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Perceived Effect of Roles of Agricultural Extension Workers in Combating Emergencies among Arable Crop Farmers in Osun State, Nigeria

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ABSTRACT

This study examined the perceived effects of the roles played by agricultural extension workers in combating emergencies among arable crop farmers in Osun State, Nigeria. A multistage sampling technique was employed to select 156 registered arable crop farmers from two agricultural zones. Data were collected using a structured questionnaire and analysed using descriptive statistics, Chi-square, and Pearson Product Moment Correlation. Findings revealed that farmers experienced multiple emergencies including climate variability, pest outbreaks, flooding, drought, and pandemics. Extension workers played crucial roles such as information dissemination, early warning, training, and provision of advisory services. However, farmers reported constraints such as poor road networks, inadequate staffing, limited funding, and weak access to ICT tools. Results further showed a significant relationship between farmers' socioeconomic characteristics, constraints encountered, and their perceived effect of extension roles. The study recommends strengthening extension systems through improved funding, capacity building, digital tool integration, and enhanced farmer–extension linkages to support effective emergency response.

Keywords: *Agricultural extension, emergencies, arable crop farmers, climate variability, pest outbreak, Osun State, resilience*

INTRODUCTION

Agriculture remains a cornerstone of economic development, food security, and employment in many developing countries, particularly across Sub-Saharan Africa. It sustains the livelihoods of millions of households and produces the majority of staple foods consumed nationally and globally (Food and Agriculture Organization [FAO], 2020). The sector is critical not only for meeting immediate food needs but also for driving rural development and poverty reduction. Despite its importance, agricultural production, especially arable crop farming, is increasingly threatened by emergencies such as climate variability, droughts, flooding, pest and disease outbreaks, input shortages, and other socio-economic disruptions. These challenges reduce crop yields, destabilize food supply systems, and threaten the sustainability of agricultural livelihoods (Osuji *et al.,* 2025).

Arable crop farmers, who form the backbone of food systems in developing economies, often operate under constrained conditions, including limited access to improved inputs, credit, and technical information. Their ability to sustain production and adapt to emergencies largely depends on access to timely and relevant agricultural knowledge and support. Empirical evidence shows that farmers' decisions regarding crop choice, planting schedules, and adaptive practices are shaped by their perceptions of risk and their access to information during crises. Farmer groups also play an important role in collective farming, enabling resource sharing, knowledge exchange, and achieving economies of scale that improve productivity, quality, and continuity (Permentan, 2007; Prayoga *et al.,* 2024).

Agricultural extension workers serve as vital intermediaries between research institutions and farmers, providing technical guidance, advisory services, and capacity-building support. Their roles include disseminating innovations, educating farmers on improved agronomic practices, facilitating the adoption of climate-smart techniques, and helping farmers respond effectively to emergencies (Maka, 2025; Ayegbusi *et al.,* 2024). Extension workers

conduct field outreach, assist in solving farm problems, and provide information that enables farmers to increase yields and maintain production despite environmental or socio-economic shocks. Studies indicate that farmers often perceive extension services as critical for building climate resilience and adopting adaptive strategies, while institutional limitations and inadequate training can constrain the effectiveness of these services (Frontiers Climate, 2024; Environmental Economics and Policy Studies, 2024). Moreover, access to digital extension tools and technology enhances the reach and impact of extension programs, particularly among younger farmers (Frontiers in Sustainable Food Systems, 2025). Ultimately, extension-linked climate-smart practices contribute positively toward food and nutrition security among smallholder farming communities (Agriculture & Food Security, 2025).

Understanding how arable crop farmers perceive the roles of agricultural extension workers in combating emergencies is therefore essential. Farmers' perceptions influence the adoption of recommended practices, their reliance on extension services during crises, and ultimately the resilience of agricultural systems. Insights into these perceptions can guide policymakers and development practitioners in designing responsive extension programs that strengthen farmers' adaptive capacities, enhance productivity, and promote sustainable agriculture in the face of climatic and socio-economic challenges.

METHODOLOGY

The study was carried out in Osun State, Nigeria. Osun State is located in the Southwestern region of Nigeria. It was created on August 27, 1991, from the southeastern portion of the old Oyo State, with Osogbo as the state capital. The state is bordered by Kwara State to the north, Ekiti and Ondo States to the east, Ogun State to the south, and Oyo State to the west.

The selection of Osun State as the study area was informed by its agricultural diversity, the presence of organized extension service structures, and the frequent occurrence of agricultural emergencies such as pest invasion, drought, and flood. These characteristics make the state particularly suitable for assessing the perceived effects of the roles of agricultural extension workers in combating emergencies among arable crop farmers.

A multistage sampling procedure was used in the study. First stage involved 70% random selection of the three Agricultural Zones in Osun State, resulting in the selection of Osogbo-Ikirun and Iwo-Ikire Zones. The second stage involved 30% random selection of the Local Government Areas within the selected zones, giving six LGAs: Osogbo, Olorunda, Ifelodun, Orolu, Iwo, and Ejigbo. The third stage involved using Miller and Brewer (2003) formula to get the sample size, giving a total of 156 respondents as indicated in Table 1.

Table 1: Summary of sampling Procedure and Sample Size

The Three Agricultural Zones in Osun State	70% random selection of zones from the 3 Zones	30% random selection of LGA from the 2 selected Zones	Population size of farmers in the selected LGA	Number of farmers calculated using Miller and Brewer formula	Sample size using $N_x = \frac{n \times N_x}{N}$
Osogbo-Ikirun	Osogbo	Osogbo	7520	153.1	24
Ife-Ijesha		Olorunda	7880	153.2	25
Iwo-Ikire		Ifelodun	7852	153.2	25
TOTAL		Orolu	8646	153.5	27
	Iwo	Iwo	9048	153.6	29
		Ejigbo	8250	153.3	26
			49186		156

Source: OSSADEP office, Osun State.

RESULTS AND DISCUSSION

The socioeconomic characteristics of the respondents are presented in Table 1. The majority of the respondents (73%) were male. Men are significantly more involved in the cultivation and management of staple crops than women in the study area. Idris *et al.,* (2024) reported similar gender disparities in arable crop production across Nigeria. Majority of the respondents (63.5%) were married, followed by 10.9% single, 9.6% divorced, 9% separated, and 7.1% widowed. 34.6% of the respondents are between 50-59 years of age, 30.4 were between the ages of 40 - 49years. All respondents had formal education while 64% were married. Majority (62%) of the arable crop farmers had farming as their secondary occupation. 35.2% of the respondents had 11 to 19 years of experience in arable crop farming, 27.5% of the respondent had 20 to 29years of arable crop farming experience, 23% of the respondents indicated having less than 10years of arable crop farming experience while 13.8% of the respondents had more than 30years of arable crop farming experience, more than half (53.2%) of the respondents cultivated 2-6 hectares of farm land, 42.8% of the respondents cultivated less than 1 hectare of farm land, while 3.8% of the respondents cultivated more than 7 hectares of farm land. While majority (67.3%) of the respondents had 5 to 8 people in their household, 26.3% of the respondents had 4 people or less in their household while 6.4% of the respondents had more or greater than 9 people in their household.

Table 2: Distribution of respondents according to socio-economic characteristics

Socio-economic characteristics	frequency	Percentage	Mean
Sex			
Male	114	73.1	
Female	42	26.9	
Marital status			
Single	17	10.9	

Separated	14	9	
Divorced	15	9.6	
Widowed	11	7.1	
Married	99	63.5	
Age (years)			48 years
≤30	13	8.3	
31-39	20	12.8	
40-49	47	30.4	
50-59	53	34.6	
≥60	22	14	
Religion			
Islam	60	43.6	
Christianity	79	50.6	
Traditional worshippers	9	5.8	
Number of years spent in school (years)			13 years
≤6	15	9.6	
7-12	72	46.1	
≥13	69	44.1	
Secondary occupation			
Farming	96	61.5	
Civil servant	16	10.3	
Artisan	15	9.6	
Trading	24	15.4	
Transport services	5	3.2	6 people
Household size (people)			
≤4	41	26.3	
5-8	105	67.3	
≥9	10	6.4	
Farm size (hectares)			2.307 hectares
≤1	67	42.8	
2-6	105	67.3	
≥7	10	6.4	
Years of farming experience (years)			18 years
≤10	36	23	
11-19	55	35.2	
20-29	43	27.5	
≥30	22	13.8	

Source: Field Survey, 2025

Types and extent of emergencies experienced by arable crop farmers

The result presented in Table 3 shows the types and extent of emergencies experienced by arable crop farmers in the study area. The results reveals that 91.0% of the respondents experienced pest and diseases outbreaks. Other types of emergencies experienced by arable crop farmers includes; theft (84%), flooding (74.4%), drought (67.9%), conflict (62.2%), land disputes (62.2%), fire outbreak (60.3%), market disruption (57.7%) and pandemic (34.6%). This result implies that arable crop farmers in the study area are faced with multiple and interrelated risks**,** spanning environmental, socio-economic, and institutional domains. This supports the findings of Taylor *et al.*, (2023) who reported that pests and diseases remain among the most significant threats to crop production worldwide, causing substantial yield losses especially in low-income agricultural communities. Similarly, Liu *et al.,* (2024) note that environmental hazards such as flooding and drought increasingly compound agricultural vulnerabilities due to climate variability. Furthermore, Zhang *et al.,* (2023) argue that socio-economic and institutional challenges including theft, conflict, land disputes, and market disruptions exacerbate farming risks, underscoring the interconnectedness of these threats and the need for integrated risk management frameworks.

Furthermore, extent of emergencies experienced by arable crop farmers were measured using a 3-points rating scale of severe, mild and not severe. Pest and disease outbreak rank 1st with weighted mean score of 1.31, theft was ranked 2nd with WMS of 1.17, flooding was ranked 3rd with WMS of 0.88, drought was ranked 4th with WMS of 0.81, fire outbreak was ranked 5th with WMS of 0.79, also, land disputes was ranked 6th with WMS of 0.74, conflict was ranked 7th with a WMS of 0.69. In addition, market disruption was ranked 8th with WMS of 0.63 and pandemic was ranked 9th with WMS of 0.40**.** This results implies that arable crop farmers face significant biological threats that can directly reduce yields and destabilize their livelihoods. This aligns with the findings of Taylor et al. (2023)**,** pests and plant diseases are responsible for an estimated 20 to 40% of global crop yield losses annually**,** with the most severe impacts occurring in low-income, smallholder farming systems. These biological threats not only reduce productivity but also increase input costs, deepen poverty, and limit the ability of farmers to reinvest in their farms.

Table 3: Distribution of the respondents according to the types and extent of emergencies experienced by arable crop farmers.

Types of emergencies	Frequency	Percentage	Severe (%)	Mild (%)	Not severe (%)	WMS	Rank
Pest and diseases	142	91.0	46.2	44.1	9.6	1.31	1st
Theft	131	84.0	43.3	40.7	16.0	1.12	2nd
Flooding	116	74.4	22.1	51.0	26.9	0.88	3th
Drought	106	67.9	20.6	51.2	28.2	0.81	4th
Fire outbreak	94	60.3	27.0	50.0	23.0	0.79	5th
Land disputes	97	62.2	16.5	59.8	23.7	0.74	6th
Conflict	97	62.2	10.3	64.1	25.6	0.69	7th
Market disruptions	90	57.7	11.3	48.9	39.8	0.63	8th
Pandemic (covid)	54	34.6	6.1	38.1	55.8	0.40	9th

Percentage (Figures in parenthesis) Source: Field survey, 2025
WMS: Weighted Mean Score
%= Percentage
*Multiple response

Roles of agricultural extension workers in combating emergencies

The result presented in the Table 4 shows the role of agricultural extension workers in combating emergencies. The result revealed the mean score of the roles of agricultural extension workers in combating emergencies in the study area which were measured with a 4 points rating scale of never, sometimes, often, always. It indicated that provided timely information on where to get inputs ranked 1st with weighted mean score of 3.56 followed by provided advisory services which ranked 2nd with WMS of 2.40, while monitoring and evaluation of emergency interventions/ inputs with WMS 2.38 ranked 3rd. Also community mobilization to respond to emergencies ranked 4th with WMS 2.37

subsequently followed by provided moral support with WMS 2.22 which ranked 5th, provided psychological support ranked 6th with WMS 2.18.

Furthermore, linking farmers to external support with WMS 2.17 ranked 7th, distributed seed with WMS 2.14 ranked 8th, distributed fertilizers ranked 9th with WMS of 2.03. Meanwhile, advised on alternative farming practices with WMS of 1.97 ranked 10th, distributed agrochemicals ranked 11th with WMS of 1.96 while provided link to government support/ intervention programs ranked 12th with WMS of 1.83. This indicates that arable crop farmers rely heavily on extension workers for immediate, actionable information, particularly during crises. This implies that information access is one of the most critical needs during agricultural emergencies**.** This corroborates with FAO (2023)**,** timely and accurate information is essential for farmers to make informed decisions, especially during crises such as pest outbreaks, climate shocks, or market disruptions.

Table 4: Distribution of the respondents according to the roles of agricultural extension workers in combating emergencies

Roles of extension workers	Always (%)	Often (%)	Sometimes (%)	Never (%)	WMS	Rank
Provided timely information on where to get inputs	68.5	20.5	9.0	1.9	2.56	1st
Provided advisory services	57.7	28.8	9.6	3.8	2.40	2nd
Monitoring and evaluation of emergency intervention/ inputs	58.3	26.3	10.3	5.1	2.38	3rd
Community mobilization to respond to emergencies	59.6	21.8	14.1	4.5	2.37	4th
Provided moral support	48.1	33.3	10.9	7.7	2.22	5th
Provided psychological support	47.4	28.8	4.9	7.7	2.18	6th
Linking farmers to external support	48.7	26.9	16.7	7.7	2.17	7th
Distributed seeds	39.7	39.1	16.7	4.5	2.14	8th
Distributed fertilizers	40.4	27.6	26.3	5.8	2.03	9th
Advised on alternative farming practices	42.8	21.8	26.9	9.0	1.97	10th
Distributed agrochemicals	40.4	23.7	26.9	9.0	1.96	11tht
Provided link to government support/ intervention programs	46.2	14.1	16.0	23.7	1.83	12th

Percentage (Figures in parenthesis)
Source: Field survey, 2025
WMS: Weighted Mean Score
%= Percentage
*Multiple response

Perceived effect of roles of agricultural extension workers in combating emergencies among arable crop famers

The result in Table 5 shows the perceived effect of agricultural extension worker in combating emergencies which were measured using a 5-points likert scale of strongly disagree, disagree, undecided, agree, strongly agree. Improved productivity ranked 1st with weighted means score of 3.46, improved decision making ranked 2nd with WMS of 3.26 while conflict mitigation and peace building ranked 3rd with WMS of 3.23. Also, risk management ranked 4th with WMS of 3.22 and adoption of new farming practices ranked 5th with WMS of 3.14. Furthermore, encouragement of farmer cooperatives with WMS of 3.13 ranked 6th, enhanced technology adoption ranked 7th with WMS of 3.10 while reduced poor yield of farm produce and linkages to credit programs both ranked 8th with WMS of 3.03, early warning and rapid response with WMS of 2.95 was ranked 9th. Furthermore, increased input efficiency was ranked 10th with WMS of 2.82, improved farmers knowledge and awareness in combating emergencies was ranked 11th with WMS of 2.81. Post-harvest loss reduction ranked 12th with WMS of 2.79 while post-emergency recovery planning ranked 13th with WMS of 2.69. This indicates that extension services play a crucial role in empowering farmers with the knowledge and skills needed to manage risks effectively and sustain agricultural output under stress.

Table 5 Distribution of the respondents according to their perceived effect of roles of agricultural extension workers in combating emergencies

Perceived effect of role of extension workers	Strongly agree (%)	Agree (%)	Undecided (%)	Disagree (%)	Strongly disagree (%)	WMS	Rank
Improved productivity	53.8	42.3	0.6	2.6	0.6	3.46	1st
Improved decision making on Choice of adaptive farming practices	34.6	61.5	0.6	1.3	1.9	3.26	2nd
Conflict mitigation and peace-building	38.5	51.9	5.1	3.2	1.3	3.23	3rd
Risk management	36.5	58.3	0	1.3	3.8	3.22	4th
Adoption of new farming practices	34.0	55.8	1.9	7.1	1.3	3.14	5th
Encouragement of farmers cooperatives	32.7	58.3	1.3	5.1	2.6	3.13	6th
Enhanced technology adoption	30.8	58.3	3.8	3.8	3.2	3.10	7th
Linkages to credit programs	28.8	57.1	5.1	5.8	3.2	3.03	8th
Reduced poor yield of farm produce	32.7	50.0	6.4	9.6	1.3	3.03	8th
Early warning and rapid response	25.0	59.0	4.5	9.0	2.6	2.96	9th
Increased input efficiency	29.6	47.4	2.6	16.7	3.8	2.82	10th
Improved farmers knowledge and awareness in combating emergencies	34.6	43.6	0.6	10.9	10.3	2.81	11th
Post-emergency recovery planning	24.4	50.6	7.7	14.7	2.6	2.79	12th
Post-harvest loss reduction	21.2	51.9	6.4	16.0	4.5	2.69	13th

Percentage (Figures in parenthesis) Source: Field survey, 2025
WMS: Weighted Mean Score
%= Percentage
*

Relationship between the selected socioeconomic characteristics of the respondents and the perceived effect of role of agricultural extension workers in combating emergencies among arable crop farmers.

The result of the Pearson Product Moment Correlation in the Table 6 below revealed that some selected socio-economic variables such as: household size (r = 0.370**, p = 0.000), had positive and significant relationship with the perceived effect of role of agricultural extension workers in combating emergencies among arable crop farmers. This implies that larger households tend to recognize or value the contribution of extension services more strongly than smaller households. Also, farm size (r = 0.330**, p = 0.000) had positive and significant relationship with the perceived effect of role of agricultural extension workers in combating emergencies among arable crop farmers. This implies that farmers with larger landholdings are more likely to value, engage with, and depend on extension services during agricultural emergencies**.** Additionally, years of farming experience (r =

0.410**, p = 0.000) had positive and significant relationship with the perceived effect of role of agricultural extension workers in combating emergencies among arable crop farmers. This may suggest that more experienced farmers are more likely to recognize, appreciate, and rely on extension services during agricultural crises.

Table 6: Summary of PPMC analysis showing the relationship between selected socio-economic characteristics and perceived effect of role of agricultural extension workers in combating emergencies among arable crop farmers.

Socioeconomic characteristics	r - value	p -value	Remarks
Number of years spent in school	0.092	0.256	NS
Household size	0.370**	0.000	S
Farm size	0.330**	0.000	S
Years of farming experience	0.645**	0.000	S

Correlation is significant at 1%
Correlation is significant at 5%
Correlation is significant at 0.05 level (2 - tailed)
Computed data, 2025

CONCLUSION AND RECOMMENDATIONS

The study concludes that arable crop farmers in the area face multiple, interrelated risks. The study recommended that extension agents, research institutes, and government agencies organize regular training workshops, field demonstrations, and farmer field schools to strengthen farmers' skills and improve emergency preparedness.

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