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Agricultural Marketing and Sustainable Household Food Security in Sub-Saharan Africa: Evidence from Nigeria

Emmanuel Ejiofo Nwanmuoh [1]; Nduka Elda Vitalis Okolo-Obasi [2]; Jane Nwakaego Anene [1]; Innocent Vitus Uwakwe [1]; Francisca Tochukwu Udu [3]; Ikenna Amuka [4]; and Patrick Okechukwu Emeter [1]

[1]Department of Marketing, Faculty of Business Administration, Enugu Campus, University of Nigeria, Nsukka, Nigeria. [2]Institute for Development Studies, Enugu Campus, University of Nigeria, Nsukka, Nigeria. [3]Department of Music, Faculty of Arts, University of Nigeria, Nsukka, Nigeria. [4]Institute of Maritime Studies, University of Nigeria, Nsukka, Nigeria.

Corresponding author: nduka.obasi.pg82232@unn.edu.ng

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Abstract

This paper assessed if agricultural marketing activities – assembling and grading, transportation, storage and distribution channels have made any appreciable impact on food security in the area of food availability, accessibility, utilization and stability in Sub-Saharan Africa using evidence from Nigeria. In the explanatory research design, we adopted both descriptive and inferential statistics to answer the four research questions. Primary data was generated from a sample of 800 respondents selected across the six geopolitical zones of Nigeria using multiple sampling techniques. Results from logistic regression analysis model show that agricultural marketing activities have made significant impacts on food security in Nigeria. The study concluded that any increase in the activities of Agricultural marketing affects food security directly and the common household either benefit or suffer for it. Hence, the study recommended that partnership between the government and private sector should ensure that enabling environment are created for sustainable agricultural marketing by improving on rural access road proper management of oil prices, provision of storage facilities as well as checking distribution channels.

Keywords: Agricultural Marketing, Food Security, Distribution Channels, Logistic Models, Nigeria.

Introduction

Africa is a continent that is blessed with abundant human and natural resources and sub-Saharan Africa (SSA) endowed with unfathomable potential for productivity in agriculture (UNCTAD, 2017; Mugabe et al, 2020) ILO (2018) noted that in the economies of SSA nations, agricultural sector generates employment for over 58% of the employable, willing and ready to work population (labour force). Along the agricultural value chain in countries like Madagascar, Burkina Faso, and Burundi more than 75% of the labour force are accommodated. Other countries with the least percentage of their labour forces in

agriculture are South Africa (4.6%) Angola (5.1%), and Mauritius (7.8%), and currently in Nigeria, agricultural sector employs about 40% of the labour force. Unfortunately, ILO (2018) as corroborated by Bekele et al (2019), VOS et al (2020) Kitabu (2022), and Ogbomah (2023), holds that agricultural sector only accounts for 15% of the Gross Domestic Product (GDP) of SSA nations. To Nwankpa (2024) this performance is absurdly very low below potentials innate in these nations especially Nigeria.

With a geographical area of 932,768KM^2 and available arable land of about 36.9 million hectares a total agricultural land of 70.8 million hectares (Idris et al, 2020), and over two hundred million persons (NBS, 2023), the potential of Nigeria's agriculture is so massive. With wild range of topographical regions supporting diverse agricultural activities, arrays of agricultural produce are grown in Nigeria (Otekunrin & Oteturin (2020)

However, FAO, (2021), asserted that majority (over 70%) of the farming business in Nigeria is done at subsistence level. This may not be unconnected with the fact that, over 70% of Nigerians are rural dwellers and more than 65% of such engage in one form of agriculture or the other but mostly at subsistence level. This subsistence level of food production in Nigeria some scholars and even policy makers have attributed to the rise in food insecurity in the country.

Food security according to Rudd Center for Food Policy and Health (2023) entails a person having sufficient physical and economic access to food in quantity and quality that is enough to generate a minimum calorie requirement of about 2200-2300 calories per day for adult females and 2900-3000 calories per day for adult males for healthy living. An individual household or nation is food secured if the about is achieved and food insecurity where there is and uncertainty concerning the availability, accessibility and affordability future quantity and quality of food for a healthy lifestyle (World Food Summit, 2003; UN, 2023).

Nigeria was able to feed her populace and export the surplus food items before her oil was discovered leading to availability of urban jobs that triggered rural-urban migration and neglect of agriculture to which Nigeria then became a net importer of agriculture products. To this, many Nigerian citizens are food poor and food insecure as food prices continue to rise astronomically in the face of an equally galloping population Abdulazeez et al (2023). According to Economic Impact (2022), Nigeria ranked 25th out of 28 Sub-Saharan African countries surveyed in food affordability, availability, quality, safety, sustainability and adaptation with a score of only 42 in Global Food Security Index (GFSI). A report from Statista (2024), shows that between 2019 and 2022, the percentage of Nigerian citizens enduring moderate to severe food insecurity enlarged from 58.5% percent to 69.7%. Currently the rise is astronomical with food inflation almost hitting almost 40%. In 2022, FAO, Nigeria projected an additional 26.5 million Nigerians to be food insecure in 2024 (Kouacou, 2023; Sasu, 2023) but current situation shows that over 40 million has crossed the line. With children the most vulnerable to food security according to (UNICEF, 2023); Nigeria is currently the 12th hungriest country in the world (Vanguard, 2024).

Nigeria maybe worse hit with food insecurity but definitely not alone as most of the nations in sub-Saharan Africa are passing through the same experience (Food Security Information Network, 2022; UNDP, 2022; UNICEF, 2023). According to estimates from African Food Summit Briefs (AFSB) (2012), almost one in the three people who live in sub-Saharan African are food poor, insecure and undernourished (Akerele et al, 2013). Resent report of UNICEF (2023), Statista (2024) noted that, while about 30% of SSA population are experiencing severe food insecurity, about 37% experience moderate food insecurity, hence about 724million people inhabitants of SSA are affected by food insecurity.

In Nigeria, the prices of food items are alarmingly on the increase since the withdrawal of oil subsidy in 2023, making life bleaker and even more unbearable for many citizens. According to IMF (2022), because the per capita food aggregate has been increasing is indication that Nigeria's agricultural production has struggled in keeping up with the growing population yet, the per capita consumption of basic staples is much lower than expected.

Advocating for increase in productivity of the smallholder farmers maybe be vital to enhance food security in in Nigeria, but making the produce available and affordable is a different kettle of fish. Remarkably, only but few scholars and policy makers have highlighted agricultural marketing as a major factor in ensuring food security in SSA. A review of past empirical works on food security in Nigeria show that only quite a few approached it from marketing perspective even when scholars in social marketing have identified marketing as a potent tool for meeting societal need. While scholars like Ejionueme and Nebo (2014), Okolo-Obasi, and Uduji (2021), Ojo et al (2023), Nwanmuoh et al (2023) insists that agricultural marketing which entails execution of all the business activities that concerns the flow of agricultural produce from the point of initial production to the hands of ultimate consumers can be the wand needed to change the course of food security in Nigeria and SSA, others Nwankpa (2017), Asongu et al (2019), Umaru (2020), argued that when enough food is produced, it will definitely find its way to the consumers. Others Olaoye and Ojo (2023), Hannatu and Jide (2021), have equally argued that numerous highly perishable agricultural products are wasted especial in the north central axis for lack of proper distribution channels, poor transportation infrastructures, storage facilities and the likes.

According to UNCTAD (2017), in measuring food security, four universal benchmarks must be involved. Such benchmarks are, food availability on a national scale, food accessibility to households in a country, food utilization by individuals and food stability/sustainability at all times. Marketing of agricultural produce is considered as an integral part of agriculture, since it is not enough to produce a crop or animal product; but making sure they are delivered to the last consumer for the cycle to be complete. Hence, agricultural marketing includes both pre- and post- harvest operations that will save the necks of both producers and consumers. Such operations like assembling and grading, storage, transportation and distribution. Some papers Nwanmuoh et al (2021b), Uduji and Okolo-Obasi (2019d),

Otekunrin et al (2019), FOA (2021), Uduji et al (2019d) believe that if these are well performed, availability, accessibility, affordability and stability/sustainability of food all year round may be enhanced.

It is against this background that this paper contributes to the agricultural productivity and food security debate in SSA nations by critically assessing the influence of agricultural marketing (in the areas of transportation, assembling and grading, storage and distribution channels) on sustainable food security in Sub-Saharan Africa. Hence, specifically the paper attempted to answer the following questions.

- What is the effect of agricultural marketing assembling and grading on household food security in Nigeria?
- What is the effect of agricultural marketing storage on household food security in Nigeria?
- What is the effect of agricultural marketing transportation on household food security in Nigeria?
- What is the effect of agricultural marketing distribution channels on household food security in Nigeria?

Hypothesis Development

Ensuring food security is important for several reasons as food security is an essential component of eradicating hunger and malnutrition, which are persistent universal challenges affecting millions of people (WHO, 2020) Statista (2024). In Nigeria, the citizens are already traumatized and buffeted by the ill-winds of social crisis over the last three decades like the Boko-Haram crisis, banditry and kidnapping for ransom, Niger-Delta militancy, the South-East sit at home crisis, and most especially the farmer-herders' clashes which has scared many farmers out of their farms and caused a serious drop in food production, food availability and accessibility to the citizens over the years. In SSA nation in general prices of staple food have surged by an average of about 24% between 2020 and 2022 (Okou et al, 2022), IMF, (2023), Leadership News (2023), and in Nigeria the removal of fuel subsidy of June 2023 has exorbitantly increased food prices beyond the scopes of the common man and food vendor keep complaining of high cost of transportation (vanguard 2024). Incessant insecurity of lives and properties on the other hand have also caused short supply of certain essential food items like fish, meat, yam, and cassava etc and their availability and accessibility to the citizens, to the extent that the prices of meat and fish have gone beyond the affordability capacity of most common. Most staple foods consumed in Nigeria are produced domestically, yet fear of life, cost of transport, has often led to waste of perishable products as there is a big scarcity of functional storage facilities all over the nation. To ensure fruits and vegetables are not wasted out of farm-gate, farmers are forced to sale at giveaway price without proper sorting and grading, thereby reducing the earning capacity of the farmers. Hence, this study noted that it may not be that enough foods are not being produced but, there seem to be a whole lot of faults in marketing the

ones produced so as to maximize the durability and availability all year round. It is on this note that we hypothesized that;

- assembling and grading agricultural produce have significant impact on household food security in Nigeria
- storage of agricultural produce has significant impact on household food security in Nigeria
- transportation price of agricultural produce has significant impact on household food security in Nigeria
- distribution channels of agricultural products have significant impact on household food security in Nigeria

The rest of the paper is structured as follows. Section 2 considers the literature and theoretical underpinnings. Section 3 describes the methodology and data. Section 4 focuses on the empirical results and corresponding discussion. And section 5 handles the concluding remarks, caveats, and future research directions.

Relevant Literature and Theoretical Underpinning

Food Security

Food in this context is substances consisting of six essential classes (protein, carbohydrate, fats, vitamins, minerals and water) consumed to sustain growth, repair vital tissues and supply energy by providing the nutritional support needed to maintain healthy and productive lives (Okaka & Okaka, 2011; Ejionueme & Nebo, 2014; Rhodes, 2017, Asongu, et al, 2020b)). Most food are produced through agricultural or manufacture with agricultural raw material (Okocha, 2021l; Uduji et al, 2023). The agricultural food produces are mostly natural, raw, unprocessed, homogenous/undifferentiated, unbranded, bulky, readily perishable and sometimes seasoned as in case of food crops whereas manufactured food products are mostly processed, heterogeneous/differentiated and branded (Ejionueme and Nebo, 2014; Rhodes, 2017; Wormwood & Lust, 2018, Uduji et al., 2020).

The term food security first originated in the mid-1970s, when the World Food Conference (1974) defined food security in terms of food supply-assuring the availability and price stability of basic food stuffs at the international and national level. To World Food Summit, (1996), World Bank Policy Study (2006) FAO (2021), Uduji and Okolo-Obasi (2021), food security refers to a situation where all people, at all times have social, physical and economic access to sufficient, safe and nutritious foods that meet their dietary needs and food preferences for active and healthy life. The first essential component of social and economic justice is adequate food production. A household is considered food secure when it occupants do not live in hunger or fear of starvation (Idachaba, 2006; Uduji, et al, 2019c). To the Economic Commission for Africa (2009) food security involves not only food availability through storage, and trade but also more importantly food access through domestic or home production. That is to say food insecurity is the absence of a sustainable physical, social and economic access to adequate safe and nutritious food that meets the

dietary needs and preferences of people in a given society, for their active and healthy living (Muriuki, Hudson & Fuad, 2023). As such, FAO (2021) believes that addressing agriculture and population growth is vital to achieving food security.

Food Security and Efforts in Nigeria

Food insecurity exists when people are undernourished as a result of the physical unavailability of food, their lack of social or economic access to adequate food (Nwanmuoh, 2020; Cardoza et al, 2023). Food insecure people are those whose food intake falls below their minimum energy requirements as well as those who exhibit physical symptoms caused by energy and nutrient deficiencies resulting from an inadequate or unbalance diet or from the body's inability to use food effectively because of infection or disease (Uduji, et al, 2019a; Ugbede 2021; Okolo-Obasi et al, 2021).

Currently, over 75% of Nigerian citizens are food insecure, the prices of food in the country today is nothing to write home about and that is why Nigeria is currently the 12th hungriest country in the world and the country with the largest population of people living in poverty (Vanguard, 2024). Ranked under food affordability, availability, quality, safety, sustainability and adaptation Nigeria scored 42% and came 25th out of 28 Sub-Saharan African countries surveyed in Global Food Security Index (Economic Impact, 2022). As at September 2024, over 75% of Nigerians are living in food insecurity with about 41% food inflation (Statista, 2024). A number of approaches have been recommended by various government and non-governmental organization on how to tackle food insecurity problems in Nigeria (Abdulazeez, 2023; Adedipe, 2020). However, despite the quantum of government programmes and scholarly works struggling to address food insecurity challenges in Nigeria, food prices keep escalating to the extent that a large number of families now find it difficult to eat three course meals a day.

Some of the major factors contributing to food insecurity in Nigeria include poverty, climate change, conflict and insecurity, increasing population, poor policy and policy inconsistencies, corruption, inefficient agricultural practices etc. frequent policy changes and poor performance of agencies assigned to implement food and agricultural policies have serious setback on food production and distribution in Nigeria (Okolo-Obasi and Uduji, 2022, 2023)). Each time a new government comes to power, the previous agricultural policies and programmes are abandoned and new ones put in place and not that the new ones are better than the old ones. It is in a bid to create opportunities for graft. This creates no room for stability and progress in food production (Nwanmuoh et al, 2022). Similarly, the dismal performance of some of the past programmes have contributed low agricultural and food production in Nigeria (Nwanmuoh et al, 2021a)

The emergence of oil sector and the substantial revenue accruing from the sector shifted emphasis from agriculture to the extent that even domestic food production is not given the desire requirement (Uduji et al, 2019b). The government felt that it was better to import food than to embark on local production, especially when oil money has changed the tastes of most Nigeria in favour of foreign imported goods.

Table 1 below shows the various programmes and efforts made by successive government to boost agricultural productivity and enhance food security in the country.

It is widely accepted that Nigeria is not a poor county except that it has been poorly managed by those entrusted with its development (Sanyu, 2024)). It is also widely accepted that Nigeria is rich enough to feed herself and the rest of Africa (WHO, 2020; Uduji et al, 2023). The ethnic and religious conflicts which claimed many lives and the destruction of food crops with able men and women staying in refugee camps for two or three years without farming. Those who rule Nigeria do not believe in Nigeria because of that lack of political will and patriotic zeal to do deal with the problem of food insecurity in Nigeria, hence they adopt all forms of neoliberal economic policies recommended by the World Bank and IMF for personal profit.

Table 1: Various Programmes/Policies by Successive Governments in Nigeria from 1972-2022 on Food Security

S/N	Programme	Government Head	Year	Objective of the Programme/Policy
1	Nigerian Agriculture and Cooperation Bank (NAFPP)	Yakubu Gowon	1972	To unite single grower to boost their business productivity and increase yield
2	National Accelerated Food Production Programmes (NAFPP)	Yakubu Gowon	1973	To boast the production of agricultural yield, food and cash crops for local consumption and export aimed at increasing the GDP
3	Lake Chad Basin Development Authority (LCBDA)	Murtala Mohammed	1975	To sustain and equally manage the lake chad and other shared water resources preserve the eco system, promote integration and preservation of peace and transboundary security in the lake chad
4	Agriculture Development Project (ADPS)	Murtala Mohammed	1975	To sustain and efficiently intensify improvement of resources and improve the supply of raw materials to processing plant
5	River Basin Development Authority (RBDA)	Murtala Mohammed	1975	To develop both surface and under-ground water resources.
6	Operation Feed the Nation (OFN)	Olusegun Obasanjo	1976	To reduce importation by increasing food production.
7	Nigerian Export Promotion Council (NEPC)	Olusegun Obasanjo	1979	To spear head the diversification of the Nigerian economy by non-oil exports, for sustainable and inclusive economic growth.
8	Green Revolution (GR)	Shehu Shagari	1979	To distribute seeds and fertilizers to farmers to increase nationwide productivity in farming in agriculture
9	Federal Agricultural Co-ordination Unit (FACU)	Shehu Shagari	1983	To develop the agricultural sector
	Back to Land (BL)	Mohammed Buhari	1983	To make food production self-sufficient nationwide.
10	National Directorate of Employment (NDE)	Ibrahim Babangida	1986	To combat mass unemployment through skill acquisition, self-employment and labour inclusive work scheme.
11	Nigeria Export Processing Zone (NEPZ)	Ibrahim Babangida	1986	To generate employment and foreign exchange earnings for the host country.
12	Agricultural Credit Guarantee Scheme (ACGS)	Ibrahim Babangida	1986	To make available specific required finance to farmers to promote small and medium establishment in the agricultural aid
	National Agricultural Insurance Corporation (NAIC)	Ibrahim Babangida	1988	To provide financial support to farmers on the aftermath of the occurrence.
13	Directorate of Food, Roads and Rural Infrastructure (DFRRI)	Ibrahim Babangida	1989	To rectify the unimpressive efforts and major errors of rural development programmes of natural hazards attributable to climate change.
16	National Fadama Development Project (NADP), World Bank Project in Nigeria to Boost Irrigation	Ibrahim Babangida	1990	To reduce poverty by improving the living condition of the initial poor and to contribute food recurring and increasing access to rural infrastructure. To strengthen dam and improve management of water resources for hydro power and irrigation in selected areas of Nigeria.
17	National Agricultural Land Development Authority (NALDA)	Ibrahim Babangida	1991	To develop rural communities through agricultural and to make agriculture a business and a source of wealth creation for the country.
18	Family Economic Advancement Programme (FEAP)	Sanni Abacha	1997	To harness the resources that exist in the rural areas with a view to establishing
19	National Programme for Food Security	Abubakar Abdusalam	1999	To improve the multinational status of all Nigerians by improving food security, enhancing.
20	Nigeria Agricultural Co-operative and Development (NACCD)	Olusegun Obasanjo	2000	To improve access to technologies, credit training and ware houses, markets natural resources, information, communication and the capacity within the country to address food production.

21	Root Tuber Expansion Programme (RTEP)	Olusegun Obasanjo	2001	To commercialize food security, root and tuber production to improve the living conditions and multinational health of the poorest smaller holder.
22	Presidential Initative on Rice, Cassava etc (PIRC).	Olusegun Obasanjo	2001	To enhance the productivity of cassava by increasing area cultivated to 5 million hectares with the hope of harvesting 150 million tons of fresh cassava tuber annually.
23	Vegetable oil Development Programme (VODP)	Olusegun Obasanjo	2001	To be self-sufficient in vegetable oil production
24	TREE Crop Development Project (TCDP)	Olusegun Obasanjo	2001	To help to improve production and productivity in palm oil rubber.
25	National Special Programme on Food Security (NSPFS)	Olusegun Obasanjo	2002	To improve food security within poor household
26	National Economic Empowerment and Development Strategy (NEEDS)	Olusegun Obasanjo	2004	To eradicate extreme poverty and hunger.
27	National Food Reserve Agency (NFRA)	Umuru Yar'Adua	2008	To maintain the type and quality of a designated agricultural commodity as determined by agency.
28	The Transformation Agency (TTA)	Goodluck Jonathan	2010	To assiduously pursue policies that will promote youth employment programme in both public and private sector
29	Agricultural Transformation Agenda (ATA).	Goodluck Jonathan	2011	To increase on a sustainable basis, the income of smaller holder farmers and rural entrepreneurs that are engaged in the production, processing storage and marketing of the selected commodities in value chains
30	The 7-point Agenda (Agricultural Development Food Security)	Goodluck Jonathan	2015	To attain national food security by ensuring sustainable access, availability and affordability of quality food to all Nigerians as a net food exporter.
31	Presidential Fertilizer Initiative (PFI)	Mohammed Buhari	2017	To reduce the cost of direct fertilizer subsidies to the federal government, improve accessibility and deliver commercially significant quantities of affordable and consistently high quality fertilizer.
32	National Agricultural Technology and Innovation policy (NATIP)	Mohammed Buhari	2022	To generate agricultural employment and services promoting the production and supply of raw materials for the products of the industrial sectors, generating foreign

Source: Adapted with modification from Ezeani (2006).

Eradicating hunger and poverty requires an understanding for the ways in which these two injustices interconnected. Hunger and the malnourishment that accomplishes it, prevent poor people from escaping poverty because it diminishes their ability to learn, work and care for themselves and their family members. Food is not like other commodities, it is an indispensable and an important factor in nation's quest for economic growth and development. Being an inevitable commodity, all efforts must be geared towards ensuring it adequate supply for sustainable food security, economic development and human survival.

The Concept of Agricultural Marketing

Marketing is at the heart of every organization activity as it involves creating customers' value and satisfaction (Okocha, 2021). Agricultural marketing therefore entails the performance of all business activities that involved the flow of agricultural produce from the point of initial agricultural production (mostly from rural communities) to the hands of ultimate consumers (secondary and tertiary consumers who are mostly urban based) (Uduji and Okolo-Obasi,2017; Asongu, et al, 2020a; Sanyu, 2024). Various tasks are involved in agricultural from production of agricultural produce to co-ordination and movement of the produce through various channels such as; Wholesalers----Agents------Retailers----Consumers Nwadi, 2017); Nwanmuoh, et al (2024). Hence, agricultural marketing begins with a decision to produce a saleable farm commodity and it involves all aspects of market structure of system, both functional and institutional, based on technical and economic considerations and includes pre and post- harvest operations, assembling, grading, storage, transportation and distribution (Nwadi, 2017; Uduji and Okolo-Obasi, 2020). As applied in other forms of marketing, agricultural marketing is more than just banner adverts, television commercials but activities of a company associated with buying, advertising, distributing or selling a product or service having in mind the goal of delivery of customer satisfaction at a profit (Uduji et al 2021, Nwanmouh et al 2024). Agricultural marketing is the link between the needs of a society and farming activities. It is an important function that matches agricultural offering to the dynamic need of the market place (Okocha, 2021; Ugbede, 2021).

The function of agricultural marketing can be broadly classified as exchange functions, physical functions; and facilitative functions. Exchange functions are considered to be the most important of all the functions of agricultural marketing because it involves buying and selling (Ojo, 2020; Asongu, et al, 2020b, 2020c). While buying function is largely involve seeking the sources of supply, assembling of products and activities which are associated with the purchase of goods, raw materials; selling is the process which stimulates demand or desire, finds the buyer, advises the buyer, and negotiates with him to bring about a transfer of title (Muriuki & Fuad, 2023). Physical Functions on the other hand entails physical handling of agriculture produce either in moving it from one place to another or in storing it over a period of time (Uduji and Okolo-Obasi, 2022c) And facilitative functions involve the smooth discharge of the above functions.

Sustainable Agricultural Marketing

Sustainable Agricultural Marketing according to Olaide, (2024), is all about production and distribution of agricultural products in an environmental-friendly and socially responsible manner with less water, pesticides and fertilizer application. It is the marketing of all agricultural products in line with three dimensions of sustainability such as economic, environmental and social Sustainability in agricultural marketing include meeting the present needs of the future generation without affecting the needs of the present generation from the pre and post-harvest operation (Sasu, 2023) In line with Bill and

Anirbau, 2024, sustainable agriculture combines both plant and animal production practices to achieve satisfaction of human food needs, enhance quality environment and farmer's life as well as sustaining the economic operations of the farm.

There is conflict of interest in agricultural and food marketing systems. The farmer's interest is focused on getting the best return from his produce, which usually equates to maximum price for unlimited qualities. Manufacturers want least cost, best quality produce from the farmer so that he can sell it at competitive, but profitable prices. Traders and retailers want high quality and reliable suppliers from the manufacturer or farmer at the most competitive prices. Consumers are interested in obtaining high quality products at low prices. Clearly, there are conflicting interests in achieving sustainable food security. In an ideal world there should be some forms of strategic partnership between these key players. It is obvious that, in the long run, any one of the four groups would find it difficult to survive if the others do not. However, in real life, attitudes are not those of the ideal world or of the longer term. It is focused more on the shorter term and in preserving the interests of each group. Only be allowing each group to take care of its interests, can a balanced longer term relationship evolve. This must be borne in mind when considering what the food industry expects from agriculture. Moreover, those expectations will vary according to the level of sophistication of the markets the food industry itself is attempting to serve.

Sustainable Development Goals (SDGs)

In 2015, all countries in the United Nations adopted the 2030 Agenda for sustainable Development. It sets out 17 goals which include 169 targets; these wide-ranging and ambitious goals interconnect. The 2030 agenda and its goals offer a comprehensive vision for sustainable development. Out of the 17 goals, the second goal is zero hunger, that is to end hunger, achieves food security and improved nutrition and promote sustainable agriculture. According to the United Nations, Sustainable Development Goals 2 is to create a world free of hunger by 2030.

This lofty goal has to be achieved by ensuring access to safe, nutritious and sufficient food all year round to all people (SDG target number 2.1), and to "eradicate all forms of malnutrition" SDG target number 2.2). This notwithstanding the number of people who suffer from hunger has been on the increase, underscoring the immense challenge of achieving the zero hunger targets by 2030 (World Bank, 2018). Studies have equally shown that food insecure countries suffer low life expectancy rate, hunger, malnutrition, stunted growth in children, under nourishment of children, high infant mortality rate, immune deficiency in man, poverty, employment, under-development, unhealthy and unproductive live as well as social-economic instability (Adebayo, 2020); Idris et al, 2020, Otekunrin et al, 2020). Food security significance to public health is incontestable due to the fact that 870 million people throughout the world consume fewer amounts of calories than their requirement and a plethora of mental and physical health repercussions are associated with such deprivation (FAO, 2012).

Theoretical Underpinnings

This study is anchored on two important theories, the value chain theory and political economy theory. While the value chain theory was developed by Porter (1985) in Harved Business School, and written in a book titled "Competitive Advantage: creating and sustaining superior performance", political economy theory was developed by Stiglitz, (2002). The value chain theory described the full range of activities which are required to bring a product or service from conception, through different phases of production and marketing (involving creation of form, place, time, information and possession utilities) for delivery to the final consumers. And Political Economy Theory examines the interactions between political and economic factors that shape resource allocation, policy decisions, and institutional arrangements within a society

Value chain theory has a strong relationship with the present study because the marketing system earlier discussed depicts interdependent and interconnected organizations/institutions that works together from the conception of food products, through manufacturing and distribute to final consumers. Each stage of the food marketing system adds value to food until it gets to the consumer's table. This theory can be used to access why foods are not available, accessible, stable and affordable in some households, communities, states, regions and nations. Once the constrains/weakness in the food marketing system are identified and marketing system are identified and solved, the value chain approaches can be used to design and implement effective solutions that will increase the availability, affordability, accessibility, quality, safety, acceptability and stability of nutritious foods.

Political economy theory on the other hand, emphasizes power dynamics, interests, and incentives that influence agricultural innovation systems and food security outcomes in Sub-Saharan Africa, including government policies, international trade agreements, market structures, and land tenure. In using this theory, this study analyses and understands the intrigues of political and economic factors affecting the distribution of agricultural products and the overall food security landscape in Nigeria and sub-saharan African region.

Materials and Methods

For this study, we adopted explanatory research design using survey research techniques. Data for the study was generated from a representative sample of the population of the Nigeria. The data collected was a cross-sectional data as it described what is present as at the time of data collection. Figure 1 identifies the constituents' administrative states of all the geopolitical zones of Nigeria.

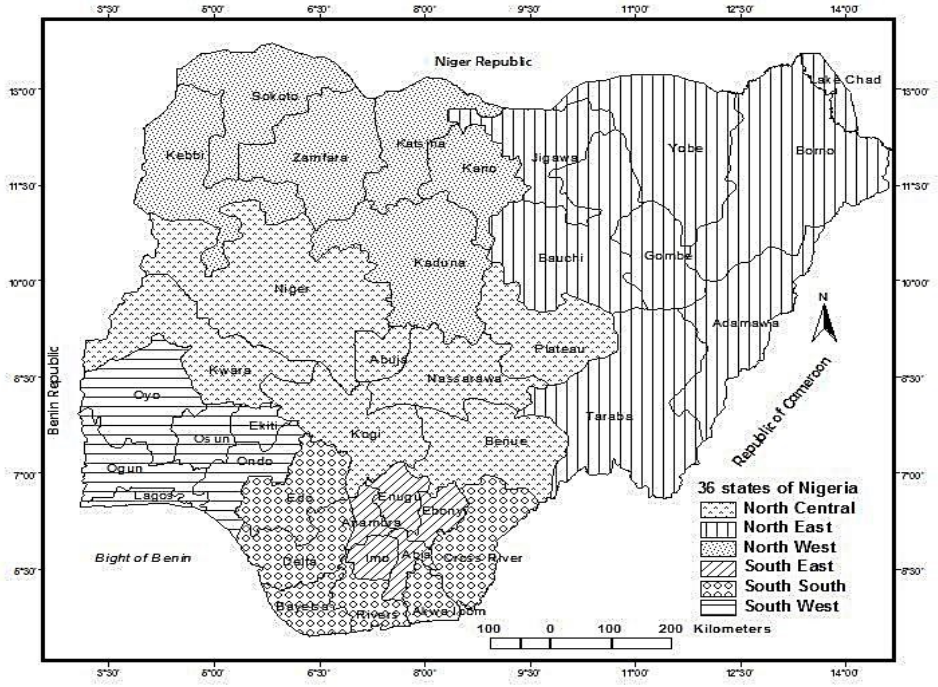

Figure 1: Constituent administrative states of the geopolitical zones of Nigeria
Source: Adapted with modification from Uduji and Okolo-obasi, 2018

Sample Size

We calculated the sample size used in this study using the Fisher formula which is mathematically represented as follows:

$$n = \frac{z^2 p(1-p)}{d^2}$$

Where, n = the sample size;

z = the standard normal deviation for a given level of confidence, (95% confidence =1.96)

d = margin of error at 0.05 for CI at 95%;

p = proportion to be estimated. If the value of p is not known with certainty, p is always assumed to be 0.5. Therefore, we calculated the sample size thus:

$n = \frac{1.96^2(0.5)(1-0.5)}{0.05^2}$ = $n = \frac{0.9604}{0.0025}$ = 384; this, we approximated to 400. Because we are interested in two groups of people (the farmers or producers and consumers) we further multiplied the size by 2 to further minimize the possible errors in the sample selection. Hence, the total sample size used was 800 respondents.

Sampling Procedure

To ensure that the relevant population is represented, we used multi-stage sampling in selecting the final respondents used for the study. The stages involved in the selection are as follows: in the first stage, we followed the six national geopolitical zone as our first cluster to select one state from each zone (cluster). Hence, we purposefully selected Benue

State from the North-Central cluster, Adamawa State from the North-East cluster, Kano State from North-West. Others are Ebonyi State from South-East, Cross Rivers State from South-South cluster, and Ekiti State from South-West cluster. The purpose was based on intensity of agricultural practices in the states. In the next stage, we listed all the Local Government Areas (LGAs) in each of the selected States using purposive sampling, two LGAs were selected. The purpose was based on the intensity of agricultural practices in the LGAs. Thus, a total of 12 LGAs were selected for the study. In the next stage, to ensure proper representation, the main communities in the selected LGAs were listed and four communities were randomly selected from each LGA, giving a total of 36 communities for the study. In the last stage, from the communities selected, we randomly 400 farmers and another 400 non- farmers making a total of 800 respondents (see Table 2).

Table 2: Sample size determination table

Selected States (Geopolitical zones)	Total Population	Population of farmers	% Total Population	Sample per state	Farmer	Consumers
Kano (North-West)	13,076,892	8,499,980	40	316	158	158
Benue (North-Central)	5,741,815	3,732,180	17	139	69	69
Adamawa (North-East)	4,248,436	2,761,483	13	103	51	51
Cross River (South-South)	3,866,269	2,513,075	12	93	47	47
Ekiti (South-West)	3,270,798	2,126,019	10	79	40	40
Ebonyi (South-East)	2,880,383	1,872,249	9	70	35	35
Total	33,084,593	21,504,985	100	800	400	400

Source: NPC, 2017/Authors' computation

Data collection

We used written semi-structured questionnaire to generate data used for the study from primary sources. The use of this technique was informed by the fact that, the views of the people being studied on all the issues are paramount. The SSI was the major tool used for the survey to glean data from the 800 respondents. The questionnaire was directly administered by the researchers with the help of research assistants. The use of local research assistants was because of the inability of the researchers to speak the different local languages and dialects of the many ethnic groups in the sampled communities.

Analytical framework

The collected data was rigorously treated and cautiously analyzed to answer the research questions and test the hypotheses with both descriptive and inferential statistics. We

presented the results of descriptive statistics in tables, figures and charts. Also, we used inferential statistic tool of logit model to estimate the functions of selected dependent and control variables.

The study's logistic model is stated with the following equations:

$$\text{Log}\left(\frac{Pi}{1-Pi}\right) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_1 + \beta_4 X_4 + \cdots \ldots \ldots \ldots \beta_n X_{4n} + \mathcal{E}$$

Equation (1)

With this, we estimated the effect of Agricultural marketing on food security in Nigeria thus:

$$Logit\ (FS) = \beta_0 + \beta_1 AM + \beta_2 C_{1\ldots\ldots n} + \beta_3 M_{1\ldots\ldots n} + \mathcal{E}$$ Equation (2)

Where:

FS = represent the dependent variable which include Food Availability, Accessibility, Utilization, and Stability. *AM* = Agricultural marketing which is further disaggregated into, Transportation cost, Assembling and grading, Storage, and Distribution channels.

C = other socio economic control variables (Age, household size, occupation, income, etc.)

M = other moderating variables like Government policies, agricultural production outputs etc.

$\mathcal{E}$ = stochastic error term.

*In this model, the main parameter of interest is β_1 in terms of sign and significance.

Therefore, the AM is further analyzed thus:

$$AM = \beta_0 + \beta_1 TC + \beta_2 St + \beta_3 AG + \beta_4 DC + \mathcal{E}$$ Equation (3)

Thus, using equation 3, we hold other control and moderating variables constant and test the effects of the AM variables on food security as follow:

$$FS = \beta_0 + \beta_1 TC + \beta_2 St + \beta_3 AG + \beta_4 DC + \mathcal{E}$$

Where:

FS = Household food security (Dependent variable) and the explanatory variables are:

St = Storage, AG = Assembling and Grading, TC = Transportation cost, DC = Distribution Channels, and β_0, $\beta_{1\text{-}4}$ = coefficients of estimates and $\mathcal{E}$ = Error Term

These are estimated for Food Availability, Food Accessibility, Food Utilization, and Food Stability.

Results and Discussion

We started the analysis of this study description of some of their demographic, socio-economic characteristic (Table 3). These characteristics are important in understanding the makeup of the respondents and how such makeups can react with food security. The analysis of Table 2 shows that while about 55% of the farmers are men, about 45% are women, also while 36% of the respondents are men, women are about 36%. This confirms the findings of Ntakyo & Berg (2019), Uduji et al (2020) that most women especially in the rural communities do farm under their husband, it also agrees with Uduji and Okolo-Obasi (2019) that women often play active role in the processing and final marketing of agricultural produce. Among the producer, while about 66% are full time farmers, only about 34% are part-time farmers. Also, only about 5% of the consumers are part-time

farmers. With bulk of them about 33% involved in trading, 25% in paid employment and about 22% in handicraft. This confirms Uduji and Okolo-Obasi (2018a) Mbam et al (2021) that many are getting involved in farming no matter the level as food prices continues to hit the ceiling.

While the average age of the farmers is about 48years, that of the consumers is 32% showing that the age of food producers in the nation is getting older while the nation has a bubbling consuming age. This aggress with Uduji and Okolo-Obasi (2022b) Offornedu et al (2022) in that the rapid rural-urban migration is seriously affecting the ages of people involved in agricultural production.

Likewise, while only 19% of the producers are uneducated, only about 4% of the consumers are in the same category. This agrees with Nweke & Mba (2018) in that farming is still regarded as the business of less educated. While the average household size of the producers is about 11 persons, that of consumers is about 7 persons. This collaborated the finding of Nwankpa (2024) that most farming household are big because of their value for family labour.

Conversely, irrespective being a producer or consumer, the average monthly income on both sides is still very low showing that the rate of poverty in the study area is still very high as asserted by scholars like Williams and Francis (2021) Okolo-Obasi and Uduji (2022) Adebisi et al (2022).

Table 2: Socio- economic Characteristics of the Respondents

	Farmers			Consumers		
Variables	**Freq**	**%**	**Cum**	**Freq**	**%**	**Cum**
Sex						
Male	220	55	400	145	36	36
Female	180	45	100	255	64	100
	400	**100**		**400**	**100**	
Primary Occupation						
Farming /Fishing	265	66	66	18	5	5
Trading	41	10	77	131	33	37
Paid Employment	15	4	80	101	25	63
Handicraft	56	14	94	88	22	85
Others	23	6	100	62	16	100
	400	**100**		**400**	**100**	
Age of Respondents						
Less than 20 years	10	3	3	34	9	9
21-30 years	70	18	20	120	30	39
31-40 years	119	30	50	105	26	65
41 - 50 years	89	22	72	67	17	82
51 - 60 years	86	22	94	42	11	92
Above 60 years	26	7	100	32	8	100
	400	**100**		**400**	**100**	
Level of Education						
None	77	19	5	17	4	4
FSLC	173	43	50	98	25	29
WAEC/WASSCE	122	31	87	150	38	66
Degree and above	28	7	100	135	34	100
	400	**100**		**400**	**100**	
Household Size						
1-4 Person	140	35	53	292	73	73
5-9 Person	185	46	86	76	19	92
10 Persons and above	75	19	98	32	8	100
	400	**100**		**400**	**100**	
Monthly Income		0				
1000 - 100,000	79	20	3	68	17	17
101,000 - 200,000	85	21	17	74	19	36
201,000 - 300,000	102	26	38	112	28	64
301,000 - 400,000	68	17	60	74	19	82
401,000 - 500,000	44	11	79	54	14	96
Above 500,000	22	6	100	18	5	100
	400	100		**400**	100	

Source: Computed from the field data by authors

Figure 2: Percentage distribution of respondents according to their major issue in food security

Source: Computed from the field data by authors

In assessing the major issues of food security challenges as opined by the producers and consumers, Analysis Figure 2 shows serious discrepancies. While about 80% of the producers are saying there is availability of food only 30% of the consumers agree with this. Also, while about 50% of the producers are saying that produced food are accessing only 20% agree with the that assertion. On the other hand, while the consumers are saying that they utilized over 70% of the food produced, the food producers are claiming that only about 30% of the food produced are utilized. Yet in all, both agreed that food stability is low with producers ranking 20% and consumers 30%. While the producers (farmers) are saying that other factors limit access to the food they produced, the consumers are blaming the unavailability on low productivity of the farmers. This confirms the findings of Cele & Mudhara (2022) Uduji and Okolo-Obasi (2018b) in that even with high level of productivity if factors like rural transportation, storage facilities, government policies activities of middle men are not checked, food security will continue to be big issue.

However, analysis Figure 3 indicates that in ranking the main reason for poor stability of food in Nigeria, the respondents both producers and consumers agreed that poor supply by farmer of food in Nigeria accounts for only about 12%, while poor production of the famers due to insecurity accounts for about 23%. Also the ranking saw poor patronage by consumers leading to wastages accounting for about 19%, poor storage and processing means accounting for 18%, horrible transportation cost accounting for 22% and activities of middle men 9%.

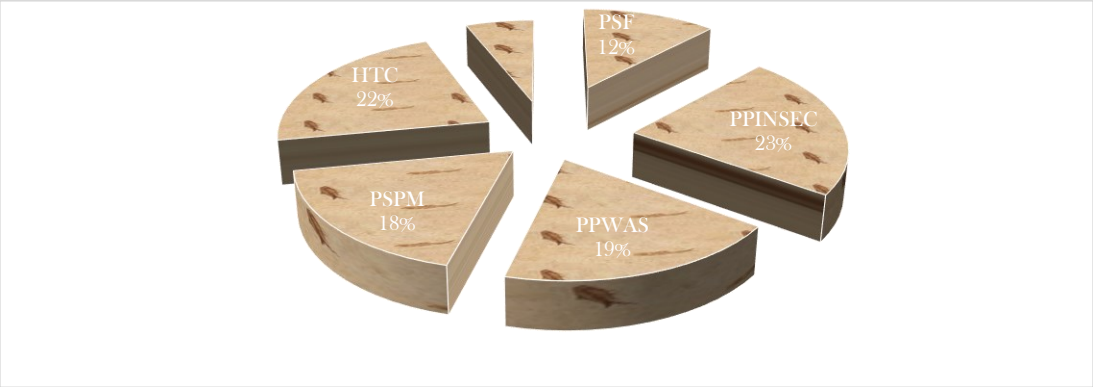

Figure 3: Percentage distribution of respondent according to why food stability is very low[1]
Source: Computed from the field data by authors.

This simply confirms that improving agricultural productivity is vital in ensuring food security in the land, but cannot stand alone at all. In all this, unless other enabling environments are improved, no matter how much food is produced, food security cannot be guaranteed as the analysis shows that poor production is only about 23% of the problem and the poorness of production is attached to insecurity due to insurgencies like book haram, banditries, cults wars, kidnapping etc. and above all headers-farmers' crisis and attendant loss of lives and properties. These findings support Oguegbe and Iloke (2023), Uduji and Okolo-Obasi (2022a) in that a proper management of the quantity of food produced and or imported into Nigeria can alleviate food insecurity to a larger extent.

Econometric analysis

We estimated the average effect of the independent variables (agricultural marketing in the area of transportation cost, storage, assembling and grading, and distribution channel) on the dependent variables (food security in the area of food availability, accessibility, utilization and stability) and checked the significance at 5% statistically significance level.

Effect of Agricultural Marketing - Transportation Cost on Household Food Security in Nigeria

Analysis of (Table 3) indicates that agricultural marketing activity – transportation cost has made significant effects on food security in Nigeria especially where it concerns food availability, affordability accessibility and stability. The finding shows that the fluctuation in the cost of transportation, poor road networks, high cost of transportation oil (petroleum moto spirit and diesels) have reasonable affected cost of transporting agricultural products to the relevant consumer. In some places where producers are not able to pay for transporting their product to the farm gate and the wholesalers are not able to pay their

[1] PSF = Poor Supply by farmer, PPINSEC = Poor production due to insecurity, PPWAS = Poor patronage by consumers leading to wastages, PSPM = Poor storage and processing means, HTC = Horrible transportation cost, Ame = Activities of middle men

ways to the same farm gate leads to wastage of produced products or ridiculous reduction in prices.

We conducted a logistic regression analysis to predict the impact of transportation cost on household food security using the variables in equation below as the predictors.

Table 3: Projected effects of Transportation Cost on household food security in Nigeria

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I. for EXP(B)	
		Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper
Step 1(a)	*AM-TC*	1.521	0.061	6.324	1	0.003	17.212	1.045	1.443
	PriOcc	0.124	0.212	0.033	1	0.856	0.962	0.635	1.459
	Edu	0.026	0.021	0.652	1	0.419	1.017	0.977	1.059
	MHHY	0.096	0.114	0.715	1	0.398	0.908	0.727	1.135
	HHSize	0.321	0.021	0.492	1	0.483	0.986	0.947	1.026
	Age	116	0.009	3.205	1	0.073	0.983	0.966	1.002
	Constant	4.216	0.567	1.140	1	0.064	3.331		

a Variable(s) entered on step 1: *PriOcc*, *Age*, *Edu*, *MHHY, AM-TC.*

Source: Computed from the field data by authors.

Logit (FS) = 4.216 +1.521AM-TC + 0.116 Age + 0.124 PriOcc +0.321 HHSize +0.026Edu +0.096 MHHY

A test of the full model against a constant only model was statistically significant, indicating that the predictors as a set reliably distinguished between the "Yes" and "No" impact of AM-TC (chi square = 47.101, p <.000 with df= 8). Nagelkerke's R^2 of .812 indicated a strong relationship between prediction and grouping. Prediction success overall was 90%. (92% for Yes and 88% for the No). The Z- value for AM-TC is 5.137, with an associated p-value of .073. Based on the set 5% significant level, the study accepted the hypothesis and concluded that agricultural marketing activity – Transportation cost have made a significant impact on food security in Nigeria. The EXP (B) value of the Predictor – AM-TC is 17.212, this implies that if the anytime transportation cost is increased by one unit, the odds ratio is 17.0 times as large. Therefore, the cost of food in the market will about 17 times more likely increase.

Effect of Agricultural Marketing - Storage on Household Food Security in Nigeria

Table 4: Projected effects of Storage on household food security in Nigeria

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I. for EXP(B)	
		Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper
Step 1(a)	*AM-St*	1.141	0.061	5.125	1	0.003	11.143	1.045	1.443
	PriOcc	0.217	0.212	0.033	1	0.856	0.962	0.635	1.459
	Edu	0.139	0.312	0.033	1	0.456	0.562	0.435	1.459
	MHHY	0.181	0.021	0.652	1	0.419	1.017	0.977	1.059
	HHSize	0.057	0.009	3.205	1	0.073	0.983	0.966	1.002
	Age	0.321	0.124	2.895	1	0.029	1.810	0.635	1.033
	Constant	2.186	0.667	1.940	1	0.164	5.131		

a Variable(s) entered on step 1: *PriOcc*, Age, *Edu*, MHHY, *AM-St*,

Source: Computed from the field data by authors.

Analysis (Table 4) estimates the effects of agricultural marketing activity – storage on household food security in Nigeria. The result of logistic regression analysis we conducted confirms that agricultural marketing activity – Storage have made significant impact on household food security in Nigeria.

Logit (FS) = 2.186 + 1.141AM-St + 0.321Age + 0.217PriOcc +0.57HHSize + 0.139Edu +. 0.181MHHY

A test of the full model against a constant only model was statistically significant, indicating that the predictors as a set reliably distinguished between the "Yes" and "No" impact of AM-St (chi square = 45.210, p <.000 with df= 8). Nagelkerke's R^2 of .831 indicated a strong relationship between prediction and grouping. Prediction success overall was 92%. (94% for Yes and 90% for the No). The Z- value for CSR is 5.125, with an associated p-value of .083. Based on the set 5% significant level, the study concluded that agricultural marketing activity –storage have made a significant impact on food security in the area of availability and stability. The EXP (B) value of the Predictor – GMOU is 11.143, this implies that if the storage capacity is raised by one unit, the odds ratio is 11.1 times as large and therefore availability of food off season will 11.1 times more likely.

Effect of Agricultural Marketing - Assembling and Grading on Household Food Security in Nigeria

Analysis of (Table 5) points out that the agricultural marketing activity – assembling and grading has made significant effects on household food security in Nigeria.

A logistic regression analysis was conducted to predict the impact of agricultural marketing activity – assembling and grading on food security using the variables in equation below as the predictors.

Logit (FS) = 3.021 + 0.512AM-AG + 0.161Age + 0.213 PriOcc +0.196HHSize + 0.219Edu +0.136MHHY

Table 5: Projected effects of Assembling and Grading on household food security in Nigeria

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I. for EXP(B)	
		Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper
Step 1(a)	*AM-AG*	0.512	0.016	6.211	1	0.003	4.114	1.045	1.443
	PriOcc	0.213	0.221	0.023	1	0.456	1.017	0.761	1.459
	Edu	0.219	0.321	0.313	1	0.398	0.562	0.435	1.459
	MHHY	0.136	0.012	0.652	1	0.419	0.954	0.977	1.059
	HHSize	0.196	0.141	0.715	1	0.856	0.908	0.761	1.135
	Age	0.213	0.012	0.492	1	0.483	0.986	0.947	1.026
	Constant	3.021	0.617	1.140	1	0.064	3.331		

a Variable(s) entered on step 1: *PriOcc*, *Age*, *Edu*, *MHHY, AM-AG.*
Source: Computed from the field data by authors.

A test of the full model against a constant only model was statistically significant, indicating that the predictors as a set reliably distinguished between the "Yes" and "No" impact of AM-AG (chi square = 44.213, p <.000 with df= 8). Nagelkerke's R^2 of .842 indicated a strong relationship between prediction and grouping. Prediction success overall was 91%. (90% for Yes and 92% for the No). The Z- value for AM-SG is 6.211, with an associated p-value of .120. Based on the set 5% significant level, the study concluded that agricultural marketing AM-AG have made a significant impact on household food security in Nigeria. The EXP (B) value of the Predictor – AM-AG is 4.114 this implies that if if assembling and grading activity of agricultural marketing is increased by one unit, the odds ratio is 4.114 times as large. Food will be about 4 times more likely to be available, accessibly and stable.

Effect of Agricultural Marketing - Distribution Channels on Household Food Security in Nigeria

Analysis (Table 6) estimates the effects of agricultural marketing - Distribution Channels on household food security in Nigeria. This finding confirms that distribution channels have made some impacts in food security. A logistic regression analysis was conducted to predict the effect of agricultural marketing - Distribution Channels on household food security in Nigeria using the variables in equation below as predictors.

Logit (FS) = 1.262 + 1.141AM-DC + 0.021Age +0.728PriOcc + 0.071HHSize + 0.362Edu +0.051MHHY

Table 6: Projected effects of Distribution Channels on household food security in Nigeria

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I. for EXP(B)	
		Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper
Step 1(a)	*AM-DC*	0.421	0.031	3.242	1	0.003	6.321	1.053	1.443
	PriOcc	0.728	0.223	0.033	1	0.816	0.962	0.635	1.459
	Edu	0.362	0.252	0.033	1	0.456	0.562	0.435	1.459
	MHHY	0.051	0.315	0.652	1	0.193	1.017	0.977	1.059
	HHSize	0.071	0.109	3.205	1	0.023	0.983	0.966	1.002
	Age	0.021	0.142	2.895	1	0.014	1.810	0.635	1.033
	Constant	1.262	0.667	1.940	1	0.164	5.131		

a Variable(s) entered on step 1: *PriOcc*, Age, *Edu*, MHHY, *AM-DC*,

Source: Computed from the field data by authors.

A test of the full model against a constant only model was statistically significant, indicating that the predictors as a set reliably distinguished between the "Yes" and "no" impact of AM-DC (chi square = 45.210, p <.000 with df= 8). Nagelkerke's R^2 of .816 indicated a strong relationship between prediction and grouping. Prediction success overall was 88%. (90% for Yes and 86% for the No). The Z- value for AM-DC is 3.423, with an associated p-value of .093. Based on the set 5% significant level, the study concluded that agricultural marketing activity – distribution channel has made a significant impact on food security in Nigeria. The EXP (B) value of the Predictor – AM-DC is 6.321, this implies that if the distribution channels involved in agricultural marketing is harmonized and minimized, the odds ratio is 6.3 times as large and therefore availability, accessibility, utilization and stability of food are 6.3 times more likely.

Generally, the outcome of this study makes suggestions that, the Agricultural marketing activities (transportation cost, storage, distribution channels, assembling and grading) has extensively affected food securities in different ways. Backed up by the value chain theory Porter (1985), and political economy theory Stiglitz, (2002) the study noted the increase in the cost of oil has made negative significant impact in the price of transportation which in turn affected the cost of products in the market and reduced availability and accessibility of food. The value chain was seriously affected by on government policy that exacerbate food insecurity. This finding aggress with the position of Nwanmouh et al (2024), in that where the political class have not managed communication of policy well, it backfires on the economy. It also confirms Abdulazeez et al (2023) who noted that determinant of food security in Nigeria is hydra headed and warned that proper management by relevant government agencies must be essential. The study also supported Asongu et al (2020b) in that any fluctuations in price of goods and services is an offshoot of political economy. On the side of Uduji and Okolo-Obasi (2023a, 2023b), an Jiya et al (2024) the study found that in support of their findings that lack of storage facilities increases wastages and prices of

the remaining produce at the same time. Like Shaibu et al (2023), and Asongu et al (2020c), noted, if storage is properly managed food will be available in and out of season because wastages will be reduced and stability will be reasonably ensured. For instances, areas like the middle belt where mangos, oranges, pineapple and other vegetables are wasted, it is important that storage facilities are looked into and if adequate provisions are made for processing and storage food security will improve.

Also, the study noted that assembling and grading of agricultural produce has significant impact on food security. This supports Nweke and Mba (2018) in that when products are well sorted, packaging becomes easier and such will reduce the negative effect on the profitability of production. Finally, the study established that multiple distribution channels increases the food prices thereby making them inaccessible to the average households. This is a confirmation to the findings of Offornedu et al (2022), Uduji et al (2024) in that food racketeering by the numerous middle persons in the value chain affect availability, affordability and usage negatively.

Hence, it is our contention that agricultural marketing when it is sustainable with human face is a major panacea to the incessant food crisis in sub-Saharan Africa. Both the government and the private sector are well positioned to collaborate in addressing some of the logistical glitches that face agricultural marketing and marketers in Nigeria in particular and SSA in general. The governments, in particular, are properly placed to tackle the issues of access roads to the rural communities where majority of the food are produced as well as manage well the area of oil pricing to ease off the oil price stress. In partnership with the private sectors, adequate storage facilities can be provided to safeguard both locally produced and even imported foods. In addition to tackling the enabling environment, the various arms of government must pay adequate attention to the activities of middle men who most time crate artificial scarcities to hike the price.

Conclusion and Policy Implications

Conclusion, caveats and future research directions

As a hydra-headed issues, food continues to be scarce in Nigeria and insecurity of food is always on the rise in the last decade. Currently households hardly feed due to excruciating rise in the price of food and related item, even at that the amount spent by the government in importation of food kept soaring high. Hence, the situation looks gloomy as it appears there is no more hope for the common household in the country. On this note, this study decided to evaluate the effect of agricultural marketing activities on food security in Sub-Saharan Africa using Nigeria as a case. This paper adds to the debate on food security, by looking at empirical proof in four areas that have enjoyed much attention in the literature as it concerns agricultural marketing. With the four areas notably: transportation cost storage facilities assembling and grading as well as distribution channels we assessed food security in the area of food availability, accessibility, utilization and stability.

Eight hundred respondents were sampled across the six geopolitical zones of Nigeria and using logit regression model, results reveal that agricultural marketing has serious

significant impact on food security in Nigeria and sub-Saharan African region. This simply means that if agricultural marketing is properly and sustainable managed with professional precisions, food security will be enhanced.

Declaration of conflict of interests

The authors declared no potential conflict of interest as it concerns the research, authorship and /or publication of this article.

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