The Nigerian Journal of Rural Extension and Development

THE NIGERIAN JOURNAL OF RURAL EXTENSION AND DEVELOPMENT (NJRED)

Aims and Scope

The Nigerian Journal of Rural Extension and Development (NJRED), a referred journal, is an annual publication of the Department of Agricultural Extension and Rural Development, University of Ibadan, Nigeria. The journal is intended to encourage systematic and continuous publication of practical ideas and empirical research work in the area of Rural Extension and Development as it relates to Rural Development, Women in Development. Agriculture and Extension Education, Rural Sociology, Livelihood, Mass and Extension Communication, Health and Nutrition Extension, Home Economics, Adult Education and Multi-disciplinary Rural Extension issues.

In addition, the Journal publishes book reviews and research and research –in-brief articles.

The Review Process

NJRED employs a two-tier review system.

First, the editor reviews each submission to determine its suitability for further peer review by the NJRED Manuscript Review Committee. If the submission is judged as unsuitable, the editor either rejects the submission or highlights weaknesses and proffers revision suggestions to the author(s).

Second, submission judged suitable for further review is sent to 2 reviewers for in-depth assessment based on a blind review process. The reviewers focus on contribution to knowledge and appropriateness of methodology alongside writing style.

All correspondence to: njred.ui@gmail.com

Note to contributors

Mission of Manuscripts

Articles must be original research work which should not have been submitted for publication elsewhere. Formatting of articles is to be done using MS Word (any version) with tables and figures well formatted, heading and other illustrations clearly distinguishable.

Articles submitted should be provided with a short abstract of about 250 words at the beginning of the text, reporting concisely the main results and important conclusions. At least 3 keywords are required at the base of the abstract. The cover sheet should contain:
a. Title of the article
b. Author (s), name (s), indicating correspondence author with e-mail address
c. The first page of the manuscript should contain the title of the article.

List of references for each work cited should be given at the end of the text, in alphabetical order using the APA style of referencing, that is, surname of author (s), initials, year of publication in parenthesis, title of paper, name of journal (underlined or italicized) or book, volume, and first and last pages of the reference.

Tables and figures must be numbered, self-explanatory and appropriately referred to in the body of paper. All measurements must be in metric system with currency conversions stated.

Only e-copies of manuscripts are acceptable and the journal assumes no responsibility for loss of manuscripts or accompanying materials in the mails. Authors are advised to retain copies of their submission.

Author(s) of accepted manuscript will receive a pdf and hard copy of the journal volume in which their article appears. Authors will be required to pay a set of fees to off-set the cost of publication, which are **Reviewing fee = ₦10,000** and **Publication charge = ₦25,000**.

Annual Subscription*

Overseas	Surface Mail	Airmail
Institution/Organisations	$100 $50	$120 $60
Individuals		
Student	$20	$30

Africa

Institutions /Organisations	₦10,000.00	

E-Copies of paper are to be sent preferably by e-mail to: njredunibadan@yahoo.com

TABLE OF CONTENTS

Analysis of apple fruits profitability in selected markets in Abuja Metropolis, Nigeria.

[1]Ajibade, Y. E., [1]Opaluwa, H. I., [1]Odiba, J. A., [2]Gbadamosi, A. O. and [1]Momoh, S.

[1]Department of Agricultural Economics and Extension, Faculty of Agriculture, Prince Abubakar Audu University, Anyigba
[2]Department of Agricultural Education, College of Education, Ankpa
Correspondence details: euniyetbade@yahoo.com

ABSTRACT

This study analysed profitability of apple fruits in some selected markets in Abuja metropolis, Nigeria. A purposive sampling technique was used to select 120 apple fruit marketers. The data obtained was analysed using descriptive analysis, gross margin analysis, multiple regression analysis and factor analysis. The results reveal that most (76.67%) of the apple fruit marketers were male. Gross margin of N4,240.19 per carton (45kg) was recorded, while the benefit cost ratio was 1.20. The study also revealed that the profit made by apple fruit marketers were premise on their level of education and marketing experience. Poor pricing (0.5260), perishability (0.6106), inadequate extension services (0.9395) were the constraints experienced by apple fruit marketers in the study area. Therefore, more women should be encouraged to join the business and those already in the business should collaborate to generate fund to purchase storage and transport facilities. In addition, apple fruit marketers should visit extension agents to learn modern ways of preserving and prolonging apple fruit shelf life.

Keywords: Factor analysis, Profitability, Constraints, Marketers, Apple fruit

INTRODUCTION

Apple fruits (*Malus domestica*) is a nutritious fruit which offers multiple health benefits to humans. It is rich in dietary phytochemicals such as flavonoids which are necessary for optimal health (Ferretti *et al.*, 2014). The antioxidants in apple have much health promoting and disease prevention properties. Over hundred (100) varieties of apples are grown in North America and there are different varieties which are a bit bigger than the size of a cherry to as big as the size of a grapefruit. Dietary fibres are found in the skin and core apple. It is consumed by humans and it is rich in nutrients with significant bioactive compounds (Bastein *et al*., 2022). There are many who delight in apple fruit consumption (Abdullahi *et al.*, (2017). In Nigeria, apple hardly grows because it requires cold weather for optimal growth and production, but cold region in Nigeria, such as Jos, Mambila and Obudu Plateau support it growth. According to Kughur *et al.* (2015), fruits and vegetable production are cultivated in some specific locations in Nigeria and are prominent in Plateau and Kaduna States from where supply are made to local markets and neighboring states of the country such as Lagos , Oyo, Abuja and others. Apple, strawberries, grapes and others are the temperate fruits whose demand are on the increase as postulated by Osadebamwen *et al.* (2022). However, to an average Nigerian, apple fruit is highly expensive and this actually restricts its consumption coupled with poor attitude of many Nigerians toward fruit consumption Abdullahi *et al* (2017). The health benefit and change in orientation of many, especially among the elites is making apple fruit a prominent business among fruit sellers.

The land area where apple was cultivated globally was 4,904,305 ha with total production output of 86,142,197 tonnes in 2018 (FAO, 2020). FAO (2020), also stated that China is the greatest apple producer in the world with over 39.2 million tonnes production volume. According to Shah (2020), apple farmers sell their products directly to middlemen (assemblers, wholesalers and retailers) who eventually sell apple fruits to the ultimate consumers. Agricultural commodities marketers usually operate within and without their geographical areas. Apple fruit are among fruit crops that are exported and imported across nations of the world.

Natalia and Harvey (2021) stated that the awareness of consumption of healthy food, increased income and population growth, especially in urban area resulting into global demand for fruits, where the second position goes to apple, necessitate efficient and profitable marketing. In Nigeria, the efficiency of fruits and vegetables marketing has been a great concern as observed by Kughur *et al.* (2015).

However, agricultural marketing helps in sustaining produce/ product in the market due to the prevalence of open competition both in the present global and liberal world (Ibeawuchi *et al.*, 2015). Apple fruit production is beneficial in agriculture and food markets due to its health benefits aside its social and economic benefits (Senchi and Malami 2015). Profitability is an important terms with respect to business and it determines the business long term success. It's primary goal of a business which is pivotal to business growth. Studies on profitability of apple fruit marketing is expedient considering the health benefit derived by teeming population of its

consumers. Many studies have been conducted on apple fruit by several authors (Abdullahi *et al* (2017), 2015; Muraki *et al.,* 2013) and few others like Abdullahi *et al*. (2017) and Omotesho *et al*. (2013) in other parts of Nigeria. Other authors (Ojo *et al*, 2016 and Ajibade *et al*, 2021) have conducted studies on tomato fruit. However, the focus of this study is on analysis of apple fruits profitability in selected markets in Abuja Metropolis, Nigeria. The specific objectives of the study were meant to describe the socio-economic characteristics of apple fruit marketers, estimate apple fruit marketers' costs and returns, identify factors that determine apple fruit profitability and identify constraints faced by apple fruit marketers in the study area.

METHODOLOGY

The study was conducted in Abuja, Nigeria. It has an estimated population of 2.5 million. Abuja is the 4th biggest metropolitan population after Lagos, Kano and Ibadan. It consists of six area councils with total land area of approximately 7.290 km^2. The climate is tropical with mostly warm weather coupled with normal bright sunny days. Abuja being the Federal Capital Territory of Nigeria is blessed with markets where various commodities are sold. Due to its urbanisation fruits marketing especially apple fruit and others are common in some of the markets within Abuja metropolis which many elites preferred to junks consumption.

Purposive sampling technique was used to select three main markets (Zuba Market, Wuse market, and Deidei market) in Abuja, based on high level of involvement in fruits and vegetables in these markets. One hundred and twenty (120) respondents were randomly selected across the three markets with respect to the lists of apple fruit marketers obtained from their associations. Thirty percent of the registered apple fruit marketers were selected from Wuse (50), Zuba (40) and Deidei (30) from sample frame of 401.

The study used structured questionnaire as an instrument for collection of primary data from the respondents. The analytical tools employed in the study were descriptive statistics, gross margin analysis, multiple regression and factor analysis.

Gross margin shows the difference between total revenue (TR) and the total variable cost (TVC). Gross margin analysis was used as proxy for apple fruit profitability. Gross margin analysis helps in measuring business efficiencies and setting selling prices of agricultural products. It exposes the financial health of business venture. It reveals whether the business is running profitably or otherwise. The study followed Gosa *et al*. (2023), Gambo (2015) and a host of others in using gross margin analysis to ascertain apple fruit profitability

$$GM = TR - TVC \quad \text{........ (i)}$$
$$\text{Profit } (\pi) = TR - TC \quad \text{...... (ii)}$$
$$TC = TFC + TVC \quad \text{....... (iii)}$$

The following Profitability ratios were calculated:
$$\text{Benefit Cost Ratio (BCR)} = \frac{TR}{TC} \quad \text{...... (iv)}$$

Where;
GM = Gross Margin (N / 45kg)
TR = Total Revenue (N / 45kg)
TVC = Total Variable Costs (N / 45kg)
TC = Total Costs (N / 45kg)

Multiple regression analysis

It is a statistical tool used for estimating the relationship among variables with reasons and results for relationship. Multiple regression model has one dependent and many independent variables. This study determined the factors affecting profitability of apple fruit marketers following empirical studies of Nguyen and Nguyen (2020) and others. The model was specified as follows:

$$Y = a + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + b_6x_6 + b_7x_7 + b_8x_8 + b_9x_9 + e_t \quad \text{.......... (v)}$$

Where;

Y = Average Return (N)
X_1 = Age of marketers (years)
X_2 = Household size (numbers)
X_3 = Education level (number of schooling years)
X_4 = Marketing experience (years)
X_5 = Transportation cost (N)
X_6 = Access to credit (1 = Yes; 0 = otherwise)
X_7 = Co-operative society (1 = member, 0 = non-member)
a = constant intercept
b_1 = the coefficient corresponding to X_1… X_9
e_t = error term

Factor analysis

The possible constraints confronting marketing of apple fruit was analysed using factor analysis.

Factor analysis is a method for investigating whether a number of interests C_1, C_2, C_3, C_4 are linearly related to a smaller number of unobservable factors F_1, F_2, F_3, F_4 Equamax with Kaiser Normalization was the rotation method used to examine constraints confronting marketing of apple fruits following the study of Ali *et al (*2013). It is mathematically represented as;

$$C_1 = \beta_{10} + \beta_{11}F_1 + \beta_{12}F_2 + e_1 \quad vi$$
$$C_2 = \beta_{20} + \beta_{21}F_1 + \beta_{22}F_2 + e_2 \quad vii$$
$$C_3 = \beta_{30} + \beta_{31}F_1 + \beta_{32}F_2 + e_3 \quad viii$$

$C_4 = \beta_{40} + \beta_{41}F_1 + \beta_{42}F_2 + e_4$ ix

Where:

C_1 to C_4 are unknown factors or component

β_{10} to β_{42}-Factor loadings

e_1 to e_4 - error variance

RESULTS AND DISCUSSION

The results in Table 1, show the socio-economic characteristics of respondents. The majority (76.67%). of the respondents who engaged in apple fruit marketing were male. The implication is that the apple fruit marketing was a business majorly embraced by men, who can on-load and off-load apple fruits especially in carton. Also, apple fruit could be a business mostly engaged in by men because it does not entails further processing apart from cleaning and little or no packaging before marketing, which can easily be done by men (Chidiebere-Mark, 2016). The mean age of respondents was 39 years, which shows that the majority (63.3%) of the respondents were still active and could carry out every activities associated with apple fruit marketing. The results is in-line with the findings of Osadebamwen *et al* (2022) who reported 32 years as the mean age of respondents in their study on apple fruit in Plateau State, Nigeria. This study also revealed that most (83.3%) of the apple fruit marketers were married, while others were either single, separated and widow. The implication of the findings is that the apple fruit marketing could be a good source of income for their livelihood and family upkeep. The findings of Omotesho *et al.* (2013) also affirmed high percentage of married respondents among apple fruit sellers in their study. Pavlović *et al.* (2020) findings also discovered more (90%) married respondents. The results, further show also that over 86% of the apple fruit marketers were formally educated. The level of education attained by the respondents could aid their ability in packaging and learning better method of preservation of their products. This could be an added advantage in reaching out and communicating effectively with their consumers who were mostly elites. The results indicated that the respondents were well informed and were fully informed on the health benefit of apple fruits and are ready to engage in such enterprise that would enhance wellness of their customers profitably. Also, their exposure educationally would help them to adapt and adopt new marketing strategies that will enhance their efficiency in their business. In addition, the educational composition of the respondents is a clear indication that they were knowledgeable enough to provide reasonable answers to issues related to apple fruits

marketing. The study agrees with the findings of Pavlović *et al.* (2020), where they asserted high level of respondents' education in their study. The mean household size in this study is 6 persons. This implies that members of the household who were within the reach of the marketers could be of help in apple fruit marketing related activities. Thus, the respondents' household is not too big but moderate and the marketers may have less distraction from family tie. The study is almost similar to the findings of Reshi *et al.* (2010) in which they reported a household size of not more than 5 members. This study discovered that apple fruit marketers in the study area have been in the business for an average of eleven (11) years. The implication is that the apple fruit marketers are highly experienced and this made them to remain in the business, probably due to the benefit derived from the business, since no one will continue investing in an unprofitable venture and the more years they spent in the business the better their performance and more market entry opportunities could be discovered. Majority (70.8%) of the respondents sourced fund or capital from their personal savings and re-invested their profit from precious sales to their business, while others borrowed from cooperatives and less than 5% got loan from bank. This implies that the respondents may not be able to expand the size and scope of their business beyond their means, since they probably lack collateral security for bank loan or probably they didn't desire operating beyond small to medium scale. The results is in line with the findings of Ajani (2007), who asserted that personal savings, cooperative societies and friends were the sources of capital for the start-up of fruit and vegetable business, which have the tendencies to impede their business expansion. Majority (94.17%) of the respondents had no access to extension services, no wonder they recorded high perishability of their products, since they have little or no knowledge on modern way of apple fruit preservation and other necessary marketing information on their venture. The results further indicate that majority (92.50%) of the respondnets were members of cooperative which could mean there is a derivable benefits in being member of apple fruit marketers. Thus, large number of apple fruits marketers being a member of cooperative society could be attributed to the benefit enjoyed such as access to credits facilities, access to first-hand information among others. The provision of credits by the cooperatives could drive development among farmers (Kehinde and Ogundeji, 2022). Thus, membership of cooperative could enhance better performance than non-membership due to economies of scale.

Table 1: Distribution of respondents according to their socio-economic characteristics

Socio-economic characteristics	Frequency	Percentage	Mean
Sex			
Female	28	23.33	
Male	92	76.67	
Age (years)			
20-40	72	63.33	
41-60	42	35.00	39 years
61-80	2	1.67	
Marital status			
Single	10	8.33	
Married	100	83.33	
Separated	8	6.67	
Divorced	2	1.67	
Level of education			
No formal education	7	5.83	
Primary education	9	7.50	
Secondary education	68	56.67	
Tertiary education	36	30.00	
Household size			
1-5	50	41.67	
6-10	62	50.67	
11-15	8	6.66	6 persons
Marketing experience			
1-10	68	56.67	
11-20	41	34.17	
21-30	9	7.50	11 years
31-40	1	0.83	
41-50	1	0.83	
Monthly income (N)			
Less than 100, 000	61	50.8	
100,000-200,000	24	20.0	₦84,583.33k
Above 200,000	35	29.2	
Source of credit			
Bank loan	4	3.3	
Personal savings	70	58.3	
Cooperatives	31	25.8	
Profit investment	15	12.5	
Extension Service			
Access	7	5.83	
No access	113	94.17	
Cooperative society			
Non member	9	7.50	
Member	111	92.50	
Total	120	100	

Source: Field Survey, 2022

Costs and returns of apple fruits marketing

The results in Table 2 reveal the average return from apple fruit marketing as N24, 030.83 per carton. The average variable cost incurred by the apple fruit marketers was N19, 979.17 per carton. The Gross margin was N 4,240.19 per carton, while the profit was N4, 051.66 per carton. Apple fruit marketers were able to recover the variable costs invested into the business, thus, it is possible to continue the business in the short run (Senchi and Malami, 2015). The profitability ratio estimated reveals 1.20 as the benefit cost ratio (BCR), which implies that 20 kobo accrued to the apple fruit marketer on every one naira invested into the business. Omotesho *et al.* (2013) also found apple fruit marketing to be a profitable venture in their study.

Table 2: Average Costs and Returns of Apple Fruit Marketing per Carton (45kg)

Items	Value (N)
A. Return	24,030.83
Variables Costs	
Purchase	17,779.17
Transportation	822.59
Loading	82.76
Offloading	67.75
Levy	19.72
Polythene bag	161.37
Labour	857.28
B. Total Variable Costs, TVC	**19,790.64**
C. Gross Margin, GM = A – B	4,240.19
D. Depreciation on fixed items	188.53
E. Total Costs, TC = B + D	**19,979.17**
F. Profit = A – E	4,051.66
G. Benefit Costs Ratio, BCR = A/E	1.20

Source: Field Survey, 2022

Determinants of apple fruits profitability

The results in Table 3 show that the adjusted R^2 value of 0.6924 indicates that 69.24% of the variation in the average return accrued to apple fruit marketers were as a result of the effects of all the explanatory variables (transportation cost, household size, education, marketing experience, age and membership of cooperatives) while 30.76 % unexplained may be embedded in the error term. The results show that apple fruit marketers' level of education and experience in apple fruit marketing were the determinants of their average return which were significant at 1%. Thus, education would enhance better performance of the respondents in terms of getting new market information, quick discovery of the customers' apple fruit varieties preference, new entry to other markets, quick link to elites who could demand home/office delivery of apple fruits and many more. Also, years of experience in apple fruit marketing could increase marketers' skills with its multiplier effect on higher return. It is a common knowledge that no one will remain in an unprofitable venture for a long period of time (Ajani, 2007).

Table 3: Determinants of Apple Fruits Profitability

Variables	Coefficient	Standard error	T	P> | t |
Transportation cost	-0.000994	0.0022714	-0.44	0.663
Household size	0.000045	0.000117	0.38	0.701
Education	0.5744486	0.0516706	11.12	0.000***
Marketing experience	0.4630999	0.1491957	3.10	0.002***
Age	0.1010807	0.1056696	0.96	0.341
Cooperative	0.537225	0.5735535	0.09	0.926
Constant	-17.93092	3.609954	-4.97	0.000***
Number of obs	= 120			
F (7, 112)	= 39.27			
Prob > F	= 0.0000			
R^2	= 0.7105			
Adjusted R^2	= 0.6924			
Root ME	= 4.4973			

Source: Field survey, 2022

Note: *** -Significant at 1%

Constraints to marketing of apple fruits

The results in Table 4 show the constraints to apple fruit marketing in the study area. These include inadequate extension services (0.9395) and inadequate technical-know-how (0.6222) were institutional factors constraining apple fruit marketing. Poor transportation system (0.8932) and lack of storage facilities (0.5112) were infrastructural factors that constrained apple fruit marketing. Perishability (0.6106) was a marketing factor, while credit facilities was an economic factor constraining apple fruit marketing in the area. The perishable nature of the product in most cases have forced respondents to offer their apple fruits to buyers at low prices. The study deduced that apple fruits marketers do not have

adequate access to capital to expand their business ventures. This affirms the findings of Kaka *et al.* (2020), which postulated access to credit as a constraint to marketers. Omotesho *et al* (2013) also discovered inadequate credit facilities as aconstraints in apple fruit marketing in their study within Ilorin metropolis, Kwara State, Nigeria. Poor transport facilities placed the respondents at a disadvantage while buying and selling apple fruits leading to increase transportation costs. The resultant effect will lead to increase marketing costs which will eventually lower marketers' total revenue and profit. Poor transport facilities could lead to produce losses as a result of perishable and bulky nature of apple especially if the commodity is going to be transported to distance places (Al-Dairi *et al.,* 2021; Okwuokenye and Onemolease, 2011). In addition, inadequate storage facilities were rated as serious constraint facing apple fruits marketing in the area. This may bring about considerable losses of apple fruits which invariably may reduce marketers' profit (Mohammed *et al*, 2021).

Table 4: Constraints Confronting Apple Fruits Marketers

Constraints	Mkt. 1	Inst. 2	Eco. 3	Infra. 4
Inadequate source of information	-0.0996	0.0217	0.1121	-0.0240
Lack of credit facilities	0.1337	0.3208	0.5400	0.1763
Poor marketing	-0.0591	0.2083	0.2896	-0.1981
High cost of Packaging materials	0.2132	0.3066	-0.6308	0.2368
Poor transportation system	0.2014	-0.2116	0.0107	0.8932
Lack of storage facilities	-0.0022	0.3321	-0.0438	0.5112
Lack of processing technology	0.0667	0.3032	0.1032	0.2092
Inadequate extension services	-0.2440	0.9395	0.0731	0.0643
Availability of many retailers	0.2789	0.3853	-0.6165	-0.1990
Labour shortage	0.1038	0.0676	-0.0527	-0.2514
Inadequate technical know-how on packaging and preservation	-0.0827	0.6222	0.1625	-0.0611
Poor Communication facilities	0.1604	0.0815	-0.0144	-0.0315
Poor pricing	0.5260	0.4215	0.3447	-0.1831
Seasonality	-0.0045	0.3531	-0.1384	0.4582
Bulky nature of fruits	0.0242	0.2618	-0.1695	0.3894
Theft and pilfering	0.1618	0.3173	0.1325	-0.4424
Perishability	0.6106	0.3946	0.2841	0.1574
Low patronage	0.0121	0.2614	-0.0241	-0.0685
Losses resulting from fruits spoilage	0.2027	0.1578	0.2841	-0.0116
The packaging material is not of standard quality	0.3042	0.2281	0.0752	-0.0640
Losses resulting from pests attack	0.0714	0.3589	0.3962	-0.0320

Source: Field survey, 2022

Note: Mkt.(1) = Marketing Factor, Inst.(2) = Institutional Factor, Econ.(3) = Economic Factor, Infra. (4)= Infrastructural Factor

CONCLUSION AND RECOMMENDATION

The study concludes that educated and married men dominated apple fruit markets in the area. The study further asserted that apple fruit marketing was a profitable venture. Furthermore, the level of education and marketing experience were the determinants of profitability, while poor pricing and perishability (marketing factors), inadequate technical-know-how on packaging and preservation (institutional factors), lack of credit facilities (economic factor), poor transportation system and lack of storage facilities (infrastructural factors) were the constraints to apple fruit marketing in Abuja metropolis. Therefore, apple fruit marketers should collaborate to purchase adequate transportation and cold storage facilities, visit the extension agents to learn modern ways of preserving and prolonging apple fruit shelf life. More women should also be encouraged to engage in the sales of apple fruits to create business opportunity without gender bias.

REFERENCES

Abdullahi, A., Ja'afar-Furo, M.R. and Yahya, H. (2017). Analysis of socio-economic determinants of apple fruits (Chrsophyllum Albidum) Demand among consumers in Mubi metropolis, Adamawa State, Nigeria. *International Journal of social sciences, 3(3), 61-67.* doi: 10.23918/ ijsses.v3:3p61.

Abate, T.M., Mekie, T.M. and Dessie, A.B. (2019). Determinants of marketing outlet choices by smallholder Teff farmers in Dera District,

south Gonder Zone, Amhara National Regional State, Ethopia: a multivariate Probit approach. *Journal of Economic Structures, 8:39.*https:doi.org/10.1186/s40008-019-0167-x.

Ajani, O. I. (2007), Economic analysis of the marketing of fruit inLagos State of Nigeria (A case study of Oyingbo, Oshodi andIkotun markets). *Nigerian Journal of Horticultural Science, 10(1), 38-46.* Doi.10.4.3314/njhs.vioi1.3407

Ajibade, Y.E., Oyibo, F.O., Ameh, O.E. and Enimola, M.O. (2021), Analysis of gender roles in tomato production in Municipal Area Council, Abuja, Nigeria. *Journal of Agricultural Science and Practice, 6(1), 1-12.* https//doi.org/10.31248/JASP2020.237.

Al-Dairi, M., Pathere, P.B. and Alyahyai, R. (2021). Effect of post harvest transport and storage on color and firmness quality of tomato. *Horticulturae,7,163.* https>//doi.org//10.3390/horticulturae7070163.

Ali, A.J., Hooman, D.M., Mirza, H.H. and Zanol, A.R. (2013). A factor analysis of identifying the customer behavior pattern: A case study of Tehran. *European online Journal of Natural and Social sciences, 2(3), 1347-1353.*www.european-science.com.

Aliyu, A., Shelleng, B.A., Hadddeb, A.S. and Abubakar, A. (2020). Analysis of fresh tomato marketing in Mubi metropolitan Area, Adamawa State. *International Journal of Science Academic Research, 1(3), 067-081.* https://www.scienceijsar.com

Bateuen, V.M., Marie Verheyde, Sonia Ponerleau, Alan Doyen and Charles Couillard (2022). Health benefits of apple juice consumption: *A Review of International Trials in Humans Nutrients, 2022.14.821.* http://doi.org//10.3390/nu14040821.

Chidiebere-Mark,N. M. (2016). Consumers attitude and Behavior to fruit. *Academic International Conference on business, marketing and management, 2016, 1-10.*

Ferretti, G. Turco, J. and Bacchetti, T. (2014). Apples as a source of dietary phytonutrients, bioavailability and evidence of protective effects against human cardiovascular disease. *A food and Nutrition Science, 5,1234-1246.* http://dx.doi.org/10.4236/fns.2014.513134

Gambo, B. (2015). Analysis of fruit trade in Yanlemo market, Kano Metropolis, Nigeria. *Academic Research International, 6(3), 61-68.* www.Journals.savap.org.pk

Gosa, A.S., Megento, T.L. and Teka, M.A. (2023). Analysis of vegetable production status and marketing system in Ethiopia: The case study of Sebeta Hawas Woreda, Oroma, Region.

Cogent Food and Agriculture, 9(2), 1-32. https://doi.org/10.1080/23311952.2023.2286047

Ishfaq, A.S. (2020). An analysis on marketing problems of apple fruit growers in Jammu and Kashmir. *Journal of Postharvest Technology, 08(2), 43-53.* www.jpht.in

Kaka, Y., Sahabi, H., Auwal, A.G. and Umar, H.S. (2020). Analysis cowpea (Virgna unguiculata) marketing and price trends in selected markets of Argungu Local Government Area, Nigeria. *Equity Journal of Science and Technology,7(2),125-130.* www.equijost.com

Kehinde, A.A. and Ogundeji, A.A. (2022). The simultaneous impact of access to credit and cooperative services on cocoa production in South-western, Nigeria. hhtps//doi.org/10.1186/s40066-021-0035-4.

Kasonga, F.C. (2018). Gross margin analysis of irrigated beans: A case of Khosolo Extension Planning Areas. *Adv. Crop Science Tech.,6, 402.*doi:10.47172/2329-8863.1000402.

Kughur, P.G., Iornenge, G.M. and Ityonongu, B.E. (2015). Effects of post-harvest losses on selected fruits and vegetables among small-scale farmers in Gboko local government area of Benue State, Nigeria. *International Journal of Innovation. Scientific Research. 19(1), 201-208.*https://www.ijisr.issr-journals.org/

Mohammed, S.Y., Onwuarah, A.S., Panwal, E.F. and Iroegbute, U.K. (2021). Assessing the marketing channels of sweet melon and water melon in Bauchi and Gombe States, Nigeria. *Dutse Journal of Pure and Applied Sciences (DUJOPAS), 7(1), 288-297.* https://fud.edu.ng.2021_MAR_Vol_7_Issue 1PDF

Mosisa, C.A (2018). Constraints, Challenges and Opportunities of Horticultural Crops Marketing in Ambo Town, Ethiopia. *International Journal of Innovative Research and Development, 7(5), 29-35.* https://doi.org/10.24940/2018/v7/i5/APR8030

Muraki, I., Imamura, F., Manson, J.E., Hu, F.B., Willett, W.C. Dam, R.M. and SunQ (2013). Fruit consumption and risk of type 2 diabetes: Results from three prospective longitudinal cohort studies. *BMJ, 2013 August 28, 347:f5001.* doi:10.1136/bmj.f5001

Natalia, V. and Harvey, J. (2021). Product and trade patterns in the world apple market. *Journal of Innovative Marketing, 17(1),16-25.* doi:10.21511/im.17(1).2021.02.

Nguyen, T.N.L. and Nguyen, V.C. (2020). Determinant of profitability in listed enterprises: A study from Vietnamese stock

exchange. *Journal of Asian Finance, Economics and Business, 17(1), 47-58.*10.13106/jafeb.2020.v17.no1.47

Ojo, A.O., Mustapha, A. and Ojo, M.A. Analysis of marketing efficiency of tomato fruits in Abuja Municipal Area Council, Nigeria. *Nigerian Journal of Scientific Research, 15(2), 2016.*

Okwuokenye, G.F and Onemolease, E.A. (2011). Influence of socio-economic characteristics of yam sellers on marketing margin among yam wholesalers in Delta State, Nigeria. *Journal of Agriculture and Social Research (JASR), 11(1), 81-90.* https. ajol.info>jasr>article>view.

Omotesho, O.A., Falola, A. and Adebisi, L.O. (2013). Performance of wild fruit marketing in nigeria (A case study of African Albidum) in Ilorin Metropolis, Kwara State, Nigeria. *Journal of Agriculture and Food Sciences, 11 (1), 44-56.* www ajol.info

Osadebanwen, U.G., Adekoya, A.E. and Akintunde, E.A. (2022). Baseline study of growers constraints in the production of apple (Malus domestica) in Plateau State, Nigeria. *Nigerian Agriculture and Food Security, 11.* https: //doi.org/10.1186/s40066-022-00354-9

Pavlović M., Radoičić, J. and Milanović M. (2020). Profitability Analysis of Apple Production in the Republic of Serbia. *Journal of Economics of Agriculture, 7(3), 817-830.* https://doi.org/10.5937/ekopolj2003817P.

Reshi, M. I., Malik, M.A., and Vijay, K. (2010). Assessment of problems and prospects of apple production and marketing in Kashmir valley, India. *Journal of Environmental Research and Development, 4(4), 1077-1082.* https://www.jerad.org.

Senchi, A.A. and Malami, A.A. (2015). Profitability of non-timber forest product (NTFPS) production and marketing in Zuru Local Government Area, Kebbi State. A case for honey. *Journal of sustainable Agricultural Research, 2 (2), 55-65* Doi:https://doi.org/10.18488/journal.70/2015.2.2/70.2.55.65.

Shah, I. A. (2020). An analysis on marketing problems of apple fruit growers in Jammu and Kashmir. *Journal of Postharvest Technology, 08(2), 43-53.* www.jpht.in

Turocz, Z and Liviu. M. (2012). Emerging markets queries in finance and business. multiple regression analysis of performance indicators in the ceramic industry. *Procedia Economics and Finance, 3, 509-514.* doi:10.1016/52212-5171(12)00188-8.

Climate change mitigation practices among arable crop farmers in Saki East local government area, Oyo state, Nigeria

[1]Adekola, O. A., [2]Adesiji, G. B., [3]Eniola, P. O., [3]Ayandele, A. O. and [2]Komolafe, S. E.

[1]Department of Agricultural Extension and Rural Development, Federal University of Agriculture, Abeokuta, P.M.B. 2240 Abeokuta, Ogun State, Nigeria

[2]Department of Agricultural Extension and Rural Development, University of Ilorin, P.M.B. 1515 Ilorin, Kwara State, Nigeria

[3]Department of Agricultural Technology, The Oke-Ogun Polytechnic, Saki, Oyo State.

Correspondence details: kemmas04@yahoo.com

ABSTRACT

The study investigated the climate change mitigation practices among arable crop farmers in Saki East Local Government Area of Oyo State. Multiple sampling procedure was used to get a sample size of 120 respondents for the study. Interview schedule was used to collect information from the respondents. The result shows that majority (83.3%) of the respondents were male and average of 17.3±4.71 years of experience in arable crop farming. Majority of the respondents indicated that climate change had caused scarcity of food (85.0%), reduction in crop yield through flood and drought (75.0%), and reduction in water availability (60.0%). Use of drought resistance crop (mean=3.0), mixed cropping (mean=2.7) planting of early mature crop and change of seed rate (mean=2.6) ranked 1st, 2nd and 3rd, respectively as the mitigation practices and adaptation measures adopted for arable crop farming. Also, lack of climate information on mitigation practices (100%), lack of resources and modern technology (85.0%), high cost of fertilizer (75.0%), inadequate of funding support (60.0%) were the major constraints faced in using the adaptation measures. There were significant relationship between sex (χ^2=21.875), age (χ^2=144.875), marital status (χ^2=11.725), education (χ^2=65.456) and effects of climate change on arable crop production. The study concludes that arable crop farmers mainly employed the use drought resistance variety, mixed cropping, and early maturing variety practices to mitigate the adverse effects loss of crops and food insecurity caused by climate change. Thus, extension empowerment programmes to build resilience to climate change of farmers is needed among farmers.

Keywords: Climate change, Crop yield, Food security, Climate information

INTRODUCTION

It is not a gainsaying that agriculture is the mainstay of the preponderance of the populace in the rural community of Nigeria where about 80 percent of the engage in agriculture as their means of livelihood (Komolafe *et al*., 2022). Because the land is suitable for farming, farmers in Nigeria cultivate arable crops including yam, cassava, maize, millet, cocoyam, cowpea, guinea corn, and vegetables among others. However, farmers' interest to reap high yield seems to be jeopadiced by the challenges of insecurity through the herdsmen (Eniola *et al*., 2016), soil degradation, deforestation, high cost of external inputs, and climate change among others (Banjoko *et al*., 2021).

Climate change is exhibited by irregular rainfall pattern, high temperature, frequent flooding incidence during the raining season, reduced crop yield, increased crop diseases and pest infestation, reduced fertility of farm land due to excessive erosion and destruction of soil microbes, and increased drought occurrence (Bolarin *et al*., 2022). These effects had resulted in low harvest, food shortage, hunger, unemployment, low life span, and slow economic growth of country (Gabriel *et al*., 2023). Small scale farmers have become the most vulnerable to climate extremes and related risks (Owusu and Yiridomoh,

2021) due to their unequal access to financial resources, lack of productivity enhancing inputs and limiting institutional and infrastructural barriers on their use of climate information (Ogundeji *et al*., 2022) and low level of education and inadequate access to necessary input to mitigate the effects of climate change (Amare and Balana, 2023).

There are some mitigation practices that are less stressful with minimal cost. These include irrigation management, organic practice, planting of pest resistance crops, planting of drought resistance crops, and planting of early mature crop. Such practices should be used by small scale arable crops farmers (Adetomiwa and Kolapo, 2023). Although some of these mitigation practices have already been put to use by the farmers, thus empirical study is needed to understand prominent climate mitigation practices used by farmers growing arable crops to avert the effects of change in climate.

The broad purpose of this study was to examine climate change mitigation practices among arable crop farmers in in Saki East Local Government Area (LGA) of Oyo State. Specifically, the study (i) described the socio-economic characteristic of arable crops farmers in the study area, (ii) examined the adaptive and mitigation measures used by the farmers, and (iii)

identified constraints to adaptive and mitigation measures to climate change effects.

METHODOLOGY

The research was carried out in Saki East local government area Oyo States, Nigeria. The headquarters of the council is Ago-Amodu. It has an area of 1,569km and a population 10232 at the 2006 census with Ago- Amodu, Sepeteri, Ogbooro, Oje-Owode and Ogbonle as the major communities. It is geographical located on longitude 3.32E and latitude 6.35N. The annual temperature is 36-30^c. The lowest temperature is experience in august with 24 to 30^c as mean and the highest in March with a mean of 37^c. The major language spoken is Yoruba and farming is the main occupation in the study area.

The population of the study consists of arable crop farming. Multistage sampling technique was used in this study. The first stage involves random selection of two wards namely ward 4 and 6 having population of 184 farmers and 215 farmers respectively, as retrieved from Oyo State ADP office. The second stage involved a random selected 30% of the population of farmers in the selected wards. Thus, 120 was the sample size.

Primary data for the study were obtained with the use of structured questionnaire. The instrument was designed gather information on the specific objectives and administered by researchers through interview. All the 120 instruments were retrieved. Adaptation and mitigation practices was measured at nominal level as agreed 1, Strongly agreed 2, Undecided 3, Disagreed 4, strongly disagreed 5 and vice versa for the negative questions. Constraint to adaptation and mitigation practices was measured on the scale of yes 1 and no 0. Descriptive statistics including frequency and percentage were used to analyse and present the specific objectives while hypothesis was tested using chi-square analysis at 5.0% significant level.

RESULTS AND DISCUSSION

Socioeconomic characteristics

Table 1 shows that majority (83.3%) of the respondents were male. Average age proportion was 51.0±12.2 years among the respondents. This indicates that a large proportion of the farmers is ageing and may become more vulnerable to climate change effects because of the diminishing strengths to carry-out some adaptation practices (Adetomiwa and Kolapo, 2023).

Majority (83.3%) of the respondents were married with average of 5.3±2.30 persons per household. This indicates the farmers in the study area have household responsibility to at least 5 persons. This number could be considered moderate to manage and could also be utilized to implement climate change adaptation practices that require high labour (Owusu and Yiridomoh, 2021). Regarding educational status of the respondents, larger percentage (45.0%) had no formal education, while others (55.0%) had one form of formal education of at least primary schools education. Formal education is expected to positively influence the use of climate smart adaptation practices in the study area (Anabaraonye et al., 2019).

The average monthly income of the respondents was ₦35,833±11,313. This amount is suggested to be low considering the present economic situation and the cost of agricultural inputs. This factor may hinder the effective use of climate change adaptation practices where inputs such as drought tolerance variety, flood tolerance variety and others are needed to be purchase (Amare and Balana, 2023). Furthermore, the average years of experience in arable crop farming was 17.3±4.71 years. This suggests that farmers in the study area have relatively long years of experience in arable crop farming. This attribute is expected to have built farmers' knowledge of the effects of climate change and peculiar working measures to adapt the effects in the study area. Additionally, all (100.0%) of the respondents were aware of climate change phenomenon. This status is expected to help the farmers in preparation for use the adaptation measures to mitigate the effects of climate change on arable crops.

Effect of climate change on arable crop production

Results presented in Table 2 show that majority of the respondents indicated that climate change had caused scarcity of food (85.0%), reduction crop yield through flood and drought (75.0%), and reduction in water availability (60.0%), while appreciable percentage further indicated extreme temperature and precipitation prevents crop from growing (55.0%) and severe storm destruction of crops (45.0%) as other effects of climate change. This shows that the incidence of climate change on arable crops of farmers has mainly caused reduced water available for crop growth, reduced crop yield and then food insecurity in the study area. These findings are consistent with previous studies that reported that climate change reduced crop yield and food insecurity among smallholder farmers (Bolarin et al., 2022; Amare and Balana, 2023).

Table 1: Socio economic Characteristics of Respondents

Variable	Frequency	Percentage	Mean±SD
Sex			
Male	100	83.3	
Female	20	16.7	
Age			
20-29	10	8.3	
30-39	10	8.3	51.0±12.2
40-49	30	25.0	
50 and above	70	58.4	
Marital status			
Single	20	16.7	
Married	100	83.3	
Education status			
Non formal	54	45.0	
Primary school	29	24.2	
Secondary school	26	21.7	
Tertiary	11	9.2	
Monthly Income (₦)			
Below 20,000	40	33.3	
20,000-30,000	50	41.7	35,833±11,313
30,001-40,000	10	8.3	
40,001-50,000	10	8.3	
50,001 and above	10	8.3	
Household size (persons)			
1-5	70	58.3	
6-10	50	41.7	5.3±2.30
Years of experience			
1-5	30	25.0	
6-10	10	8.3	17.3±4.71
11-15	10	8.3	
16-20	30	25.0	
21 and above	40	33.4	
Awareness of climate change			
Yes	120	100.0	

Source: Field Survey, 2022

Table 2: Effect of climate change on arable crop production

Effect of climate change on arable crop production	Frequency	Percentage
Scarcity of food	102	85.0
Reduction crop yield	90	75.0
Reduction in water availability	72	60.0
More severe storm destructive	54	45.0
Flood and drought may reduce yield	90	75.0
More extreme temperature and precipitation prevents crop from growing	66	55.0

Source: Field survey, 2022

Mitigation practices and adaption measures

Information on mitigation practices and adaptation measures adopted by respondents in Table 3 shows that Use of drought resistance crop (mean=3.0), mixed cropping (mean=2.7) planting of early mature crop and change of seed rate (mean=2.6) ranked 1st, 2nd and 3rd, respectively as the mitigation practices and adaptation measures adopted for arable crop farming. Other mitigation practices were prompt identification of weather and change of planting space (mean=2.5) and use of renewable energy (mean=2.1). This finding implies that the prominent mitigation practices and adaptation measures adopted by arable crop farmers in the study area were the use of drought resistance crop, mixed cropping, planting of early mature crop and change of seed rate.

Table 3: Distribution of respondents on mitigation practices and adaptation measures

Mitigation practices and adaption measures	SA F %	A F %	U F %	D F %	SD F %	Mean
Irrigation management	-	10 8.3	-	38 31.7	72 60.0	1.6
Use of drought resistance crop	-	56 46.7	34 28.3	10 8.3	10 16.7	3.0
Organic practice	18 15.0	44 36.7	38 31.7	20 16.7	-	2.5
Use renewable energy	18 15.0	82 68.3	10 8.3	10 8.3	-	2.1
Planting of early mature crop	8 6.7	56 46.7	36 30.0	20 16.7	-	2.6
Use of pest resistance crop	36 30.0	46 38.3	28 23.3	-	10 8.3	2.2
Change of planting space	18 15.0	44 36.7	38 31.7	20 16.7	-	2.5
Change of seed rate	8 6.7	56 46.7	36 30.0	20 16.7	-	2.6
Mixed cropping		52 43.3	48 40.0	20 16.7	-	2.7
Prompt identifying of weather	72 60.0	38 31.7	-	10 8.3	-	2.5

Source: Field survey, 2022

Constraints faced in using the adaptation measures

Regarding the constraints to usage of adaptation measures to the mitigate the effects of climate change, Table 4 shows that majority of the respondents indicated that lack of information on mitigation practices (100%), lack of resources and modern technology (85.0%), high cost of fertilizer (75.0%), inadequate of funding support (60.0%) were the major constraints faced in using the adaptation measures, while few others indicated lack of technical expertise (40.0) and insufficient labourers (30.0%). This finding implies that the main constraints to the mitigate the effects of climate change by arable crop farmers in the study area were lack of information on mitigation practices, lack of resources and modern technology, high cost of fertilizer, and inadequate of funding support.

Table 4: Distribution of respondents on constraints faced in using the measures

Constraints	Frequency	Percentage
Lack of technical expertise	48	40.0
Inadequate of funding support	72	60.0
Insufficient labourers	36	30.0
Staff work plan and procedures	84	70.0
Lack of information on mitigation practices	120	100.0
High cost of fertilizer	102	85.0
Lack of resources and modern technology	102	85.0

Test of hypothesis

There is no significant relationship between socio-economic characteristic of the respondents and effect of climate change on arable crop production.

Table 5 shows that there were significant relationships between sex ($\chi^2 =21.875$), age ($\chi^2 =144.875$), marital status ($\chi^2 =11.725$), education ($\chi^2=65.456$) and effects of climate change on arable crop production. This shows that marriage, education, advanced age and increased years of formal education support the employment of adaptation measures against climate change effects on arable crops of the farmers in the study area.

16

Table 5: Relationship between socio-economic characteristic of the respondents and effect of climate change on arable crop production

Variable	Chi-Square	df	Significance (p)	Remark
Sex	21.875	1	0.000	Significant
Age	144.875	4	0.000	Significant
Marital status	11.725	2	0.003	Significant
Household	4.300	3	0.231	Not Significant
Education	65.456	3	0.005	Significant
Monthly income	6.4678	3	0.072	Not Significant

CONCLUSION AND RECOMMENDATIONS

Results from this study reveal that increasing in temperature, destructive storms and drought in sampled local governments have existed over the many years. This has undermined gradually arable crop production yield and made arable crop farmers more vulnerable to climate change. Thus, the farmers mainly employed the use drought resistance variety, mixed cropping, and early maturing variety practices to mitigate the adverse effects loss of crops and food insecurity caused by climate change. However, they did not make use of irrigation management system because of lack of fund and knowledge. It is therefore recommended that the Federal government, State and local government are encouraged to support arable crop farmers in the provision of irrigation facilities and support services as well as frequent extension training to support farmers.

REFERENCES

Adetomiwa, K., and Kolapo, A. J. (2023). Implementation of conservation agricultural practices as an effective response to mitigate climate change impact and boost crop productivity in Nigeria. *Journal of Agriculture and Food Research*, *12*, 100557. https://doi.org/10.1016/j.jafr.2023.100557

Amare, M., and Balana, B. (2023). Climate change, income sources, crop mix, and input use decisions: Evidence from Nigeria. *Ecological Economics*, *211*, 107892. https://doi.org/10.1016/j.ecolecon.2023.107 892

Anabaraonye, B., Okafor, J. C., and Hope, J. (2019). Educating farmers in rural areas on climate change Adaptation for sustainability in Nigeria. In *Springer eBooks* (pp. 2771–2789). https://doi.org/10.1007/978-3-319-93336-8_184

Banjoko, I. K., Ifabiyi, J. O., Lawal, S. W., Ahmed, S. A., Isiaka, M. A., and Komolafe, S.E. (2021). Small ruminant farmers' perception of climate change in Moro Local Government Area, Kwara State, Nigeria. *Nigerian Agricultural Journal, 52*(2), 289-296.

Bolarin, O., Adebayo, S.A., and Komolafe, S.E. (2022). Resilience building mechanism to mitigate effects of climate change by yam farmers in Benue State, Nigeria. *Sarhad Journal of Agriculture, 38*(4), 1279-1288. https://doi.org/10.17582/journal.sja/2022/38. 4.1279.1288

Eniola, P. O., Adeleke, A. O., and Okanlawon, O. M. (2016). Effect of transhumance pastoralism on farming activities among crop farmers in Oke-Ogun area of Oyo State. *Nigeria journal of rural sociology, 16*(3), 45-50.

Gabriel, I., Olajuwon, F., Klauser, D., Michael, B., and Renn, M. (2023). State of climate smart agriculture (CSA) practices in the North Central and Northwest zones Nigeria. *CABI Agriculture and Bioscience*, *4*(1). https://doi.org/10.1186/s43170-023-00156-4

Komolafe, S.E., Adesiji, G.B. and Akanbi, S.O. (2022). The contribution of yam farming activities to livelihood of farmers in Ekiti State, Nigeria. *Jambura Agribusiness Journal, 4*(1), 1-12. http://doi.org/10.37046/jaj.v4i1.13706

Ogundeji, A. A., Danso-Abbeam, G., and Jooste, A. (2022). Climate information pathways and farmers' adaptive capacity: insights from South Africa. *Environmental Development*, *44*, 100743. https://doi.org/10.1016/j.envdev.2022.10074 3

Owusu, V., and Yiridomoh, G. Y. (2021). Assessing the determinants of women farmers' targeted adaptation measures in response to climate extremes in rural Ghana. *Weather and Climate Extremes*, *33*, 100353. https://doi.org/10.1016/j.wace.2021.100353

Influence of agriculture portrayal in *Ona Wura* movie on youths' perception of agricultural career in Ibadan North local government area of Oyo State, Nigeria

Badiru, I. O. and Soladoye-Adewole, T. J.
Department of Agricultural Extension and Rural Development, University of Ibadan
Correspondence details: bodebadru@gmail.com

ABSTRACT

Entertainment-education tools are underutilised in the promotion of food security in Nigeria. This study assessed the influence of positive portrayal of agriculture in few scenes of *Ona Wura* movie on youths' perception of agriculture as a career in Oyo State. Exposure to, satisfaction and retention of the movie as well as youths' perception of career in agriculture were assessed using structured questionnaire administered to 130 secondary school students randomly selected from the study area. Data were analysed using t-test at 95% level of significance. Only a few students (4.7%) had watched the movie more than once. Respondents were satisfied with the lessons learnt in the movie ($\bar{x}=1.54$), but majority (86.9%) had low retention of the movies watched. There was a slight increase in the percentage of respondents with favourable perception of a career in agriculture (from 50.8% to 56.9%) after watching the movie. There was no significant difference in the respondents' perceptions of career in agriculture before and after exposure to the movie ($p \geq 0.05$). Stakeholders should be strategic in their use of entertainment education to enhance youths' perception of agriculture in Nigeria.

Keywords: Entertainment-education, Behavioural change, Positive portrayal, Food security

INTRODUCTION

Entertainment education (EE) is the process of purposely designing and implementing a media message to both entertain and educate. This is done to increase audience members' knowledge about an educational issue, create favourable attitudes and influence behaviour and cultural norms (Media Impact, 2013). Entertainment education is a communication tool which involves incorporating educational messages into popular entertainment content to raise awareness, increase knowledge, create favourable attitude, and ultimately motivate people to take socially responsible actions in their own lives (Singhal and Rogers, 1999). It is an aspect of the media which has been successfully used for social engineering in many fields of human development for decades. As a strategy, it is taken very seriously by the public health community, as well as other sectors. In fact, millions of naira is usually spent by advertising industries in a bid to promote certain selected ideas by influencing the thoughts and actions of viewers.

In Nigeria, EE has been used successfully in addressing important social, environmental and health issues using soap operas, sitcoms, movies as well as reality shows. A good example is the outcome of a study to evaluate a newly introduced HIV themed TV series, 'SHUGA', which suggested that edutainment is more influential and cost effective than traditional behaviour change campaigns for HIV and other issues may be more successful with the help of professional storytellers. Young people who watched Mtv Shuga were found twice as likely to get an HIV test, while Chlamydia infections dropped by 58% among women (World Bank, 2017).

Research has shown that the entertainment education can affect viewers positively. It is also known to affect them negatively when unhealthy messages are passed across. Issues raised in this regard include smoking and violence which has been shown to negatively influence viewers, most especially the youths (Luxury Beach Rehab, 2020). This goes to show that the media can go a long way in influencing public views and behaviour at both conscious and sub conscious levels.

The kind of influence that entertainment education has proven to possess over the years suggests that it can as well be used to tackle one of the major problems being faced by Nigeria's agricultural sector and sustain interest of youths in agriculture as a career.

Since youths are the future of the nation as well as its food security, Nigeria need to optimise the strength of her youths in the agricultural sector. Recent government efforts and stark economic realities are gradually enhancing the involvement of youths in the agricultural sector. This trend needs to be sustained through enhanced appreciation and sensitisation on the potential economic benefits accruable from agricultural activities and the value chain that supports it.

Badiru (2017) and Badiru (2019) proposed that partnering with the entertainment media can play an important role in educating the young generation about agriculture as well as erasing the widespread jaundiced view on the practice of agriculture. It is opined that since movies, films, and documentaries are used to promote health, democracy and good values, same can go for agriculture. The younger generations need to see that agriculture is profitable for them to practice it.

In addition, positive portrayal of farmers is needed so that their successful stories can encourage potential farmers (Badiru, 2023). Empirical validation or otherwise of the foregoing assertion necessitated the study of the influence of portrayal of agriculture in *Ona wura* movie on youths' perception of agriculture as a career.

Ona Wura is a Yoruba movie produced by Muyiwa Ademola in 2013. Although, a love movie, it has an interesting agricultural theme that can captivate the audience.

The movie has two main characters, Leye and Pemisire who took an oath of love as teenagers. They later separated from each other by the tides of life, but the oath that bound them caused an impediment that brought them together again. Pemisire however, could not cope with Leye, a poor local farmer and therefore decided to dump him after securing what she desired from the union. Leye went on to study agriculture and became successful, proving everyone wrong that a farmer cannot be an achiever.

The main objective of this research was to ascertain the influence of portrayal of agriculture in *Ona wura* movie on secondary school students' perception of agriculture as a career. The specific objectives were to:

1. describe the personal characteristics of the respondents,
2. determine the respondents' level of exposure to the movie;
3. ascertain the satisfaction of respondents with the message embedded in the movie watched;
4. assess the respondents' level of retention of the movie watched;
5. evaluate the respondents' perception of the agricultural protagonist in the movie watched; and
6. examine the respondents' perception of a career in agriculture before and after watching the movie.

METHODOLOGY

The study was conducted in Ibadan North Local government of Ibadan, Oyo state, Nigeria. A three-stage sampling procedure was used to select the respondents of the study. Ibadan North local government has a total of 86 secondary schools. The listed schools were grouped into 4 clusters based on geographical location (UI/Ojoo axis, Sango/Ijokodo axis, Bodija axis, and Mokola axis), out of which 50% random selection of the clusters was done to select Sango /Ijokodo Axis which consists of 16 secondary schools and Mokola axis which consists of 22 schools. Five schools representing 10% of the schools in the selected clusters were then selected using simple

random sampling technique. However, three out of the total number of selected schools accepted to participate in the research; The polytechnic high school and United secondary school from Sango/Ijokodo axis, and Cenfex high school from Mokola axis.

Ten percent of the overall population of senior secondary students in each of these school were selected as a representative sample to participate in the research.

Collection of data was done with the aid of structured questionnaires filled by a total of 130 respondents. A quasi-experimental research design (before and after exposure method) was used to ascertain if watching the movie resulted in any change in the perception of respondents on career in agriculture. Since the movie which the research work was based on is an old production, and many of the students might not have been in contact with it prior to the research work, the film was projected for viewing in the school halls, while questionnaires were administered immediately before and after it was watched.

The choice of the movie was due to its agricultural theme. Although, a better and more deliberate agricultural-themed movie would have been preferred, but such movies are scarce. An agricultural themed intervention titled, 'yellow cassava' sponsored by IITA and HarvestPlus. However, 'yellow cassava' was deemed unsuitable because it promoted an agricultural technology rather than portray the prospect of engaging in agriculture which was the focus of the research effort.

The research variables of the study include personal characteristics of the respondents, exposure to the movie, retention of the movie, satisfaction with the movie, and respondents' perception of the movie protagonist and agriculture as a career.

Exposure to the movie was measured by asking respondents if they had watched the movie before, and asking them to state how many times they had watched the movie. Retention of the movie was operationalised by asking the respondents to give a summary of the movie. The summary was graded on a scale of 0 to 10 and based on a benchmark of 5 categorised into low and high retention. To determine satisfaction with the movie, respondents were asked to rate their movie experience which was measured on a three-point scale of; not satisfactory (NS), satisfactory (S), and very satisfactory (VS). The responses were scored 0, 1 and 2, respectively. The weighted mean scores were thus used to rank the movie viewers' satisfaction levels. Meanwhile, respondents' perception of the movie protagonist and agriculture as a career were measured by using perception statements which were rated on a

5-point Likert like scale as strongly agree (SA), agree (A), undecided (U), disagree (D) and strongly disagree (SD). The respective means of the perception scores were further used in categorising the respondents into favourable and unfavourable.

RESULTS AND DISCUSSION

Personal characteristics of respondents
Table 1 below shows that the respondents were between the ages of 14 and 16 years. This is expected as they are still within the period to form career choices, with the added advantage that they are more prone to entertainment media like movies. A larger percentage were female (57.7%), this could indicate more of female enrolment in secondary schools more than males in the study area.

More of the respondents indicated that their parents had some form of formal education, with mothers attaining secondary school level of education (31.5%), while 32.8% of the fathers had secondary school

education. This may imply that the parents would cherish formal education and would want their children to obtain successful careers after their studies.

The table shows that 50% of the respondents' parents were involved in agriculture, with only 12.3% of the figure involved in it as their main business, while the rest had varying degrees of interest in agriculture. This suggests a fair exposure to agricultural activities by the students and this provides a balanced influence on the students' interest in agriculture as a career choice.

The table also indicates that only 42.3% of the respondents were interested in agriculture as a future career. This is expected considering their level of exposure to the career choice through their parents' involvement in agriculture. Badiru *et al* (2019) had earlier concluded that parents with better awareness about the prospects of agriculture tend to influence their children positively toward a career in the in the sector.

Table 1: Distribution of personal characteristics of respondents

Personal characteristics	Frequency	Percentage	Mean
Age			
12	1	0.8	15.2615
13	4	3.1	
14	22	16.9	
15	55	42.3	
16	30	23.1	
17	17	13.1	
18	1	0.8	
Sex			
Male	55	42.3	
Female	75	57.7	
Academic qualification of mother			
No formal education	2	1.5	
Primary	40	30.8	
Secondary	42	32.3	
NCE/Diploma	10	7.7	
B.Sc./HND	15	11.5	
Post graduate	21	16.2	
Academic qualification of father			
No formal education	4	3.1	
Primary	20	15.4	
Secondary	44	33.8	
NCE/Diploma	14	10.8	
B.Sc./HND	11	8.5	
Post graduate	37	28.5	
Parents' involvement in farming			
My parents are not involved at all	65	50	
They are involved, but as a hobby	28	21.5	
Involved as side business	21	16.2	
Involved as main business	16	12.3	
Career in view			
Agricultural related	55	42.3	
Non-agricultural related	75	57.7	
Total	130	100	

Source: Field Survey, 2020

Level of exposure to the movie

Table 2 below shows that only very few students (4.7%) had watched the movie more than once. This implies that the movie was not widely publicised and watched. Therefore, the effect of its exposure to the youths, if any, could be easily ascertained after watching. After all, entertainment education has been found to be effective in behaviour change (Ladigbolu and Olajide, 2018); (Olajide and Ladigbolu, 2020).

Table 2. Distribution of secondary school students' degree of frequency of secondary school students' exposure to *Ona wura*

Degree of exposure	Frequency	Percentage	Mean
Once	124	95.3	1.1154
Twice	1	0.8	
Thrice	3	2.3	
Four times	1	0.8	
Six times	1	0.8	
Total	130	100	

Source: Field Survey, 2020

Satisfaction of the students with the message embedded in the movie.

Results from Table 3 indicates that the respondents were generally satisfied with the movie as all of the mean scores except one were above the set benchmark. In fact, they were satisfied with the lessons learnt in the movie ($\bar{x}=1.54$), storyline of the movie ($\bar{x}=1.30$) and ability of the movie to promote agriculture ($\bar{x}=1.29$) which ranked third in priority. They were equally satisfied with the language used in the movie ($\bar{x}=1.29$). As the study area consists mainly of Yoruba speaking communities, this may indicate that students prefer watching movies in their own local language.

Meanwhile, the students were most dissatisfied with the length of time in which the movie played ($\bar{x}=0.87$), which is an indicator of the short attention span of the youths. Hence, entertainment educational messages targeted at the youth should be brief in nature to achieve the desired purpose in line with Kraus Group (2022) position that adverts should be shorter and smarter to align with the reduction in the attention span of customers.

Respondents' retention of the movie

Data in Table 4 reveal that only 13.1% of the respondents were able to reproduce the storyline excellently in writing, while the remaining 86.9% were unable to produce it to a high degree of accuracy. This may indicate the respondents' low retention ability of the messages inherent in the movie by the students. It could as well indicate the writing prowess which differs from one respondent to the other.

Table 3: Distribution of secondary school students' satisfaction with the message embedded in the movie

Statements	Not satisfactory	Satisfactory	Very satisfactory	Mean	Rank
The lessons learnt in the movie	7(5.4)	46(35.4)	77(59.2)	1.54	1st
The storyline of the movie	5(2.3)	81(62.3)	44(33.8)	1.30	2nd
The movie's ability to stimulate interest in agriculture	12(9.2)	68(52.3)	50(38.5)	1.29	3rd
Language used in the movie	8(6.2)	77 (59.2)	45(34.6)	1.29	4th
Ability of the movie to promote agriculture	13(10.0)	67(51.5)	50(38.5)	1.29	4th
The language translation in the movie	13(10.0)	75(57.7)	42(32.3)	1.22	6th
Interpretation of character	14(10.5)	83(63.8)	33(25.4)	1.15	7th
Agricultural content in the movie	15(11.5)	85(65.4)	30(23.1)	1.12	8th
Sound quality of the movie	26(20)	68(52.3)	36(27.7)	1.08	9th
The movie plot	22(16.9)	76(58.5)	32(24.6)	1.08	9th
The picture quality of the movie	27(20.8)	71(54.6)	32(24.6)	1.04	11th
The length of time in which the movie played	35(26.9)	75(57.7)	19(14.6)	0.87	12th

Source: Field Survey, 2020 *Percentages are in parentheses

Table 4: **Distribution of respondents based on retention of the movie**

Level of retention	Frequency	Percentage
Low retention	113	86.9
High retention	17	13.1
Total	130	100

Source: Field Survey, 2017 *Percentages are in parentheses

Respondents' perception of the agricultural protagonist in the movie

From Tables 5a and b, more of the respondents (53.9%) had favourable perception of the agricultural protagonist in the movie. In addition, the protagonist's (Leye) character improved the views of majority (75.4%) of the respondents about agriculture.

Most of them (81.5%) also agreed or strongly agreed that more of such characters should be encouraged in movie production. Majority (86.9%) also agreed or strongly agreed that the agricultural protagonist in the movie interpreted his role well. Also, more of the respondents (61.5%) strongly agreed that the movie protagonist was able to convey how a farmer can be successful in real life, with 23.8% also agreeing to the statement.

The findings imply that the respondents were impressed by the character of the protagonist and could therefore be attracted to his career in the film since media watchers can learn the behaviours of the actors in the movies and believe that their actions are real and valid in line with Gerbner's theory (Badiru, 2019).

Perception of respondents on a career in agriculture

Perception of respondents on a career in agriculture (before exposure to the movie). From Table 6, there are indications that majority of the students saw nothing wrong with practising agriculture, but they thought that it is usually overrated. The categorisation shows that more of the respondents (50.8%) had a favourable perception of a career in agriculture. This favourable perception could be as a result of their parents' involvement in agriculture at various levels (Badiru *et al*, 2019).

Table 5a. Distribution of secondary school students' perception about the agricultural protagonist in the movie.

Perception statements	SA	A	U	D	SD
I like the character played by Leye.	83(63.8)	35(26.9)	11(8.5)	0(0.0)	1(0.8)
The character played by Leye in the movie was not exactly inspiring.	20(15.4)	17(13.1)	18(13.8)	48(36.9)	27(20.8)
Leye's character improved my views on agriculture	51(39.2)	47(36.2)	21(16.2)	8(6.2)	3(2.3)
I think Leye overrated agriculture in the movie.	20(15.4)	40(30.8)	25(19.2)	25(19.2)	20(15.4)
Leye added value to himself as agricultural entrepreneur.	50(38.5)	49(37.7)	18(13.8)	5(3.8)	8(6.2)
I think the protagonist interpreted his role well.	67(51.5)	46(35.4)	15(11.5)	2(1.5)	0(0.0)
Characters like the one played by Leye should be encouraged in movie production	51(39.2)	55(42.3)	19(14.6)	3(2.3)	2(1.5)
The protagonist could have done better than studying agriculture	21(16.2)	41(31.5)	28(21.5)	30(23.1)	10(7.7)
I think Leye was able to convey how a farmer can be successful in real life	80(61.5)	31(23.8)	14(10.8)	4(3.1)	1(0.8)
I think the protagonist's decision to study agriculture was great	63(48.5)	47(36.2)	14(10.8)	3(2.3)	3(2.3)
Leye's character doesn't really have a positive impact on how I view agriculture	22(16.9)	15(11.5)	28(21.5)	36(27.7)	29(22.3)

Table 5b: Categorisation of respondents' perception about the agricultural protagonist in the movie.

Perception	Frequency	Percentages
Favourable	70	53.9
Unfavourable	60	46.1
Total	130	100

Source: Field Survey, 2020

22

Table 6: Distribution of secondary school students' perception of a career in agriculture before being introduced to the movie

Perception statements	SA	A	U	D	SD
I think agriculture is usually overrated	33(25.4)	49(37.7)	16(12.3)	24(18.5)	8(6.2)
Agriculture is very important	88(67.7)	36(27.7)	4(3.1)	1(.8)	1(.8)
Too many injuries are involved in agriculture	6(4.6)	32(24.6)	20(15.4)	52(40.0)	20(15.4)
Agriculture is practised by educated people	18(13.8)	35(19.2)	13(10.0)	37(28.5)	36(27.7)
I can practise agriculture as full-time business	28(21.5)	48(36.9)	12(9.2)	25(19.2)	17(13.1)
Farmers are dirty people	7(5.4)	4(3.1)	8(6.2)	52(40)	59(49.4)
Farmers are illiterates	5(3.8)	9(6.9)	15(11.5)	43(33.1)	58(44.6)
Agriculture is meant for school drop outs	5(3.8)	8(6.2)	5(3.8)	33(25.4)	79(66.8)
I will only farm if modern machines are available	26(20)	33(25.4)	17(13.1)	32(24.6)	22(16.9)
Agriculture is too laborious for me	15(11.5)	30(23.1)	13(10.0)	54(41.5)	18(13.8)
I will like to practise agriculture in future	23(17.7)	50(38.5)	23(17.7)	21(16.2)	17(13.1)
I can achieve success as an educated farmer	61(46.9)	54(41.5)	10(7.7)	4(3.1)	1(.8)
I intend to study agriculture in the university	4(3.1)	6(4.6)	23(17.7)	39(30.0)	76(58.5)
Agriculture is meant for poor people	4(3.1)	6(4.6)	5(3.8)	39(30)	76(58.5)
An agriculturist can attain the same level in the society as professionals in other fields	48(36.9)	10(7.7)	4(3.1)	6(4.6)	7(5.4)
Agriculture can solve the problem of unemployment in Nigeria	81(62.3)	39(30.0)	6(4.6)	3(2.5)	1(.8)
I think I will be called a local person if I go into agriculture	10(7.7)	9(6.9)	11(8.85)	60(46.2)	40(30.8)
I don't think I can have a close relationship with someone practising agriculture in future	10(7.7)	7(5.4)	10(7.17)	48(36.9)	55(42.3)
A person who studied agriculture can write and speak fluently	75(57.7)	38(29.2)	13(10.0)	3(2.3)	1(.8)
I can marry someone practising agriculture in future	49(37.7)	45(34.6)	21(16.2)	10(7.7)	5(3.8)
Nothing can ever convince me to go into agriculture in future	14(10.8)	29(22.3)	22(16.9)	40(30.8)	25(19.2)
I can only practise agriculture as a side business.	25(19.2)	65(50)	20(15.4)	9(6.9)	11(8.5)
Agriculture is just as important as any other career	58(44.6)	55(40)	10(7.7)	5(3.8)	5(3.8)
Like agriculture, every career has its own risks.	53(40.8)	56(43.1)	9(6.9)	6(4.6)	6(4.6)
Educated farmers are neat	61(46.9)	43(33.1)	13(10.0)	7(5.4)	6(4.6)
Jobs that are not related to agriculture can also be tasking	44(33.8)	43(33.1)	20(15.4)	15(11.5)	8(6.2)

Categorisation of secondary school students' perception scores before the movie intervention

Perception	Frequency	Percentage
Unfavourable	64	49.2
Favourable	66	50.8
Total	130	100

Source; Field survey, 2020

Table 7 shows the perception of the respondents after being introduced to the movie. Some responses indicate only little changes in perception. The categorisation shows a slight increase in respondents' overall favourable perception of a career in agriculture after exposure to the movie (56.9%) from 50.8% in Table 6, and subsequently, a fall in the percentage of respondents with unfavourable perception of a career in agriculture from 49.2% (before exposure to the movie) to 43.1%. This may indicate that agricultural themed movies have the potential of changing people's opinions or stance on agriculture from negative to positive.

Test of difference between the perception of respondents before and after the movie intervention

Results in Table 8 show that there is no significant difference between the respondents' perception before and after exposure to the movie ($p \geq 0.05$), although the mean difference reflects a marginal increase in the mean from 98.19 before exposure to 98.81 after exposure to the movie. One may reason that since there was a slight and positive difference in perception due to exposure to one movie with a positive portrayal of agriculture, multiple and continuous exposure to agriculture themed movies like *Ona Wura* could bring

about a significant and positive difference in the perception of the viewers about agriculture.

Table 7: Distribution of secondary school students' perception of a career in agriculture after being introduced to the movie.

Perception statements	SA	A	U	D	SD
I think agriculture is usually overrated	24(18.5)	35(26.9)	22(16.9)	25(19.2)	24(18.5)
Agriculture is very important	78(60)	42(32.3)	8(6.2)	1(.8)	1(.8)
Too many injuries are involved in agriculture	8(6.2)	29(22.3)	22(16.9)	41(31.5)	30(23.1)
Agriculture is practised by educated people	18(13.8)	25(19.2)	14(10.8)	44(33.8)	29(22.3)
I can practise agriculture as full-time business	38(29.2)	47(36.2)	22(16.9)	11(8.5)	12(9.2)
Farmers are dirty people	7(5.4)	7(5.4)	17(13.1)	51(39.2)	48(36.9)
Farmers are illiterates	4(3.1)	6(4.6)	21(16.2)	48(36.9)	51(39.2)
Agriculture is meant for school drop outs	5(3.8)	4(3.1)	20(15.4)	38(29.2)	63(48.5)
I will only farm if modern machines are available	23(17.7)	31(23.8)	19(14.6)	34(26.2)	23(17.7)
Agriculture is too laborious for me	9(6.9)	26(20)	22(16.9)	46(35.4)	27(20.8)
I will like to practise agriculture in future	25(19.2)	43(33.1)	32(24.6)	14(10.8)	16(12.361)
I can achieve success as an educated farmer	61(46.9)	47(36.2)	14(10.8)	2(1.5)	6(4.6)
I intend to study agriculture in the university	19(14.6)	28(21.5)	31(23.8)	28(21.5)	24(18.5)
Agriculture is meant for poor people	4(3.1)	7(5.4)	11(8.5)	44(33.8)	64(49.2)
An agriculturist can attain the same level in the society as professionals in other fields	82(63.1)	32(24.6)	12(9.2)	3(2.3)	1(.8)
Agriculture can solve the problem of unemployment in Nigeria	89(68.5)	26(20)	9(6.9)	3(2.3)	1(.8)
I think I will be called a local person if I go into agriculture	10(7.7)	13(10.0)	17(13.1)	44(33.8)	45(34.6)
I don't think I can have a close relationship with someone practising agriculture in future	9(6.9)	8(6.2)	15(11.5)	15(11.5)	57(43.8)
A person who studied agriculture can write and speak fluently	73(56.2)	35(26.9)	15(11.5)	2(1.5)	5(3.8)
I can marry someone practising agriculture in future	51(39.2)	37(28.5)	27(20.8)	12(9.2)	3(2.3)
Nothing can ever convince me to go into agriculture in future	17(13.1)	24(18.5)	22(16.9)	34(26.2)	33(25.4)
I can only practise agriculture as a side business.	28(21.5)	50(38.5)	27(20.8)	12(9.2)	3(2.3)
Agriculture is just as important as any other career	67(51.5)	40(30.8)	13(10.0)	8(6.2)	2(1.5)
Like agriculture, every career has its own risks.	56(44.6)	52(40.0)	14(10.8)	4(3.1)	2(1.5)
Educated farmers are neat	65(50.0)	36(27.7)	18(13.8)	7(5.4)	4(3.1)
Jobs that are not related to agriculture can also be tasking	49(37.7)	42(32.3)	25(19.2)	11(8.5)	3(2.3)

Categorisation of secondary school students' perception scores after the intervention

Perception	Frequency	Percentages
Unfavourable	56	43.1
Favourable	74	56.9
Total	130	100

Source: Field survey, 2020

Table 8: Distribution of difference between perception of respondents before exposure to the movie and after being exposed to the movie

Statements	Mean	T	df	P value
Perception before the movie	98.19	1.257	129	0.211
Perception after the movie	98.81			

Source: Field survey, 2020

CONCLUSION AND RECOMMENDATION

The portrayal of agriculture in *Ona wura* movie did not effectively influence the perception of agriculture as a career among the selected secondary school students. This could however be attributed to their low rate of exposure to the movie. Since continuous exposure to more agriculture themed movies, is expected to cause a significant improvement in youths' perception of a career in agriculture, stakeholders in the agriculture industry should therefore explore the use of agricultural themed movies as a means of enhancing the youths' perception of agriculture. Publicising of such movies is required, while brevity in its duration is advocated for optimum youth engagement and positive impact.

REFERENCES

Badiru, I. O. (2017, October 26): Expert advocates agric ministry-nollywood partnership to promote agriculture. *The Nigerian Expression*. http://thenigerianexpression.com/2017/10/26/expert-advocates-agric-ministry-nollywood-partnership-to-promote-agriculture/

Badiru, I. O. (2019). Nollywood's coverage and framing of agriculture in the transformation agenda period (2013 -2014) in Nigeria, *Journal of Agricultural and Food Information,* 20 (3), 277-290.

Badiru, I. O. (2023). Leveraging the entertainment industry to drive Nigerian agriculture: Expanding agricultural policy beyond the usual, *Nigerian Economic Summit Group*, pp 1-9.

Badiru, I. O., Obabire, F. F. And Aina, A. S. (2019). Educators' Perception on the Choice of Agriculture as a Career Among Youth in Oyo State, Nigeria, *Nigerian Journal of Rural Extension and Development,* 13, 27 – 35.

Kraus Group (2022). Average Consumer Attention Span Has dropped again in 2022. https://www.krausgroupmarketing.com/marketing-strategy/average-consumer-attention-span-has-dropped-again-in-2022/

Ladigbolu T. A. and Olajide B. R. (2018). Farmers' proclivity to use soap opera for sourcing agricultural information in Southwest, Nigeria. *Agricultura Tropica et Subtropica,* 51 (4), 121-124

Luxury Beach Rehab (2020). Do movie and tv series influence drug use? http://www.luxurybeachrehab.com/in-depth/does-the-media-influence-drug-use/

Media Impact (2013). Definition of entertainment education. http://mediaimpact.org/entertainment-education/

Olajide B. R. and Ladigbolu, T. A. (2020). Scriptwriters' perception of use of soap opera in agricultural information dissemination in South-western Nigeria. *Journal of Agricultural Extension* Vol. 24 (1): 54-63

Singhal, A. and E.M. Rogers (1999). *Entertainment-education: A communication strategy for social change.* Lawrence Erlbaum Publisher.

World Bank (2017). MTV Shuga soap opera turns edutainment into a tool to fight HIV and gender-based violence. www.worldbank.org/en/news/feature/2017/02/23/mtv-shuga-soap-opera-turns-edutainment-into-a-tool-to-fight-hiv-and-gender-based-violence

Involvement of youths in soilless agriculture in Ogun State, Nigeria

Amusan, O. J. and Adeleke, O. A.

Department of Agricultural Extension and Rural Development, Faculty of Agriculture, University of Ibadan, Nigeria

Correspondence details: aladeoluwaseun@yahoo.com

ABSTRACT

The need to make agriculture attractive especially for the youth population is key to achieving food security and eradicating hunger in the nation. This is possible when appropriate technologies are introduced and made available to farmers of all ages, which necessitated this study. This study examined the involvement of youths in soilless agriculture in Ogun State, Nigeria. A multi-stage sampling procedure was used to select 122 youths for the study and data were collected with the use of questionnaire. Results were analysed using percentages, mean and Chi-square. The result shows that 60.7% were male and 45.9% of the respondents had tertiary education. More than half (55.7%) of the respondents had unfavourable perception about soilless agriculture. Insufficient information ($\bar{x}$=1.11), inadequate finance ($\bar{x}$=0.91) and lack of interest ($\bar{x}$=0.75) were the major constraints experienced by respondents as regards soilless agriculture. Involvement in soilless agriculture was low (76.2%) among respondents. There was a significant relationship between the level of education (χ^2=8.826, p=0.032) and involvement in soilless agriculture. The study concluded that youths' involvement in soilless agriculture was low and should be improved through publicity and trainings from extension agents and various research institutes.

Keywords: Awareness, Involvement, soilless agriculture, Improved technology, Youths

INTRODUCTION

Agriculture contributes significantly to national food self-sufficiency by accounting for over 90% of total food consumption requirements and also helps to maintain a healthy population (Obisesan, 2021). However, despite these great potentials, it is alarming that most African countries still depend on food importation. Importation of food is expected to increase from $35 billion to above $110 billion dollars by 2025 (FAO, 2017). In West Africa, most farming households are purely subsistent in nature producing limited agricultural output for family consumption (Osabohien et al., 2019). Moreover, agricultural labour force is getting older as rural youths are looking for better and more lucrative means of livelihoods than traditional farming, hence there has been an increase in the migration of youth from rural to urban areas despite the insufficient jobs there. Therefore, agriculture remains Africa's inevitable means of growing inclusive economies and answer to unemployment especially among the youths

In Nigeria, agricultural practices remain largely unattractive to people, especially the youths for various reasons, such as their perceptions, lack of interest, inadequate financial resources, availability of better opportunities outside the agricultural sector, poor and limited infrastructures, production inputs and resources, extension services, trainings, among others (Geza et al., 2021). The National Population Commission (2019) estimated that more than half of Nigerian population is made of youths (18 and 35 years). However, it is disturbing that youth unemployment increases as youth population rises. As stated by the NBS (2018), unemployed youths numbered about 20.9 million, while youth unemployment rate has increased to 23.1%. Agriculture is capable of providing productive employment opportunities for youths and encouraging active youth involvement in agriculture will introduce new strength and inventions into its development in Nigeria. For this to be actualised, utilisation of improved agricultural technology like soilless agriculture, investments from stakeholders, provision of credit facilities, diffusion of adequate information, institutional support, equipping youths with adequate technological skills, must be properly put in place (Geza et al., 2021).

Soilless agriculture is a recently developed technology, although history reveals that it started around early 60s, but was not a commonly used method of growing crops. It connotes agriculture without the soil, which operates under controlled condition in order to obtain higher productivity and income (El-Kazzaz, 2017). It is also referred to as soilless farming. Soilless agriculture can be classified into four types, namely solid media culture, hydroponics, aeroponics, and aquaponics, based on the type of substrates, containers and the nutrient system for the plant and drainage. In the solid media culture, coco-peat, pearlite, vermiculite, vermicompost, gravel, tur, rockwool, saw dust, coconut fiber and peat moss are commonly used (Kumari et al., 2021). Initially, only three crop species were grown when hydroponics was applied commercially and these include: tomato, lettuce and herbs. However, in the more recent time, a wide range of crops are successfully grown hydroponically, e.g. pepper, strawberry, cucumber, potatoes and roses, (Jemima et al., 2020).

In Nigeria, it was pioneered by Mr. Adebowale Onafowora, the CEO, BIC Farms Concept in Abeokuta, Ogun State, in 2013 (Tijani, 2022). It is a sustainable agricultural practice that possesses a more sustainable solution to the challenges of soil farming today, because it has several advantages which includes higher productivity, requirement of little labour, not season-bound, low costs of management, no weed competition, no soil-borne pests and disease, water and land conservation, adaptable to areas disturbed by drought, flooding, and other soil-based limitations (Ajibade and Oyeniyi, 2018). It is also a viable means of achieving a world free of hunger by year 2030 (Okemwa, 2015; Kurklu, 2018; Kumari *et al*., 2021). Soilless agriculture can help address the issue of decline in arable land causing clashes between farmers and herders (Pradhan and Deo, 2019). Furthermore, Mikah *et al*, (2021) posited that with soilless agriculture, agriculture can be more attractive to youths, increase income, ensures national food security despite limited access to arable land.

The main objective of the study was to assess the involvement of youths in soilless agriculture in Ogun State, Nigeria. The specific objectives were to describe the socio-economic characteristics of respondents, assess their awareness about soilless agriculture, identify channels through which respondents became aware of soilless agriculture, assess respondents' knowledge about soilless agriculture, ascertain respondents' perception about soilless agriculture, evaluate respondents' involvement in soilless agriculture and identify constraints to respondents' involvement in soilless agriculture.

$H_0 1$: There is no significant relationship between respondents' socio-economic characteristics and involvement in soilless agriculture.

METHODOLOGY

The study was carried out in Ogun State. Ogun State is a state in South western Nigeria, bordered by Lagos State and the Atlantic Ocean to the south, Oyo State and Osun State to the north, Ondo State to the east and the Republic of Benin to the west. The vegetation is typically rainforest. The state has a tropical climate with mean annual rainfall of about 1,500 millimetre and temperature range of 25 to 35 degree Celsius. Commonly cultivated crops are maize, yam, plantain, beans, rubber, palm tree, sugar cane, kola nut, citrus, cassava and vegetables. Its natural resources include extensive fertile soil suitable for agriculture and mineral deposits. Abeokuta is the capital of Ogun State as well as its largest city and a vibrant market centre in the state. The state is further divided into four agricultural zones namely; Abeokuta, Ikenne, Ijebu Ode and Ilaro by Ogun State Agricultural

Development programme (OGADEP). The population of the study included all youths in Ogun state.

A multi stage sampling procedure was used to select respondents for the study. In the first stage, Abeokuta agricultural zone was purposively selected because it houses the two major soilless agriculture Farms in the State, which are BIC farms concept and Soilless farm Lab. BIC farms concept and Soilless farm lab offer training opportunities for youths in the state which makes them suitable to be chosen for this study. At the second stage, simple random sampling was used to select 60% of the local government under the zone, which are Odeda, Abeokuta South and Ewekoro Local Government. At the third stage, two major towns were randomly selected from each local government, making a total of 6 towns; Odeda (Camp and Osiele); Abeokuta South (Adatan and Asero); Ewekoro (Awowo and Obada-oko). At the last stage, systematic random sampling was used to select respondents proportionate to size to make a total of 122 respondents: {Odeda: Camp (22) and Osiele (21)}; {Abeokuta South: Adatan (20) and Asero (19)}; {Ewekoro: Awowo (23) and Obada-oko (17).

Level of involvements in soilless agriculture was operationalised by asking respondents if they were involved in any of the three major types of soilless agriculture (Hydroponics, aeroponics and aquaponics). This was measured on a three point Likert-type scale of not involved (0), partially involved (1) and fully involved (2). Respondents were asked to indicate their knowledge about soilless agriculture by providing them with statements that describe soilless agriculture, and this was operationalised as correct (1) or incorrect (0). Respondents were also asked to indicate their perception to certain statements which was operationalised using a five point Likert-type scale of Strongly Agree (SA)-5, Agree (A)-4, Undecided (U)-3, Disagree (D)-2 or Strongly Disagree (SD)-1 for positive statements and reverse for negative statements. Also, constraints to involvements in soilless agriculture was operationalised on a three-point Likert- type scale of not a constraint (0), mild constraint (1) and severe constraint (2). Data were collected using a structured questionnaire and analysed using frequencies, mean, percentages and chi-square.

RESULTS AND DISCUSSIONS

Socioeconomic characteristics

Table 1 shows that 60.7% of the respondents were male, while 39.3% were female. This implies that male youths were more involved in agricultural practices than female. The finding aligns with Osabohien *et al* (2021) that male participation in agriculture was

higher than that of female in a similar study in Nigeria. The less participation by female might be due to involvement in non-farm activities or the rigorous work of agricultural activities. Also, 45.9% had tertiary education while 43.4% had secondary education. This could strongly impact involvement in soilless agriculture activities, as majority of the respondents would have access to information on modern agricultural technologies from a wide range of sources. In addition, 46.7% and 21.3% were artisans and students, respectively. This result shows that only few of the population were into agricultural activities as their primary occupation. This corroborates Osabohein *et al* (2021) that most youths engaged in non-farming activities. Most (83.6%) of the respondents earned about ₦30,000 monthly. This finding aligns with Maisule*et al* (2023) who noticed a higher percentage of youth earns below ₦30000 on a monthly basis. This low earning and financial constraint could affect youth involvement in agricultural technology- driven activities like soilless agriculture. Respondents were wage earners (35.5%) and 20.5% sourced for income from family and friends. This suggests that respondents' source of income were from personal savings from their earnings and loans which is seemingly inadequate to fully take up technology-driven agriculture.

Table 1: Socioeconomic characteristics of respondents

Variable	Percentage	Mean	SD
Sex			
Male	60.7		
Female	39.3		
Level of education			
No formal education	3.3		
Primary education	7.4		
Secondary education	43.4		
Tertiary education	45.9		
Primary occupation			
Farming	8.2		
Artisan	46.7		
Civil servant	12.4		
Student	21.3		
Trading	11.5		
Monthly income (₦)			
0-30000	83.6	₦21696	₦147.30
30001-60000	13.1		
60001-90000	0.8		
90001-120000	0.8		
Source of income			
Wages	35.5		
Family and friends	20.5		
Salary	23.8		
Others	20.3		

Source: Field Survey, 2022

Awareness of respondents about soilless agriculture

From Table 2, 47.5% of the respondents were aware of the hydroponics technology, aeroponics (14.8%) and aquaponics (22.1%). The findings support Mikah *et al* (2021) that there existed low awareness on soilless agriculture in Ogun State. The low awareness among respondents could be attributed to inadequate information, exposure and financial constraint.

Table 2: Awareness of respondents about soilless agriculture

Variables	Percentage
Hydroponics	47.5
Aeroponics	14.8
Aquaponics	22.1
Total	100.0

Source: Field survey, 2022

Channels of information about soilless agriculture

The findings from Table 3 reveal that 54.1% of the respondents indicated that they heard about soilless agriculture from friends and 36.9% through social media platform. A higher percentage of respondents got to know about soilless agriculture through their friends and social media platform. This corroborates Geza *et al* (2021) that social media platforms like Facebook, Google, WhatsApp, friends and families form the major channel embraced by youths involved in agriculture enterprise.

Table 3: Channels of information about soilless agriculture

Channels	Percentage
Friends	54.1
Radio	22.1
Television	25.4
Social media platform (WhatsApp, Instagram, Facebook, LinkedIn)	36.9
Print media (Newspaper, flyers)	18.9
Farmer's association	21.3
Youth group	21.3

Source: Field survey, 2022

Knowledge about soilless agriculture

Table 4 shows that 62.3% knew that soilless agriculture is planting without the soil, 40.2% signified that plants are grown under controlled conditions in soilless agriculture, while 53.3% asserted that soilless agriculture needs constant supply of water and nutrients, and 49.2% identified with the fact that soilless agriculture is capital-intensive. The findings showed that respondents are relatively knowledgeable about soilless agriculture. This study contradicts Adepoju and Olaseni (2021), who found that there exists low knowledge about aeroponics system of soilless agriculture among farmers in Nigeria.

Table 4: Knowledge of respondents about soilless agriculture

Variables	Correct (%)
Soilless agriculture is planting out of the soil.	62.3
Aeroponics is the most high-tech type of soilless agriculture.	29.5
Aquaponics is a combination of both hydroponics and aquaculture.	36.9
Media such as cocoa peat, percolate are used in soilless agriculture.	38.5
Plants are grown in controlled conditions in soilless agriculture.	40.2
Soilless agriculture is mostly used to grow leafy crops like vegetables, tomatoes, cucumber and herbs.	41.0
Nutrient film, grow bags, deep irrigation are systems used in hydroponics.	45.1
Soilless agriculture needs constant supply of water and nutrients.	53.3
Soilless agriculture is capital intensive.	49.2
Hydroponics, aeroponics and aquaponics are the three major types of soilless agriculture.	53.3

Source: Field survey, 2022

Perception of respondents about soilless agriculture

Result from Table 5 shows that respondents were in agreement that soilless agriculture will likely proffer solution to problems encountered in traditional farming ($\bar{x}$=4.02). Also, respondents agreed that soilless agriculture may be effective for regions having scarcity of arable land ($\bar{x}$=3.94) and 69.7% agreed that soilless agriculture might help to achieve food security ($\bar{x}$=3.86). Further result in Table 6 shows that 55.7% of respondents had unfavourable perception about soilless agriculture. This suggests that perception of respondents about soilless agriculture is unfavourable in the study area. This is in line with the findings of Oyediran *et al* (2016) that youths were willing to

engage in agriculture with unique technology and a lot of advantages. This perception could affect

involvement in technology driven production like soilless agriculture.

Table 5: Perception of respondents about soilless agriculture

Perception	Mean	SD
Soilless agriculture will likely proffer solution to problems encountered in traditional farming.	4.02	0.93
Soilless agriculture may be effective for regions having scarcity of arable land.	3.94	0.98
Soilless agriculture might help to achieve food security.	3.86	1.01
Produce from soilless agriculture may seem unhealthy.	3.00	1.16
Soilless agriculture may not be sustainable.	2.84	1.16
Soilless agriculture is likely less beneficial when compared to traditional agriculture.	2.64	1.25
People may not be willing to consume produce obtained from soilless agriculture.	2.38	1.17
Soilless agriculture may be too complex to start.	2.56	1.04
Soilless agriculture may be too capital intensive than agriculture using the soil.	2.43	1.03
Soilless agriculture will likely be environmentally hazardous.	2.84	1.06
Subsidization of soilless agriculture practice might not be a motivating factor for its adoption.	2.80	1.18

Source: Field survey, 2022

Table 6: Categorisation of respondents' perception about soilless agriculture

Perception levels	Percentage	Min. Max.	Mean	SD
Unfavourable (19.00-33.30)	55.7	19.00 48.00	33.30	5.19
Favourable (33.31-48.00)	44.3			

Source: Field survey, 2022

Constraints to respondents' involvement in soilless agriculture

Table 7 shows that insufficient information (1.11±0.90), lack of interest (0.91±0.87) and inadequate finance (0.75±0.79) as major constraints to respondents' involvement in soilless agriculture. The

result is in tandem with Egboduku et al (2021) that several factors limit youth participation in agricultural activities, ranging from financial challenges, lack of awareness, lack of interest, lack of access to basic information among others. The implication of this is that youth involvement in soilless agriculture could be low as a result of these constraints.

Table 7: Constraints to respondents' involvement in soilless agriculture

Constraints	Mean	SD	Rank
Lack of interest	0.91	0.87	2nd
Inadequate finance	0.75	0.79	3rd
Insufficient information	1.11	0.90	1st
Personal preference for soil-based agriculture	0.48	0.68	6th
Cultural beliefs and tradition	0.52	0.69	5th
Peer influence	0.52	0.74	4th

Source: Field survey, 2022

Involvement in soilless agriculture by respondents

Information in Table 8 shows that most of the respondents were not involved in hydroponics (81.1%), aeroponics (85.2%) and aquaponics (87.7%). This obviously shows that respondents were not engaged in soilless agriculture practices. Also, Table 9

reveals that there was low involvement in soilless agriculture among majority (76.2%) of respondents. This corroborates the findings of Gumisiriza et al (2022) that involvement in hydroponics was low among youths in a similar study. This low involvement could be as a result of inadequate finance and lack of interest by respondents.

Table 8: Involvement in soilless agriculture

	Not Involved %	Partially involved %	Fully involved %
Hydroponics	81.1(99)	12.3 (15)	6.6 (8)
Aeroponics	85.2 (104)	10.7 (13)	4.1 (5)
Aquaponics	87.7 (107)	6.6 (8)	5.7 (7)

Source: Field survey, 2022

Table 9: Categorisation of involvement in soilless agriculture

Involvement	Frequency (%)	Mean	SD
Low (0.00-0.61)	93.0 (76.2)	0.62	0.79
High (0.62-6.00)	29.0 (23.8)		

Source: Field survey, 2022

Relationship between socioeconomic characteristics and Involvement in soilless agriculture

Table 10 reveals that there was a significant relationship between respondents' level of education (χ^2=8.826, p=0.032) and involvement in soilless agriculture, whereas, source of income (χ^2=1.137, p=0.768) and primary occupation (χ^2=7.725, p=2.59) were not significantly related to involvement in soilless agriculture. This implies that involvement in soilless agriculture is influenced by level of education, thus, youth who are more educated are able to venture into soilless agriculture because they will be more exposed to information through the internet and other collaborations that will help them to be well informed. The findings corroborate Trevor and Musole (2018), that level of education affects youth involvement in agricultural technologies.

Table 10: Chi-square result between selected socio-economic characteristics of respondents and involvement in soilless agriculture

Variables	χ^2	df	p-value	Decision
Level of education	8.826	3	0.032	Significant
Source of income	1.137	3	0.768	Not significant
Primary occupation	7.725	6	2.590	Not significant

Source: Field survey, 2022

CONCLUSION AND RECOMMENDATIONS

Respondents were aware of and knowledgeable about soilless agriculture but had unfavourable perception about soilless agriculture. Also, involvement in soilless agriculture is low and which is attributed to inadequate finance and lack of interest. Furthermore, involvement in soilless agriculture is influenced by level of education as this will boost the rata at which youths will be informed which will increase their chances of involvement in soilless agriculture. Campaign programmes and trainings about soilless agriculture should be organised by research institutes and extension agents across all governmental agencies and provision of financial assistance and inputs is necessary for youths so that they can be more interested in agriculture as a business.

REFERENCES

Adepoju, A. O., and Olaseni, O. C. (2021). Are yam farmers aware and willing to adopt the aeroponics farming system in Oyo State, Nigeria? *AGRIS on-line Papers in Economics and Informatics*, 13 (4), DOI:10.22004/ag.econ.320244

Ajibade, L. T. and Oyeniyi S. T. (2018). Soilless farming: A key player in the realisation of "Zero Hunger" of the Sustainable Development Goals in Nigeria, *International Journal of Ecological Science and Environment Engineering*, 5 (1), 1-7.

Egboduku, C.O., Sennuga, S.O. and Okpala, E.F., (2021). Factors influencing the interest of youths towards career in agriculture: A case study of Bwarri Area Council, Abuja, Nigeria, *International Journal of Advance Agricultural Research*, 9, 61-68, doi.org/10.33500/ijaar.2021.09.006

El-Kazzaz, K. A. and El-Kazzaz, A. A., (2017). Soilless Agriculture, a New and Advanced Method for Agriculture Development: an Introduction, *Agri. Research and Tech: Open Access Journal*, 3(2), DOI: 10.19080/ARTOAJ.2017.03.555610

Food and Agriculture Organization of the United Nations (FAO) (2017). The future of food

and agriculture – Trends and challenges, Rome, ISBN 978-92-5-109551-5

Geza, W., Ngidi, M., Ojo, T., Adetoro, A. A., Slotow R.., and Mabhaudhi T. (2021). Youth Participation in Agriculture: A scoping review. *Sustainability*, 13, 9120, https://doi.org/10.3390/su13169120

Gumisiriza, M.S., Mbega, E.R. Ndakidemi, P.A. Kabirizi, J.M.L. and Mugerwa, M.(2022). Can Soilless farming feed urban East Africa? An assessment of the benefits and challenges of hydroponics in Uganda and Tanzania, *Environmental Challenges*, 6 (1692), DOI:10.1016/j.envc.2021.100413

Kurklu, A., Ghafoor, A., Khan, F. A., and Ali, Q. (2018). A review on hydroponic greenhouse cultivation for sustainable agriculture, *International Journal of Agriculture, Environment and Food Sciences*; 2 (2), 59-66, DOI.10.31015/jaefs.18010

Kumari, A., Upadhyaya, A., Jeet, P., Prakash, V., Ahamad, A. and Saurabh K. (2021). Soilless farming: A worthwhile effort towards smart agriculture, *Food and Scientific Reports*, 2(8). https://foodandscientificreports.com/details/soilless-farming-a-worthwhile-effort-towards-smart-agriculture.html

Mikah, O.I., Adamu, A. F., and Fatunbi, A.O. (2021). Soilless farming; the smart climatic agriculture for youth perception reformation and food security. In Fatunbi A.O, and Sarfatti, P (eds.), *Proceeding of the First Biennial Climate Smart Agriculture Conference*, Accra, Ghana, 1-2 December 2020, 138-145

Jemima, M., Dhruv, P., Himanshu. and Archana, M. (2020). Review article on soilless method of cultivation: hydroponics, *International Journal of Recent Scientific Research*, 37122-37127, DOI. http://dx.doi.org/10.24327/ijrsr.2020.1101.5058.

Maisule, A. M., Sennuga, S. O., Bamidele, J., Alabuja, F. O. and Osho-Lagunju, B. (2023). Rural youth participation in Agriculture-Based livelihood activities in Abuja, Nigeria, *International Journal of Research and Scientific Innovation,* 10 (3*)*, 45-62, DOI.10.51244/IJRSI

National Population Commission (NPC) (Nigeria) and ICF International (2014). Nigeria Demographic and Health Survey, 2013, Abuja, Nigeria and Rockville, Maryland, USA: NPC and ICF International.

National Bureau of Statistics. (2018). https://www.nigerianstat.gov.ng.

Obisesan, A. A. (2021). What drives youth participation an dlabour demand in agriculture? Evidence from rural Nigeria, *Periodicity*, 10 (1), DOI:https://doi.org/10.5281/zenodo.5092537

Osabohien, R., Matthew, O., Ogunbiyi, T. and Nwosu, E. (2019). Agriculture development, employment generation and poverty reduction in West Africa, *The Open Agricultural Journal*, 13, 82-89, https://doi.org/10.2174/1874331501913010082

Osabohein, R., Wiredu, A.N., Nguezet, P.M.D., Mignouna, D.B., Addoulaye, T., Mangon., V., Bamba, Z. and Awotide, B.A. (2021). Youth participation in Agriculture and poverty reduction in Nigeria, *Sustainability*, 13, 7795, https://doi.org/10.3390/su13147795

Okemwa, E. (2015). Effectiveness of aquaponic and hydroponic gardening to traditional gardening, *International Journal of Science Research and Innovative Technology;* 2, 2313- 3759

Oyediran, W.O., Omoare, A.M., Theresa, T.D and Shobowale, A. A (2016). Perception of youth in selected tertiary institutions on Agricultural education as a means of ensuring food security in Ogun state, Nigeria, *Asian Journal of Scientific Research*, 6 (11), 148-157, doi/10.18488/journal.2/2016.6.11.148.157

Pradhan, B. and Deo, B. (2019). Soilless farming–the next generation green revolution. *Current Science*, *116* (5), 728-732, https://www.jstor.org/stable/27137929

Tijani, A. (2022). Soilless farming to the rescue, how to boost Agriculture without hurting forests, Foundation for Investigative Journalism, Special report

Trevor, S. and Kwenye, J. M. (2018). Rural youth participation in Agriculture in Zambia, *Journal of Agricultural Extension*, 22 (2), 52-63. https://doi.org/10.4314/jae.v22i2.5

Perceptivity: How Yoruba 'elder' farmers use their secret weapons against insecurity in Ondo state, Nigeria

Olutegbe, N. S., Iyiola, T. I., and Joseph, O. C.
Department of Agricultural Extension and Rural Development, University of Ibadan
Correspondence details: siji004u@yaho.com

ABSTRACT

In today's global landscape, security consciousness is paramount, given the surge in criminal activities often leading to conflicts. Nigeria, notably, has witnessed a distressing rise in insecurity, leading to substantial loss of lives, property, and agricultural assets. This study explores the interplay of security consciousness and indigenous protective strategies in Ondo State's agrarian communities, Nigeria. The study adopted a multistage sampling procedure, selecting 116 farmers within some selected agrarian communities of Ondo State, Nigeria. Data was collected using a well-structured interview schedule, while analysis used frequency counts, means, factor analysis and multiple regression. The prevalent forms of insecurity incidents which have triggered security consciousness included farmers-herders clashes (mean = 12.36), theft (mean = 9.24), abduction/kidnapping (mean = 7.64) and armed-robbery (mean = 4.01). There was an exceedingly high level of security consciousness among the majority. Vigilante patrol teams (56.9%), local security guards (50.9%), and community rules and regulations (40.5%) were the most utilized communal indigenous measures. Although personal traditional protective measures were less common, they are not completely out of use Regression analysis indicates that household size and perceived need for improved security significantly influenced respondents' use of indigenous protective measures. The findings underscore the need to improve the government-controlled security system to safeguard the farming environment and nurture the already challenged agri-food system in Ondo state, Nigeria.

Keywords: Security consciousness; Indigenous protective measures; Farmers-herders clashes; Agrarian communities; Insecurity incidences

INTRODUCTION

Security forms the cornerstone of any society, its establishment, and maintenance intertwined with the political, economic, and social systems of a nation. It stands as a fundamental necessity for the progress and well-being of both individuals and communities. Since gaining independence on October 1, 1960, Nigeria has grappled with a series of coup de tats, civil strife, and persistent ethno-religious conflicts (Eyeh, 2020; Omorogbe and Omohan, 2005). Presently, the nation faces heightened challenges with the Boko Haram insurgency and nomadic crises, surpassing previous years in complexity (Amao, 2020). While extensive attention has been drawn to the Boko Haram insurgency, the resurgence of violent herders, and other forms of insecurity spotlights the overarching struggle to uphold law and order nationwide (Amao, 2020; Maiangwa and Amao, 2015; Oginni, Opoku, and Alupo, 2020). Farmers-herders' conflicts have drawn condemnation both within and outside the country due to their far-reaching impact on communities (Okoro, 2018; Ahmed-Gamgum, 2018). The North-Central zone, particularly, Benue State, often referred to as the "Food Basket of the Nation," bears the brunt of the agro-pastoralist crisis, experiencing substantial loss of lives and livelihoods (Amadi and Anokwuru, 2017; Soomiyol and Fadairo, 2020; Peter Yikwab and Tade, 2022; Vanger and Nwosu, 2020). Existing literature underscores the plight of indigenous populations, grappling with

widespread forced displacement and severe humanitarian and human rights concerns, coupled with a food and nutrition crisis of monumental proportions. Presently, over 2.2 million individuals find themselves internally displaced across three states in the northeast, with about 80 percent in Borno state, and about 8.4 million people needing humanitarian programme (UN Office for the Coordination of Humanitarian Affairs, 2022).

Beyond the Boko-Haram and banditry, which are most prevalent in the Northern states of the country and farmers-herders clashes which has a wider spread across six geopolitical zones of the country, Ondo State has recently been confronted with more forms of insecurity. One of such is kidnapping/abduction, armed robbery, hired killings, and other local issues, which create sense of insecurity in local communities. One notable incident of banditry was the attempted kidnapping, gunfire, and tragic murder of Mrs. Funke Olakunrin, the second daughter of Afenifere leader, Ruben Fasoranti, between Kajola and Ore. Reported fatalities surged notably in the first half of 2015, particularly in connection with criminal activities such as bank robberies in Owo and Akoko North West LGAs, as well as piracy in Ilaje LGA, resulting in numerous casualties (The Fund for Peace, 2015; Akingbade, 2022; The Punch, 2019) . The insecurity situation in the area between 2012 and 2015 was particularly alarming, especially in Akure, the state capital, with the identification of a hotspot called Ijoka

in Akure metropolis where bandits operated unchecked (The Punch, 2019). In response, regional governors in the south-western Nigeria, under the leadership of the Ondo state Governor, summoned a security summit attended by key stakeholders, prompting the inauguration of a security network known as "*Amotekun*" in conjunction with their counterparts (Izuora, 2020; Colman, 2020; Sowole and Kolawole, 2020). The Corps' mandate is to rid the state of various criminal elements. This all-important agenda was pursued up to the point of all the state government within the zone passing a bill into law which established *Amotekun* as state-level security arms. Although, the federal government opposed this move, arguing that this conflicts with the already existing national security structure, this was not a hurdle sufficient enough to stop the agenda. *Amotekun* has since been empowered by different state governments and have helped to put the activities of major conflict actors in check, with Ondo state being the most successful state in this regard.

In order to compliment the efforts of the state government, the various communities and individuals seem to have become aware of increasing cases of insecurity incidences amidst growing concerns for an improved security system. This has a way of changing the social landscape and given the inadequate presence of security personnel which characterizes the Nigeria, rural people in the agrarian community may have resorted to self-helps either at community or individual levels. One prevalent choice is indigenous or traditional protective measure, which may vary among tribes but are unique to each of Nigeria's over 250 cultural and ethnic groups (Olufayo and Jegede, 2014; Atolagbe, 2011a). For example, the Yorubas in the past are known to utilize Yoruba indigenous Anti-burglary Devices (YIAD) in diverse forms, shapes, and sizes (Atolagbe, 2011a). These devices are administered through various means, some requiring incantations (*Ofo* or *Ogede*) for potency. They can be hung in different parts of the house, buried at entrances, concealed in ceilings or furniture, consumed, incised into blood circulation, attached to clothing, and more, each attribute contributing to the classification of Yoruba Indigenous Anti-burglary Devices (YIAD). Community security encompasses both group and personal security, aiming to ensure that communities and their members live free from threat, fear, or anxiety and there are also evidences of use of these measures in communities in the zone (Atolagbe, 2011; Olufayo and Jegede, 2014). These actions are in tandem with the age-long tradition of the Yoruba, and this disposition is clear in one of Yoruba's proverbs, which says, *'ifura l'ogun agba'* meaning, perceptivity is the secret weapon of an elder. Meanwhile, increased modernization and exposure to the western culture seem to have rendered these measures unpopular progressively over the past years. However, given the

worrisome state of security in the state and the need to safeguard life, properties and their livelihood, particularly the agri-food systems, it will be interesting to see the extent to the people's security consciousness has been awakened, and how much this informs the patronage of traditional protective measure options, either communally or individually. Therefore, the need to document these measures, as well as the key drivers such as different dimensions of security consciousness, informs this study. Hence, this study provides answer to each of the following research questions:

i. What forms and magnitudes of insecurity incidents which may have triggered security consciousness are common within the rural agrarian communities of Ondo State?

ii. To what extent are households in rural agrarian communities of Ondo State security conscious?

iii. How do security consciousness and related variables inform households' utilization of indigenous protective measures?

METHODOLOGY

The study was carried out in Ondo State of Nigeria. Ondo State was created on February 3, 1976, from the former Western State. It originally included the present Ekiti State, which was split off in 1996. Akure is the state capital. Ondo State has its coordinates 70N 5005E. Ondo State is bordered with Ekiti State to the north, Kogi State to the northeast, Edo State to the east, Delta State to the southeast, Ogun State to the southwest, and Osun State to the northwest. Ondo state is primarily inhabited by the Yoruba. Ondo State has a total population of 3,441,024 comprising of 1,761,263 male and 1,679,263 females. Presently, there are 18 Local Government Areas (LGAs) across the State. Agriculture is the mainstay of the economy, and the chief products are cotton and tobacco from the north, cacao from the central part, and rubber and timber (teak and hardwoods) from the south and east; palm oil and kernel are cultivated for export throughout the state. Ondo State is Nigeria's chief cocoa-producing state. Other crops produced include rice, yam, maize coffee, taro, cassava, vegetables, and fruits. Traditional industries include pottery making, cloth weaving, tailoring, carpentry, and blacksmithing. Mineral deposits include kaolin pyrites, iron ore, petroleum, and coal. There is a textile mill located at Ado-Ekiti and a palm-oil processing plant at Okitipupa. The study population consists of all the locals in the agrarian communities of Ondo State.

A multi-stage sampling procedure was used to select respondents for the study. First stage involved purposive selection of four LGAs with highest

occurrence of insecurity. The selected LGAs were Akoko North East, Akoko North West, Ifedore and Akure North. Second stage involved purposive selection of agrarian communities in the selected LGAs. The selected communities were Ise akoko and Auga Akoko (Akoko North East), Ijare (Ifedore), Ilu abo (Akure North) and Ikaram (Akoko North West). The last stage involved numbering of households and systematic random sampling of 20 percent (every 5th house – 20 per cent) was employed and a sample 116 of household heads were analysed, which formed the study sample size.

Qualitative data were obtained from focus group discussion (FGD) and In-depth Interview (IDI) in selected communities, and followed by administration of structured interview schedules for the collection of quantitative data. In addition to socioeconomic characteristics, vital variables relevant to the research questions were also assessed. The forms and magnitude of insecurity incidents were gauged by incorporating questions on different forms of insecurity with response options of either 'yes' (1) or 'no' (0). The occurrence magnitude of these incidents was measured on a three-point Likert scale of 'high', 'low', and 'not at all', with scores of 2, 1 and 0 assigned, respectively.

The dependent variable in this study is indigenous protective measures. Respondents were presented with list of possible indigenous measures sourced from available literature (Atolagbe, 2011) and informed by qualitative data obtained earlier for them to indicate how often they use each of the indigenous measures in

combatting crimes in their area on a three-point scale of 'on every occasion', 'as occasion demands' and 'never' with scoring of 2, 1 and 0, respectively

Security consciousness was evaluated using a scale containing twenty statements, employing a five-point Likert-type scale ranging from 'strongly agree' (5) to 'strongly disagree' (1) for both positively and negatively worded statements. For analytical convenience, we conducted a factor analysis using the 'fa' function in the 'GPArotation' package in R studio. The analysis yielded four factors from the twenty items as shown in Figure 1. Items 6, 8, 9, and 10 loaded on Factor 1, items 4 and 5 on Factor 2, and items 16, 18, and 20 loaded on Factor 3. Additionally, items 2, 13, 14, and 15 loaded on Factor 4. Based on a factor loading benchmark of 0.4 (Stevens, 1992), seven items showed no significant correlation with any of the four underlying factors, indicating minimal variance to the construct. In consultation with fellow researchers in rural sociology, each factor was assessed for common attributes and themes, and named accordingly. Consequently, the four factors were designated as follows 'preparedness against various threats', 'community awareness and alertness', 'perceived need for improved security', and 'security practices and restrictions', respectively. The scores for each respondent and for each of these factors were then saved as separate variables and merged with the original dataset using the 'cbind' function from the 'dplyr' package in Rstudio. To enhance interpretation (Upton, Constenla-Villoslada, and Barrett, 2022), factor scores were transformed into percentages.

$$\text{Transformed Score} = \frac{\text{Factor Score} - \text{Minimum Score}}{\text{Maximum Score} - \text{Minimum Score}} \times 100$$
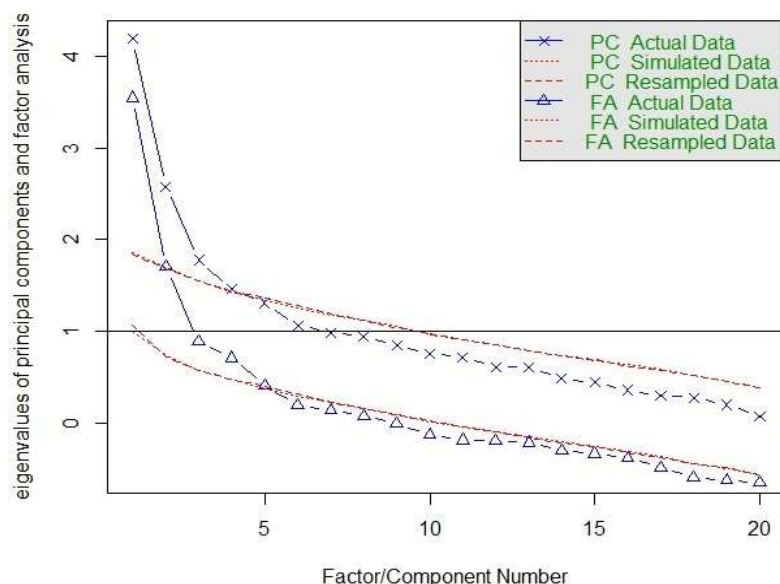
Figure 1: Scree plot showing a four-factor loading from security consciousness scale

The percentage scores obtained were subsequently used in multiple regression analysis to explain the use of indigenous security measures by farmers. We first conducted a multiple regression analysis incorporating all pertinent socioeconomic variables, conflict prevalence, and security consciousness components as explanatory variables for the use of indigenous security measures. Our model specification is shown below:

$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 \ldots + \beta_{12}X_{12} + \varepsilon$, Where:

Y = Indigenous Security Measures;
β_0 = Intercept;
X_1 = Sex (male = 1);
X_2 = marital status (married = 1);
X_3 = Religion (Christianity = 1);
X_4 = Age (years);
X_5 = Household size (number);
X_6 = Farm size (Ha);
X_7 = Educational attainment (Post-primary education = 1);
X_8 = Conflict occurrence(score);
X_9 = Preparedness against various threats (score);
X_{10} = Community awareness and alertness (score);
X_{11} = Indigenous security measures and satisfaction (score);
X_{12} = Security practices and restrictions (score);
ε = Error term

RESULTS AND DISCUSSION

Prevalent forms of insecurity triggering security consciousness

As revealed in Table1, the most identified frequent forms of insecurity incidence in the study's agrarian communities include farmers-herdsmen clash (mean = 12.36), theft (mean = 9.24), abduction (mean = 7.64), and rape (mean = 5.60), ranking 1st, 2nd, 3rd, 4th and 5th, respectively in the last five years. This conforms with earlier studies identifying farmers-herders clashes as a major problems the agricultural and food system is confronted with (Ofoegbu, 2009; Sangotegbe, Odebode, and Onikoyi, 2012; Adisa, 2012; Olutegbe and Ogungbaro, 2020; Vanger and Nwosu, 2020; Oghuvbu and Oghuvbu, 2021; Olaosebikan *et al*.,

2023; Peter, Yikwab and Tade, 2022). The result of the FGD also corroborates this:

"Attack by Fulani is the most severe challenge faced by farmers in this community and Ondo state generally. They destroy our farms in our absence, and sometimes if you are unfortunate to be around while they invade your farm, they may even kill you or injure you badly. This has caused conflicts between farmers and herders more in recent years. Majority of the herders are also involved in kidnapping for ransom and sometimes raping of women." (FGD, Women in Auga community).

The highest occurrence of farmers-herders clash may be attributed to the lack of adequate measures from the federal government to regulate the activities of herders living among farmers. This finding corroborates the assertions of Okoro (2018) who emphasized that these conflicts have taken on a more dangerous dimension, negatively impacting farmers' production output in affected areas. This outcome serves as an early indication in our findings that security concerns are escalating, as what was once a peaceful coexistence among people of different ethnic backgrounds in Nigeria has now shifted dramatically. This represents a departure from the past, as reported by Blench, Dendo, Road, and Kingdom (2003), when many farmers and herders enjoyed a harmonious social and economic relationship. The result, which also ranks kidnapping high, further aligns with Akoni and Olowoopejo (2016) and Osawe (2015) report, highlighting the growing concern among Nigerians, particularly in the South West region. It underscores how this area has emerged as Nigeria's kidnap capital, and emphasizes the alarming rate at which the culture of kidnapping is spreading in a cultural milieu where people once viewed themselves as brothers and sisters (Akoni and Olowoopejo, 2016). Additionally, this finding is consistent with the insights of Adisa (2012), Ofuoku (2009), Sangotegbe, Oguntoyinbo, and Oluwasusi (2015) and Tonah (2000) who have identified social ills such as reprisal attacks on humans, cattle rustling, rape, theft, and kidnapping as secondary consequences of farmer-herders clashes.

Table 1: Prevalent forms of insecurity triggering security consciousness

Variable	Mean	Rank
Banditry	2.81	6th
Kidnapping/abduction	7.64	3rd
Farmers-herdsmen clash	9.36	1st
Cattle rustling	0.24	11th
Armed robbery	4.01	5th
Rape	5.60	4th
Suicide bombing	0.16	12th
Theft	9.24	2nd
Cultism	0.69	7th
Fight of superiority among groups	0.38	9th
Chieftaincy title clash	0.57	8th
Infidelity	0.26	10th

Source: Field survey (2020)

Security consciousness of rural households

The results of the findings as shown in Table 2 reveal that the level of security consciousness was high for all the four domains. However, it was highest with community awareness and alertness (mean = 88.2), followed by preparedness against different threats (89.6). The second domain reflecting the highest level of consciousness was people's preparedness against various threats (mean = 83.5). While results reveal that perceived need for improved security with the value of 65.3 was ranked least, it is an indication of that there is a growing concern for a worsening security situation in the state and an unhealthy signal for functional and resilient agri-food and livelihood systems. It also suggests that achieving reduced hunger and prevalence of poverty as stipulated under the SDGs (goals 2 and 1) is under the threat of insecurity in Ondo state, Nigeria. This argument is in consonance with Adelaja and George (2019) who asserted that conflict has negative effects on outputs of major staples such as rice, sorghum, soya, yam and cassava in Nigeria. Earlier, similar studies had also linked conflicts to other food and livelihood-related consequences globally and in Nigeria Kah, (2017) and Awodola and Oboshi (2015).

Table 2: Security consciousness of rural households

Security consciousness	Mean	Standard deviation
Preparedness against various threats:	83.51	19.00
Community awareness and alertness	89.62	15.15
Perceived need for improved security	65.33	26.85
Security practices and restrictions	72.52	29.79

Indigenous measures for curbing insecurity

Regarding communal measures to curb insecurity, Table 3 reveals that the vigilante patrol team was the most commonly used, ranking 1st and employed by 56.9 per cent on every occasion. This validates earlier findings that use of vigilante is a commonly adopted protective measure in most communities in Nigeria (Ugwuja, 2020). Similarly, the use of local security guards ranked 2nd, with more than half (50.9 per cent) indicating that it is also used on every occasion. The implications of using local security guards could be attributed to the absence or limited access to conventional security options such as the police and the Nigerian Civil Defense Corpse in rural areas. The finding is further corroborated with the FGD result where one of the discussants remarked:

"The government's security outfits have failed us in this community, and we now depend on the vigilante group and other local security strategies

for the security of life and properties in our community." (FGD, Men in Ijare)

Furthermore, the formation of rules and regulations by the community security committee ranked 3rd. This implies that the behavior and activities of the community members are being regulated to guard against insecurity occurrences. This aligns with the argument of Ogunleye (2021) that involving traditional rulers and committees of community leaders will be instrumental in addressing insecurity in Nigeria. Ogunleye (2021) further argues that the inclusion of indigenous security operatives such as the OPC in Yoruba land and the *Bakassi* Boys in the Eastern part of the country in the country's security strategy would be of immense help in combating security challenges. This argument stems from the low number of police and other security operatives relative to the population, and the success that the *Amotekun* Corps have achieved since its inauguration by the South-western states of Nigeria. Nwoko (2021) also

argues that the failure of the central government to secure lives and properties, a breach of its social contract with Nigerians, gave rise to 'self-help' initiatives such as *Amotekun* and other community-based and socio-ethnic security groups. Furthermore, these findings support the assertion of Adeyemi and Olotu (2020) that the use of physical security measures will help to monitor and prevent illegal access of people into schools and communities.

However, there is a low level of patronage of personal protective measures. Table 3 reveals that only 21.6 per cent made use of *gbere* (charm incised into blood circulation) to provide protection against insecurity, ranking number one. This was followed by the use of

Ajesara, *Atola*, or *Atoje* (swallowed charm) used by 15.5 per cent of respondents. Similarly, 14.7 per cent of respondents used *Asoko* (hung charm) to provide protection in the household. Also, the majority (81.9 per cent) of the respondents had never used *Isuju* (De-visioning or Illusion Charm), *Mafenukeje* (Poisonous Weapon), *Eti* (Procrastinator), and *thunderbolt* (magun) to guard against infidelity, respectively. Furthermore, the majority (81.0 per cent) had never used *Ayeta* (bullet deflector), while 79.3 per cent never used *Ayelala* (mump Inducing charm) and 78.4 per cent had never used *Afeeri* (Disappearance Charm) to become invisible while experiencing insecurity challenges.

Table 3: Distribution of respondents based on community utilization of indigenous measures to curb security challenges

Indigenous measures	On every occasion	As occasion demands	Never	Mean	Rank
Communal					
Use of vigilante patrol team	56.9	41.4	1.7	1.55	1st
Use of local security guard	50.9	46.6	2.6	1.48	2nd
Curfew	27.6	69.8	2.6	1.25	4th
Formation of indigenous security police	33.6	57.8	8.6	1.25	4th
Oodua People's Congress (OPC) intervention	40.5	42.2	17.2	1.23	6th
Use of vigilante patrol team	44.0	53.4	2.6	1.41	3rd
Personal					
Asoko (hung charm) in providing protection in the household	14.7	20.7	64.7	0.50	3rd
Ajesara, Atola or Atoje (swallowed charm) to curb insecurity	15.5	22.4	62.1	0.54	2nd
Gbere (charm incised into blood circulation) to provide protection against insecurity	21.6	12.9	65.5	0.56	1st
Afeeri (Disappearance Charm) to become invisible while experiencing insecurity challenges	10.3	11.2	78.4	0.32	4th
Isuju (De-visioning or Illusion Charm)	3.4	14.7	81.9	0.26	7th
Ayeta (Bullet Deflector)	7.8	11.2	81.0	0.27	6th
Eti (Procrastinator)	5.2	12.9	81.9	0.23	9th
Mafenukeje (Poisonous Weapon)	6.9	11.2	81.9	0.25	8th
Gbetugbetu (Defetishing Charm)	6.9	13.8	78.3	0.28	5th

Source: Field survey (2020)

From these results, it can be deduced that most of the respondents do not make use of indigenous measures to curb security challenges. The implications could be attributed to their religious background or affiliations. However, it is still noteworthy that a few members of the community still made use of some of these traditional indigenous measures. This finding is supported by Arinola (2013) who opined that Christianity and Islam have had their roles in why the knowledge and practice of traditional Yoruba religious beliefs are relatively low.

Security consciousness and related factors as determinants of use of indigenous protective measures

The result of the analysis Table 4 reveals that of all the variables, inclusive of socioeconomic characteristics,

occurrence of conflicts and domains of security consciousness (occurrence frequency, preparedness against various threats, community awareness and alertness and perceived need for improved security), only household sizes and security practice and restrictions have significant effects on respondents' use of indigenous security measures.

This result implies that households with large members used more indigenous measures compared to those with smaller household size. We did not find any direct corroborations of this result from the existing literature. However, our interpretation of this twist is that households with large members are more open to varying options of suggestions for possible consideration and use, and this seems to put them in a vantage position over other households with fewer members. This result seems to validate the relationship

among three types of social capital which include bonding (primarily, the family), linking (from the community) and bridging (outside the community) as three mutually-reinforcing entities. This result concurs with Azad and Pritchard (2023) which reveals that these different types of social capital play mutual roles in enhancing the adaptive capacity of individuals and households to flood hazard. The result is also corroborated by Rustinsyah (2015) and Rustinsyah, Prasetyo andAdib (2021), which both asserted that linking, bonding and bridging social capital rather exist as interdependent than independent entities. There was a relationship between one aspect of security consciousness and respondents' adoption of indigenous security strategies. The findings demonstrate that respondents' perceived necessity for security protocols (t = 2.234) significantly influences their utilization of indigenous security measures. This suggests that as individuals perceive greater insecurity in terms of their perceived need for security practices and restrictions, they are more inclined to resort to indigenous measures. This underscores the government's inadequacy in guaranteeing a secure

farming environment and a thriving agri-food system owing to low police-population ratio, amidst other challenges (Nwoko, 2021). This finding further points out the fact that feeling of insecurity, which arouses the consciousness of farmers may have triggered the embrace of unconventional security measures in spite of the perceived civilization and exposure to western education and culture which may have been perceived to have rendered such indigenous practices unpopular. It disagrees with Arinola (2013) which had in an earlier study asserted that western education has its toll on the use of indigenous measures and in general tradition religion and beliefs in Nigeria. This result also represents a different scenario from the one reported by Lafadchan (2019) that continuous patronage of indigenous conflict measures in Talubin, Philippines was because of the deep-seated respect that the people demonstrate on the rituals and non-ritualistic symbols and archetypes. The result also agrees with Omotara and Olutegbe (2015) where education and sex were not instrumental to use of indigenous methods among small ruminant farmers in Osun state, Nigeria.

Table 4: Determinants of Respondents' use of Indigenous Protective Measures in Ondo state

Variable	Coefficient	t_Statistic	p_value
(Intercept)	8.611	1.770	0.080
Male	1.570	1.287	0.201
Married	-0.451	-0.318	0.751
Christianity	-1.686	-1.568	0.120
Post-primary education	-0.402	-0.303	0.762
Age	0.002	0.036	0.971
Household size	0.391*	1.969	0.052
Farm size	0.054	0.343	0.732
Occurrence frequency	0.005	0.171	0.865
Preparedness Against Various Threats	0.042	1.202	0.232
Community Awareness and Alertness	-0.057	-1.372	0.173
Need for self-help	-0.011	-0.508	0.612
Perceived need for improved security	0.041**	2.234	0.028

*Significant at 10%; ** significant at 5%.

CONCLUSION

In conclusion, this study sheds light on the critical issue of security consciousness in Ondo state's agrarian communities, Nigeria. The findings emphasize the alarming prevalence of insecurity incidents, with farmers-herders clashes, theft, abduction, and armed robbery being prominent challenges. This escalation of security concerns underscores the urgent need for comprehensive security initiatives to safeguard lives, property, and agricultural assets, especially in a region where agriculture forms the backbone of the economy. The research highlights the diverse indigenous protective strategies employed by the local communities. Vigilante patrol teams, local security guards, and community rules and regulations emerged as the most utilized communal measures. These indigenous

methods play a vital role in complementing the efforts of formal security agencies, particularly in the rural areas where access to conventional security systems is limited. However, the study also reveals weak embrace of use of personal traditional protective measures, possibly influenced by increasing modernization and exposure to the Western culture. Nevertheless, few individuals still rely on these practices, indicating their continued relevance in certain contexts.

Furthermore, the research demonstrates that household size and perceived need for improved security significantly influence the adoption of indigenous protective measures. This insight suggests that households with larger members may be more open to considering a range of security options, underlining the importance of social dynamics and

potential impacts on households and individual decision making on security. In the light of these findings, it is imperative that security agencies collaborate closely with local vigilante groups and support the dissemination of effective indigenous security measures. Additionally, cooperative organizations should provide resources and training to empower rural communities in implementing these strategies.

REFERENCES

Adelaja, A., and George, J. (2019). Effects of Conflict on Agriculture: Evidence from the Boko Haram Insurgency. *World Development, 117*, 184-195.

Adeyemi, B. A., and Olotu, G. (2020). Security Consciousness among Students in Higher Institutions in Nigeria. *Nigerian Journal of Social Studies XXIII(2)*, 32-47.

Adisa, R. (2012). Land Use Conflict between Farmers and Herdsmen – Implications for Agricultural and Rural Development in Nigeria. In R. Adisa (Ed.), *Rural Development - Contemporary Issues and Practices* (pp. 101-118). InTech. doi: 10.5772/45787.

Ahmed-Gamgum, W. A. (2018). Herdsmen and Farmers Conflict in Nigeria: Another Dimension of Insecurity. *Journal of Public Administration and Social Welfare Research, 3*(1), 35-62.

Akingbade, A. (2022). Confronting the Challenges of Insecurity in Ondo State: The Role of Geospatial Surveillance and Mapping. *Global Journal of Arts, Humanities, and Social Sciences, 10*(5), 25-38.

Akoni, S., and Olowoopejo, B. (2016). Lagos Records 246 Murders, 51 Kidnap Cases in One Year. *Vanguard*. Retrieved from http://www.vanguardngr.com/2016/12/2016-lagos-records-246-murders-51-kidnap-cases-in-one.

Amadi, L., and Anokwuru, G. (2017). Security, Vulnerability and Agricultural Resilience: Experience from Herdsmen and Rural Farmers' Conflict in Nigeria. *International Journal of English Literature and Social Sciences, 2*(2), 239-178. doi: 10.1234/5678.

Amao, O. (2020). A Decade of Terror: Revisiting Nigeria's Interminable Boko Haram Insurgency. *Security Journal, 33*, 357-375. doi: 10.1057/s41284-020-00232-8.

Arinola, A. O. (2013). Western Education and Its Effects on Yoruba Social Institutions: Yoruba Religious Education as Case Study. *Academic Journal of Interdisciplinary Studies, 2*, 147. Doi:10.5901/ajis.2013.v2n6p147.

Atolagbe, A. (2011). Security Consciousness in Indigenous Nigerian Houses: A Preliminary Survey of Yoruba Ethno-medical Devices. *Studies on Ethno-Medicine, 5*(1), 57-62. doi: 10.1080/09735070.

Awodola, B., and Oboshi, A. (2015). Terrorism in Northern Nigeria: A Threat to Food Security in Maiduguri. *Mediterranean Journal of Social Sciences, 6*(3), 11-17.

Azad, M. J., and Pritchard, B. (2023). Bonding, Bridging, Linking Social Capital as Mutually Reinforcing Elements in Adaptive Capacity Development to Flood Hazard: Insights from Rural Bangladesh. *Climate Risk Management, 40*, 100498. doi: 10.1016/j.crm.2023.100498.

Blench, R., Dendo, M., Road, G., and Kingdom, U. (2003, September). The Transformation of Conflict between Pastoralists and Cultivators in Nigeria. *Africa, 12*. Retrieved from http://www.rogerblench.info/Conflict/Herder-farmerconflictinNigeria.pdf.

Colman, E. (2020, February 12). Ogun Approves Amotekun Bill. *MSN*. Retrieved from https://www.msn.com/en-xl/africa/nigeria/ogun-approves-Amotekun-bill/ar-BBZVhT6.

Eyeh, E. T. (2020). Violent Religious Conflicts in Nigeria, 1980-2019: Causes, Mitigation and Management Strategies. *The International Journal of Humanities and Social Studies, 8*(6). doi: 10.24940/theijhss/2020/v8/i6/HS2006-128.

Izuora, Y. (2020, February 14). Amotekun: IGP, S/West Governors Accept Operating Modalities Southwest. *Oriental News*. Retrieved from https://orientalnewsng.com/Amotekun-igp-s-west-governors-accept-operating-modalities-southwest/.

Kah, H. K. (2017). 'Boko Haram Is Losing, but So Is Food Production': Conflict and Food Insecurity in Nigeria and Cameroon. *Africa Development, 42*(3), 177-196.

Lafadchan, D. C. P. (2019). Indigenous Security Measures in Can-eo and Talubin, Northern Philippines. *International Journal of Science and Management Studies (IJSMS), 02*(02), 68-76.

Maiangwa, B., and Amao, O. B. (2015). Daughters, Brides, and Supporters of the Jihad: Revisiting the Gender-based Atrocities of Boko Haram in Nigeria. *African Renaissance, 12*(2), 117-144.

Nwoko, K. C. (2021). Amotekun: The Southwest Region's Response to the Failures of the Nigerian Police and Worsening Insecurity in Nigeria. *African Identities*. doi: 10.1080/14725843.2021.1994368.

Ofuoku. (2009). The Role of Community Development Committees in Farmer-Herder Conflicts in Central Agricultural Zone of Delta State, Nigeria. *Journal of Alternative Perspectives in the Social Sciences, 1*(3), 921-937.

Oghuvbu, E. A., and Oghuvbu, O. B. (2021). Farmer-Herders Conflict as a Challenge to National Unity in Nigeria. In A. M. Vasiliev, D. A. Degterev, and T. M. Shaw (Eds.), *Africa and the Formation of the New System of International Relations* (p. 16). Cham: Springer. doi: 10.1007/978-3-030-77336-6_16.

Oginni, S. O., Opoku, M. P., and Alupo, B. A. (2020). Terrorism in the Lake Chad Region: Integration of Refugees and Internally Displaced Persons. *Journal of Borderlands Studies, 35*(5), 725-741. doi: 10.1080/08865655.2018.145

Ogunleye, A. R. (2021). God-Gods: Engaging African Cultural Realities in Tackling Security Challenge in Nigeria. *African Journal of Culture, History, Religion and Traditions, 4*(1), 1-14.

Okoro, J. P. (2018). Herdsmen-Farmers' Conflict: Implication on National Development (Nigeria in Perspective). In *1st International Conference of Social Sciences (ICOSS'2018)*. National Open University of Nigeria, 25th–27th June.

Olaosebikan, O., Bello, A., Utoblo, O., Okoye, B., Olutegbe, N., Garner, E., *et al*. (2023). Stressors and Resilience within the Cassava Value Chain in Nigeria: Preferred Cassava Variety Traits and Response Strategies of Men and Women to Inform Breeding. *Sustainability, 15*(10), 1-18. 37. https://doi.org/10.3390/su15107837

Olufayo, O.-O., and Jegede, L. I. (2014). Redressing Security and Crime in Nigeria through Traditional Yoruba Social Values and Cultural Practices. *Developing Country Studies, 4*(4), 52-57.

Olutegbe, N. S., and Ogungbaro, O. O. (2020). Efficacy of the Ekiti State Antigrazing Law: Key Stakeholders' Perspectives. *Afrika Focus, 33*(2), 117-136.

Omorogbe, S. K., and Omohan, M. E. (2005). Causes and Management of Ethno-religious Conflicts: The Nigerian Experience. In *Crisis and Conflict Management in Nigeria since 1980*. Kaduna: Baraka Press.

Omotara, O. A., and Olutegbe, N. S. (2015). Use of endogenous knowledge in treating pests and diseases of small ruminants in Obokun government area of Osun State. Nigerian Journal of Rural Sociology, 15(2).

Osawe, C. O. (2015). Increase Wave of Violent Crime and Insecurity: A Threat to Socio-Economic Development in Nigeria. *Journal of Humanities and Social Science, 20*(1), 123-133.

Peter Yikwab, Y., and Tade, O. (2022). How Farming Communities Cope with Displacement Arising from Farmer-Herder Conflict in North Central Nigeria. *Journal of Asian and African Studies, 57*(4), 667–677.

Rustinsyah, R. (2015). Social Capital and Implementation of Subsidized Fertilizer Programme for Small Farmers: A Case Study in Rural Java, Indonesia. *International Journal of Rural Management, 11*(1), 25-39.

Rustinsyah, R., Prasetyo, R. A., and Adib, M. (2021). Social Capital for Flood Disaster Management: Case Study of Flooding in a Village of Bengawan Solo Riverbank, Tuban, East Java Province. *International Journal of Disaster Risk Reduction, 52*, 101963.

Sangotegbe, N., Odebode, S., and Onikoyi, M. (2012). Adaptation Strategies to Climate Change by Food Crop Farmers in Oke-ogun Area of South Western Nigeria. *Journal of Agricultural Extension, 16*(1), 1-10.

Sangotegbe, N., Oguntoyinbo, A., and Oluwasusi, J. (2015). Effectiveness of Role of Local Government Peace and Security Committee (PSC) in Farmer-pastoralist Conflict Prevention in Ibadan/Ibarapa Agricultural Zone of Oyo State, Nigeria. *Tropical Agricultural Research Extension, 17*(34), 95–104.

Soomiyol, M. V., and Fadairo, O. (2020). Climate-induced Conflicts and Livelihoods of Farming Households in Nigeria: Lessons from Farmers-herdsmen Conflict-ridden Communities in Benue State. *Agricultura Tropica Et Subtropica, 53*(2), 93–103.

Sowole, J., and Kolawole, Y. (2020, March 4). South-west States Pass Amotekun Bill into Law. *This Day*. Retrieved from https://www.thisdaylive.com/index.php/2020/03/04/south-west-states-pass-Amotekun-bill-into-law/.

Stevens, J. P. (1992). *Applied Multivariate Statistics for the Social Sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.

The Fund for Peace. (2015). Nigeria Conflict Bulletin: Ondo State - Patterns and Trends, January 2012 - June 2015. Retrieved from https://fundforpeace.org/wp-content/uploads/2018/08/conflictbulletin-ondo-1508.pdf (Accessed: September 2023).

The Punch. (2019). Ondo Security Situation Worrisome – UPN. Retrieved from https://punchng.com/ondo-security-

situation-worrisome-upn/ (Accessed: August 19, 2020).

Tonah, S. (2000). State Policies, Local Prejudices and Cattle Rustling along the Ghana-Burkina Faso Border. *Africa, 70*(4), 551-567. doi: 10.3366/afr.2000.70.4.551.

Ugwuja, A. (2020). Vigilante Outfits and Security in Nigeria: The Anambra State Situation, 1999-2015. *Journal of Good Governance in Africa, 2*(1), 120-136.

UN Office for the Coordination of Humanitarian Affairs. (2022). Nigeria Humanitarian Needs Overview 2022. Analysis. Retrieved from https://reliefweb.int/report/nigeria/nigeria-humanitarian-needs-overview-2022-february-2022 (Posted: 9 Feb 2022).

Upton, J., Constenla-Villoslada, S., and Barrett, C. B. (2022). Caveat Utilitor: A Comparative Assessment of Resilience Measurement Approaches. *Journal of Development Economics, 157*, 102873. Retrieved from https://www.sciencedirect.com/science/article/pii/S030438782200044X. doi: 10.1016/j.jdeveco.2022.102873.

Vanger, E. T., and Nwosu, B. U. (2020). Institutional Parameters That Condition Farmer–Herder Conflicts in Tivland of Benue State, Nigeria. *African Security Review, 29*(1), 20-40. doi: 10.1080/10246029

Rural-urban migration and welfare among farming households in Ogbomoso, Oyo State, Nigeria

Obi-Egbedi, O. and Taiwo, O. J.
Department of Agricultural Economics, Faculty of Agriculture, University of Ibadan, Ibadan
Correspondence details: gheneobi@gmail.com

ABSTRACT

Rural-urban migration can reduce poverty of farming households through remittances sent by the migrant members, thereby improving welfare, although it is not encouraged in order to avoid loss of labour for farm activities. Hence, the study examined the impact of rural-urban migration on farming households' poverty status in Ogbomoso, Oyo State, Nigeria. Primary data was used for the study collected via a multistage sampling procedure to survey 160 farming household heads. Data collected were analyzed using descriptive statistics, FGT poverty indices and propensity score matching. Results showed age and total household income were significantly higher among migrant farming households, while farm size and farm income were significantly higher among non-migrant households. Probability of migration was increased by age (0.0474), household size (0.5284), being married (1.1642) and crop production (0.8400). Poverty was higher among non-migrant households than migrant, and was significantly reduced by rural-urban migration, up to 43%. Therefore, poverty reduction policy should incorporate rural-urban migration of farming households through provision of employment opportunities for members who are willing to migrate to urban centers.

Keywords: Farming households, FGT indices, Poverty status, Propensity score matching, Rural-Urban migration.

INTRODUCTION

Poverty is a grave global pandemic which is most devastating in developing countries, especially in the rural areas. Most rural areas of developing countries lack opportunities to escape poverty hence, rural-urban migration is increasingly vital to sustainable development and poverty reduction in the rural areas (Somanje *et al*., 2020). About 8.8% of the world's population live in poverty, 478 million Africans live in extreme poverty; living on less than 1.90 PPP$/day (United Nations Conference on Trade and Development [UNCTAD], 2021). Sub-Saharan Africa has the highest concentration of poverty incidence, exceeding 35% in half of the countries. One-fifth of all poor people in Sub-Saharan Africa live the Nigeria (World Bank, 2022). Poverty is a prevalent problem pervading most sectors, especially economic and political. Nigeria ranks 161 out of 189 countries, in the category of low human development (United Nations Development Programme [UNDP], 2020). The country has been unable to achieve inclusive growth on a sustainable level, while challenges of climate change and more recently, the COVID-19 pandemic have made the task of achieving poverty reduction more difficult (World Bank, 2022).

Unequal distribution of poverty exists between urban and rural areas in Nigeria (World Bank, 2022). Poverty has been increasing in Nigeria, especially in the rural areas, despite the concerted efforts of the government to eradicate poverty in line with the first SDG goal. Migration has been suggested as an important pathway out of poverty (FAO, 2016). Historically, rural-urban migration has been a significant part of the urbanization process and continues to be important in scale in developing countries. It is a socioeconomic phenomenon as well as a spatial process that involves people moving from rural areas to cities, either permanently or semi-permanently. Rural-urban migration in Nigeria has been increasing over the years; between 1985 and 1990 over 3 million Nigerians migrated from rural areas to urban centres, while over 5 million Nigerians migrated between 2011 and 2021. This shows over 75% increase in the rural-urban migration for every period of ten years (Statista, 2022).

According to the Drivers for Migration and Urbanization in Africa report by the United Nations (2017), about half of the world's population now live in cities. This trend is expected to increase to 75 per cent by 2050, at a growing rate of 65 million urban dwellers annually. Migration had been considered to cause undesirable effects in terms of the departure of young, healthy and educated labour force from the rural area, resulting in rural economy deterioration, chronic poverty and food insecurity (Oginni and Tahirou, 2019). However, migration has also been identified as a survival strategy used by the poor, especially the rural dwellers (Gwanshak, Yusoff and Shafre, 2021; Hung and Peng, 2020; Mukhtar *et al*., 2018). Evidence infers that migration can have significant positive impacts on livelihoods and well-being (Gwanshak, Yusoff and Shafre, 2021; Hung and Peng, 2020; Mukhtar *et al*., 2018). However, it also carries risks and costs since the burdens of migration will be borne by the poor, especially if poorly managed. Migration is now seen as a global

phenomenon that needs to be understood and managed (Miroslav, 2018).

The assessment of migration's impacts on rural areas has remained relevant because migration acts as a catalyst in the transformation process of the migrating individual's (migrant) fate, the conditions of family members left behind, the local communities, and the larger sending regions (Nguyen *et al*, 2017). Hence, many rural households rely on migration to reduce or escape poverty. One significant source of development for the rural population as a result of this rising drift towards the cities is remittances. Migrants' remittances and the income multipliers they create are becoming critical resources for the sustenance strategies of receiving households as well as agents of regional and national development. Households that receive remittances tend to use the funds primarily for current consumption (food and clothing), as well as investments in children's education, health care, household food and security, and water and sanitation. (Hung and Peng, 2020).

Aside from a few studies such as Nguyen *et al*. (2017) in Vietnam and Agza *et al*. (2020) in Ethiopia, most studies on rural-urban migration excluded the impact of migration on the rural sending households and communities. Most studies are sample surveys on characteristics and determinants of migration, (Al-Maruf *et al.*, 2022; Xu *et al.*, 2021; Alarima, 2018; Fassil and Mohammed, 2017). Thus, more empirical research to identify the impact of rural-urban movement on rural households and communities in developing nations are needed, particularly in Nigeria,

where rural-urban migration is increasing, though empirical studies that show the link with poverty are limited. Therefore, this study examined the impact of rural-urban migration on farming households' welfare in Ogbomoso, Oyo State. Specifically, the study examined the factors that influence rural-urban migration in the area, estimated the farming households' welfare (using poverty level as proxy) and examined the impact of rural-urban migration on farming households' poverty status.

METHOLOGY

Ogbomoso is a city in Oyo State, South-Western Nigeria. According to World Bank (2022) the income poverty level in the state was 9.8% while the multidimensional poverty level is 19.6%. Ogbomoso population was approximately 503,806 in 2018 with population density of $253/km^2$ (World population review, 2018). The area lies on 8^0 10' North of the Equator and 4^0 10' East, of the Greenwich meridian. It is located within the derived savanna region and has a fairly high uniform temperature, moderate to heavy seasonal rainfall, and high humidity. The major occupation of the people in the area is farming and the predominant crops cultivated include; maize, cassava, yam, watermelon and cash crops like cashew, palm trees and mango. Ogbomoso Agricultural zone is one of the four agricultural zones in Oyo State. According to the Agricultural Development Project (ADP) categorization, each LGA represents a block and each block has eight (8) cells. The zone has a unique concentration of farming households relative to other zones. Figure 1 depicts the map of Ogbomoso town.
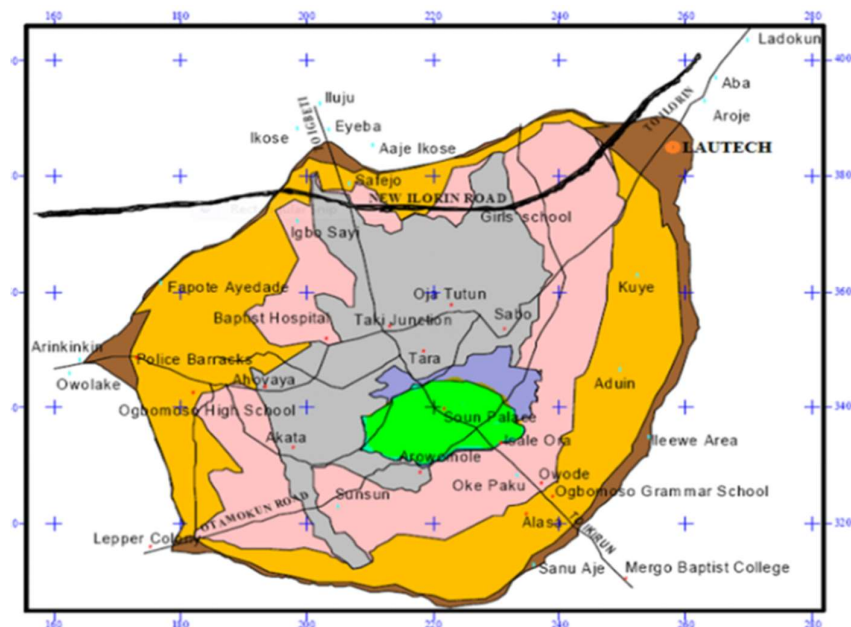

Figure 1. Map of Ogbomoso, Oyo state
Source: Britannica online, 2007

Primary data was used for the study and collected using semi-structured questionnaires through a multi-stage sampling technique. In the first stage, two local government areas (Oriire and Ogo-Oluwa local government areas) were chosen at random from the five local government areas (LGA) in Ogbomoso. The second stage involved choosing two wards randomly from each selected LGA (wards 1 and 10 in Oriire LGA , and wards 2 and 3 in Ogo-Oluwa LGA). The third stage involved random selection of two villages from each selected ward (Oloko and Fapote village in ward 1, Elerepamo and Eleesu village in ward 10 from Oriire LGA, Osupa-ojutaye and Oluboyepe village in ward 2, Alapon and Ayede village in ward 3 from Ogo-Oluwa LGA). Lastly, a total of 160 farming households were selected, proportionate to size and used for the analysis. The sampling unit for the study was the household head.

Analytical techniques

Descriptive statistics such as frequencies, percentages, means and standard deviation were used to profile the farming household heads' socio-economic characteristics, income and migration status. In this study, a migrant household is defined as one in which at least one person who is considered as a member of the household has migrated to live in the city for more than three months, whereas a non-migrant household has no member who has migrated to the city.

The Foster–Greer–Thorbecke (FGT) poverty indices of 1984, was employed to measure poverty among the rural farming households. The FGT poverty measure is given as:

$$FGT_\alpha = \frac{1}{N} \sum_{i=1}^{H} \left(\frac{z - y_i}{z}\right)\alpha \qquad \dots\dots (1)$$

Where, N is the sample size, z is the poverty line, y is per capita income for the ith person, and α is the poverty aversion parameter. When α= 0, Pα is the headcount index or the proportion of poor people; when α = 1, Pα is the poverty gap index, a measure of the depth of poverty and when α = 2, Pα is a measure of severity of poverty and reveals the degree of inequality among the poor. The poverty line for the study was set at two-thirds of the respondents' mean per capita household expenditure (MPCHHE). Household expenditure was used instead of the income because it was challenging to capture all the farmers' income sources (Kahsu and Nagaraja, 2017).

The causal effect of rural-urban migration on rural households' poverty was examined using the propensity score matching technique, due to the issue of selectivity bias. It is expressed as follows:

$$P(X_i) = P_r(M_i = 1|X_i) = E(M_i|X_i) \dots (2)$$

M_i denotes a dummy variable such that $M_i = 1$ if at least one member of a farming household migrated and $M_i = 0$, otherwise.

Similarly, let Y_i^1 and Y_i^0 denote potential observed welfare outcomes for migrant households and non-migrant households, respectively. X is the vector of pre-treatment characteristics. The average effect of treatment on treated samples (ATT), is the parameter of interest which can be estimated as:

$$ATT = E\{E[Y_i^1 - Y_i^0|M_i = 1, P(X_i)]\} \quad \dots (3)$$
$$= E\{E[Y_i^1|M_i = 1, P(X_i)] - E[Y_i^0|M_i = 0, P(X_i)] \mid M_i = 1\}$$

The propensity score is predicted with the probit model. The predicted propensity score is then used to estimate the treatment effect. The ATT is a mean for the unobservable counterfactual, $E[Y_i^0|M_i = 1]$ following Rosenbaum and Rubin (1983). The nearest neighbour matching (NNM) and kernel-based matching (KBM) methods are methods employed in this study

The definitions of variables used in the analysis are shown in Table 1.

Table 1: Definition of variables used in the probit analysis

Explanatory variables	Definition	Expected Sign
Gender (Male or Female)	1 if the household is male, 0 otherwise	-
Age	Age of household head in years	+/-
Household size	Total number of members in the household	+
Years of education	Years of education of household head	+/-
Farm size in ha	Size of farm cultivated in hectares	-
Farm Income per year	Estimated income from the farming activities in Naira	-
Marital Status	1 if married, 0 otherwise	+
Crop production	1 if crop production, 0 otherwise	+

RESULTS AND DISCUSSIONS

Socioeconomic characteristics

The description of farming household heads' characteristics by their migration status is shown in Table 2. It reveals that both groups (migrant and non-migrant households) mostly have similar characteristics. Both migrant (87.93%) and non-migrant (77.27%) farming households, were mostly male-headed in the study area. The mean age of the household heads was 62.35±9.75 years, although the migrant farming household heads were significantly older (64.53±10.06 years) than their non-migrant (59.25±8.19 years) counterparts. This may be due to younger farmers migrating from rural areas to urban areas in search of better lives. This conforms to the findings of Oginni and Tahirou (2019), which revealed that migrant household heads were significantly older than the non-migrant households. There was no significant difference in household size, which was about 7 persons. This implies relatively large farming households. Similarly, the years of schooling for migrant and non-migrant farming household heads were not significantly different, being 7.34±3.96 years. This indicates that most of the household heads were literate and may be open to migration for the increased economic gains. This is not consistent with the study of Alarima (2018), who found that migrant households are larger than non-migrant households. Conversely, the non-migrant household heads operated significantly larger farm sizes (1.79±0.82 ha) than the migrant household heads (1.43±0.80 ha). This

may be due to migration of able-bodied youth from the migrant households, leaving the business of farming to the aging population who may not be able to cultivate large hectares of farm land owing to the traditional farming system practiced. The mean farm size was 1.53±0.83 hectares, indicating small farm holdings prevalent in the area. This disagrees with Sun *et al.* (2021) who found that migrants households' farms are larger than that of non-migrant households. Similarly, the average farm income per year for the non-migrant household heads was significantly larger (N165,613.60±76405.15) than for the migrant household heads (N136,189.70±67102.12). Hence, non-migrant households earn more income from farming activities than migrant households. This could be due to a smaller amount of family labour available for farm activity, consequent upon migration of able-bodied members from rural to urban areas. On the other hand, migrant household heads earned significantly more income (N345, 982.76±70152.67) than non-migrant household heads (N165,613.60±76405.15), on the whole. This could be as a result of the remittances received by the migrant households from the member(s) living in the cities. This has positive implications on household expenditure and poverty reduction and agrees with Liu *et al.* (2022) study of migrant households in China, which indicated that migrant households earned higher incomes compared to non-migrant households, attributing this difference to the remittances received by migrants from family members residing in urban areas.

Table 2: Description of farming household characteristics

Variables	Migrant households N = 116	Non-migrant households N = 44	Pooled N = 160	t-statistics
Explanatory variables				
Gender				
Male (%)	87.93	77.27	85.00	
Female (%)	12.07	22.73	15.00	
Age (Mean)	63.53 (10.06)	59.25 (8.19)	62.35 (9.75)	4.28***
Household size (Mean)	6.86 (1.27)	6.27 (1.04)	6.71 (1.24)	0.589
Years of education (Mean)	7.10 (3.92)	7.97 (4.04)	7.34 (3.96)	1.2493
Farm size in ha (Mean)	1.43 (0.80)	1.79 (0.82)	1.53 (0.83)	2.5417***
Farm Income per year (Mean) in ₦	136,189.66 (67102.12)	165,613.64 (76405.15)	144281.31 (80629.22)	2.0826**
Household income per year in ₦ (farm income + remittances)	345,982.76 (70152.67)	165,613.64 (76405.15)	260,178.17 (85383.65)	1.975**
Marital Status (Married) (%)	81.90	63.64	76.88	
Crop production (%)	93.10	81.82	89.76	

Source: Field survey (2018). ***, ** Significant at 1% and 5% levels, respectively. SD in parentheses.

Estimation of poverty measures

The poverty indices (headcount, depth and severity) of migrant and non-migrant farming households in the area are shown in Table 3. The poverty line was calculated as two-thirds of the mean monthly household expenditure per capita obtained as ₦5,100.04. Most non-migrant households were poor, with poverty incidence of 59.09%, whereas most migrant households (68.97%) were non-poor. Generally, most of the respondents were not poor, although the poverty incidence, depth and severity were higher in non-migrant households than in migrant households. An assessment of the poverty depth showed that an average poor non-migrant households needed an added 15.77% of household expenditure to get out of poverty, whereas an average

poor migrant farming household will only require an added 4.69%. The results for severity of poverty among the farming households also showed that poverty was more severe among non-migrant farming households than the migrant households (1.25%). Hence, a household among the poorest of the non-migrant households requires an additional 6.09% of household expenditure to escape poverty, relative to the average poor household, whereas the poorest migrant households require an additional 1.25%. The results of the migrant households' poverty status could be due to the remittances received from the migrated members living in the urban areas, which provide an additional source of income. Agza *et al.* (2020) also found that migrant households in Ethiopia were less poor than the non-migrant households.

Table 3: Poverty level by migration status

Variables	Migrant households	Non-migrant households	Pooled households
Poverty incidence (P_0)	0.3103	0.5909	0.3938
Poverty depth (P_1)	0.0469	0.1577	0.0813
Poverty severity (P_2)	0.0125	0.0609	0.0282
Poverty line (2/3 of MPCMHHE) in ₦	5,100.04	5,100.04	5,100.04

Source: Author's computations; MPCMHHE is mean per capita monthly household expenditure.

Determinants of farming households' rural-urban migration

The probit estimates of the migration decision propensity equation are shown in Table 4. The likelihood ratio test of the hypothesis reveals that all coefficients of the explanatory variables are zero and have a Chi-square value of 36.76, suggesting that the estimated model is significant. The results show that a number of variables were statistically significant at 1% level in influencing migration decision, including: age, household size, involvement in crop production and being married, which were positively associated with the probability of rural-urban migration. Thus, a unit increase in the age of the household head, increases the probability of a member of the household migrating from the rural area to the urban by 4.7%. This is plausible due to the fact that other household members have to support the aging household head, hence may seek higher wages in the urban centres. As older household heads experience dwindling economic opportunities, younger members may be inclined to seek better prospects in urban areas. This is consistent with Agza *et al.* (2023), Agza *et al.* (2020) and Alarima (2018), which revealed that the likelihood for members of rural households to migrate increases with the age of the household head. Further, an increase in the household size increases the probability of a household member migrating to the urban area by 5.28%. This may be due to surplus family labour available for farm activities, causing mobility of

labour by members to the urban areas where demand for and price of labour is higher. Also, larger households may face increased economic pressures, leading members to migrate in pursuit of better-paying jobs to support the family financially. Larger household may also have a higher dependency ratio, making it more challenging to meet the needs of all members within the household, thus encouraging migration for better opportunities. This is consistent with Agza *et al.* (2023), which revealed that the probability of rural-urban migration increases with the household size.

Involvement in crop production also had a positive influence on the probability of migration. Farming households that primarily engage in crop production tend to have members who migrate to urban regions in pursuit of a better living. This may be due to the poor revenue generated from crop farming and its associated drudgery and risks. Ren *et al.* (2023) also found that migration was common to rice farming households in China. Being married also had a positive and significant influence on the probability of migration, indicating that the tendency to migrate from rural areas to the cities is increased with being married. This is plausible due to the increased responsibility from marriage to provide for family members. The finding is corroborated by Jang *et al.* (2014) who found that marriage positively influences migration in the United States. Alarima (2018), also indicates that

the tendency to migrate from rural areas to the cities is increased with being married.

Table 4: Probit estimation of propensity score (NNM) for rural-urban migration

Variables	Coefficient	Standard error	Z	P>|z|
Gender	-0.1982373	0.4495689	-0.44	0.659
Age	0.0473904***	0.01483	3.20	0.001
Farm size	0.1737431	0.2230722	0.78	0.436
Household size	0.5284466***	0.1329662	-3.97	0.000
Years of Education	-0.004808	0.0372923	-0.13	0.897
Farm income	-3.01e-06	2.28e-06	-1.32	0.188
Crop Production	0.8399843**	0.4096537	2.05	0.040
Marital Status	1.164263***	0.4100214	2.84	0.005
Constant	-0.094261	1.174942	-0.08	0.936
Log-likelihood	-75.727604			
Pseudo R^2	0.1953			
Model Chi-square	36.76***			
Correctly predicted non-migrants	98.99			
Correctly predicted migrants	74.14			
Number of observations	160			

Source: Author's calculations. ***Significant at 1%, ** 5%.

Impact of Rural-Urban Migration on Poverty

Following the estimation of propensity scores for migration decisions, we assess the matching quality of the process using the common support condition. The marching exercise found that the predicted propensity score ranges from 0.1795 to 0.9975, with a mean of 0.7369. Thus, the common support assumption is satisfied in the region of [0.1795, 0.9975]. Figure 2 presents the histogram of the estimated propensity scores for migrant households and non-migrant households. A visual examination of the density distributions of the predicted propensity scores for the two groups reveals a significant overlap in both migrant and non-migrant households' density distributions, fulfilling the common support condition. This is shown in the intersection area of the common support graph depicted in Figure 1. The propensity scores distribution for non-migrant households is shown in the bottom half of the graph. In contrast, the propensity scores distribution for migrant households is shown in the upper half. On the horizontal axis are the density scores.
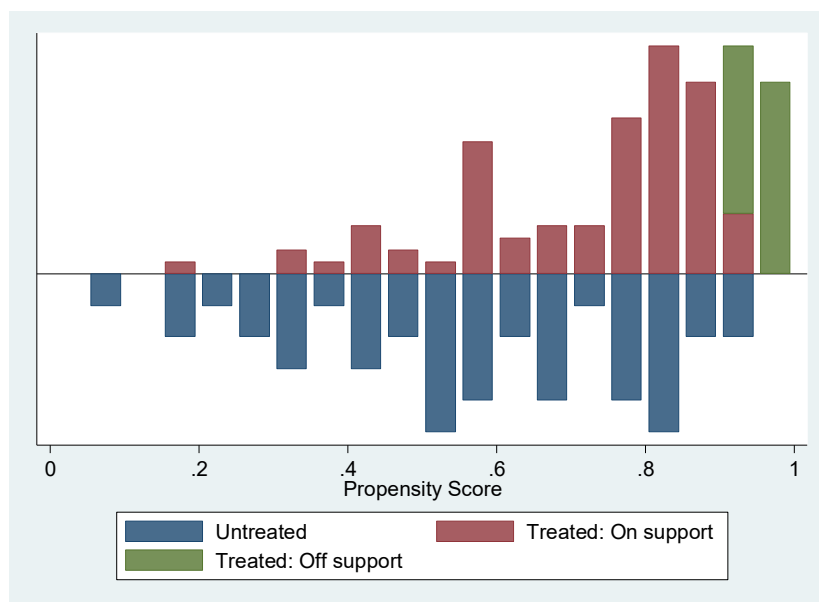

Figure 2. Distribution of propensity scores and common support for propensity score estimation.

Treated: On support indicates the observations in the migrant households' group, which have a fair comparison.

Treated: Off support indicates the observation in the migrant households' group, which do not have a fair comparison.

The result of ATT estimates for the effect of rural-urban migration on farming households' poverty status is presented on Table 5. The result showed that being a migrant household significantly reduces the poverty level of the farming households. The ATT estimate of -0.43 for poverty reduction, shows that the household participation in migration decreases the probability of poverty by 0.43 points, suggesting that rural-urban migration has a significant impact on poverty reduction among the farming households in the study area. This conforms to Agza *et al.* (2020) findings, who found out that rural-urban migration had a positive impact on rural-urban migration in Ethiopia.

Table 5: Effect of rural-urban migration on farming households' poverty; PSM results

Outcome variable	Participants	Non-participants	ATT	T-statistic
Poverty	0.27	0.70	-0.43	-5.50***

Source: Author's calculations. PSM: Propensity score matching, ATT: Average treatment effect on the treated, ***Sig at 1%

Table 6 demonstrates that rural-urban migration has a substantial effect on rural household poverty using the matching framework across all approaches. The estimated impact of participation measured by the outcome variable, poverty, are -0.430, -0.473 and -0.520 for nearest neighbour, radius and kernel matching method, respectively, suggesting that the probability of poverty decreases when rural-urban migration happens. In the presence of hidden bias, it is accepted that propensity score matching usually underestimates the average treatment effects, matching only controls for observable bias.

Table 6: Average treatment effect and sensitivity analysis: Propensity score matching results

Matching	Outcome Variable	No. of neighbours/ kernel type	Caliper	ATT	T	No. of treated	No. of control
NNM	Poverty	6	0.002	-0.430	-4.352***	116	44
Radius	Poverty	-	0.005	-0.473	-4.788***	116	44
Kernel	Poverty	Bandwidth	0.005	-0.520	-5.805***	116	44

Source: Author's calculations. ***Sig at 1%.

CONCLUSION AND RECOMMENDATIONS

The study concluded that most rural farming households in the area have at least one member that has migrated to the cities, hence, are migrant households. Most migrant households are not poor whereas non-migrant ones are mostly poor. Furthermore, it was established that rural-urban migration is enhanced by the age of the household head, household size, being married and involvement in crop production. It was also concluded that rural-urban migration reduces the probability of poverty. Hence, it is recommended that poverty reduction policy options should incorporate migration, since it was found to reduce poverty among the rural farming households. The government and non-governmental organisations should create more employment opportunities to absorb rural-urban migrants, while proper migration management policies that improve welfare gains beyond the household level to the community level should be initiated by government. At the household level, short-term migration during the off-season should be encouraged to engage idle resources, since farming activities are seasonal due to reliance on rain-fed agriculture. This ensures efficiency which will bring about welfare gains for the farmers.

REFERENCES

Agza, M., Alamirew, B., and Shibru, A. (2020). The impact of migration on multi-dimensional poverty in Gurage Zone, SNNPR, Ethiopia. *International Journal of Creative Research Thoughts, 8*(6), 144-165.

Agza, M., Alamirew, B., and Shibru, A. (2023). Determinants of rural-urban migration and its impact on migrant-sending households' livelihood security in Gurage zone, Ethiopia. *Cogent Social Sciences*, *9*(1). https://doi.org/10.1080/23311886.2023.2190253

Alarima, C. I. (2018). Factors Influencing Rural-Urban Migration of Youths in Osun State, Nigeria. *Agro-Science Journal of Tropical Agriculture, Food, Environment and Extension, 17*(3), 34-39.

Al-Maruf, A., Pervez, A., Sarker, P., Rahman, M. S., and Ruiz-Menjivar, J. (2022). Exploring the factors of Farmers' Rural-Urban Migration

Decision in Bangladesh. *Agriculture*, *12*(5), 722. https://doi.org/10.3390/agriculture12050722

Britannica. (2006). *Map of Ogbomoso, Oyo state* [Map]. Britannica online.

Dehejia, R. H., and Wahba, S. (2002). Propensity score matching method for non-experimental causal studies. *The Review of Economics and Statistics, 18*(1), 151-161.

Food and Agriculture Organization of the United Nations. (2015). *Rural migration, agriculture and rural development*.

Fassil, E., and Mohammed, B. (2017). Dynamics and determinants of rural-urban migration in Southern Ethiopia. *Journal of Development and Agricultural Economics, 9*(12), 328-340.

Foster, J., Greer, J., and Thorbecke, E. (1984). A class of decomposable poverty measures. *Econometrica, 52*(3), 761-766.

Gwanshak, J. Y., Yusoff, M. B., and Shafie, A. (2021). Impacts of Rural-Urban Migration on Rural Communities and Urban Centres in Plateau State, North-Central- Nigeria. *PalArch's Journal of Archaeology of Egypt/Egyptology*, *18*(8), 985-1002.

Hung, L., and Peng, S. (2020). Rural-urban migration with remittances and welfare analysis. *Regional Science and Urban Economics, 91*, 103629–103629. https://doi.org/10.1016/j.regsciurbeco.2020. 103629

International Organization for Migration and United Nations. (2017). *Drivers for Migration and Urbanization in Africa*. International Organization for Migration.

Jang, J. B. Casterline, J.B. and Snyder, A. (2014). Migration and Marriage: Modeling the Joint Process, *Demogr Res.* 30(1), 1339–1366.

Kahsu K., and Nagaraja G. (2017). Empirical Analysis of the Relationship between Poverty and Economic Growth in Ethiopia: Micro Panel Data Evidence from Amhara Region. *Asian Journal of Economics, Business and Accounting, 2*(4), 1-14.

Liu, M., Zheng, W., and Zhong, T. (2022). Impact of migrant and returning farmer professionalization on food production diversity. *Journal of Rural Studies, 94*, 23-36. https://doi.org/10.1016/j.jrurstud.2022.05.02 0

Miroslav, L. (2018). *Why we need a global understanding of migration*. World Economic Forum. https://www.weforum.org/agenda/2018/01/g lobal-migration-can-be-a-success/

Mukhtar, U., Zhong, Z., Tian, B., Razzaq, A., Naseer, M.A., and Hina, T. (2018). Does Rural-Urban Migration Improve Employment

Quality and Household Welfare? Evidence from Pakistan. *Sustainability*, *10*(11), 4281. https://doi.org/10.3390/su10114281

Nguyen, M., Nguyen, M. H., and Tran, T. (2017). The impact of internal migration on rural poverty and inequality: Evidence from Vietnam. *Journal of Rural Studies, 51*, 96-108.

Oginni, O. C., and Tahirou, A. (2019). Impacts of rural-urban migration of youths on household's welfare in Nigeria. *African Association of Agricultural Economists (AAAE)*. 2019 Sixth International Conference, Abuja, Nigeria.

Ren, G., Zhu, X., and Feng, S. (2023). The Impact of Migration on Farm Performance: Evidence from Rice Farmers in China. *Agriculture*, *13*(3), 708.

Rosenbaum, P. R., and Rubin, D. B. (1983). The central role of propensity score in observational studies for causal effects. *Biometrical 70*(1), 41-45.

Smith, J., and Todd, P. (2005). Does matching come Leland's critique of non-experimental estimator. *Journal of Econometrics 125*(2), 305-353.

Somanje, A. N., Geetha, M., Julia, L., Adelina M., Christopher, G., Xin, Z., Mustafa M., Osamu S., and Kazuhiko T. (2020). Challenges and Potential Solutions for Sustainable Urban-Rural Linkages in a Ghanaian Context. *Sustainability 12*(2), 507.

Statista. (2022). Nigeria: Urbanization from 2011 to 2021. Statista. https://www.statista.com/

Sun, Y., Hu, R., and Zhang, C. (2021). Impact of rural–urban migration experience on rice farmers' agricultural machinery expenditure: Evidence from China. *Agriculture 11*(8), 764. https://doi.org/ 10.3390/agriculture11080764

United Nations. (2020). *Sustainable Development Goals Report*. UN Department of Economic and Social Affairs. https://unstats.un.org/sdgs/

United Nations Conference on Trade and Development. (2021). *Economic Development in Africa Report: Reaping the potential benefits of the African Continental Free Trade Area for inclusive growth*.

United Nations Development Programme (2020). *Human Development Report*. Washington D.C, United Nations.

World Population Review (2018). Ogbomoso Population 2018. Retrieved from https://worldpopulationreview.com/world-cities/ogbomosho-population

World Bank. (2022). *Nigeria poverty assessment 2022: A better future for all Nigerians*. The World Bank Group.

Xu, Y., Zhang, Y., and Chen, J. (2021). Migration under economic transition and changing climate in Mongolia. *Journal of Arid Environments*, *185*, 104333.

Use of advertising media by small-scale agricultural entrepreneurs in Odeda local government area, Ogun State, Nigeria

[1]Amusat, A. S. and [2]Oyekumle, O.

[1]Institute of Agricultural Research and Training, Obafemi Awolowo University, Moor Plantation, Ibadan
[2]Agricultural Media Resources and Extension Centre, Federal University of Agriculture, Abeokuta
Correspondence details: niyiamusat2000@yahoo.co.uk

ABSTRACT

Advertising media engender a wider reach of agricultural products and services to potential customers and clients. Yet agricultural products and services are rarely advertised in the media. The study examined the use of advertising media by small-scale agricultural entrepreneurs in Odeda Local Government Area of Ogun State. Snow-ball sampling was used to select 180 respondents for the study. Data were obtained with the aid of interview guide. Descriptive (percentages and mean scores) and inferential (Chi-square and PPMC) statistics were used to analyse the data. Results show that the mean age of the respondents was 30.0±57.8 years. Majority (73.3%) were male, a little above half (51.1%) attended secondary schools, while 18.9% had tertiary education. Less than half (45.6%) had below 10 years of experience in agricultural enterprises, while 68.3% had positive perception of the use of media for advertisement. Physical display of products ($\bar{x}$=1.82) and social media ($\bar{x}$=1.67), limitation in customer's access to online advertisement ($\bar{x}$=1.27), and high number of media advertisement competitors ($\bar{x}$=1.15) were the most serious constraints to their use of media for advertisement. There were significant relationships between type of agricultural enterprise (χ^2=7.281, p=0.02), constraints (r=-0.260, p=0.00) and use of advertising media. The study concluded that there was low use of advertising media among the respondents, however the favourable perception towards the use of advertising media should be leveraged upon by relevant stakeholders to engender a greater use of advertising media for a wider reach to customers and prospective clients.

Keywords: Advertising, Agricultural entrepreneur, Customer, Product patronage

INTRODUCTION

Advertising relates to any paid mode of communication between manufacturers and product/service users done via media including radio, television, print, internet, press, hoardings, direct selling, posters, events, etc. (Nainawat, 2021). It is described as a means or tactic of calling the attention of the public and persuading them to buy a product, service or idea. Advertising aims to turn the attention of people towards a product or business through paid announcement in the print, broadcast or electronic media.

Media is just the vehicle which an advertiser uses in conveying his messages to the consumer. Paul and Rai (2021) described media as communication systems, content generators and other technologies for mediated human speech. While the media are valued for their informational and entertainment functions, they also provide advertising function (Lavuri, 2018). In advertising, media can be categorised into two: above the line media and below the line media. According to Awolowo and Akinteye (2016), the line is just an artificial line which is meant for easy identification and does not mean one is superior to the other. The above the line includes television, radio, newspaper, magazine, cinema, while below the line includes exhibition, sale promotion, sponsorship, gift items, direct mails, etc. They stated that media usually attract the interest of advertisers with a view to persuading them of their potential as effective channels for advertising messages.

With rapid growth of information technology and electronic media, television has topped the list among the media of advertising. It has the most effective impact as it appeals to both eye and ear (combination of audio and visual presentation). Products can be shown, their uses can be demonstrated and their utilities can be told over television. Just like radio, advertisements are shown on television during short breaks and there are also sponsored programmes by advertisers. According to Aziz et al. (2017), television is considered the most effective and efficient channel for spreading information in agriculture, making it a valuable teaching tool for agricultural extension. Radio is also one of the advertising media. It has an advantage of wide coverage and cost effectiveness. It is very useful to illiterates, who cannot read and write. During radio broadcasts, there are short breaks which are filled with advertisements of products and services.

Similarly, newspapers constitute a very common medium of advertising. An advertiser can communicate his message through a newspaper that has a wider reach. Considering that newspapers are published in different regions and different languages, advertised items therefore get to a wide range of people with language differences (Afolabi, 2014). The internet is equally a vital medium for marketing and

advertising. Marketing of products and services to prospective customers have evolved overtime as a result of the advent of the internet. Both online and offline enterprises use the internet to promote their products or services in forms such as text ads, pop up ads, banner ads and paid search placements (Eram, 2020). Consequently, the deployment of advertising media for use in agriculture can significantly contribute to the marketing of agricultural products and services, particularly by small-scale agricultural entrepreneurs, who possess the greater reach to the final consumer or customer.

Small-scale agricultural enterprises are non-subsidiary, independent firms, individuals or organizations with few employees. They are found everywhere in the society, spanning crop and animal production, processing and product marketing (Bello, 2015). These entrepreneurs play vital roles in the economic development of nations and form the bulk of business activities in growing economies like that of Nigeria.

The use of the media for advertising function has been in existence for a long time. Many small-scale agricultural enterprises have been using these media to increase the selling of their products and services to the general public, creating awareness in cases of changes or new offer in the existing product line, introduction of new products and services to the existing and prospective customers. There is still a gap between the agricultural entrepreneurs and the media of advertisement owing to the fact that agricultural products, inputs and services are rarely advertised in the media as the case with other non-agricultural products and services.

It is also noteworthy that small-scale entrepreneurs have different views and ideas about the media and their advertising content. Many of the agricultural products and services are not regularly featured in the available media of advertisement as with other non-agricultural products and services. This might be due to some constraints associated with the use of such media by the agricultural entrepreneurs. Against this background, the study examined the use of advertising media by the small-scale agricultural entrepreneurs. The specific objectives were to:

1. describe the personal characteristics of small-scale agricultural entrepreneurs;
2. identify the types of enterprises small-scale agricultural entrepreneurs are involved in;
3. determine the perception of small-scale agricultural entrepreneurs on media advertisement;
4. ascertain the extent of use of advertising media by small-scale agricultural entrepreneurs;

5. identify the constraints to use of advertising media by small-scale agricultural entrepreneurs.

The hypotheses tested were:

H_01: There is no significant relationship between types of agricultural enterprises and use of advertising media.

H_02: There is no significant relationship between associated constraints and use of advertising media.

METHODOLOGY

The study was carried out in Odeda Local Government area of Ogun State, Nigeria. The Local Government has a geographical land mass of 123,341,020 hectares with an estimated population of 186,300 people (Brinkhoff, 2022). It is composed of few semi-urban areas and several small scattered settlements in which over 60% of people are farmers. The inhabitants of Odeda Local Government are mainly Egbas who are involved in the cultivation of crops such as yam, cowpea, cassava, maize, cocoa, kolanut and oil palm. They are also involved in livestock production such as poultry, piggery and rabbitry on a small-scale.

The population of this study comprised all small-scale agricultural entrepreneurs in Odeda. There was no available record nor constituted group or association of agricultural entrepreneurs in the study area, hence snowball sampling was used to select 180 agricultural entrepreneurs involved in different agricultural related enterprises which constituted the respondents for this study. Agricultural entrepreneurs are those involved in new available agricultural ventures, setting new trends in agricultural related business and ready to take risks as opposed to conventional farmers still sticking to traditional system of farming. Interview guide was used to source data from the respondents in line with objectives of the study. Data were analysed with descriptive (frequencies, percentages, mean scores) and inferential statistics (Chi-Square, PPMC). The operationalisation of the study variables was done as follows:

Type of agricultural enterprise: Respondents were asked to indicate the agricultural enterprise applicable to them, using a two-point scale of involved = 1 and not involved = 0 from a list of seven enterprises. The maximum obtainable score was 7, while the minimum was 0.

Perception on media advertisement: Respondents indicated their perception by reacting to a list of six perception statements presented to them. This was measured using a 5-point Likert scale of strongly agree (5) to strongly disagree (1) for positive statements, with the scores reversed for negative statements. The maximum obtainable score was 30, while the

minimum was 6. The mean score was obtained and used to categorise the respondents into favourable (≥ mean score) and unfavourable (<mean score) perception towards use of advertising media.

Constraints to media advertisement use: A list of six possible constraint items was presented to the respondents from which they reacted to those affecting their enterprises. It was measured on the scale of serious constraint = 2, mild constraint = 1, and not a constraint = 0. The maximum score obtainable was 12, while the minimum was 0. The mean scores for each of the constraints were obtained and used to rank them based on the order of severity.

The dependent variable of the study was use of advertising media. Respondents were required to indicate always used (2), occasionally used (1), and not used (0) to the seven advertising media provided. The maximum score obtainable was 14, while the minimum was 0. The mean scores for the advertising media were obtained and used to rank them based on

the extent to which they were used by the agricultural entrepreneurs.

RESULTS AND DISCUSSION

Personal characteristics of small-scale agricultural entrepreneurs

Results in Table 1 show that majority (73.3%) of the respondents were male, while 26.7 were female. This implies that there were more male agricultural entrepreneurs than female in the study area. Most of them (41.66%) were between the age of 31-40 years while the mean age was 30.0±5.8 years, indicating a dominance of small-scale agricultural entrepreneurship by young people.

This contradicts the submission that young people usually do not like to work in the agricultural sector, but prefer seeking job opportunities in other sectors (Hilmi, 2021). More than half (51.1%) of the respondents had secondary education, while 18.9% had tertiary education.

Table 1: Distribution of the respondents by their socio-economic characteristics

Variable	Percentage	Mean
Sex		
Male	73.3	
Female	26.7	
Age		
21-30	16.7	30.0±5.9
31-40	41.7	
41-50	28.8	
> 50	12.8	
Religion		
Christianity	80.0	
Islam	18.3	
Traditional	1.7	
Education		
Primary	30.0	
Secondary	51.1	
Tertiary	18.9	
Marital status		
Single	20.0	
Married	80.0	
Years in agribusiness		
< 10	45.6	18.2±11.6
10-20	25.0	
21-30	17.7	
> 30	11.7	
Annual income (N)		
≤500,000	85.0	255,754.9±195.8
500,001 - 1,000,000	11.7	
1,000,001 - 1,500,000	1.7	
>1,500,000	1.6	

The relatively high percentage of graduates practicing small-scale agricultural entrepreneurship might be due

to the presence of an agricultural institution (i.e. Federal University of Agriculture, Abeokuta) in the

study area. Since there are diverse media types that are accustomed to the present day and age, and everybody (i.e. young or adult) has their fair share of media exposure (Paul and Rai, 2021), graduate entrepreneurs would be vast in the use of various advertising media. It was further revealed that 80.0% of the entrepreneurs were married. This is expected because most of them were within the adult age of 31-40years.

On the average, the respondents possessed 18.2±511.6 years of agribusiness experience, which is quite ample. They are thus expected to be attuned with the appropriate media to use to effectively reach potential customers. The annual income revealed that most (85.0%) of them earned not more than N500,000 annually, making it apparent that they are small-scale entrepreneurs. By this, they will be restricted to patronising only advertising media that are within their financial capability, such as physical display of products and social media.

Types of small-scale agricultural enterprises available in the study area

Results in Table 2 show the types of agricultural enterprises involved in by the respondents, these were classified into seven. Most of them were general agro-input sellers (52.1%). This was followed by poultry equipment sellers (13.8%) and agricultural consultancy service providers (12.7%), with agricultural equipment hiring (1.7%) being the least. The prominence of general agro-input sellers is understandable considering the essential nature of wide agro-input offered for agricultural production in the area. Having the belief that farmers would often demand quality inputs, agro-input sellers have learnt to view smallholder farmers as potential customers for their products and services (Gerstenmier, 2015). Similarly, considering rural poultry production as a suitable means of providing humans with quality food and additional income (Atsbeha and Gebre, 2021), this assertion equally supports the popularity of the respondents' involvement in the sale of poultry equipment. Agricultural entrepreneurs providing consultancy services operate like extension agents who provide extension service to rural farmers by keeping farmers abreast of latest or improved technologies. Knowledge of such technologies can also engender farmers' interest in them.

Table 2: Distribution of agricultural entrepreneurs by the types of small-scale agricultural enterprises

Types of small-scale enterprise	Percentage
Livestock feed milling and selling	4.4
Poultry equipment sellers	13.8
Fish feed milling and selling	8.8
General agro-inputs sellers	52.1
Agricultural consultancy services providers	12.7
Agricultural equipment hiring	1.7
Honey production and selling	6.5

Perception of agricultural entrepreneurs on media advertisement

Table 3 reveals that agricultural entrepreneurs were positively disposed to the use of media advertisement for promotion of their goods and services. For instance, most respondents (91.7%) perceived that media advertisement is very important and necessary for better sales and customers' patronage. Also 86.0%

agreed that media advertisement enhances sales/patronage of products and services. Furthermore, 68.3% disagreed that media advertisement is meant for large-scale entrepreneurs, while 68.9% equally disagreed that media advertisement is for the educated entrepreneurs. Generally, as indicated in Table 3b, most of the respondents had favourable perception (68.3%) towards media advertisement.

Table 3a: Perception of agricultural entrepreneurs on media advertisement

Statement	SA	A	U	D	SD	Mean
Advertisement is not important/necessary	1.7	6.7	0.0	26.7	65.0	1.47
Using the media for advertisement is unproductive	1.7	3.3	6.7	33.4	55.0	1.97
Sticking to one type of media is the best	8.3	13.3	60.0	13.3	2.35	1.05
There is high competition in media advertisement	38.3	28.3	8.3	21.7	3.3	3.77
Media advertisement is for the educated entrepreneurs	8.3	13.8	8.8	45.7	22.2	2.28
Media advertisement is meant for large-scale entrepreneurs	10.0	21.7	0.0	45.0	23.3	2.50
Media advertisements enhance sales/patronage of products and services	34.4	51.6	0.0	12.8	1.1	2.82

The implication of a favourable perception is that it would translate to high willingness of the respondents to deploy media advertisement in the promotion of their agricultural enterprises. This finding aligns with the reality that entrepreneurs are known for exhibiting positive biases in their perception (Zhang and Cueto, 2015).

Table 3b: Perception categories of agricultural entrepreneurs on media advertisement

Perception categories	Percentage	Mean	SD
Favourable	68.3	18.5	4.09
Unfavourable	31.7		

Agricultural entrepreneurs' use of advertising media

It was revealed that physical display of products ($\bar{x}$=1.82) and social media ($\bar{x}$=1.68) were the top two advertising media used by the agricultural entrepreneurs for promoting their enterprises for onward patronage by their intending customers, while the other were less used as displayed in Table 4. This finding generally suggests that there is low use of available advertising media among the agricultural entrepreneurs, which may be attributed to constraints associated with their use e.g. cost related constraint as shown in Table 5. For instance, the high use of physical display of products along with social media is due to the reality that they are relatively cost-free compared to broadcast and print media advertisements. These two media are user-generated. White *et al*. (2014) reported that using user-generated media, particularly social media, avail agriculturists with free and almost direct channels through which they can connect with their customers.

Table 4: Distribution of media used for advertisement by agricultural entrepreneurs

Advertising media	Always	Sometimes	Never	Mean	Rank
Radio	1.7	25.0	73.3	0.28	3rd
Television	1.7	13.3	85.0	0.18	6th
Newspaper	3.3	3.3	93.3	0.10	7th
Magazine	5.0	18.3	76.7	0.22	5th
Physical display of products	86.7	11.6	1.7	1.82	1st
Social media	63.3	16.7	20.0	1.68	2nd
On-line advertisement (Website)	1.2	23.7	75.1	0.24	4th

Constraints to use of advertising media by agricultural entrepreneurs

As displayed in Table 5, high cost of electronic and print ($\bar{x}$=1.67), limitation in customer's access to online advertisement ($\bar{x}$=1.27), high number of media competitors ($\bar{x}$=1.15) and low targeted audience ($\bar{x}$=1.10) were the serious constraints affecting the small-scale agricultural entrepreneurs' use of media advertisement. Asogwa and Musa (2018) similarly identified cost and competition related among other things as constituting threats to the use of e-marketing by entrepreneurs in agribusiness. Therefore, the occurrence and degree of severity of the stated constraints will have a great influence on the extent to which advertisement media would be used by agricultural entrepreneurs in making their products and services known to prospective customers.

Table 5: Distribution of agricultural entrepreneurs by constraints to use of adverting media

Advertising media	Always	Sometimes	Never	Mean	Rank
High cost of electronic and print media advertisement	73.3	20.0	6.7	1.67	1st
High number of media advertisement competitors	35.0	45.0	20.0	1.15	3rd
Choice of media to use for advertisement	10.0	51.7	38.3	0.72	6th
Limited area of media coverage	20.0	43.3	36.7	0.83	5th
Limitation in customer's access to on-line advertisement	38.3	50.0	11.7	1.27	2nd
Low targeted audience	21.7	66.7	11.7	1.10	4th

Relationship between type of agricultural enterprise and use of advertising media

Results in Table 6 show that a significant relationship existed between type of agricultural enterprise and use of advertising media (χ^2=7.281, p=0.02). This means that some agricultural enterprises require specific type of advertising media for effective products and services promotion to prospective customers.

Considering that different types of advertising media have their strengths and weaknesses, it implies that some may be appropriate in promoting certain agricultural enterprises but also inappropriate for others. Generally, the type of media selected for use is determined among other things by extent of reach, cost, prestige, image, rating, share of media and circulation (Esiri *et al*., 2014).

Table 6: Chi-square relationship between type of agricultural enterprise and use of advertising media

Variable χ^2	Df	p-value	Decision
Type of agricultural enterprise 7.281	6	0.02	Sig

Relationship between associated constraints and use of advertising media

Table 7 shows that there was a significant relationship between constraints and use of advertising media (r= -0.260, p=0.00). The negative sign implies that the constraints experienced by the respondents are inversely related to the advertising media used. In other words, the greater the severity of the associated

constraints, the lower will be the use of advertising media by agricultural entrepreneurs. Notwithstanding the reality of entrepreneurs being positively biased in their perception of media advertisement (Zhang and Cueto, 2015), when the level of constraints affecting media advertisement is high, they would be less disposed to publicising their products and services to targeted customers through advertising media.

Table 7: PPMC relationship between associated constraints and use of advertising media

Variable r-value	p-value	Decision
Constraints -0.260	0.000	Sig

CONCLUSION AND RECOMMENDATION

Agricultural entrepreneurs, most of whom were agro-input sellers, were generally characterised by low use of advertising media. They primarily utilised physical display of products and social media as the advertising media for promoting their enterprises for onward patronage by their prospective customers. However, high cost of electronic and print media, limitation in access to customers' online advertisement, high number of media advertisement competitors, as well as low target audience constituted limitations to the use of other advertisement media. Notwithstanding, respondents had favourable perception towards the use of advertising media, hence it is recommended that the positive disposition should be leveraged upon by all relevant stakeholders to engender a greater use of advertising media for a wider reach to customers and prospective clients.

REFERENCES

Afolabi, A. R. (2014). Repositioning the print industry in Nigeria: the issues, the strategy. *The Nigerian Voice*. https://www.thenigerianvoice.com/news/153201/repositioning-the-printing-industry-in-nigeria-the-issues.html

Awolowo, W. and Akinteye, G. (2018). *ABC of advertising*. Print Group Publishers.

Asogwa, V. C. and Musa, S. (2018). Issues in E-Marketing for Prospective Entrepreneurs in Agribusiness. *International Journal of Innovative Education Research, 6*(3), 66-76. https://seahipaj.org/journals-ci/sept-2018/IJIER/full/IJIER-S-10-2018.pdf

Atsbeha, A. T. and Gebre, G. G. (2021). Factors affecting women access to agricultural extension services: evidence from poultry producer women in northwestern Tigray, Ethiopia. *Cogent Social Sciences*, *7*(1), 1975413. https://doi.org/10.1080/23311886.2021.1975413

Aziz, R., Siddiqui, B. N., Ali, J., Ali, A., Fahmid, S., Raza, Q. and Akram, M. (2017). Role of advertisements and short agricultural messages telecast on PTV in dissemination of agricultural technologies. *International Journal of Advanced Research in Biological Sciences, 4(9)*, 16-20. http://doi.org/10.22192/2017.04.09.003

Bello, R. S., B. M. (2015). Small-scale enterprises (SMEs) and agricultural transformation: the Nigeria experience. *Science Journal of*

Business and Management, 3(5-1), 11-15. https://doi.org/ HYPERLINK "https://doi.org/10.11648/j.sjbm.s.20150305 01.13" \t "_blank" 10.11648/2015030501.13

Brinkhoff, T. (2022). Odeda local government area in Nigeria. https://www.citypopulation.de/en/nigeria/ad min/ogun/NGA028016__odeda/

Eram, M. (2020). Importance and efficacious of advertisement. *Journal of Emerging Technologies and Innovative Research*, 7(2), 285-291. https://www.jetir.org/papers/JETIR2002449. pdf

Esiri, J.M., Kolade, A., Oloyede D. B. and Ogungbamigbe K.O. 2014. Determinants of media selection among advertising practitioners in Nigeria. *Singaporean Journal of Business Economics, and Management Studies*, 2(6), 35 – 47. https://doi.org/10.12816/0003880

Gerstenmier, A. (2015). *Agricultural input supply: an action plan for African agricultural transformation*. Feeding Africa. https://www.afdb.org/fileadmin/uploads/afd b/Documents/Events/DakAgri2015/Agricult ural_Input_Supply.pdf

Hilmi, M. (2021). Entrepreneurship in farming: small-scale farming and agricultural mechanization hire service enterprises in Iraq. *Middle East Journal of Agriculture Research*, 10(1), 10-52. https://doi.org/10.36632/2021.10.2.45

Lavuri, R. (2018). Media strategies and consumer purchase behaviour with special reference to FMCG products. https://doi.org/10.2139/3154452

Nainawat, S. (2021). Importance of advertising in business communication. *International Journal of Advanced Research in Commerce, Management and Social Science*, 4(2), 195-204.

Paul, S. and Rai, M. (2021). Role of the Media. In S. Romaniuk, M. Thapa, P. Marton (Eds.), *The palgrave encyclopedia of global security studies*. Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-319-74336-3_277-1

White, D., Meyers, C., Doerfert, D. and Irlbeck, E. (2014). Exploring agriculturalists' use of social media for agricultural marketing. *Journal of Applied Communications*, *98*(4). https://org/10.4148/1051-0834.1094

Zhang, S. X., and Cueto, J. (2017). The study of bias in entrepreneurship. *Entrepreneurship Theory and Practice*, *41*(3), 419-454. https://doi.org/10.1111/etap.12212