

## Econometric Analysis of Factors Affecting Access to Market by Yam Farmers in Benue State

Dennis Terpase Nomor\*<sup>1</sup> & Ashifa Tersugh<sup>1</sup>

<sup>1</sup>Center for Food Technology and Research, Benue State University, Makurdi

\*Correspondence Email: [tenoms80@gmail.com](mailto:tenoms80@gmail.com)

### Abstract

*It is evident that in developing countries, agriculture serves as a foundation for economic activities. It plays an active role in determining the wealth, social and political system of a society. Therefore, policies and programmes as well as research and development in the sector is necessary for increased productivity and marketing. This study examines the variables influencing yam farmers' access to markets in Benue State. The level to which the produce intended for sale the previous season was actually sold was used to determine whether or not the market was accessible. Data were collected with the use of a structured questionnaire from three local governments in Sankera Zone, the dominant yam producing zone of Benue state. The results of the logistic regression analysis showed the variables that affected the likelihood that a farmer in the study area would have easy access to markets. Gender, educational attainment, prior farming experience, vehicle ownership, and market space all showed positive and had a significant impact on the likelihood that a farmer would have simple access to the market. However, the age of the household and size had a negative effect, and were statistically significant. A farmer training programme is strongly recommended to equip farmers with modern farming techniques. Additionally, the establishment of infrastructural facilities, market boards, and yam processing factories were recommended to support their endeavors.*

**Keywords:** Market, Market Commercialization Index, Benue state, Logit model, Yam

**JEL Classification:** A10, C21, C83, D01, D13, D21, D60, H56, I31

### 1. Introduction

The agricultural sector serves as the bedrock of economic activities in developing nations, significantly shaping their economic, social, and political systems. It is a crucial provider of food for domestic consumption and raw materials for marketable products, while also being the primary source of employment for a substantial portion of the population (Demeke & Haji, 2014; Mabya & Gueye, 2018). Ngutsav and Nomor (2016) emphasize the agricultural sector's potential to serve as a catalyst for industrial and economic growth in developing countries. However, this sector faces pressing challenges that threaten its progress. Agricultural activities in these countries are predominantly situated in underdeveloped rural areas, which urgently require transformation, redistribution, poverty alleviation, and socio-

economic development (Ngutsav & Nomor, 2016). The agricultural sector is a critical component of national development, playing a significant role in poverty reduction and economic growth (Adejobi et al., 2006). This sector's productivity is closely linked to market access, which can impact farmers' production costs and output prices (Ngutsav & Nomor, 2016). Therefore, it is essential to consider market access when integrating emerging farmers into the agricultural sector, particularly in developing countries.

In Nigeria, agriculture which contributes 22.35% of its GDP and employs more than 70% of its workforce, is a good example of a nation where the agricultural industry is essential to the economy (FAO, 2021). However, a number of obstacles impede the sector's productivity, such as inadequate irrigation, low land tenure, climate change and land degradation, low technology, increased production costs, insufficient input distribution, funding constraints, high post-harvest losses, and restricted market access (FAO, 2021). Due to these difficulties, the sector's GDP contribution to the nation has suffered, and population growth has led to an increase in food imports, which has decreased food sufficiency levels (Oyaniran, 2020). In order to solve these issues, the Nigerian government has launched a number of initiatives and programs in recognition of the importance of the agricultural industry. For instance, the Agriculture Promotion Policy (APP) seeks to raise agricultural production in order to provide an abundance of commodity crops for export and enough food to meet domestic demand (FAO, 2021). The Presidential Economic Diversification Initiative (PEDI) seeks to diversify the economy and lessen reliance on oil, while the Nigeria-Africa Trade and Investment Promotion Programme (NATIPP) seeks to encourage trade and investment in the agriculture sector (FAO, 2021). While the Reducing Emission from Deforestation and Forest Degradation (REDD) program seeks to promote sustainable natural resource management and lower greenhouse gas emissions, the Zero Reject Initiative (ZRI) intends to eliminate post-harvest losses (FAO, 2021). Restoring degraded lands and lowering erosion and climate vulnerability are the goals of the Action against Desertification (AAD) Program and the Nigeria Erosion and Watershed Management Project (NEWMAP) (FAO, 2021).

Although these programs and initiatives are praiseworthy, in order to actually raise the productivity of the sector, attention must be paid to household characteristics, market indicators, and agricultural production efficiency (Ngutsav & Nomor, 2016). Enhancing the market accessibility of agricultural goods, granting farmers access to credit and insurance, and encouraging the application of technology in the agricultural industry can all help achieve this. To genuinely raise the productivity of the industry, it is also necessary to address issues with inadequate irrigation, weak land tenure, climate change and soil degradation, and insufficient funding.

In the realm of agricultural economics, the enhancement of sectoral productivity and the expansion of market access play pivotal roles in fortifying the foundation of a robust agricultural economy. Studies by Ngutsav & Nomor (2016) and Akrong, Mbogoh, & Irungu (2021) show the significance of market access in driving smallholder agricultural production towards increased productivity and poverty alleviation. The ability to enter reliable markets not only boosts efficiency and income levels but also bolsters food security, thereby

contributing to poverty and hunger alleviation within farming communities (National Department of Agriculture, 2000).

Market access serves as a crucial factor in integrating new farmers into the agricultural mainstream, significantly influencing their chances of success (National Department of Agriculture, 2000). By facilitating enhanced access to both local and global markets, small-scale producers can consistently sell higher-quality goods at premium prices, encouraging investment in their enterprises and fostering improvements in production quantity, quality, and diversity (Kenton, 2023). On a broader scale, market access is essential for the economic development of nations, as it can spur investment, job creation, and economic growth by facilitating the export of goods and services (Kenton, 2023). Focusing on the yam industry, a fundamental staple in West and Central Africa sustaining over 160 million people, it is noteworthy that West Africa plays a significant role in global yam production, contributing approximately 94% of the total output (Aighewi et al., 2022). Nigeria, Ghana, and Côte d'Ivoire emerge as the top three yam-producing countries, collectively accounting for a substantial portion of global production (Aighewi et al., 2022).

Yam holds immense nutritional and economic value for both rural and urban populations, providing around 200 calories of energy per capita daily in Nigerian and West African diets (Reuben & Barau, 2012). However, recent reports signal a decline in yam production in Nigeria, raising concerns about food security and economic stability (Neina, 2021; Kalu et al., 2023). This decline may be linked to challenges in accessing markets for yam farmers (Ngutsav & Nomor, 2016). Despite the critical importance of market access for yam farmers, there remains a lack of comprehensive investigation into the factors influencing market entry for yam producers in Benue State (Ngutsav & Nomor, 2016). This knowledge gap hampers the development of targeted interventions and policies aimed at improving market access for yam producers. As global efforts intensify to eradicate extreme poverty and hunger by 2030, prioritizing the production of food crops like yams becomes imperative. Therefore, a thorough examination of the factors affecting market access among yam farmers is essential. By gaining a comprehensive understanding of these factors, stakeholders can develop strategies to enhance the economic livelihoods of yam farmers and foster the growth of the yam sector, ultimately contributing to sustainable agricultural development and economic prosperity. The study focused on the dominant yam producing zone of Benue state; Sankara, comprising Ukum, Katsina-Ala, and Logo Local Government Areas of Benue State. Benue State is the leading state in yam production and much of the yam produced in Benue State comes from Sankera axis (Agba, Ode, Ugbem, and Nwafor, 2019). The study therefore takes these three local governments as the area of study. This paper is organized into five sections. The subsequent section is literature review, followed by methodology in Section 3. Section 4 covers the discussion of results, while conclusions are drawn in Section 5.

## **2. Literature Review**

### *Conceptualization*

The ability for farmers, particularly those in rural areas, to access markets is essential for increasing productivity, income, and overall livelihood. The National Department of Agriculture emphasized in 2000 that facilitating the integration of new farmers into

mainstream markets is a pivotal element for their success. A well-functioning marketing system is crucial as it not only provides opportunities but also serves as a driving force for farmers to increase their productivity. By improving their access to both local and global markets, small-scale producers can effectively sell their high-quality goods at competitive prices consistently, thereby boosting their economic prospects. Marketing in agriculture plays a multifaceted role, not only in enhancing productivity and consumption but also in fostering economic growth. Market access, as defined by Killick, Kydd, and Poulton (2000), encompasses the various aspects of engaging in market activities, including effectiveness, efficiency, and associated costs. Key factors influencing market access include product availability, attributes, and price information, the reliability and cost of such information, trustworthiness of transaction partners, market regulations, and the physical costs of market access influenced by infrastructure quality, transportation, and market dynamics.

Nghi, Thanh, and Dung (2021) further elaborate on market access, defining it as the ability of farmers to interact with input suppliers and negotiate profitable sales with buyers. They identify crucial determinants affecting market access for small-scale farmers, such as proximity to markets, farm size, productivity levels, age, experience, education, training, labor availability, linkages, and access to communication tools like telephones. Enhancing these factors can significantly improve farmers' market access and ultimately contribute to their economic well-being and sustainability.

#### *Theoretical Framework and Empirical Literature Review*

The concept of market access lacks thorough theoretical development in economic literature. Nonetheless, numerous authors have conceptualized market access and explored a range of factors that is commonly perceived as strands shaping access to markets. Camberlin and Jayne (2011) highlight a key observation in rural development: remote areas tend to exhibit lower economic prosperity, productivity, and integration with input and output markets. Remoteness is predominantly characterized by physical access, often assessed through factors such as road infrastructure, transportation costs, travel time to urban markets, and various transaction costs. Regarding access to agricultural markets, this study adopts the access theory formulated by Ribot and Peluso in 1970. This theory suggests that factors such as demographic characteristics (age, gender), educational level, farming experience, access to transportation, ownership of market space, involvement of middlemen, proximity to markets, and quality of road infrastructure significantly influence access to agricultural markets. Mahuwi and Israel (2023) argue that these factors can either facilitate or impede efforts to improve market access for agricultural products. In exploring the impact of trade costs and technology adoption on market access, Aggarwal et al. (2022) have identified travel costs as the primary determinant of market access for agricultural products.

Previous research on factors influencing market access has yielded varied results. However, there are common factors identified across these studies that impact market access in rural areas, including age, gender, farmer experience, vehicle ownership, market space ownership, middlemen activities, road infrastructure, and distance to the market. For instance, Magingxa, *et al.* (2009) emphasized the factors that determine smallholder market access, such as off-farm income, farmer skills, market access type, support services

inventory, and physical access to the market. Their study, which employed a logit regression model, discovered that the type of market access, farmer skills, and physical access were all very significant factors influencing smallholders' ability to access the markets.

In a similar vein, Gatere, Zernon, and Oduor (2017) carried out research in Rwanda to look into a number of factors affecting agricultural products' ability to access markets. They looked at the availability of market information, the location of the market, the impact of cooperative societies, factor costs, and the effects of training. Their result showed that a number of factors, including the producer's position in relation to the buyer, the state of the roads and the means of transportation, the availability of market information, and the expenses of factoring such as transportation and market search, all had impact on market access. The study found that major barriers to farmers' access to markets were inadequate transportation infrastructure, high expenses associated with preparing commodities for market, a lack of information on prices, long travel times to markets, and seasonal road closures.

In a rural region of South Africa, Baloyi and Anim (2018) investigated the variables affecting the marketing of vegetables among smallholder cooperative farmers. From a population of more than 100, they chose 50 active farmers using a straightforward random sample technique. Questionnaires were used to gather data, and Binary Logistic Regression was used for analysis. According to their findings, female smallholder vegetable producers with agricultural experience and qualifications had a higher chance of getting their produce marketed. In order to ascertain the variables impacting the sale of agricultural produce among small-scale farmers in the Giaki area of Meru County, Kenya, Karani and Wanjohi (2017) conducted a study. They looked at how access to marketing information, road infrastructure, and middlemen in the market affected small-scale farmers' ability to sell sorghum. These three factors were shown by the study to be important predictors of sorghum marketing in the region.

Sehar (2018) carried out a thorough investigation on the socioeconomic traits of cattle farmers in a specific province, looking at the variables affecting marketing inefficiency and market access. For the study, standardized questionnaires were used to gather data from 300 farmers, and logit regression models and descriptive statistics were used for analysis. Market access and efficiency were found to be highly influenced by a number of factors, including infrastructure, livestock composition, marketing channels, market price information, advertising, transport ownership, and expenses. The study suggested that barriers in the cattle marketing system be addressed, that young people be encouraged to pursue careers in agriculture, and that training programs and readily available marketing-related data be made available. Kyaw, *et al.* (2018) looked at the variables affecting smallholder farmers' involvement in the market in Myanmar's Central Dry Zone, Myothit Township, and Magway Region. The researchers examined factors influencing smallholder rice farmers' choices to engage in the agricultural market using the Heckman two-stage selection model. Market participation was found to be significantly influenced by a number of factors, including the age of the household head, the level of education, the size of the household, the price and production of rice, the income of the household, the ownership of livestock, the accessibility of roads, the distance to the market, the availability of extension

services, and market information. The study advised the government and legislators in Myanmar to enact fair laws for small-scale farmers in order to promote agricultural development and lessen poverty while also promoting food security and economic expansion.

With an emphasis on connecting smallholder farmers to markets, Namah (2019) investigated the difficulties faced by participants in the tomato value chain in the Fako Division of Cameroon. Using the "Making Markets Work Better for the Poor" (M4P) concept, the study determined that the primary obstacles faced by value chain actors were low prices during peak seasons, limited infrastructure, and market information sources. Nghi, *et al.* (2021) carried out their study in Ben Tre Province to ascertain the variables influencing green pomelo producers' access to the market. Six criteria were shown to have an impact on market access: age, training, phone access, connectivity, distance to market, and acreage. The province's green pomelo growers found that the most important element affecting their ability to access markets was farmers' training.

In Southwest Ethiopia, Tilahun *et al.* (2023) looked into the variables affecting the level of cattle market participation. Using both descriptive statistics and Poisson regression analysis, the study found that the following factors positively impacted market participation intensity: animal ownership, grazing land access, market accessibility, education level, and expertise in livestock production. On the other hand, being close to marketplaces had a detrimental effect. The study found that livestock farmers' participation in the market was influenced by a number of variables, including limited market access, long travel times to marketplaces, and a lack of current market information. In order to increase the intensity of livestock market involvement, the research suggested expanding the number of farmers' training centers, building rural infrastructure, boosting consultation and training services, and strengthening farmer education through adult education programs.

### **3. Methodology**

Benue State, situated in Nigeria's North Central region with a population of approximately 6,141,300 according to projected figures from the National Population Commission in 2022, holds the prestigious title of the "Food Basket of the Nation" due to its abundant agricultural resources. The fertile lands along the Benue River and its tributaries support the cultivation of various crops, including yams, cassava, rice, maize, soybeans, and potatoes, alongside a thriving livestock industry encompassing cattle, pigs, poultry, and goats. Notably, the state hosts two major agricultural institutions: Joseph Sarwuan Tarkaa University in Makurdi and Akperan Orshi College of Agriculture in Yandev. Additionally, Benue boasts the largest yam market in Africa, the Zaki Ibiam International Yam Market, located in Ukum Local Government Area. The presence of the Benue River offers significant potential for irrigation, facilitating year-round cultivation and enhancing agricultural productivity. Despite facing challenges such as inadequate infrastructure, land tenure issues, and limited access to credit, Benue State's agricultural sector remains the linchpin of its economy, providing livelihoods for many and playing a crucial role in both state and national food security and economic development endeavors.

The research employed a survey approach, drawing upon primary data sourced from a cross-sectional survey. This methodology incorporated a questionnaire designed to gather both

quantitative and qualitative information about farmers and their farming endeavors. The questionnaire aimed to capture information on various aspects including household demographics such as size, gender, and educational attainment of the household head, as well as metrics like annual yam production, intended and actual sales, age, and farming experience. The population of the study comprises the number of yam farmers in Ukum, Katsina-Ala and Logo Local Government Areas. According to the National Population Commission (NPC) census of 2006, published in 2010, there are 112,846 households in the selected local governments, made up of 40,732 households from Ukum Local Government Area, 39,920 households from Katsina-Ala Local Government Area while Logo Local Government Area has 32,194. According to the International Food Policy Research Institute (IFPRI; 2015), about 70% of the rural population are farmers. According to Verter and Becvarova (2014), yam production is the primary crop for 64% of farmers in the Logo Local Government Area. Therefore, the population of yam farmers is  $64/100 \times 78,992 = 50,555$  households. To determine the sample size for this study, the study adopted the formula developed by National Education Association cited in Krejcie and Morgan (2012). Using the formula, calculated sample for the study is 340. This is proportionally shared among the three local governments as viz: 123 for Ukum 113 for Katsinal-Ala and 104 for Logo Local Government Area base on the population of the local government. For this cross-sectional survey, we employed a combination of stratified and purposive sampling techniques to construct our sample. The focus of the study was on the Sankara-Axis of Benue State, encompassing three key Local Governments: Logo, Ukum, and Katsina-Ala. These specific areas were chosen due to their significant contribution to yam production within Benue State. Our sampling strategy ensured representation from each of these local governments, with emphasis on households that are engaged in yam farming. To achieve this, households were randomly selected within each local government, ensuring that every chosen household was actively involved in yam cultivation. The data required for this study were generated through the use of a well-structured questionnaire which was prepared and distributed to farm households from the three selected Local Governments. The respondents were household heads or any other adult member that manages the household's farm. The questionnaire was orally administered and responses were recorded.

The study made use of descriptive analysis and regression to achieve the objective of this study. To do this, the study adopted and modified the binary logistic regression model as used by Baloyi and Anim, (2018) and Nghi, Thanh and Dung (2021). The logistic regression model is econometrically specified as follows;

$$p_1 = F(\alpha + \sum \beta_i X_i) = \frac{1}{1+e^{-z}} \dots\dots\dots 1$$

Where;  $P_1$  is the probability that a farmer has access to market or does not have given  $X_i$ .  $e$  denotes the base of natural logarithms, which is approximately 2.718,  $X_i$  represents the  $i^{\text{th}}$  explanatory variables.  $\alpha$  and  $\beta$  are the parameters to be estimated. Hosmer and Lemeshow (1989) noted that the logit can be expressed in terms of odds and the log of odds, which helps in interpreting the coefficients. The odds ratio represents the probability of an individual choosing one alternative over another, or not choosing it, and is calculated as the ratio of the probability of success to the probability of failure. This ratio is often used in

logistic regression to interpret the strength of association between risk factors and outcomes. The estimated coefficient is also useful, but its primary application is in demonstrating an effect's sign and statistical significance. An estimated odds ratio's proper interpretation should take into account the particular circumstances surrounding its estimation, such as the set of explanatory factors used in the model. Thus, model one is re-stated as follows:

$$(1 - p_i) = \frac{1}{1 - e^z} \dots\dots\dots 2$$

Therefore,

$$\left[ \frac{p_i}{1 - p_i} \right] = \left[ \frac{1 + e^{z_i}}{1 + e^{-z_i}} \right] = e^{z_i} \dots\dots\dots 3$$

Or, taking the natural logarithm of equation (3), we have;

$$Z_i = Ln \left[ \frac{p_i}{1 - p_i} \right] = \alpha + \sum_{i=1}^m \beta_i X_i + \mu_i \dots\dots\dots 4$$

The dependent variable  $Z_i$  is of dichotomous nature representing a farmer's access to market. Market access in the study was proxied by household market access index (HMAI) also known as commercialization index (Goverh, Jayne & Nyoro, 1999). The HMAI shows a discriminate between those who have effective access to the market and those who do not. The HMAI is measured by the extent to which the produce intended for sale the previous season was actually sold. That is, actual sales divided by intended sales. If the HMAI is greater or equal to 0.5, the household has effective access to the market otherwise the household has ineffective access to the market. If the household has effective access to the market,  $Z = 1$  otherwise  $Z = 0$ . The specific form of the model is given as;

$$Z_i = \mu_0 + \mu_1 AGE + \mu_2 GEN + \mu_3 EDU + \mu_4 FEA + \mu_5 HHS + \mu_6 OOV + \mu_7 OOS + \mu_8 AOM + \mu_9 ROI + \mu_{10} DTM + \varpi_1 \dots\dots\dots 5$$

The description of the explanatory variables is presented in Table 1.

Table 1: Description of explanatory variables used in the model

Variable Label	Variable Name	Variable Measurement	Expected Sign
AGE	age of the household head	In years (number)	-
GEN	gender of the household head	D= 1 if HHH is a male, otherwise D=0	+
EDU	Educational attainment of household head.	Not educated=0, Primary education = 1, Secondary education = 2 and Post-Secondary Education = 3	+
FAE	Farming Experience	number of years that the household head has been a farmer	+
HHS	household size	number of people in the household	-
OOV	Ownership of a Vehicle to convey goods to the market	D=1 if the household own vehicle to convey goods market, otherwise D=0	+
OOS	Ownership of a Yam Space for Display of Yam Output for sale	D=1 if the household own a space in the market, otherwise D=0	+
AOM	Activities of middlemen	D-1 if middlemen are available, otherwise D = 0	-
ROI	Road Infrastructure	D=1 if infrastructure (roads, holding facilities) is good, otherwise D=0	+
DTM	Distance to the market	Kilometer	-

*Source: Author's Compilation*



#### 4. Result

The results of Table 1 show that the model's explanatory variables, as indicated by the Mac Fadden R2 value of 0.629240, account for 62.92% of changes in market access. A p-value of 0.034, significant at  $p < 0.05$ , and a log likelihood of -173.56 confirm the model's statistical significance and strong fit. The low Akaike and Schwarz statistics further point to the model's strong performance. The presence of a joint impact among the explanatory variables in the model is indicated by the LR statistics' significance at 5% level. Every criterion's outcome indicates that there is a considerable difference between every  $\beta$  and zero.

Table 2: Result of Logistic Regression Model

Variables	Coefficient	Std Error	Prob.	EXP $\beta$
Constant	-0.036	0.769	0.097	
AGE	-0.047	0.012	0.016	0.95
GEN	0.515	0.192	0.030	1.67
EDU	0.306	0.143	0.048	1.36
FAE	1.005	0.412	0.043	2.73
HHS	-0.802	0.217	0.020	0.45
OOV	1.040	0.348	0.038	2.83
OOS	0.724	0.279	0.039	2.06
AOM	-0.248	0.754	0.742	0.78
ROI	2.477	1.441	0.031	11.91
DTM	1.899	0.854	0.026	6.679
Mac Fadden R-Squared		0.62920		
Akaike Info Criterion		1.175146		
Schwarz Criterion		1.271802		
Prob. (LR Statistics)		0.034192		
Log Likelihood		-173.560		

Source: Author's Computation

The findings of the logit regression showed that the following factors have positive and statistically significant coefficients at 5% level: gender, household head's educational level, farmer experience, vehicle ownership for delivering commodities to market, market space ownership, road infrastructure, and distance to market. On the other hand, activities of middlemen have a negative but small coefficient, while the age of the head of the household and the size of the farmer's family have negative but substantial coefficients. The Exp value of the  $\beta$  value for age indicates that the household head's likelihood of market access declines by 95% as they age, with a negative coefficient of -0.047 for age that is statistically significant at the 5% level. The findings of Sehar (2018) and Nghi et al. (2021), discovered a positive and substantial association between age and market access, are in conflict with this result. Differences in the study circumstances or sample characteristics may be the cause of this. With a gender coefficient of 0.514 and statistical significance at 5% level, a farming household is more likely to have easy market access if its head is a man. This outcome is consistent with Sehar's (2018) research.

A farming home is more likely to have easy access to the market if the household head has one more unit of education, according to a positive correlation between market access and educational level that is statistically significant at the 5% level (coefficient of 0.306). The significance of education lies in its ability to elevate an individual's cognitive level, which in turn broadens and enhances their range of activities and makes them more marketable. The findings of Agwu, Anyanwu, and Mendie (2012) and Sehar (2018) are consistent with this outcome. Moreover, there is a positive correlation between farming experience and market access (coefficient of 1.005 significant at the 5% level), meaning that for every unit increase in farming experience, the likelihood that an agricultural household may easily access the market increases. Household size has a negative relationship with market access, meaning that as the number of people in the household increases, the probability of the household having easy market access decreases by 45%. This result is as expected because larger households have more domestic consumption needs, which may detract from their enterprise activities. This result aligns with findings by Agwu et al. (2012) and Akrong et al. (2021). Owning a vehicle and a market space positively impacts market access, increasing the likelihood of easy market access. The activities of middlemen have a negative but insignificant impact on market access, suggesting that their impact on a farmer's probability of having easy market access is marginal.

Road infrastructure has a positive impact on market access with a coefficient value of 2.477 and significant at 5% level of significance. This means that an improvement in road infrastructure increases the likelihood of having market access by 136%. This outcome is expected given that road infrastructure is essential to any nation's economic growth since it permits the unrestricted flow of products and services. The market's distance has a positive coefficient, meaning that the likelihood of a farmer having simple access to the market increases with the distance between the farm gate and the market. The longer the distance between a farm gate and the market, the less likely it is that a farmer will have easy access to the market, hence this result is not what was anticipated. This can be the result of variations in the caliber or reachability of marketplaces at certain separations. Although the outcome defies the study's predictions, it is consistent with the study of Akrong *et al.* (2021).

### **5. Conclusion and Recommendations**

Market access stands out as a critical determinant of success for small-scale agriculture. The persistent challenge faced by farmers, even those capable of generating surpluses, is the lack of access to profitable markets, which often perpetuates poverty. The factors influencing smallholder market access are extensively explored in existing literature, forming a complex network of influences on smallholders in general. This study aimed to investigate the factors impacting a yam farmer's ease of market access in the Sankera Axis of Benue State, Nigeria. The results of the logistic regression analysis identified key factors influencing market access probability in the study area. Notably, the gender, educational level, farming experience, ownership of a vehicle, and space ownership by the household head all positively and significantly influenced market access probability. Conversely, the age of the household head and household size had negative but statistically significant impacts.

Recommendations stemming from these findings include the necessity for the government to provide technical and capacity-building training to empower yam farmers in understanding market dynamics and making informed decisions. Emphasis should be placed on identifying niche markets rather than competing in saturated markets. Strengthening farmer associations, particularly due to the benefits they offer in terms of landholding sizes, which can lead to the development of marketing associations and cooperatives, enabling farmers to access more lucrative markets collectively. Enhancing female participation in market activities is crucial for improving overall market access. Training and information dissemination can significantly boost productivity, especially among less commercialized female farmers. Addressing infrastructure deficiencies, particularly in transportation, is vital to enable farmers reach markets efficiently and at lower costs. Urgent efforts to upgrade and maintain rural road networks can greatly enhance market access, benefiting farmers and alleviating poverty.

Establishing a yam processing factory and market boards within the study area is recommended. The factory would create a substantial market for yam farmers in the state, while market boards would offer advisory and promotional services, empowering farmers to manage their output and sales effectively. This approach aims to reduce harvest losses during production, ultimately enhancing farmer productivity and economic outcomes.

#### References.

- Adejobi, A. Amaza, P & Ayoola, G. (2006). Enhancing the Access of Rural Households to Output Markets for Increased Farm Incomes. A Paper Presented at the International Association of Agricultural Economists Conference, Gold Coast, Australia, August 12-18, 2006. <http://www.ageconsearch.umn.edu/bitstream/25454/1/pp060602.pdf>
- Aggarwal et al (2022). Market access, trade costs, and technology adoption: evidence from northern Tanzania. *NBER Working Papers* 25253, National Bureau of Economic Research, Inc.
- Agba, S. A., Ode, I., Ugbem, C., & Nwafor, S. C. (2019). Impact of Yam Postharvest Activities on Standard of Living of Yam Farming Households in North-East Zone of Benue State, Nigeria. *Journal of Applied Life Sciences International*, 21(1), 1–9.
- Agwu, N.M., Anyanwu, C.I., & Mendie, E.I. (2012). Socio-Economic Determinants of Commercialization among Small Holder Farmers in Abia State, Nigeria. *Greener Journal of Agricultural Sciences*. 2(8), 392-397.
- Aighewi, B., Maroya, N., Asiedu, R., Mignouna, D., Balogun, M. & P. Lava Kumar, P.L. (2022). Eliminating hunger: yam for improved income and food security in West Africa. <http://creativecommons.org/licenses/by/4.0>.
- Akrong, R., Mbogoh, S. G. & Irungu, P. (2021). What factors influence access to and the level of participation in high value mango markets by smallholder farmers in Ghana? <https://doi.org/10.1016/j.heliyon.2021.e06543>
- Baloyi, S. & Anim, F.D.K. (2018). Socio-economic analysis of factors affecting access to markets by smallholder cooperative vegetable farmers. *Journal of Humanities and Ecology*, 62(1-3), 35-40. DOI: 10.31901/24566608.2018/62.1-3.3010
- Camberlin, J & Jayne, T. S. (2011) Unpacking the Meaning of “Market Access”: Evidence from Rural Kenya. *World Development*, 41, 245-264, [10.1016/j.worlddev.2012.06.004](https://doi.org/10.1016/j.worlddev.2012.06.004)

- Demeke L, & Haji J. (2014). Econometric analysis of factors market participation of smallholder farming in Central Ethiopia. *Munich Personal RePEc Archive*.
- Enete, A.A. and Igbokwe, E.M. (2009) Cassava Market Participation Decision of Producing Households in Africa. *Tropicultura*, 27, 129-136.
- Food and Agriculture Organisations of the United Nations (2021). Nigerian agriculture at a glance. <https://www.statista.com/statistics/1165865/contribution-of-oil-sector-to-gdp-in-nigeria>
- Food and Agriculture Organisations of the United Nations (2020). Nigerian agriculture at a glance. <https://www.statista.com/statistics/1165865/contribution-of-oil-sector-to-gdp-in-nigeria>.
- Gatare, E., Zernon, M. & Oduor, J. (2017). Factors affecting market access in agricultural based projects in Rwanda: a case of home grown school feeding (HGSF) project in Nyaruguru district. *International Journal of Civil Engineering, Construction and Estate Management*. 5, (1), 27-37. <https://www.eajournals.org>
- Govere J, Jayne T. S & Nyoro, J. (1999). Smallholder Commercialization, Interlinked Markets and Food Crop Productivity: Cross-Country Evidence in Eastern and Southern Africa. [http://www.aec.msu.edu/fs2/ag\\_transformation/atw\\_govere.PDF](http://www.aec.msu.edu/fs2/ag_transformation/atw_govere.PDF)
- International Food Policy Research Institute (2015). Global nutrition report 2015. Actions and accountability to advance nutrition and sustainable development. Washington, DC. Retrieved from <https://www.ifpri.org/publication/global-nutrition-report-2015>
- Kalu. C, Nnabue, I., Edemodu, A. Agre, P. A., Adebola, P., Asfaw. A. & Obidiegwu, J. E. (2023). Farmers' perspective toward a demand led yam breeding in Nigeria. *Frontiers in Sustainable Food System*. 1-14.
- Karani, K. D. & Wanjohi, J (2017). Factors influencing marketing of agricultural produce among small-scale farmers: a case of sorghum in giaki location, meru county Kenya. *International Journal of Economics, Commerce and Management*. 5(8), 664-678.
- Killick, T, Kydd, J & Poulton (2000). Agricultural Liberalization, Commercialization and the market Access Problem in the Rural Poor and the Wider Economy. The Problem of Market Access. IFAD. [www.academicjournals.org/ajar.pdf](http://www.academicjournals.org/ajar.pdf)
- Kyaw, N. N., Ahn, S., & Lee, S. H. (2018). Analysis of the factors influencing market participation among smallholder rice farmers in Magway Region, Central Dry Zone of Myanmar. *Sustainability*. 10(12), 2-15. <https://www.mdpi.com/2071-1050/10/12/4441>
- Magingxa, L. L., Alemu, Z. G. & Schalkwyk, H. D. (2009). Factors influencing access to produce markets for smallholder irrigators in South Africa. *Development Southern Africa*, 26(1), 47-58, DOI: 10.1080/03768350802640081
- Mbaye A.M. & Gueye, F. (2018), Labor Markets and Jobs in West Africa, Working Paper Series N° 297, African Development Bank, Abidjan, Côte d'Ivoire.
- Mahuwi, L. & Israel, B. (2023). Supply chain issues affecting market access among smallholder maize farmers in Mbozi district, Tanzania. *International Journal of Food and Agricultural Economics*. 11(2), 115-129
- Namah, T. F. (2019). Linking smallholder farmers to markets: The role of extension in market information distribution for poverty reduction in Fako, Cameroon. (A Mater's Dissertation Iowa State University). Ames, Iowa.

- National Department of Agriculture, (2000). *Agricultural marketing: a discussion document*. Pretoria: Government Printer.
- Neina, D. (2021). Ecological and edaphic drivers of yam production in West Africa. *Applied and Environmental Soil Science*. 1–13. doi: 10.1155/2021/5019481.
- Nghi, N. Q., Thanh, L. K. & Dung, L. N. T. (2021), Factors influencing market access of green pomelo farmers in Ben Tre Province. *World Journal of Advanced Research and Reviews*. 12(01), 256–260
- Ngutsav, S. A. & Nomor, D. T. (2016). Market access and agricultural productivity. a case of yam farmers in Sankera Axis of Benue State. *International Journal of Economics and Management Science*. 2(1), 147-158.
- Okwuokenye, G.F. & Onemolease, E.A. (2011). Influence of Socio-Economic Characteristics of Yam Sellers on Marketing Margins among Yam Wholesalers in Delta State, Nigeria. *Journal of Agriculture and Social Research (Jasr)*. 11(1), 81-90.
- Oyaniran, T. (2020). Current state of Nigeria agriculture and agribusiness sector. A paper presented at AfCFTA workshop, September, 2020.
- Reuben, J. and Barau, A. D.(2012). Resource use efficiency in yam production in Taraba State, Nigeria, *Journal of Agricultural Science*. 3(2), 71-77.
- Sehar, M. (2018). Factors influencing market access and livestock marketing inefficiency in Mpumalanga province, South Africa. (A Mater's dissertation, University of South Africa).<https://uir.unisa.ac.za/handle/10500/24978>