change: Studies in new methods of measurement*. Cambridge: Harvard University Press.
- Grönroos, C. 1994. From marketing mix to relationship marketing: Towards a paradigm shift in marketing. *Management Decision*, 32(2):4-20.
- GrowAfrica n.d. From smallholder to small business: private sector insights on service delivery models that boost profitability along the value chain. <https://www.growafrica.com/resources/smallholder-small-business-private-sector-insights-service-delivery-boosting-profitability> (Accessed 20 February 2017).
- Grunert, K. G. 1997. What's in a steak? A cross-cultural study on the quality perception of beef. *Food Quality and Preference*, 8(3):167-174.
- Gyimah-Brempong, K., Dorosh, P., Kuku, O., Pradesha, A. and Ajibola, A. 2012. Informing Nigeria's agricultural transformation agenda with policy analysis and research evidence. Paper presented at NSSP national conference held in Abuja, Nigeria, 13-14 November 2012.
- Haab, T. and McConnell, K. 2002. *Valuing Environmental and Natural Resources: The Econometrics of Non-Market Valuation*. Edward Elgar Publishing, Inc. USA.
- Hager, C. 1983. Demand for nutrient and non-nutrient components of meat, poultry and fish products using a hedonic approach. Paper presented at Agricultural Economics Workshop, NCSU, November 1983.
- Hanemann, M. 1984. Welfare evaluations in contingent valuation experiments with discrete responses. *American Journal of Agricultural Economics*, 67(3): 332-341.
- Hans, C.M. and Trijp, P. 1996. Why switch? Product category level exploitation for true variety seeking behaviour. *American Journal of Marketing Research*, 32 (3):105-116.
- Hasan, M.M., Rafii, M.Y., Ismail, M.R., Mahmood, M., Rahim, H.A., Alam, M.A., Ashkani, S., Malek, M.A., and Latif, M.A. 2015. Maker-assisted backcrossing: a useful method for rice improvement. *Biotechnology & Biotechnological Equipment*, 29(2):237-254.

- Hazarika, G. and Alwang, J. 2003. Access to credit, plot size and cost inefficiency among smallholder tobacco cultivators in Malawi. *Agricultural Economics*, 29(1):99-109.
- Hensher, D., Rose, J., and Greene, W. 2005. *Applied choice analysis: a primer*. Cambridge: Cambridge University Press, 2005.
- Hiroiyuki, T., Michael, J., Jawoo, K., Tewodaj, M., and Akeem, A. 2012. *Growth potential for the domestic rice economy*. Paper presented at NSSP National Conference held in Abuja, Nigeria, 13-14 November 2012.
- Hite, R. E., and Fraser, C. 1998. Meta-analyses of attitudes towards advertising by professionals. *Journal of Marketing*, 52:95-105.
- Hogg, M.K., Cox, A.J. and Keeling, K. 2000. The impact of self-monitoring on image congruence and product brand evaluation. *European Journal of Marketing*, 34 (5/6): 641-666.
- Horská E. and Sparke K. 2007. Marketing attitudes towards the functional food and implications for market segmentation. *Agricultural Economics– Czech*, 53(7):349–353.
- Houthakker, H. S. 1952. Compensated changes in quantities and qualities consumed. *Revised Economics Studies*, 19(1952):155-164.
- Howard, J.A. and Sheth, J.N. 1969. *The Theory of Buyer Behaviour*, Wiley
- Hubbard, E.M., Jervis, S.M., and Drake, M.A. 2016. The effect of extrinsic attributes on liking of cottage cheese. *Journal of Dairy Science*, 99(1):183-193.
- Hussein, A., Silva, A. and Fraser, I. 2015. Linking intrinsic quality attributes of agricultural produce to revealed consumer preferences. *Food Quality and Preference*, 41(2): 180-188
- IFC 2012: Innovative agricultural SME finance models. International Finance Corporation, November 2012.
- <http://www.ifc.org/wps/wcm/connect/55301b804ebc5f379f86bf45b400a808/Innovative+Agricultural+SME+Finance+Models.pdf?MOD=AJPERES> (Accessed 15 January 2017).
- Isa, J. O., Cyprian, C. A. and Sam, O. O. 2012. Resource use efficiency and rice production in Guma Local Government Area of Benue State: An application of stochastic frontier production function. *International Review of Social Sciences and Humanities*, 3(1):108-116
- Jain, S.K. and Kaur, G. 2006. Role of socio-demographics in segmenting and profiling green consumers: an exploratory study of consumers in India. *Journal of International Consumer Marketing*, 18(3):107–117.

- Jairo, M. 2008. Making microeconomic policy work for small business and enterprise development, *AfricaGrowth Agenda*, 5(1):7-12.
- Jamal, A., and Goode, M. 2001. Consumers' product evaluation: A study of the primary evaluative criteria in the precious jewellery market in the UK. *Journal of Consumer Behaviours*, 1(2):140-155.
- Johnson, M., Takeshima, H., Gyimah-Brempong, K. and Kuku-Shittu, O. 2013. Policy options for accelerated growth and competitiveness of the domestic rice economy in Nigeria. IFPRI policy note 35, IFPRI Washington, D.C. <http://ebrary.ifpri.org/utils/getfile/collection/p15738coll2/id/127869/filename/128080.pdf>(Accessed 30 February 2014).
- Jones, A. M., Mothersbaugh, L. D. and Beatty, E. S. 2000. Switching barriers and repurchase intentions in services. *Journal of Retailing*, 76(2):259-274.
- Jordan, L. J., Shewfelt, R. L., Prussia, S.E. and Hurst, W. C. 1985. Estimating implicit marginal prices of quality characteristics of tomatoes. *Southern Journal of Agricultural Economics*, December 1985.
- Kamakura, W. A., and Russell, G. 1993. Measuring brand value with scanner data. *International Journal of Research in Marketing*, 10(1):9-22.
- Kamenidou, L., Zimitra-Kalogianni, L., Zotos, Y. and Mattas, K. 2002. Household purchasing and consumption behaviour towards processed peach products. *New Medit.*, 1(1):45-49.
- Kassali, R., Kareem, R.O., Oluwasola, O. and Ohaegbulam, O.M. 2010. Analysis of demand for rice in Ile Ife, Osun State, Nigeria. *Journal of Sustainable Development in Africa*, 12(2):63-72.
- Katona, G. and Strumpel, B. 1978. *A New Economic Era*. New York: Elsevier.
- Kaur, S., Panesar, P. S., Bera, M. B. and Kumari, S. 2014. Physio-chemical, textural, pasting, and in vitro digestion properties of some basmati and non-basmati rice cultivars. *International Journal of Food Properties*, 17(5):1055-1066.
- Keane, M. 1997. Current issues in discrete choice modelling. *Marketing Letters*, 8(3)307-322.
- Kearney, M., Jearney, J.M., Dunne, A. and Gibney, M.J. 2000. Socio-demographic determinants of perceived influences on food choice in a nationally representative sample of Irish adults. *Public Health Nutrition*, 3(2): 219-226.
- Kellerman, B. J., Gordon, P. J. and Hekmat, F. 1995. Product and pricing courses are under-represented in undergraduate marketing curricula. *Journal of Product & Brand Management*, 4(1):18-25.

- Ken, D. 2001. Individual level discrete-choice conjoint using CBC/HB. *Marketing Research: A Magazine of Management & Applications*, 2(1):110-112.
- Kim, S.S. 2003. A study on consumers' willingness-to-pay for domestic and imported rice. Research Report, Korea Food Research Institute.
- Kim, H.S. and Yim, H.R. 2014. Exploratory study of Korean traditional food, rice cake's product attributes, and customers' satisfaction and loyalty. *Journal of Culinary Science & Technology*, 12(4):339-353.
- Kim, W.G., Ma, X. and Kim, D.J. 2006. Determinants of Chinese hotel customers' satisfaction and purchase intention, *Tourism Management*, 27(5):890-900.
- Kim, H., Yang, I. and Heo, E. 2005. Cause-effect analysis of brand equity factors in contract food service management company in college and university in Incheon area. *Korean Journal of Nutrition*, 38(5):395-403.
- Kjaer, T. 2005. A review of the discrete choice experiment - with emphasis on its application in health care. *Health Economics*, University of Southern Denmark.
- Klaus, P., Mark, H. and Andreas, H. 2009. Getting a feel for price effect: A conceptual framework and empirical investigation of consumers' emotional responses to price information. *Psychological Marketing*, 26(1): 39-66.
- Kohansal, M.R. and Mansoori, H. 2009. Factors affecting on loan repayment performance of farmers in Khorasan-Razavi Province of Iran. Paper presented at the conference on international research on food security, natural resource management and rural development, University of Hamburg, October 6-8, 2009.
- Kortge, G.D. and Okonkwo, P.A. 1993. Perceived value approach to pricing. *Industrial Marketing Management*, 22(2):133-140.
- Kotler, P. and Keller, K.L. 2013. *Marketing management*. Grada: Praha.
- Kotler, P. 2002. *Marketing management*. Upper Saddle River, USA: Pearson Education, Incorporation, Pearson Prentice Hall.
- Kroes, E.P. and Sheldon, R.J. 1988. Stated preferences methods: An introduction. *Journal of Transport Economics and Policy*, 22(1):11-25.
- Krueckeberg, H.F. 1990. Retail food store employee influence on customer shopping behaviour. *Journal of Food Distribution Research*, 21(1):121-138.
- Krutulyte, R., Ana, I., Costa, K. and Grunert, G. 2009. A cross-cultural study of cereal food quality perception. *Journal of Food Products Marketing*, 15(3):304-323.

- Kubendran, V. and Vanniarajan, T. 2005. Comparative analysis of rural and urban consumers on milk consumption. *Indian Journal of Marketing*, 35(12):27-30.
- Kumar, K., A., Jordan, B.B. and Barker, T. A. 1987. Made in India, what it means to Indian consumers? *Indian Journal of Marketing*, 17(9): 26-34.
- Kuo, Y., Wu, C. and Deng, W. 2009. The relationships among service quality, perceived value, customer satisfaction and post-purchase intention in mobile value-added services. *Computers in human behaviour*, 25(4):887-896.
- Kurtz, D. L. and Boone, L. E. 1987. *Marketing*, 3rd edition. Chicago: The Dryden Press.
- Ladd, G. W. and Suvannunt, V. 1976. A model of consumer goods characteristics. *American Journal of Agricultural Economics*, 58(3): 504-510.
- Ladd, G. W. and Martin, M.B. 1976. Prices and demands for input characteristics. *American Journal of Agricultural Economics*, 58(1):21-30.
- Ladd, G. W. 1982. Survey of promising developments in demand analysis: Economics of product characteristics. G. C. Rausser, (eds.), *New Directions in Econometric Modelling and Forecasting in U.S. Agriculture*. New York: North Holland.
- Lai, F., Griffin, M. and Babin, B.J. 2009. How quality, value, image, and satisfaction create loyalty at Chinese telecom. *Journal of Business Research*, 62(10):980-986.
- Lambin, J.J. 2007. *Market-Driven Management*. Palgrave Macmillan.
- Lancaster, K.J. 1966. A new approach to consumer theory. *Journal of Political Economy*, 74 (2):132-157.
- Lancon, F., Olaf, E., Akande, S.O., Titilola, S.O., Akpokodje, G. and Ogundele, O.O. (2003). Imported rice retailing and purchasing in Nigeria: A survey. In: the Nigerian rice economy in a competitive world: Constraints, opportunities and strategic choices. West Africa Rice Development Association (WARDA), Abidjan, Coted'Ivoire. http://www.usaid.gov/ng/downloads/markets/imported_rice_consumption_and_retailing_in_nigeria.pdf (Accessed 12 October 2012).
- Lançon F. and Benz, H.D. 2007. Rice imports in West Africa: Trade regimes and food policy formulation. Poster prepared for the 106th seminar of the European Association of Agricultural Economists, Montpellier, France, 25–27 October 2007.
- Latvala, T. 2010. Risk, information and trust in the food chain: factors explaining consumer willingness to pay. *International Journal Food System Dynamics*, 1(4):295-304.
- Lauterborn, B. 1990. New Marketing Litany: Four Ps Passé: C-Words Take Over. *Advertising Age*, 61(41):26.

- Lea, E. 2005. Food, health, the environment and consumers' dietary choices. *Nutritional Diet*, 62(1):21-52.
- Lee, J.H., Seo, J.G., Choi, J.H., Kim, T.G., Jeong, J.G., Kim, S.H. and Lim, S.Y. 2004. A study on strategy for 2004 rice negotiation. Research Report, Korea Rural Economic Institute.
- Li, Q., Curtis, K.R., McCluskey, J.J. and Wahl, T.I. 2003. Consumer attitudes toward genetically modified foods in Beijing, China. *AgBioForum*, 5(4):145-152.
- Liefeld, J. P., Wall, M. and Heslop, L. A. 2000. Cross cultural comparison of consumer information processing styles. In: L. R. Kahle (eds.), *Cross-national consumer psychographics*, 29-43. New York: International Business Press.
- Lloyd, M.A., Coons, L.M., Engstrom, E.E., Shintaro P., Pahulu, H.F., Ogden, L.V. and Pike, O.A. 2014. Sensory and nutritional quality of white rice after residential storage for up to 30 years. *International Journal of Food Sciences and Nutrition*, 65(3):320-326.
- Longtau, S. R. 2000. Multi-agency partnership in West African agriculture: A review and description of rice production system in Nigeria. Monograph published by Eco-system development organization, Jos, 2001:47.
- Loose, S.M. and Szolnoki, G. 2012. Market price differentials for food packaging characteristics. *Food Quality and Preferences*, 25(2):171-182.
- Loureiro, M.L. and Umberger, W.J. 2003. Estimating consumer willingness to pay for country-of-origin labelling. *Journal of Agricultural and Resource Economics*, 28(2):287-301.
- Louviere, J. J., Hensher, D. A. and Swait, D.J. 2000. *Stated choice methods. Analysis and applications*. Cambridge University Press.
- Low, G. and Lamb, J. 2000. The measurement and dimensionality of the brand associations. *Journal of Product and Brand Management*, 9(6):350-368.
- Lusk, J. L., Roosen, J. and Fox, J. 2003. Demand for beef from cattle administered growth hormones or fed genetically modified corn: A comparison of consumers in France, Germany, the United Kingdom, and the United States. *American Journal of Agricultural Economics*, 85(1):16-29.
- Lusk, J. L., Feldkamp, T. and Schroeder, T. C. 2004. Experimental auction procedure: Impact on valuation of quality differentiated goods. *American Journal of Agricultural Economics*, 86(2):389-405.
- Maddala, G.S. 1993. *The econometrics of panel data*. Aldershot, Hants, England; Brookfield, Vt: Elgar.
- Makatouni, A. 2002. What motivates consumers to buy organic food in the UK? Results from a qualitative study. *British Food Journal*, 104(3/4/5):345-352.

- Manski, C. F. 1977. The structure of random utility models. *Theory and Decision*, 8(3):229–254
- Maranan, C. L., Duff, B. and Juliano, B. O. 1992. Quality preferences for modern and traditional rice at the retail level: the Philippine case. In: *Consumer demand for rice grain quality*. International Rice Research Institute, Manila, Philippines.
- Martensen, A. and Maouritsen, J. 2016. Prioritising marketing activities in different types of marketing functions. *Total Quality Management and Business Excellence*, 28(11-12):1264-1284.
- Martin, C. A. and Bush, A. J. 2000. Do role models influence teenagers' purchase intentions and behaviour? *Journal of Consumer Marketing*, 17(5):441-454.
- Mathur, A., Moschis, G. P. and Lee, E. 2003. Life events and brand preference changes. *Journal of Consumer Behaviour*, 3(2):129–141.
- Mazursky, D., La Barbera, P. and Aiello, A. 1987. When consumers switch brands. *Psychology and Marketing*, 4(1):17-30.
- McCarthy, E. J. 1964. *Basic Marketing*, IL: Richard D. Irwin.
- McConnell, K. E. and Phipps. T. T. 1984. Identification of preference parameters in hedonic models: Consumer demands with non-linear budgets. Paper presented at Natural Resource Economics Workshop, NCSU, December 1984.
- McDaniel, S. W. and Hise, R. T. 1984. Shaping the marketing curriculum: The CEO Perspective. *Journal of Marketing Education*, Summer, 27-32.
- McFadden, D. 1980. Econometric models for probabilistic choice among products. *Journal of business*, 53(3):13-29.
- McFadden, D. 1987. Regression-based specification tests for the multinomial logit model. *Journal of Econometrics*, 34(1-2):63-82.
- Meenaghan, T. 1995. The role of advertising in brand image development. *Journal of Product and Brand Management*, 4(4):23-34.
- Menard, S. 1995. *Applied Logistic Regression Analysis: Sage University Series on Quantitative Applications in the Social Sciences*. Thousand Oaks, CA: Sage.
- Mhlanga, S. 2010. Economic Analysis of Consumer Based Attributes for Rice in Benin. Unpublished M.Sc Thesis, Department of Agricultural Economics, McGill University.
- Michaut, A.M.K., van Trijp, H.C.M. and Steenkamp, J.B. 2002. *Dimensions of Product Newness and their Differential Effect on Market Success*. Paper presented at 31st EMAC Conference, May 28-31, Braga, Portugal.

- Miller, K.E. and Layton, R.A. 2001. *Fundamentals of Marketing*, 4th edition. Sydney: McGraw-Hill.
- Millock, K., Hansen, L.G., Wier, M. and Anderson, L.M. 2002. Willingness to Pay for Organic products: A Comparison between Survey Data and Panel Data from Denmark. Paper presented at the 12th Annual EAERE Conference, Monterey, USA.
- Mi-Young, K., Rico, C.W., Chae-Eun, K., and Sang-Chul, L. 2011. Physiochemical properties and eating qualities of milled rice from different Korean elite rice varieties. *International Journal of Food Properties*, 14(3):640-653.
- Möller, K. 2006. The marketing mix revisited: Towards the 21st century marketing by E. Constantinides. *Journal of Marketing Management*, 22(3):439-450.
- Monroe, K.B. 2003. *Pricing: making profitable decisions*, 3rd edition, Burr Ridge, IL: Irwin.
- Monroe, K.B. 1990. *Pricing, Making Profitable Decisions*. 2nd edition, McGraw-Hill, New York.
- Monroe, K.B. and Krishnan, R. 1985. The effect of price on subjective product evaluations. In: *Perceived quality*, J. Jacoby and J. Olson, eds. Lexington, MA: Lexington Books, 209-32.
- Morris, C.F. 2016. Grain Quality Attributes for Cereals Other than Wheat. In: Wrigley, C., Corke, H., Seetharaman, K., Faubion, J., eds. *Encyclopedia of Food Grains*. 2nd edition. Oxford, England: Academic Press. p. 257-261.
- Mowen, J.C. 1987. *Consumer Behaviour*. New York: Macmillan Publishing Company.
- Mowen J.C. 1993. *Consumer Behaviour*. 3rd edition. New York: Macmillan Publishing Company.
- Muriel, C.D., Siet, J.S. and Gerrit, A. 2016. Consumer segmentation based on food category attribute importance: The relation with healthiness and sustainability perceptions. *Food Quality and Preference*, 48(A):99-106.
- Myers, J. H. 1996. *Segmentation and positioning for strategic marketing decisions*. American Marketing Association, Chicago.
- Myers, J. H. and Shocker, A.D. 1981. The nature of product-related attributes. In: *Research in Marketing*, Jagdish Sheth, ed. Greenwich, CT: JAI Press, Inc., 5:211-36.
- Naidoo, R. and Leonard, A.C. 2007. Perceived usefulness, service quality and loyalty incentives: Effects on electronic service continuance. *South African Journal of Business Management*, 38 (3):39-48.
- Narang, R. 2006. A study on branded foods. *Indian Journal of Marketing*, 36(11):3-9.

- Nicosia, F.M. 1966. *Consumer Decision Processes*, Prentice Hall, Englewood Cliffs, N.J.
- Nmadu J.N., Bako A.N. and Baba K.M. 2013. Micro-credit requirement, acquisition and repayment by vegetable farmers in Nigeria. *IJTEMT*, 2(6):34-39
- Nouman, M., Siddiqi, M.F., Asim, S.M., and Hussain, Z. 2013. Impact of socio-economic characteristics of farmers on access to agricultural credit. *Sarhad Journal of Agriculture*, 29(3):469-476.
- NPC. 2013. National Population and Housing Census. National Population Commission Retrieved from <http://www.population.gov.ng/index.php/censuses> (Accessed 20 January 2016).
- Nundkumar, P. and Singh, A.M. 2016. Repositioning the Durban chamber of commerce using the 4Ps of marketing. *The Retail and Marketing Review*, 12(2):1-13
- Obih, U. 2010. Determining appropriate tariff plan for rice imports in Nigeria. Paper presented to the Nigeria Economic Summit Group (NESG), March 2010. http://www.businessdayonline.com/ARCHIVE/index.php?option=com_content&view=article&id=10569:how-appropriate-tariff-can-boost-domestic-rice-production-nesg&catid=1:latest-news&Itemid=18 (Accessed 20 October 2012).
- Oczkowski, E. (1994). Hedonic price function for Australian Premium Table wine *Australian Journal Agricultural Economics*, 38(1): 93-110.
- Ogbe, A. O., Okoruwa, V.O. and Saka, O. J. 2011. Competitiveness of Nigerian rice and maize production ecologies: A policy analysis approach. *Tropical and Subtropical Agroecosystems*, 14:493-500.
- Ogundele, F. 2013. Determinants of household rice consumption in Nigeria: Application of working-lesser single equation model. *Net Journal of Agricultural Science*, 1(2):48-55
- Ogundele, O. 2014. Factors influencing consumers' preference for local rice in Nigeria. *African Journal of Marketing Management*, 6(4):49 – 55.
- Ogunfowora, O. 2007. Financial analysis of parboiling and milling technologies in the Kura-Kano corridor. PropCom Monograph Series 18.
- Oke, J.T.O., Adeyemo, R. and Agbonlahor, M.U. 2007. An empirical analysis of microcredit repayment in south-western Nigeria. *Humanity and Social Science Journal*, 2(1):63-74.
- Okello, J.J. 2012. Smallholder agriculture: The dilemma. Paper presented at FAO/UoNairobi regional workshop on smallholder commercialization held at Norfolk Hotel, Nairobi, 6-7 June 2012. http://www.fao.org/fileadmin/templates/esa/Workshop_reports/Smallholders_2012/Presentations_1/Okello_Smallholder_Dilemma.pdf (Accessed 12 February, 2017).

- Okojie, C. A., Monye, E., Eghafona, E., Osaghae, G. and Ehiakhamen, J.O. 2010. Institutional environment and access to microfinance by self – employed women in the rural areas of Edo State. NSSP brief No. 14. Washington, D. C: International Food Policy Research Institute.
- Okorie, A. 1986. Major determinants of agricultural smallholder loan repayment in a developing economy: Empirical evidence from Ondo State, Nigeria. *Agricultural Administration*, 21(4):223-234.
- Okoruwa, V.O. and Ogundele, O.O. 2006. Technical efficiency differentials in rice production technologies in Nigeria. Paper presented at the International Association of Agricultural Economists Conference, Gold Coast, Australia, 12-18 August 2006. http://strip1.oit.umn.edu:8080/agecon_demo/bitstream/123456789/4368/1/pp060249.pdf. (Accessed 12 February 2016).
- Oladeebo, O.E. 2008. Determinants of loan repayment among small holder farmers in Ogbomosho agricultural zone of Oyo State, Nigeria. *Nigeria Journal of Social Science*, 17(1):59-62.
- Olearius, G., Jutta R. and Larissa D. (2011). A hazard analysis of consumers' switching behaviour in German food retailing for dairy products. Paper presented at the 51st annual conference of German Association of Agricultural Economists, Halle, Germany, 28-30 September 2011.
- Olomola, A.S. 2001. Determinants of smallholder loan repayment performance: Evidence from the Nigerian microfinance system. Center for the study of African Economies, Oxford University. <https://www.microfinancegateway.org/library/determinants-smallholder-loan-repayment-performance-evidence-nigerian-microfinance-system> (Accessed 20 February 2017)
- Olshavsky, R.W. and Granbois, D.H. 1979. Consumer decision making: Fact or fiction. *Journal of Consumer Research*, 6(2): 93-100.
- Olson, J. C. 1977. Price as an informational cue: Effects in product evaluation. In: *Consumer and industrial buying behaviour*, Arch G. W., Jagdish N. S. and Peter D. B, eds. New York: North Holland Publishing Company, 267-86.
- Olszewski, W. and Wolinsky, A. 2016. Search for an object with two attributes. *Journal of Economic Theory*, 161:145-160.doi: 10.1016/j.jet.2015.11.004 (Accessed 10 May 2016).
- Opeyemi1, G., Adedeji, S. O., Komolafe, S. E., Arotiba, K. and Ifabiyi, J. O. 2015. Analysis of consumers' preference in patronizing locally produced and imported rice in Niger State, Nigeria. *Nigerian Journal of Agriculture, Food and Environment*, 11(3):38-43.

- Opoku, R.A. and Akorli, P.A.K. 2009. The preference gap: Ghanaian consumers' attitudes toward local and imported products. *African Journal of Business Management*, 3(8): 350-357.
- Oryza. 2012. Higher import tariffs spur more rice smuggling into Nigeria. <http://oryza.com/content/higher-import-tariffs-spur-more-rice-smuggling-nigeria>. (Accessed 12 October 2015).
- Oyakhilomen, O. 2014. Household consumption preference for imported and domestic rice in Kaduna State, Nigeria: Implication for rice quality improvement. Paper presented at the 24th Annual International Food and Agribusiness Association (IFAMA) world forum, Cape Town, South Africa 15th – 19th June 2014.
- Padberg, D. I. and Westgren, R.E. 1979. Product competition and consumer behaviour in the food industries. *American Journal of Agricultural Economics*, 61(4):620-625.
- Padmanaban, N.R. and Sankaranarayanan, K. 1999. Business experience, product lines of dealers and farmers loyalty to dealer for pesticides in southern Tamil Nadu. *Indian Journal of Agricultural Marketing*, 13 (3):69-74.
- Paglietti, L. and Sabrie, R. 2013. Linkages for inclusive agribusiness development. A report prepared under the FAO/World Bank Cooperative Programme, FAO Rome, 2013. <http://www.fao.org/docrep/019/i3404e/i3404e.pdf> (Accessed 20 February 2017).
- Palmer, A. 2004. *Introduction to Marketing - Theory and Practice*, UK: Oxford University Press.
- Palmquist, R. B. 1984) Estimating the demand for the characteristics of housing. *Review of Economics and Statistics*, 56(3):394-404.
- Pambo, K.O., Julius J. Okello, J.J., Mbeche, R. and John N. and Kinyuru, J.N. 2016. Consumer acceptance of edible insects for non-meat protein in western Kenya. Paper presented at the 5th African Association of Agricultural Economists (AAAE) Conference at the United Nations Conference Centre, Addis Ababa-Ethiopia, 23-26 September 2016.
- Pant, K. P. 2009. *Price-based valuation of rice genetic diversity in Nepal*. Paper presented at the International Association of Agricultural Economists conference, Beijing, China, 16-22 August 2009.
- Parasuraman, A. and Grewal, D. 2000. The impact of technology on the quality-value-loyalty chain: A research agenda. *Journal of the Academy of Marketing Science*, 28(1): 168-174.
- Park, J., Robertson, R. and Wu, C. 2006. Modelling the impact of airline service quality and marketing variables on passengers' future behavioural intentions. *Transportation Planning and Technology*, 29(5):359-381.

- Paurav, S. 2009. Impact of contextual factors, brand loyalty and brand switching on purchase decisions. *Journal of Consumer Marketing*, 26(5):348-357.
- Perrin, R. K. 1980. The impact of component pricing of soybeans and milk. *American Journal of Agricultural Economics*, 62(3):445-455.
- Peter, J.P. and Olsen, J.C. 1994. *Understanding consumer behaviour*. 3rd edition. Boston: Irwin.
- Phillip, D.E., Nkonya, J., Pender, J. and Oni, O.A. 2009. Constraints to increasing agricultural productivity in Nigeria: A review. Nigeria Strategy Support Programme (NSSP) background paper No. NSSP 006.
- Popovic, D. 2006. Modelling the marketing of high-tech start-ups. *Journal of Targeting, Measurement and Analysis for Marketing*, 14(3):260-276.
- Porter, M.E. and Kramer, M.R. 2006. Strategy and society: the link between competitive advantage and corporate social responsibility. *Harvard Business Review* 84(12): 78–92.
- PrOpCom 2007. Demand and supply study on domestic and imported rice in Kano area. Monograph Series # 22, July 2007. UK Department for International Development, Abuja, Nigeria
- Punch 2012. Nigerians eating 10-year-old rice. <http://www.punchng.com/business/business-economy/nigerians-eating-10-year-old-rice-investigation/> (Accessed 26 May 2012).
- Quagraine, K. (2006). IQF Catfish Retail: A Study of consumers' WTP. *International Food and Agribusiness Management Review*, 9(2):75-87.
- Raghubir, P. and Corfman, K. 1999. When do price promotions affect pre-trial brand evaluations? *Journal of Marketing Research*, 36(2):211–222.
- Ramasamy, K., Kalaivanan, G. and Sukumar, S. (2005). Consumer behaviour towards instant food products. *Indian Journal of Marketing*, 35(6):24-25.
- Rees, A.M. 1992. Factors influencing consumer choice. *Journal of Society of Dairy Technologists*, 45(4):112- 116.
- Revelt, D. and Train, K. 1998. Mixed logit with repeated choices: Households' choices of appliance efficiency level. *Revised Economics and Statistics*, 80(4):647–657.
- Reyes, A., Lensink, R., Kuyvenhoven, A. and Moll, H. 2012. Impact of access to credit on farm productivity of fruit and vegetable growers in Chile. Paper presented at the International Association of Agricultural Economists (IAAE) Triennial Conference, Foz do Iguacu, Brazil, 18-24 August 2012.
- Rice, C. 1993. *Consumer Behaviour: Behavioural Aspects of Marketing*. Boston: Oxford.

- Riedl, J., Konstan, J. and Vrooman, E. 2002. *Word of Mouse: The Marketing Power of Collaborative Filtering*. New York: Grand Central Publishing.
- Riesz, P. 1978. Price versus quality in the market place, 1961-1975. *Journal of Retailing*, 54 (4):15-28.
- Rijswijk, W.V. and Frewer, L.J. (2008). Consumer perceptions of food quality and safety and their relation to traceability. *British Food Journal*, 110(10):1034-1046.
- Roig, J.C.F., Garcia, J.S., Tena, M.A.M. and Monzonis, J.L. 2006. Customer perceived value in banking services. *International Journal of Bank Marketing*, 24(5):266–283.
- Rose, P. 1995. *Marketing – the Pocket Edition Study Guide*. Waiheke, N.Z.: SAM Support.
- Rosen, S. 1974. Hedonic prices and implicit markets: Product differentiation in pure competition. *The Journal of Political Economy*, 82(1):34-55.
- Rowley, J. 1997. Focusing on Customers. *Library Review*, 46(2):81-89.
- Roy, P., Ijiri, T., Okadome, H., Nei, D., Orikasa, T., Nakamura, N., Shiina, T. 2008. Effect of processing conditions on overall energy consumption and quality of rice. *Journal of Food Engineering*, 89(3):343-348.
- Rutsaert, P., Demont, M., and Verbeke, W. 2011. Consumer preferences for rice in Africa. In: M. C. S. Wopereis, D. Johnson, T. Horie, E. Tollens, & A. Jalloh eds., *Realizing Africa's rice promise*. Wallingford, UK: CABI Publishing.
- Saeed, A., Nazia, H., and Adnan, R. 2011. Factors affecting consumers' switching intentions. *European Journal of Social Sciences*, 19(1):54-62.
- Sahay, A. and Sharma, N. 2010. Brand relationships and switching behaviour for highly used products in young consumers. *Vikalpa*. 35(1):15-30.
- Sahel 2015. Rice in Nigeria: Industry Dynamics. Volume 12 October 2015. <http://sahelcp.com/wp-content/uploads/2016/12/Sahel-Newsletter-Volume-12.pdf> (Accessed 5 March 2017).
- Sanjaya, S. G. and Abdul, K. W. 2002. Study of buying behaviour of branded fine rice. *Indian Journal of Marketing*, 32(7):3-8.
- Sar, S., Gilbert, R.G. and Marks, G.C. 2012. Household rice choice and consumption behaviour across agro-climatic zones of Cambodia. *Journal of Hunger and Environmental Nutrition*, 7(2-3):333-346.
- Sarwade, W.K. 2002. Emerging dimensions of buyer behaviour in rural area. *Indian Journal of Marketing*, 32(1-2):13-19.

- Schmitt, B. 2009. The concept of brand experience. *Journal of Brand Management*, 16(7): 417–419.
- Seck, P. A., Tollens, E., Wopereis, M. C. S., Diagne, A. and Bamba, I. 2010. Rising trends and variability of rice prices: Threats and opportunities for sub-Saharan Africa. *Food Policy*, 35(5):403–411.
- Sethuraman, R. and Tellis, G. J. 1991. An analysis of the trade-off between advertising and pricing. *Journal of Marketing Research*, 31(2):160–174.
- Shanmugasundaram, S. 1990. Demographic and psychological factors that influence the pattern and selection in soft drink and tetra pack drinks: A study in Veollore. *Indian Journal of Marketing*, 20(7):102-106.
- Shiraia, M. 2010. Analysing price premiums for foods in Japan: Measuring consumers' willingness to pay for quality-related attributes. *Journal of Food Products Marketing*, 16(2):184-198.
- Shiraia, M. 2015. Impact of high quality, low price appeal on consumer evaluations. *Journal of Promotion Management*, 21(6):776-797.
- Shivkumar, J. 2004. Buying behaviour of consumers towards the products produced by SSI units. *Indian Journal of Marketing*, 34 (3):19-25.
- Shugan, S.M. 1983. Price-quality relationships. In: T.C. Kinnear (ed.). *Advances in Consumer Research*, 11:627-632.
- Singh, J.D. and Singh, R. 1981. A study of brand loyalty in India. *Indian Journal of Marketing*, 11 (11- 12):33-37.
- Smallwood, D. and Conlisk, J. 1979. Product quality in markets where consumers are imperfectly informed. *Quarterly Journal of Economics*, 93(1):1-23.
- Solomon, M.R. 1995. *Consumer Behaviour*, 3rd ed., Prentice Hall.
- Soper, K. 2007. Re-thinking the 'Good Life'. *Journal of Consumer Culture*, 7(2):205-229.
- Sonata, A. and Rasa, G. 2010. Analysing price-quality relationship using conjoint analysis. *Economics and Management*, 2010(15):350-358.
- Sproles, G. B. 1977. New evidence on price and quality. *Journal of Consumer Affairs*, 11(1):63-77.
- Srinivasan, V., Park, C. S. and Pascal, V. J. 1994. Relating consumer-based sources of brand equity and its sources. *Indian Journal of Marketing*. 15 (6):15-20.

- Steenkamp, J.B. and van Trijp, H. C.1996. Quality guidance: A consumer-based approach to food quality improvement using partial least squares. *European Review of Agricultural Economics*, 23(1):195-215.
- Sudha, V., Donna, S., Biling, H., Malik, V., Jones, C., Wedick, N.M., Hu, F.B., Willet, W., Bai, M.R., Ponnalagu, M.M., Arumugan, K., and Mohan, V. 2013. Consumer acceptance and preference study (CAPS) on brown and under-milled Indian rice varieties in Chennai, India. *Journal of the American College of Nutrition*, 32 (1):50-57.
- Suwannaporn, P. and Linnemann, A. 2008. Consumer preferences and buying criteria in Rice: A study to identify market strategy for Thailand Jasmine rice export. *Journal of Food Products Marketing*, 14(4):33-53.
- Swait, J., Erdem, T., Louviere, J., and Dubelaar, C. 1993. The equalization price: A consumer-perceived measure of brand equity. Brand equity. *International Journal of Research in Marketing*, 10 (1):23– 45.
- Tellis, G. J. 1988. The price sensitivity of competitive demand: A meta-analysis of sales response models. *Journal of Marketing Research*, 15(3):331–341.
- Tellis, G. J. and Zufryden, F. 1995. Cracking the retailer’s decision problem: Which brand to discount, how much, when and why? *Marketing Science*, 14(3):271–299.
- Tetteh, B. A., Sidney, N. A. and Stanislaus, A. A. 2011. Consumer preferences for rice quality characteristics and the effects on price in the Tamale Metropolis, Northern Region, Ghana. *International Journal of Agricultural Science*, 1(2):67-74.
- Thanasuta, K. and Metharom, P. 2015. Influencing the willingness to pay for private labels: the role of branding. *Asia-Pacific Journal of Business Administration*, 7(3):197 – 215.
- The Nation 2011. Is rice revolution possible in Nigeria? <http://www.thenationonlineng.net/2011/index.php/business/26870-is-rice-revolution-possible-in-nigeria.html> (Accessed 26 November 2012).
- Theil, H. 1965. Qualities, prices, and budget inquiries. *USDA Handbook*, No. 291, 1965.
- Tomlins, K.I., Manful, J.T., Larwer, P. and Hammond, L. 2005. Urban consumer preferences and sensory evaluation of locally produced and imported rice in West Africa. *Food Quality and Preference*, 16(1):79–89.
- Tomlins, K., Manful, J., Gayin, J., Kudjawu, B., and Tamakloe, I. 2007. Study of sensory evaluation, consumer acceptability, affordability and market price of rice. *Journal of the Science of Food and Agriculture*, 87(8):1564-1575.
- Tonsor, G. T., Schroeder, T.C., Fox, J.A. and Biere, A. 2005. European preferences for beefsteak attributes. *Journal of Agricultural and Resource Economics*, 30:367–380.

- Train, K. 1986. *Qualitative Choice Analysis – Theory, Econometrics, and an Application to Automobile Demand*. Cambridge, Massachusetts: MIT Press, London.
- Train, K. E. 2003. *Discrete Choice Methods with Simulation*. Cambridge, MA: Cambridge University Press.
- Travisi, C. M. and Nijkamp, P. 2004. Are Italians willing to pay for agricultural environmental safety? A Stated Choice Approach. A paper presented at 84th EAAE Economic Seminar on Food Safety in a Dynamic World. Ziest, Netherlands. 8-11 February 2004.
- Umeshanand, G. 2008. Study on brand switching in consumer products. Unpublished MBA Thesis, Department of Management and Technology, Chhattisgarh Vivekananda Technical University India.
- Unnevehr, L. J. 1992. Methodologies for measuring consumer preferences and welfare effects of quality improvement. In: Consumer demand for rice grain quality. International Rice Research Institute, Manila, Philippines.
- Unnevehr, L.J. 1986. Consumer demand for rice grain quality and returns to research for quality improvement in Southeast Asia. *American Journal of Agricultural Economics* 68(3): 634-641.
- Ulaga, W. and Eggert, A. 2006. Relationship value and relationship quality: Broadening the nomological network of business-to-business relationships. *European Journal of Marketing*, 40(3/4):311-327.
- USDA 2016. United States Department of Agriculture (USDA). Global Agricultural Information Network (GAIN) report. USDA Foreign Agricultural Services (FAS), April 2016.
https://gain.fas.usda.gov/Recent%20GAIN%20Publications/Grain%20and%20Feed%20Annual_Lagos_Nigeria_4-21-2016.pdf (Accessed 28 February, 2017).
- USDA 2012. United States Department of Agriculture. International data base, 2012.
- USAID 2010. Rice investment and processing in Nigeria: A review of initiatives to date. United States Agency for International Development.
<http://www.nigeriamarkets.org/files/Rice%20Market%20Research%20Executive%20Summary.pdf> (Accessed 30 November 2012).
- USAID 2009. Global food security response: West Africa rice value chain analysis. *MicroReport*, No. 161. United States Agency for International Development (USAID), Washington, D.C.
- Uwe, H., Gudmund, J.S. and Draguns, J.G. 1983. *Defence Mechanisms: Theoretical Research and Clinical Perspectives*. Elsevier

- Van der Walddt, D.L.R., Du Toit, L.S. and Redelinghuys, R. 2007. Does branded product placement in film enhance realism and product recognition by consumers? *African Journal of Business Management*, 1(2):19-25.
- Verain, M., Bartels J., Dagevos H., Sijtsema, S. J., Onwezen, M. C. and Antonides, G. 2012. Segments of sustainable food consumers: A literature review. *International Journal of Consumer Studies*, 36(2):123-133.
- Vincent, N. 2006. A study on brand consciousness among children and its effect on family buying behaviour in Bangalore city. *Indian Journal of Marketing*, 36 (1):12-18.
- WARDA 2003. West African Rice Development Association. Strategy for rice sector revitalization in Nigeria. Project report, WARDA, Abidjan, Cote d'Ivoire.
- Wardman, M. 1988. A comparison of revealed preference and stated preference models of travel behaviour. *Journal of Transport Economics and Policy*, 22(1):71-91.
- Waugh, F. 1929. *Quality as a Determinant of Vegetable Prices*. New York: Columbia University Press. 1929.
- Waugh, F. V. 1928. Quality factors influencing vegetable prices. *Journal of Farm Economics*, 19(1928):185-96.
- Wedgwood, H. and Duff, B. 1992. The economics of rough rice quality at the farm level. In: Consumer demand for rice grain quality. International Rice Research Institute, Manila, Philippines.
- Wendy, C.P., Latif, M.A., Rafii, M.Y., Ismail, M.R. and Puteh, A. 2016. Advances to improve the eating and cooking qualities of rice by marker-assisted breeding. *Critical Reviews in Biotechnology*, 36(1):87-98.
- Wiggins, S.N. and Lane, W.J 1983. Quality uncertainty, search, and advertising. *American Economic Review*, 12(1):881-889.
- Wilson, W. W. 1984. Hedonic prices in the malting barley market. *Western Journal of Agricultural Economics*, 9(1):29-40.
- Wolfe, M.J. and Crotts, J.C. 2011. Marketing mix modelling for the tourism industry: A best practices approach. *International Journal of Tourism Sciences*, 11(1):1-15.
- Wooldridge, Jeffrey M. (2006). *Introductory Econometrics*, 3rd ed. Thomson Higher Education.
- Wu, C. C. and Wu, S. I. 1998. A proposed method for the development of marketing mix of the tea drink market. *Asia Pacific Journal of Marketing and Logistics*, 10(1):3-21.
- Yamane, T., 1967, *Statistics: An introductory analysis*, 2nd edn., Harper and Row, New York.

- Yoon, Y. and Uysal, M. 2005. An examination of the effects of motivation and satisfaction on destination loyalty: A structural model. *Tourism Management*, 26(1): 45–56.
- Yue, C., Alfnes, F. and Jensen, H. H. 2006. Discounting spotted apples: Investigating consumers' WTP to accept cosmetic damage in organic products. *Journal of Agricultural and Applied Economics*, 14(1):29-46.
- Zeithaml, V.A. 1988. Consumer perceptions of price, quality, and value: A means-end model and synthesis of evidence. *Journal of Marketing*, 52(July):2–22.
- Zeithaml, V.A., Berry, L.L. and Parasuraman, A. 1996. The behavioural consequences of service quality. *Journal of Marketing*, 60(2):31-46.
- Zeng, Y. and Wei, X. 2005. Consumer's attitudes and perception toward green food in Beijing, concordant society and development of country. A selected paper of national wide agricultural economist annual conference, China Agriculture Press, 2005.
- Zhou, Y. and Peng, X. J. 2006. Consumer willingness to pay for food safety in Jiangsu Province, China: A Case Study of Reduced Pesticide Residues. *China Economic Quarterly*, (5):1319-1342.

APPENDICES

Appendix A: Questionnaire

Questionnaire

Dear respondent,

My name is Uchenna Obih, a Ph.D student of Department of Agricultural Economics, University of Kwazulu Natal, South Africa. Currently I am collecting data for my thesis on the topic “**Brand-Switching Behaviours of Rice Consumers in Nigeria**”. This questionnaire is a fundamental part of my PhD studies. I will be very grateful if you would take less than 25 minutes of your time to complete it. The questions are anonymous and your responses will be treated with strict confidentiality and will be used only for the purpose of this study. Please do not hesitate to contact me if need clarification on any of the questions (07035385317; obih_uchenna@yahoo.com).

Thank you.

Uchenna Obih

SECTION A: RESPONDENT’S SOCIECONOMIC FACTORS

Instruction: Please tick in the box provided. Tick once for each question, unless otherwise stated.

1. Gender: (a) male (b) female
2. Age group (in years): (a) 20-25 (b) 26-31 (c) 32-40 (d) 41-50 (e) 51-above
3. Education (years spent in school): (a) None (b) 1-6 (c) 7-12 (d) 13-17 (e) 18-Above
4. Monthly Income (in ₦'000): (a) 20-80 (b) 81-150 (c) 151-290 (d) 291-400 (e) 401-above
5. No of persons living with you in the house: (a) None (b) 1-3 (c) 4-6 (d) 7-10 (e) 11-above
6. Occupation.....
7. Marital Status: (a) Married None (b) Single (c) Divorced (d) Widow (e) Widower

SECTION B: RICE QUALITY ATTRIBUTES

How would you rate the attributes of local and imported rice brands you have eaten?

Please tick \surd two boxes for each quality attribute (one for local rice and the other for imported rice)

	Rice Brands →	Local Rice			Imported Rice		
S/ N	Quality Attribute	3	2	1	3	2	1
1	After-Cook Colour	Bright White []	Cream []	Dirty white []	Bright White []	Cream []	Dirty white []
2	Grain Texture	Hard []	Moderate []	Soft []	Hard []	Moderate []	Soft []
3	Aroma	Good []	Moderate []	Poor []	Good []	Moderate []	Poor []
4	Neatness	Neat []	Moderate []	Dirty []	Neat []	Moderate []	Dirty []
5	Grain Stickiness	Separate []	Moderate []	Sticky []	Separate []	Moderate []	Sticky []
6	Flavour/Taste	Good []	Moderate []	Poor []	Good []	Moderate []	Poor []
7	Grain Shape	Long []	Moderate []	Short /fat []	Long []	Moderate []	Short/fat []
8	Broken Grain	Low []	Moderate []	High []	Low []	Moderate []	High []
9	Cooking Duration	Short []	Moderate []	Long []	Short []	Moderate []	Long []
10	Swelling Capacity	High []	Moderate []	Low []	High []	Moderate []	Low []
11	Perceived Nutritional Quality	High []	Moderate []	Low []	High []	Moderate []	Low []
12	Perceived Freshness	High []	Moderate []	Low []	High []	Moderate []	Low []

13	Perceived chemical storage	Low []	Moderate []	High []	Low []	Moderate []	High []
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How would you rank these rice quality attributes in order of importance to you (1=Most important; 13=least important). Please tick \surd one box for each quality attribute.

		Level of importance of Rice Quality Attribute												
		Most Important \longrightarrow Least Important												
S/N	Quality Attribute	1	2	3	4	5	6	7	8	9	10	11	12	13
1	After-Cook Colour													
2	Grain Texture													
3	Aroma													
4	Neatness													
5	Grain Separateness													
6	Flavour/Taste													
7	Grain Shape													
8	Grain Brokenness													
9	Cooking Duration													
10	Swelling Capacity													
11	Perceived Nutrient level													
12	Perceived Freshness													
13	Perceived chemical storage													

SECTION C: RESPONDENT’S PREFERENCE SWITCH TO LOCAL RICE BRANDS

1. Do you buy or eat local rice even when served in ceremonies/events/occasions? (a) Yes [] (b) No []
2. If No, what major reason compels you to completely avoid eating local rice? (a) No reason, just negative perception [] (b) very dirty and sandy [] (c) very sticky grains [] (d)

Dull colour [] (e) Poor Aroma and Taste [] (f) past negative experience [] (g) Other reason (please specify).....

3. *If yes to question 1 above, do you have a particular brand of local rice you buy?* (a) Yes [] (b) No []
4. *If yes, what is the brand name? (Please specify)*
5. *Has your frequency of eating/buying high premium quality Nigeria (local) rice brands increased in the last 2 years?* (a) Yes [] (b) No []

SECTION D: RESPONDENT'S LOCAL BRAND AWARENESS AND PECULIAR FACTORS

Please tick \surd one box for each question

1. *Are you aware that local rice is more nutritious and healthier in terms of higher starch, vitamins and minerals than imported rice brands?* (a) much aware [] (b) aware but does not care [] (c) Not aware at all []
2. *Are you aware that local rice is fresher and safer than imported rice brand in terms of length of storage?*
(a) much aware [] (b) aware but does not care [] (c) Not aware at all []
3. *Are you aware of the cooking procedures involved in preparing local rice brands?*
(a) much aware [] (b) aware but does not care [] (c) Not aware at all []
4. *Are you aware of recent improvements in local rice grains?*
(a) much aware [] (b) aware but does not care [] (c) Not aware at all []
5. *What is your main source of awareness information about local rice brands?*
(a) Producer/suppliers' adverts/promotions [] (b) family/friends [] (c) none []
6. *What is your level of loyalty to a particular brand of local rice?* (a) strong [] (b) weak [] (c) none []
7. *What is your perception level about the quality attributes of local rice brands?*
(a) strong [] (b) weak [] (c) none []
8. *Are local rice brands available in shops near your residence?*
(a) readily available [] (b) not always available [] (c) not available at all
9. *Would your awareness of the nutritional and safety superiority of local rice over imported rice influence your decision to buy/eat local rice brands?* (a) Yes [] (b) No []

10. *Do you have a particular customer/retailer you buy rice from?* (a) Yes [] (b) No []
11. *If Yes, does s/he give you information (generally) about rice in the market?* (a) Yes [] (b) No []
12. *If Yes, how you view such information?* (a) Serious [] (b) Not serious []
13. *Does the information given by your customer sometimes influence your buying decision?* (a) Yes [] (b) No []

SECTION E: LOCAL RICE PRODUCERS/DISTRIBUTORS MARKETING

STRATEGIES

Please tick \surd one box for each question unless otherwise stated

1. *Is the brand name of local rice you buy popular?* (a) widely known [] (b) not popular [] (c) do not know []
2. *Does the label/package of local rice provide adequate information as required?* (a) Yes [] (b) No []
3. *If No, which information is/are lacking?* (a) Nutritional [] (b) Cooking procedure [] (c) safety [] (d) producers' info [] (e) other (specify)
4. *Do you know if local rice brands have NAFDAC certification?* (a) Yes [] (b) No []
5. *Are the packages of local rice brands attractive?* (a) Yes [] (b) No []
6. *Are local rice brands packaged in various sizes (5, 10, 25, 50kg bags)?* (a) Yes [] (b) No []
7. *Do you hear/get adverts on local rice brands on TV, radio, dailies or billboards?* (a) Yes [] (b) No []
8. *Do you know of sales promotions/campaigns for local rice brands in the mass media?* (a) Yes [] (b) No []
9. *If Yes to question 8, are these promotions/campaigns frequent?* (a) Yes [] (b) No []
10. *Have you been offered price discount on local rice?* (a) Yes [] (b) No []
11. *Have you been offered quantity discount on local rice?* (a) Yes [] (b) No []
12. *Have you bought any local rice brand on credit?* (a) Yes [] (b) No []
13. *Do you find local rice brands readily displayed in major market/shops/stores* (a) Yes [] (b) No []

14. *Do you find local rice brands readily displayed in shops/stores near your residence* (a) Yes [] (b) No []
15. *Where else do you find local rice brands displayed?* (a) major market and large stores [] (b) corner shops [] (c) open/roadside markets []

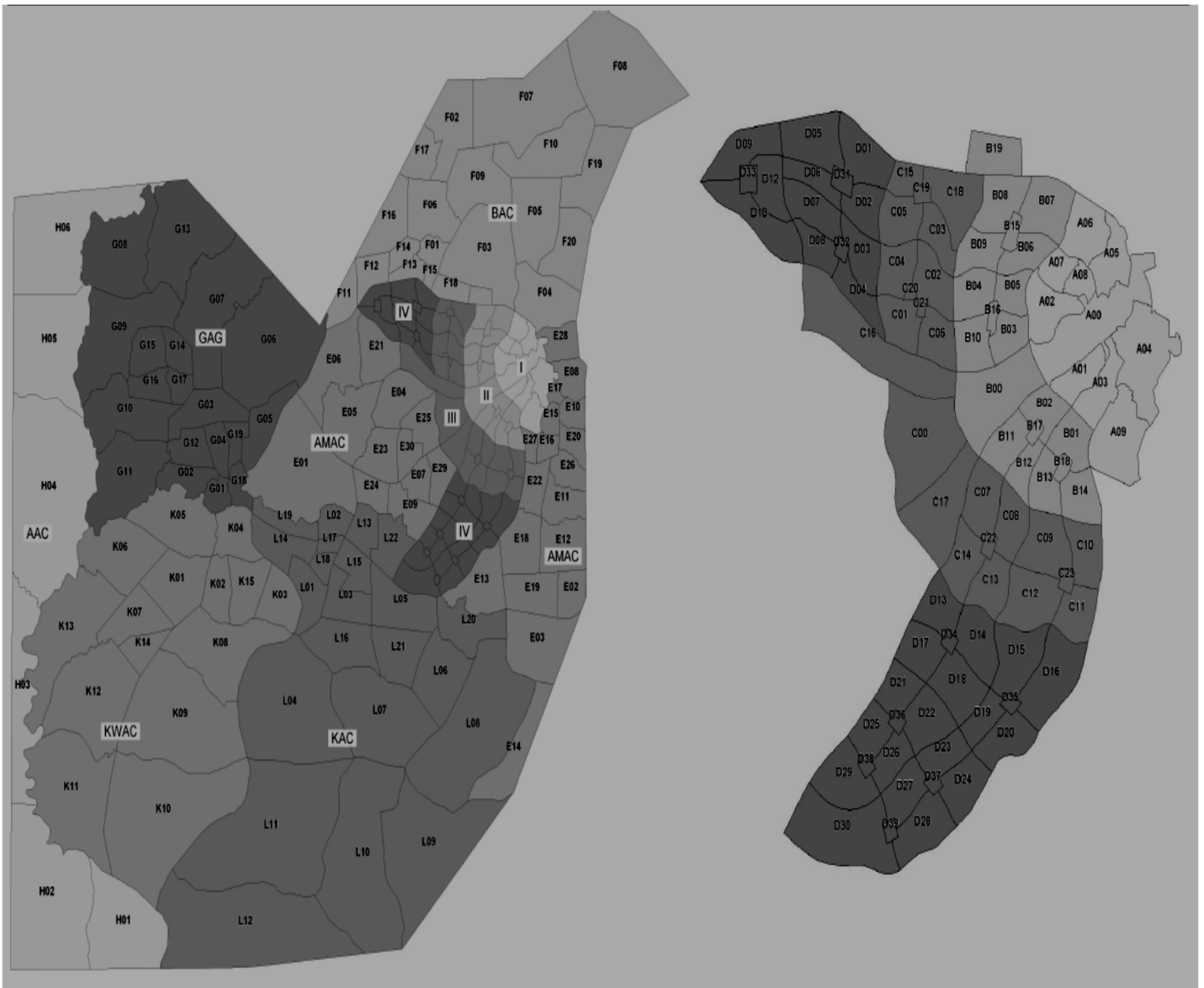
SECTION F: WILLINGNESS TO PAY FOR IMPORTED RICE BRANDS

Please tick \surd one box for each question

1. *What is your degree of perception of the quality of brand of imported rice you buy/eat?* (a) Strong [] (b) Moderate [] (c) Weak []
2. *Why do you prefer imported rice brands?* (a) No reason [] (b) very neat [] (c) separate grains [] (d) bright colour [] (e) Good Aroma and Taste [] (f) Other reason (please specify).....
3. *How much do you buy a 50kg bag or equivalent of imported rice brands? (please specify).*
N.....
4. *If the prices of imported rice brands increase, are you willing to pay the higher price?* (a) Yes [] (b) No []
5. *If yes to question 4, what is the maximum price are determined to pay? (please specify).*
N.....
6. *If the market prices of imported rice brands exceed the amount stated in 5 above, will you switch to the best alternative local rice brand that is cheaper?* (a) Yes [] (b) No []

Can you please provide me with your phone number: _____ and email: _____ to enable me reach you in case I need clarification on any of your responses.

Appendix B: AGIS Map of FCT showing the Area Councils and Towns



<input type="radio"/> FCC Phase I:	<input type="checkbox"/> Sector Centre A B15	<input type="checkbox"/> Sector Centre E C19	<input type="checkbox"/> Bude West D23	<input type="checkbox"/> Karu E10	<input type="checkbox"/> Ija F06	<input type="checkbox"/> Paikon-Kore G12	<input type="checkbox"/> Cikuku L19
<input type="checkbox"/> Central Area A00	<input type="checkbox"/> Sector Centre B B16	<input type="checkbox"/> Sector Centre F C20	<input type="checkbox"/> Bude D24	<input type="checkbox"/> Kurudu E11	<input type="checkbox"/> Igu F07	<input type="checkbox"/> Izom G13	<input type="checkbox"/> Kusaki L20
<input type="checkbox"/> Garki I A01	<input type="checkbox"/> Sector Centre C B17	<input type="checkbox"/> Sector Centre G C21	<input type="checkbox"/> Kpoto West D25	<input type="checkbox"/> Orozo E12	<input type="checkbox"/> Kau F08	<input type="checkbox"/> Dobi North East G14	<input type="checkbox"/> Chakatu L21
<input type="checkbox"/> Wuse I A02	<input type="checkbox"/> Sector Centre D B18	<input type="checkbox"/> Sector Centre H C22	<input type="checkbox"/> Kpoto East D26	<input type="checkbox"/> Gude E13	<input type="checkbox"/> Ushapa F09	<input type="checkbox"/> Dobi North West G15	<input type="checkbox"/> Gaube Farmland L22
<input type="checkbox"/> Garki II A03	<input type="checkbox"/> Katampe Ext. B19	<input type="checkbox"/> Sector Centre J C23	<input type="checkbox"/> Chafe D27	<input type="checkbox"/> Odu E14	<input type="checkbox"/> Kunapa F10	<input type="checkbox"/> Dobi West G16	<input type="radio"/> KWAC:
<input type="checkbox"/> Asokoro A04	<input type="radio"/> FCC Phase III:	<input type="radio"/> FCC Phase IV:	<input type="checkbox"/> Jaite D28	<input type="checkbox"/> Kuruduma E15	<input type="checkbox"/> Dakwa F11	<input type="checkbox"/> Dobi East G17	<input type="checkbox"/> Kwali K01
<input type="checkbox"/> Maitama A05	<input type="checkbox"/> Inst. & Research C00	<input type="checkbox"/> Karsana East D01	<input type="checkbox"/> Mamusa D29	<input type="checkbox"/> Kpaduma E16	<input type="checkbox"/> Jiba F12	<input type="checkbox"/> Gwagwal. Town G18	<input type="checkbox"/> Sheda K02
<input type="checkbox"/> Maitama A06	<input type="checkbox"/> Karmo C01	<input type="checkbox"/> Karsana South D02	<input type="checkbox"/> Parfun D30	<input type="checkbox"/> Kugbo E17	<input type="checkbox"/> Kubwa Town F13	<input type="checkbox"/> Dikwa East G19	<input type="checkbox"/> Adadu K03
<input type="checkbox"/> Wuse II A07	<input type="checkbox"/> Gwarinpa I C02	<input type="checkbox"/> Idogwari D03	<input type="checkbox"/> Sector Centre K D31	<input type="checkbox"/> Wasa E18	<input type="checkbox"/> Bazango F14	<input type="radio"/> KAC:	<input type="checkbox"/> Bako K04
<input type="checkbox"/> Wuse II A08	<input type="checkbox"/> Gwarinpa II C03	<input type="checkbox"/> Idu D04	<input type="checkbox"/> Sector Centre L D32	<input type="checkbox"/> Karshi West E19	<input type="checkbox"/> Kubwa Ext. F15	<input type="checkbox"/> Kuje South West L01	<input type="checkbox"/> Leleyi K05
<input type="checkbox"/> Guzape A09	<input type="checkbox"/> Dape C04	<input type="checkbox"/> Karsana North D05	<input type="checkbox"/> Sector Centre M D33	<input type="checkbox"/> Jikoyi E20	<input type="checkbox"/> Jika F16	<input type="checkbox"/> Kango L02	<input type="checkbox"/> Kundu K06
<input type="radio"/> FCC Phase II:	<input type="checkbox"/> Kafe C05	<input type="checkbox"/> Karsana West D06	<input type="checkbox"/> Sector Centre N D34	<input type="checkbox"/> Jiwa E21	<input type="checkbox"/> Kuchiko F17	<input type="checkbox"/> Kuje South East L03	<input type="checkbox"/> Dafa K07
<input type="checkbox"/> Kukwaba B00	<input type="checkbox"/> Nbora C06	<input type="checkbox"/> Sabo Gida D07	<input type="checkbox"/> Sector Centre O D35	<input type="checkbox"/> Apo-Tafyi E22	<input type="checkbox"/> Dawaki F18	<input type="checkbox"/> Kwaku L04	<input type="checkbox"/> Yangoji K08
<input type="checkbox"/> Gudu B01	<input type="checkbox"/> Galadimawa C07	<input type="checkbox"/> Tasha D08	<input type="checkbox"/> Sector Centre P D35	<input type="checkbox"/> Kyami E23	<input type="checkbox"/> Kurumi Daudu F19	<input type="checkbox"/> Gaube L05	<input type="checkbox"/> Kwaita K09
<input type="checkbox"/> Durumi B02	<input type="checkbox"/> Dakwo C08	<input type="checkbox"/> Kagini D09	<input type="checkbox"/> Sector Centre Q D36	<input type="checkbox"/> Wawa E24	<input type="checkbox"/> Kabusu F20	<input type="checkbox"/> Yanga L06	<input type="checkbox"/> Yebu K10
<input type="checkbox"/> Wuye B03	<input type="checkbox"/> Lokogoma C09	<input type="checkbox"/> Gwagwa D10	<input type="checkbox"/> Sector Centre R D37	<input type="checkbox"/> Lugbe North E25	<input type="radio"/> GAC:	<input type="checkbox"/> Kabi L07	<input type="checkbox"/> Dangara K11
<input type="checkbox"/> Jabi B04	<input type="checkbox"/> Wumba C10	<input type="checkbox"/> Kaba D12	<input type="checkbox"/> Sector Centre S D38	<input type="checkbox"/> Kpegyi E26	<input type="checkbox"/> Gwagwalada G01	<input type="checkbox"/> Kasada L08	<input type="checkbox"/> Tutu K12
<input type="checkbox"/> Utako B05	<input type="checkbox"/> Saraji C11	<input type="checkbox"/> Ketti North D13	<input type="radio"/> AMAC:	<input type="checkbox"/> Apo E27	<input type="checkbox"/> Kutunku G02	<input type="checkbox"/> Ahinza L09	<input type="checkbox"/> Gomani K13
<input type="checkbox"/> Mabushi B06	<input type="checkbox"/> Kabusa C12	<input type="checkbox"/> Sheretti D14	<input type="checkbox"/> Giri E01	<input type="checkbox"/> Gurku E28	<input type="checkbox"/> Paiko G03	<input type="checkbox"/> Buga L10	<input type="checkbox"/> Yangoji Piri K14
<input type="checkbox"/> Katampe B07	<input type="checkbox"/> Okanje C13	<input type="checkbox"/> Sheretti Cheche D15	<input type="checkbox"/> Karshi E02	<input type="checkbox"/> Lugbe East E29	<input type="checkbox"/> Dikwa West G04	<input type="checkbox"/> Gwargwada L11	<input type="checkbox"/> Kilankwa K15
<input type="checkbox"/> Jahi B08	<input type="checkbox"/> Pyakasa C14	<input type="checkbox"/> Waru-Pozema D16	<input type="checkbox"/> Karshi South E03	<input type="checkbox"/> Lugbe West E30	<input type="checkbox"/> Anagada G05	<input type="checkbox"/> Rubochi L12	<input type="radio"/> AAC:
<input type="checkbox"/> Kado B09	<input type="checkbox"/> Wupa C15	<input type="checkbox"/> Ketti D17	<input type="checkbox"/> Gausa E04	<input type="radio"/> BAC:	<input type="checkbox"/> Zuba G06	<input type="checkbox"/> Bamishi L13	<input type="checkbox"/> Abaji H01
<input type="checkbox"/> Dakibiyu B10	<input type="checkbox"/> Ind. Area I & Ext. C16	<input type="checkbox"/> Ketti East D18	<input type="checkbox"/> Aviation Village E05	<input type="checkbox"/> Kubwa F01	<input type="checkbox"/> Ibwa G07	<input type="checkbox"/> Pasali L14	<input type="checkbox"/> Yaba H02
<input type="checkbox"/> Kaura B11	<input type="checkbox"/> Industrial Area II C17	<input type="checkbox"/> Burun West D19	<input type="checkbox"/> Deidei E06	<input type="checkbox"/> Bwari F02	<input type="checkbox"/> Dadabiri G08	<input type="checkbox"/> Kuchiyako L15	<input type="checkbox"/> Gurara H03
<input type="checkbox"/> Duboyi B12	<input type="checkbox"/> Bunkoro C18	<input type="checkbox"/> Burun D20	<input type="checkbox"/> Lugbe Central E07	<input type="checkbox"/> Usuma F03	<input type="checkbox"/> Yelwa G09	<input type="checkbox"/> Pegi L16	<input type="checkbox"/> Kwaga H04
<input type="checkbox"/> Gaduwa B13		<input type="checkbox"/> Gidari Bahagwo D21	<input type="checkbox"/> Nyanya E08	<input type="checkbox"/> Mpape F04	<input type="checkbox"/> Dobi South G10	<input type="checkbox"/> Kuje Township L17	<input type="checkbox"/> Doga H05
<input type="checkbox"/> Dutse B14		<input type="checkbox"/> Gwari D22	<input type="checkbox"/> Lugbe South E09	<input type="checkbox"/> Shere F05	<input type="checkbox"/> Kasanki G11	<input type="checkbox"/> Sauka L18	<input type="checkbox"/> Egga H06

Appendix C: Institutional framework of financing agriculture for rural micro-farmers

