EPRA International Journal of Agriculture and Rural Economic Research (ARER)- Peer-Reviewed Journal
Volume: 13 | Issue: 9 | September 2025 | Journal DOI: 10.36713/epra0813| Impact Factor SJIF(2025): 8.733| ISSN: 2321 – 7847

STRENGTHENING FOOD SECURITY THROUGH AGRICULTURAL EXTENSION: EVIDENCE FROM SMALLHOLDER FARMERS IN UKWUANI LGA, DELTA STATE

Elusaiwe, N. M.

Agricultural Economics and Extension Dept,
Faculty of Agriculture, University of Delta, Agbor. Delta State, Nigeria.

Article DOI: https://doi.org/10.36713/epra23812
DOI No: 10.36713/epra23812

ABSTRACT----------
This study examined the Strengthening Food Security through Agricultural Extension: Evidence from Smallholder Farmers in Ukwuani LGA, Delta State, Nigeria. A descriptive survey design and multi-stage sampling technique were used to select 150 smallholder farmers. Data were collected using a structured questionnaire and analyzed using descriptive statistics (frequencies, percentages, means, and standard deviations), while hypotheses were tested using independent sample t-tests and ANOVA. The findings revealed that agricultural extension services positively influence food availability and significantly enhance food accessibility and nutritional practices among smallholder farmers. A major strategy identified for improving extension delivery was the provision of adequate transportation and mobility support for extension agents to effectively reach rural communities. Hypothesis testing showed no significant differences in perceptions of extension service roles based on gender ($p>0.05$), years of farming experience ($p>0.05$), educational level ($p>0.05$), or access to formal training ($p>0.05$). These results suggest that the perceived benefits of agricultural extension services are consistent across different farmer demographics. Based on the findings, it was recommended that the Delta State Ministry of Agriculture, in collaboration with local governments, should increase the number of trained extension personnel and ensure regular farm visits. This would promote knowledge transfer, encourage the adoption of improved agricultural practices, and provide timely support to farmers, thereby enhancing food security in the region.

KEYWORDS: *Role, Agricultural Extension Service, Food Security, Smallholder Farmers.----------*

INTRODUCTION

Agriculture continues to serve as a cornerstone of Nigeria's economic development and food security, with smallholder farmers producing a significant portion of the nation's food supply (Alabi & Adebanjo, 2021). Agricultural extension services provide a vital link between research institutions and rural farming communities by facilitating the transfer of improved technologies, knowledge, and skills (Fashina, Arogundade, & Olatunji, 2023). These services enable farmers to boost productivity, transition from subsistence to more market-oriented practices, and adapt to environmental and climate-related challenges, thereby supporting resilience and sustainable food systems (Adefila & Ajiboye, 2022; Oyelade & Ojo, 2020).

In light of the growing challenge of food insecurity in sub-Saharan Africa, extension services are central to achieving Sustainable Development Goal 2 (zero hunger), as they enhance farmers' access to climate-smart practices, sustainable production methods, and post-harvest innovations (FAO, 2022; Afolabi & Olowu, 2020). By equipping farmers with timely knowledge on soil fertility management, irrigation, improved inputs, and storage techniques, extension contributes directly to improved food availability (Fashina et al., 2023). Beyond productivity, extension also promotes inclusive rural development by reducing knowledge gaps and encouraging the participation of women and youth in agricultural activities (Oyenuga & Adebimpe, 2021; Osundare & Akinfenwa, 2022).

However, access to quality extension services in rural Nigeria remains limited, largely due to infrastructural weaknesses, low literacy levels, and weak linkages between farmers and extension agents (Adebayo & Adekoya, 2020; Ogunbiyi & Falade, 2023). Evidence indicates that participatory approaches grounded in dialogue, experiential

Volume: 13 | Issue: 9 | September 2025 | Journal DOI: 10.36713/epra0813| Impact Factor SJIF(2025): 8.733| ISSN: 2321 – 7847

learning, and community realities are more effective in promoting the adoption of innovations and improving household food availability (Akinyemi, 2019; Adeola & Bello, 2021; Olabode & Oyedokun, 2023). While earlier studies confirm the positive influence of extension services on yields, income, and dietary diversity (Alao, 2021; Adediran & Balogun, 2020; Odetola & Okunade, 2022; Bello & Arogundade, 2023; Ajibade, 2019), there remains limited grassroots-level evidence, particularly in local government areas such as Ukwuani in Delta State. This study therefore aims to assess the role of agricultural extension services in strengthening food security among smallholder farmers in Ukwuani Local Government Area, Delta State, Nigeria..

MATERIALS AND METHODS

Study Area

The population of this study comprises all registered smallholder farmers in Ukwuani Local Government Area, Delta State. Smallholder farmers in this context are defined as those operating on a relatively small scale, primarily for subsistence and local market consumption, and who are beneficiaries or intended beneficiaries of government or NGO-led agricultural extension services.

Sample and Sampling Technique

The study will utilized a multi-stage sampling technique. In the first stage, five major farming communities was be purposively selected based on their agricultural activity levels and accessibility. These include Obiaruku, Umutu, Amai, Umuebu, and Ebedei. In the second stage, stratified sampling was used to categorised them into strata, ensure representation across gender, age, and farming experience. Finally, a purposive sampling technique was used to select a total of one hundred and fifty (150) small holder farmers who have had some form of contact with agricultural extension services in the past two years. Other selection criteria include farm ownership, farming experience of at least two years, and willingness to participate in the study.

Data Analysis

Descriptive statistics such as tables, frequencies and percentages was used to present and analyze data to achieve most of the objectives. A 4-points Likert scale type rating, having 'Strongly Disagree', Disagree' 'Agree', ', and 'Strongly Agree' was used to determine the problems or bottlenecks experienced in the strengthening food security through agricultural extension. Mean and standard deviation was used to analysed the research questions. In addition, the null hypotheses was tested using the Independent sample t-test and Analysis of Variance (ANOVA). Statistical Package for Social Sciences (SPSS) Version 27 was used for analysis.

RESULT AND DISCUSSION

Socio-Economic Characteristics of Respondents

Table 1 shows that one hundred and fifty (150) respondents were sampled for this study. Of the 150 respondents, 102(68.0%) of them were male, while the remaining who constituted 48(32.0%) were female it implies dominant participation by male engaging in farming activities. This finding correspond with that of Doss et al (2025) and Offor-Ikpendu et al (2025) which reports men's substantial participation in farming activities reflecting strong male dominance. Age, the majority were aged 31–40 years, at 54.2%, which implies that majority of the beneficiaries were young and economically active. This is in agreement with Umar et al (2025) describe beneficiaries as being in their active production ages. Majority of the respondents (53.4%) were married and that they are responsible, and these also indicate the existences of marital stability in the study area. Married individual are considered to be more hard working and productive. This finding is in line with Maisule (2025) who asserted that married farmers are motivated to protect livelihoods, demonstrates proactivity and responsibility. Education: 126(84.0%) had secondary school certificate (WAEC or NECO), and the remaining 18(12.0%) had tertiary certificate, 6(4.0%) had primary school leaving certificate. Over 80% of the respondents were literate, the high literacy could motivate the adoption of new practices and increase farm output. This finding agrees with Naseri & Idris (2025) that educated farmers are more proactive and productive

Regarding their experience, 8(5.3%) of them have had farming experience of 1-5 years, 24(16.0%) have had farming experience of 6 – 10 years, and the remaining 118(78.7%) have had farming experience of 11-15 years and above, This implies that farmers have moderately years of agricultural production experience which could serve as an advantage in adoption of production technologies. This finding agrees with Owigho et al (2025) which stated that farmers with moderate levels of production years had higher motivation and willingness to adopt smart technologies.

EPRA International Journal of Agriculture and Rural Economic Research (ARER)- Peer-Reviewed Journal
Volume: 13 | Issue: 9 | September 2025 | Journal DOI: 10.36713/epra0813| Impact Factor SJIF(2025): 8.733| ISSN: 2321 – 7847

Socioeconomic Characteristics of the Respondents (n=150)

Category	Freq.	%
Gender		
Male	102	68.0
Female	48	32.0
Age Range		
21-30 years	30	11.9
31-40 years	70	54.2
41-50 years	50	22.1
Marital status		
Single	50	32.0
Married	70	53.4
Divorced	20	10.1
Widowed	10;	7.6
Educational Qualification		
Primary	6	4.0
Secondary	126	84.0
Tertiary	18	12.0
Experience		
1-5 years	8	5.3
6-10 years	24	16.1
11-15 years and above	118	78.7

Source: Field survey, 2025

The role of Agricultural extension service in enhancing food availability among smallholder farmers in Ukwuani Local Government Area of Delta State, Nigeria.

Table 2 shows the role of agricultural extension service in enhancing food availability among smallholder farmers in Ukwuani Local Government Area of Delta State, Nigeria. It shows that the respondents agreed with the following items: Agricultural extension agents regularly visit smallholder farms to provide timely advice on improved farming practices ($\bar{x}$ = 2.67). However, the respondents disagreed with the following items: extension services have helped me adopt modern techniques that increased my crop yield and food output ($\bar{x}$ = 2.20), training and demonstrations organized by extension officers have improved my knowledge of sustainable farming ($\bar{x}$ = 2.07), I have access to reliable information on weather patterns, pest control, and planting periods through extension services ($\bar{x}$ = 1.97) and extension officers provide adequate support in the selection and application of quality seeds and fertilizers ($\bar{x}$ = 1.85). based on the value of the weighted average (2.15 out of the 4.00 obtainable), which falls within the decision value for low extent, it can be inferred that the role of Agricultural extension service in enhancing food availability among smallholder farmers in Ukwuani Local Government Area of Delta State, Nigeria is positive.

Table 2

The Role of Agricultural Extension Service in Enhancing Food Availability among Smallholder Farmers in Ukwuani Local Government Area of Delta State, Nigeria

Items	SD	D	A	SA	Mean ($\bar{x}$)	Std. D
Agricultural extension agents regularly visit smallholder farms to provide timely advice on improved farming practices.	15 (10.0)	48 (32.0)	59 (39.3)	28 (18.7)	2.67	.90
Extension services have helped me adopt modern techniques that increased my crop yield and food output.	30 (20.0)	80 (53.3)	20 (13.3)	20 (13.3)	2.20	.91
Training and demonstrations organized by extension officers have improved my knowledge of sustainable farming.	46 (30.7)	54 (36.0)	44 (29.3)	6 (4.0)	2.07	.87
I have access to reliable information on weather patterns, pest control, and planting periods through extension services.	37 (24.7)	80 (53.3)	33 (22.0)	0 (0.0)	1.97	.69

Volume: 13 | Issue: 9 | September 2025 | Journal DOI: 10.36713/epra0813| Impact Factor SJIF(2025): 8.733| ISSN: 2321 – 7847

Extension officers provide adequate support in the selection and application of quality seeds and fertilizers.	28 (18.7)	117 (78.0)	5 (3.3)	0 (0.0)	1.85	.45
Weighted average			**2.15**			

Source: Field survey, 2025

Note on Decision Value: *All the mean values in the table were added and divided by the total number of the items. The items whose mean values are between 0.00 and 2.44 were taken to stand for* ***Negative*** *while the ones between 2.45 and 4.00 were taken to stand for* ***Positive.***

Hypotheses Testing

Ho: There is no statistically significant difference in the perceived role of agricultural extension service in enhancing food availability between male and female smallholder farmers in Ukwuani Local Government Area of Delta State, Nigeria.

Table 3 above shows the significant difference in the perceived role of agricultural extension service in enhancing food availability between male and female smallholder farmers in Ukwuani Local Government Area of Delta State, Nigeria. It reveals that the overall mean score for the male farmers is 11.10 and while that of the female farmers is 10.59. These mean values do not reveal an appreciable difference. In the same vein, the sig. (2-tailed) value is greater than 0.05 level of significance. Therefore, there is no significant difference in the perceived role of agricultural extension service in enhancing food availability between male and female smallholder farmers in Ukwuani Local Government Area of Delta State, Nigeria (df = 148; t = 1.343; p>0.05). Hence, hypothesis was not accepted. The results align with studies by Abubakar (2024), Bose et al. (2025) and Agha et al (2025), which stress that they finds no significant difference in odds of food insecurity by biological sex. Additionally, research by Midamba (2025) confirms no significant difference in access to extension between male- and female-headed households.

Table 3

Summary of Independent Sample T-test Showing Statistically Significant Difference in the Perceived Role of Agricultural Extension Service in Enhancing Food Availability between male and female smallholder farmers in Ukwuani Local Government Area of Delta State, Nigeria.

Test Variable	Grouping Variable (Gender)	N	Mean	Std. D	df	t	Sig.	Remark
Role of Agricultural Extension Service	Male	48	11.10	2.14	148	1.343	.194	***Not Significant***
	Female	102	10.59	2.31				

Source: Field survey, 2025

CONCLUSION AND RECOMMENDATIONS

In conclusion, the study revealed that agricultural extension services played a significant role in enhancing food security among smallholder farmers in Ukwuani Local Government Area of Delta State. By facilitating access to improved farming techniques, relevant information, and innovative practices, extension services empowered farmers to increase productivity, reduce post-harvest losses, and improve food availability and nutrition. These findings underscored the critical need for sustained investment in agricultural extension as a strategic approach to tackling food insecurity and promoting rural development in Nigeria.

The findings recommends a strong case for the Delta State Ministry of Agriculture, in collaboration with local government authorities, should increase the number of trained extension agents and ensure more frequent visits to farming communities, this will enhance knowledge transfer, improve adoption of modern practices, and ensure that farmers receive timely support throughout the farming cycle. Promote Farmer Training on Nutrition-Sensitive Agriculture: Agricultural extension programmes should include targeted training on food nutrition, crop diversification, and improved post-harvest handling to help smallholder farmers understand the link between agriculture and dietary quality, thereby improving household nutrition

REFERENCES

1. *Abubakar, A. M. (2024). Impact of rising food prices on households' food security in Nigeria.POLAC Management Review, 4(1), 1–14.*
2. *Adebayo, S. A., & Adekoya, L. O. (2020). Barriers to food security among smallholder farmers in Nigeria: Role of agricultural extension. African Journal of Agricultural Development, 12(1), 29–41.*
3. *Adediran, T. A., & Balogun, R. A. (2020). Access to extension services and adoption of climate-smart agriculture among farmers in Ogun State. Nigerian Journal of Rural Extension, 7(2), 45–58.*
4. *Adeola, T. S., & Bello, A. M. (2021). Participatory extension strategies for rural development. Nigerian Journal of Agricultural Extension and Development, 23(1), 65–77.*
5. *Adefila, J. O., & Ajiboye, T. A. (2022). Strengthening the link between extension services and rural food systems in Nigeria. Journal of Agricultural Research and Policy, 18(3), 101–115.*
6. *Agha, M., De Courten, B., & Rollo, M. E. (2025). Predictors of food insecurity among Australian university students: A cross-sectional study. International Journal of Environmental Research and Public Health, 17(1), Article 60. https://doi.org/10.3390/ijerph17010060*
7. *Ajibade, B. L. (2019). ICT tools and women empowerment in agricultural extension delivery in Oyo State. Women in Agriculture Journal, 6(1), 22–37.*
8. *Akinyemi, B. M. (2019). Promoting knowledge exchange through experiential learning in agricultural extension. Oyo State Journal of Agricultural Studies, 11(2), 88–103.*
9. *Alabi, M. A., & Adebanjo, T. K. (2021). Agricultural extension and national development: A review. Lagos Journal of Development Studies, 9(1), 33–49.*
10. *Alao, F. R. (2021). Frequency of contact with extension agents and food self-sufficiency among farmers. Journal of Food Security and Extension, 5(2), 51–67.*
11. *Bello, M. O., & Arogundade, S. B. (2023). Community-based agricultural extension and food security outcomes. Ife Journal of Agriculture, 15(1), 19–36.*
12. *Bose, I., et al. (2025). Mental health, water, and food: Joint resource insecurities and depression. Journal of Affective Disorders, 355, 136–145.*
13. *Doss, C., & Gottlieb, C. (2025). Gendered patterns of labor in agriculture. Agricultural Economics, 56(3), 431–445. https://doi.org/10.1111/agec.70012*
14. *FAO. (2022). The state of food security and nutrition in the world 2022. Food and Agriculture Organization of the United Nations.*
15. *Fashina, A. O., Arogundade, S. O., & Olatunji, M. A. (2023). Agricultural extension and sustainable development goals in Nigeria. Journal of Rural Studies and Development, 10(1), 55–70.*
16. *Maisule, S. A., Fadiji, T. O., Barnabas, T. M., Aluko, O., & Sennuga, S. O. (2025). Analysis of small-scale farmers' perception of the effect of insurgency on food security in Borno State, Nigeria. Global Academic Journal of Agriculture and Biosciences, 7(2), 23–35.*
17. *Midamba, R. P. (2025). Do gender disparities in the smallholder agriculture influence maize productivity in Western Kenya? Discover Agriculture, 3, Article 62. https://doi.org/10.1007/s44291-025-00062-2*
18. *Naseri, R. N. N., & Idris, N. H. (2025, February 15). Addressing low digital literacy among rural farmers through the AGRIKIT. International Journal of Research and Innovation in Social Science, 9(1), 5202–5208.*
19. *Odetola, A. T., & Okunade, O. F. (2022). Agricultural extension and livelihood security among rural dwellers in Osun State. Journal of Development Extension, 14(2), 84–97.*
20. *Offor-Ikpendu, F. U., Onuekwusi, G. C., Apu, U., & Ajunwa, I. S. (2024). Assessment of gender participation in rice production activities in South-East Nigeria. Journal of Community & Communication Research, 9(1), 138–146.*
21. *Ogunbiyi, K. A., & Falade, J. M. (2023). Farmer engagement and knowledge transfer in extension delivery. Journal of Agricultural Innovation in Nigeria, 4(2), 73–88.*
22. *Olabode, T. J., & Oyedokun, R. O. (2023). Participatory extension approaches and smallholder productivity. Southwestern Journal of Extension Systems, 7(1), 39–52.*
23. *Onyenuga, A. A., & Adebimpe, B. O. (2021). Extension systems and food security: An appraisal. African Journal of Agricultural and Resource Economics, 13(1), 60–76.*
24. *Osundare, K. S., & Akinfenwa, B. A. (2022). Inclusive agricultural extension for sustainable rural food systems. Journal of Rural Sociology and Development, 11(1), 91–108.*
25. *Owigho, O., Eromedoghene, E. O., & Ovwigho, B. O. (2023, December). Adoption of improved cassava (Manihot spp) production technologies in Isoko North and South Local Government Areas of Delta State, Nigeria. Journal of Agripreneurship and Sustainable Development, 6(4), 1–9.*
26. *Oyelade, R. O., & Ojo, T. A. (2020). Agricultural extension as a driver of food security in Nigeria. Journal of Sustainable Agriculture Research, 5(1), 15–28.*

27. *Umar, M. Y., Bose, A. A., & Abdullahi, S. (2025). Assessment of agricultural information sourcesutilization among Graduate Youth Empowerment Programme (GYEP) beneficiaries in Makurdi Zone, Benue State, Nigeria. Nigerian Journal of Agriculture and Agricultural Technology, 5(1A), 129–137.*
28. *Zaato, P. A., Naazie, G. K., Baidoo, J. K., Tignegre, J. B. D. L. S., & Sawi, M. (2025). Gender dynamics in smallholder vegetable farmers' production in Ghana. Discover Sustainability, 6, Article 766.*