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ROLES OF AGRICULTURAL EXTENSION PROGRAMME IN PROMOTING FOOD SECURITY AMONG FARMERS IN IKWERRE LOCAL GOVERNMENT AREA OF RIVERS STATE.

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Abstract

This study examined the roles of agricultural extension programme in promoting food Security among farmers in Ikwerre Local Government Area of Rivers State. Five research objectives, and five research questions, were used for the study. Descriptive survey research design was adopted for the study. The target population of the study was 375 farmers who are members of cooperative farmers' organisations in the study area that are registered with Rivers State Agricultural Development Programme (RSADP) office in Rivers State. The entire population was used for the study without sampling because it was a manageable size, and represents 100% of the population. The instrument for data collection was a structured questionnaire titled "Roles of Agricultural Extension Programme in Promoting Food Security Questionnaire". The face and content validity of the instrument was determined by two experts of Adult Education and Community Development. The reliability of the instrument was determined through a pilot study of 30 respondents who were registered farmers outside the study population, while Cronbach Alpha method was used to establish the overall reliability coefficient (r) value of 0.72. The data collected from the research questions were analysed with Mean ($\bar{x}$) Statistic. The findings from the study revealed that introduction of new farming technologies, education for farmers on new farming techniques, crop diversification, sustainable agricultural programme for farmers, and provision of credit and markets for farmers as agricultural extension programme plays key roles in promoting food security among farmers in Ikwerre Local Government Area of Rivers State. The study recommended amongst others that government at all levels should mobilise farmers to participate in the introduction of new farming technologies programme designed to equip farmers with modern knowledge and skills in technology to ensure sustainable food security.

Keywords: Roles, Agriculture, Extension Programme, Farmers, Food Security.

Introduction

Food security means having, at all times, both physical and economic access to sufficient food to meet dietary needs for a productive and healthy life. A family is food secured when its members do not live in hunger or fear of hunger. Ibrahim (2016) noted that food security in a broader perspective has to do with having at all times and adequate level of food products to meet increasing consumption demand to migrate fluctuation in output and price**.** On the other hand, Karolina, and Małgorzata (2020) defined food security as "all people at all times having both physical and economic access to the basic food they need". The report of World Food Summit of 1996 as cited in Abdul-Jalil (2015), pointed out that food security can be said to be as existing when all people at all-time have access to sufficient, safe and nutritious food to maintain a healthy and active life. According to Abdul, Saheed, Abraham, Bernard, and Yakubu (2022), food insecurity is attributed to the increasing population without a proportionate increase in food production.

Though, it could be precisely said that population and food production crises is in tandem with Malthus' theory of population growth. Malthus in his theory argued that population grows in geometric progression while food production grows in an arithmetic progression. Irrespective of the growing population, every human being needs food not just for energy but to sustain life in general. Hence, the issue of food security cannot be exaggerated because of its inevitability to life. Investments in agriculture such as improved irrigation and drought-tolerant crops reduce price and income variability. Agriculture was once the main stay of the country's economy and basis of foreign exchange before the discovery of oil. Nevertheless, the economy witnessed reduction in agricultural production due to less attention by the government as a result of emergence of crude oil in commercial quantity. This led to the challenge of food insecurity, unemployment and youth restiveness among other challenges. The neglect of agriculture as the stronghold of the economy by the federal government over the years also contributed to poverty and some social vices in the society.

However, combating food insecurity continues to be a major public policy challenge in developing countries. According to the Food and Agricultural Organisation (FAO) as cited in Bidisha, Khan, Imran, Khondker, and Suhrawardy (2017), over one billion people globally are malnourished, many more suffer from micronutrient deficiencies, and the absolute numbers tend to increase further, especially in Sub-Sahara Africa. Hence both the developed and developing countries make significant efforts to boost their food production capacity. Oluwasanmi, Ikechukwu, Nebechi, and Ichaba (2021) acknowledged that there are huge prospective in Nigeria's agricultural sector, which

if appropriately harnessed would give a free rein to income growth for farmers, food and nutritional security, and employment opportunities as well as raise the country to the position of leading players in universal food markets. On the other hand, there are diverse barriers to reviving Nigeria's agricultural sector.

According to Robert, Deborah, and David (2022), these barriers include among others, mutually respectful environment for agribusiness, underinvestment, corruption, and lack of access to credits as well as quality agricultural inputs, weak implementation of policies, poor market access and national insecurity. Eigege and Cooke (2016) noted that the major threat to the agricultural sector is insecurity from both the Boko Haram and Fulani herdsmen. In the northeast of Nigeria, the sustained terrorist activities of the Boko Haram have had negative impact on agricultural activities. Not only are farming activities incapable of being carried out under an insecure environment, domestic agricultural production is stifled, farming communities are displaced and access to regional market is blocked. Tunji, (2022) noted that in addition to the Boko Haram group, the Fulani herdsmen have become a major threat to farming communities due to incessant attacks on these communities with attendant fatalities.

Kobani and Wobo (2024) noted that by combining education, family support, community engagement, and tailored interventions, developmental programmes such as agricultural extension programmes may help foster an environment that empowers youths to make informed, healthy choices and resist the allure of substance abuse which is the trigger for most of these communal violence.

Similarly, in Rivers State and especially in Ikwerre Local Government Area, Insecurity resulting from cult-related war, kidnapping and activities of Fulani herdsmen has become a big barrier to farmers leading to inadequate food production. However, to achieve food security, there is need to encourage and empower farmers through diverse modern agricultural extension programmes for effective food production that ensures food security. Agriculture plays a very important role in the economy of many countries, by providing direct and indirect employment to rural and urban people, raw material for industry and foreign reserves from trade. The second Sustainable Development Goal of the United Nation is to "end hunger, achieve food security and improved nutrition and promote sustainable agriculture". As well as with all other goals, the achievement of this goal specifically is impossible without giving serious attention to agricultural sector. According to United Nation in Downie **(**2017**)**, the campaign for food security is to ensure complete eradication of hunger among citizens in communities.

Agricultural extension is the use of scientific inquiries and new knowledge in agricultural practices through farmer education. Agricultural extension is essentially an educational process in which the farmers are the learners while agricultural extension workers are the facilitators. Through agricultural extension programmes, farmers are taught better, new ideas, innovations in agriculture, and new technical and economic practices are demonstrated to the farmers. According to Ajeigbe, and Dashiell (2010) extension is a non-formal educational function that applies to any institution that disseminates information and advice with the intension of promoting knowledge, attitudes, and skills. The author further stated that agricultural extension brings about changes, through education and communication in farmers attitude, knowledge and skills. Taiwo, Agbasi, Lawal and Okaf (2015), acknowledged that extension and outreach strategies are carried out by extension agents to build farmers capacity in utilising and improving crop and animal production techniques.

Consequently, Adeola, and Ayoade (2011) avowed that agricultural extension programmes improve yields and incomes for farmers and trained agents visit communities to ensure the dissemination of current best practices, organise cooperatives, and implement secondary programmes that improves farmers knowledge on how to increase productivity of farm products. These agricultural workers are expected to travel extensively across their countries while ensuring they maintain consistent and high-quality work with limited training. Agricultural extension plays a crucial role in agricultural development by facilitating the transfer of knowledge, technologies, and best practices to farmers. According to Madu (2014), agricultural extension services are now a major activity and basic element in programmes and projects formulated to bring about agricultural development and improvement in the quality of food production and lives of the rural poor farmers.

However, Apapa (2020) acknowledged that agricultural extension programmes that are targeted at enhancing adequate and sustainable agricultural productivity among farmers include; introduction of new farming technologies programme, education/training programme for farmers on new farming techniques, crop diversification/intensification programme, sustainable agricultural programme for farmers, and provision of credit and markets programme for farmers, It is therefore envisaged that effective utilisation of these agricultural extension programmes by farmers would bridge the productivity gap to boost food supplies, consumption and security. It is against this background that this study was conducted to investigate the roles of agricultural extension programmes in promoting food security in Ikwerre Local Government Areas of Rivers State.

Statement of the Problem

In spite of the enormous agricultural potentials found in Rivers State and Nigeria at large, there is still high rate of hunger, poverty, high cost of food products such as Garri, Rice, Beans, and Yam amongst others that has become very expensive and scarce for human consumption. In Ikwerre Local Government Area of Rivers State, most of the local farmers continue to face challenges in improving their agricultural productivity and food output, leading to food insecurity. The existing agricultural extension programme aimed at promoting food security among farmers in the area have been ineffective, resulting in low adoption of improved agricultural practices and technologies, limited access to credit and market facilities, inadequate knowledge and skills among farmers, high post-harvest losses and persistent food insecurity and poverty among farming households.

Several efforts were made over the years and at present to increase the productivity of farmers across various value chains in Nigeria. Some of these efforts were through public extension services, while others were through private extension delivery system. In some communities in the study area where private extension outfits are promoted, farmers complain of their scope and coverage as their scope are narrow emphasising one or few crops and small coverage. Apart from violent conflicts and activities of herdsmen that destroy crops, the productivity gap in food production that has led to food insecurity can be attributed to lack of farmers' awareness on the importance of participating in agricultural extension programme and utilisation of modern farming technologies and techniques in farming to boost their agricultural productivity.

However, some of the agricultural extension programme that are targeted at promoting food security include introduction of new farming technologies programme, education/training programme for farmers on new farming techniques, crop diversification/intensification programme, sustainable agricultural programme for farmers, and provision of credit and markets programme for farmers. But what extent are farmers aware of these programmes? Could the exposure of farmers to these agricultural extension programmes improve their knowledge and skills to boost their agricultural productivity to promote food security in Ikwerre Local Government Area of Rivers State? To answer these questions therefore, warranted a study of this nature to fill the gap in knowledge.

Purpose of the Study

The purpose of the study was to examine the roles of agricultural extension programme in promoting food security amongst farmers in Ikwerre Local Government Areas of Rivers State. The study therefore sought to achieve the following specific objectives;

1. Find out the role of agricultural extension programme in introducing new farming technologies to farmers to promote food security in Ikwerre Local Government Areas of Rivers State
2. Ascertain the role of agricultural extension programme in education of farmers on new farming techniques to promote food security in Ikwerre in Local Government Areas of Rivers State.
3. Determine the role of agricultural extension programme in training farmers on crop diversification to promote food security in Ikwerre Local Government Areas of Rivers State.
4. Find out the role of agricultural extension programme in enhancing farmer's knowledge on sustainable agricultural practices to promote food security in Ikwerre Local Government Areas of Rivers State.
5. Investigate the role of agricultural extension programme in the provision of credit and Markets programme for farmers to food security in Ikwerre Local Government Area of Rivers State.

Research Questions

The study was guided by the following research questions:

1. What is the role of agricultural extension programme in introducing new farming technologies to farmers to promote food security in Ikwerre Local Government Areas of Rivers State?
2. What is the role of agricultural extension programme in education of farmers on new farming techniques to promote food security in Ikwerre in Local Government Areas of Rivers State?
3. What is the role of agricultural extension programme in training farmers on crop diversification to promote food security in Ikwerre Local Government Areas of Rivers State?

4. What is the role of agricultural extension programme in enhancing farmers' knowledge on sustainable agricultural practices to promote food security in Ikwerre Local Government Areas of Rivers State?
5. What is the role of agricultural extension programme in the provision of credit and Markets programme for farmers to food security in Ikwerre Local Government Area of Rivers State?

Methodology

The study was carried out in Ikwerre Local Government Area of Rivers State. Descriptive survey research design was adopted for the study. The target population for the study was 375 farmers who are members of cooperative farmers' organisations in the study area that are registered with Rivers State Agricultural Development Programme (RSADP) office in Rivers State. The entire population was used for the study without sampling because the size was manageable. The instrument for data collection was a structured questionnaire titled "Roles of Agricultural Extension Programmes in Promoting Food Security". The questionnaire was structured on a four (4)-point rating scale of Strongly Agree -SA (4), Agree --A (3), Disagree- D (2) and Strongly Disagree -SD (1). The face and content validity of the instrument was determined by two experts in the field of Adult Education and Community Development. The reliability of the instrument was determined through a pilot study of 30 respondents who were registered farmers outside the study population, while Cronbach Alpha method was used to establish the overall reliability coefficient (r) value of 0.72. Out of 375 copies of questionnaire administered, 8 copies were lost, while only 367 copies were retrieved. However, 7 copies were wrongly filled while 360 copies were correctly filled and used for analysis. The data collected from the research questions were analysed with Mean ($\bar{x}$) Statistic. Since the items were rated on a modified four (4) point scale, the average mean for answering the research questions were arrived at finding the average of the 4 points scale hence: 4 + 3 + 2 + 1 = 10/4 = 2.50. Therefore, items whose Mean ($\bar{x}$) scores were less than 2.50 were seen as low extent responses while those with Mean ($\bar{x}$) scores of 2.50 and above were accepted as high extent responses.

Results

Research question 1: What is the role of agricultural extension programme in introducing new farming technologies to farmers to promote food security in Ikwerre Local Government Area of Rivers State?

Table 1: Mean Responses on the Role of Agricultural Extension Programme in Introducing New Farming Technologies to Farmers to Promote Food Security in Ikwerre Local Government Area of Rivers State

S/N	Items	Responses				Total	Mean ($\bar{X}$)	Remark
		SA (4)	A (3)	D (2)	SD (1)			
1	Introduction of crop technologies has increased my knowledge on fertilizer application, and planting of crops in rows to increase my productivity	62 (248)	240 (720)	48 (96)	10 (10)	360 (1,074)	**2.98**	Agree
2	Knowledge gained from precision farming training has helped to improve my agricultural productivity to enhance food quality and security.	52 (208)	250 (750)	35 (70)	23 (23)	360 (1051)	**2.91**	Agree
3	Introduction of agro-forest Production Technologies has increased my knowledge on agro-forest crops like snail rearing, bee keeping, Ogbono, and Okazi cultivation to ensure food security	58 (232)	252 (756)	32 (64)	18 (18)	360 (1070)	**2.97**	Agree
4	Livestock production technologies has improve my farming skills and knowledge on poultry production, and rearing of grass cutter	67 (268)	230 (690)	33 (66)	30 (30)	360 (1054)	**2.92**	Agree
5	Introduction of new fisheries production technologies has improved my skill and knowledge on management, and fingerling production to ensure food security	80 (320)	200 (600)	49 (98)	31 (31)	360 (1049)	**2.91**	Agree
6	Agro-processing technologies has enhanced my skills and ability on the modern ways of processing soya bean into milk, and processing of cassava into adourless fufu flour to ensure food security	90 (360)	206 (618)	34 (68)	30 (30)	360 (1076)	**2.98**	Agree
	Grand mean ($\bar{X}$)						**2.94**	Agree

Source: Research's Field Result, 2024

Table 1 above for research question one shows the mean response of the respondents on the role of agricultural extension programme in introducing new farming technologies to farmers to promote food security in Ikwerre Local Government Area of Rivers State. Item 1 has mean score of 2.98. Item 2 has mean score of 2.91 Item 3 has mean score of 2.93. Item 4 has mean score of 2.92. Item 5 has mean scores of 2.91, while item 6 has mean score of 2.98 respectively. The grand mean of 2.94 was recorded. This indicates that the respondents were in agreement that agricultural extension programme plays critical roles in introducing new farming technologies to farmers to promote food security in Ikwerre Local Government Area of Rivers State.

Research Question 2: What is the role of agricultural extension programme in education/training farmers on new farming techniques to promote food security in Ikwerre in Local Government Areas of Rivers State.?

Table 2: Responses on the Role of Agricultural Extension Programme in Education of Farmers on New Farming Techniques to Promote Food Security in Ikwerre in Local Government Areas of Rivers State.

S/N	Items	Responses				Total	Mean ($\bar{X}$)	Remark
		SA (4)	A (3)	D (2)	SD (1)			
7	Educational programme boosts farmers' access to information that enhance their knowledge and skills on post-harvest processing that promote food security	100 (400)	196 (588)	34 (68)	30 (30)	360 (1086)	3.01	Agree
8	Improved knowledge, skills and practices by farmers on soil and water management that ensure production of safe, nutritious, and sustainable food.	90 (360)	168 (504)	60 (120)	42 (42)	360 (1026)	2.85	Agree
9	Equipped me with knowledge and skills that has increased my crop yields and animal productivity to ensure food security	147 (588)	183 (549)	40 (80)	20 (20)	360 (1237)	3.43	Agree
10	Improved my knowledge and skills on how to reduce waste, and optimise the use of fertilizers and pesticides to ensure food security	82 (328)	200 (600)	48 (96)	30 (30)	360 (1054)	2.92	Agree
11	Equipped me with knowledge and skills on how to produce quality and safe food that meets high standards in ensuring food security	83 (332)	197 (591)	55 (110)	25 (25)	360 (1058)	2.93	Agree
	Grand mean ($\bar{X}$)						3.02	Agree

Source: Research's Field Result, 2024

Table 2 above for research question two confirmed the mean response of the respondents on the role of agricultural extension programme in education of farmers on new farming techniques to promote food security in Ikwerre in Local Government Areas of Rivers State. Item 7 has mean score of 3.01. Item 8 has mean score of 2.85. Item 9 has mean score of 3.43. Item 10 has mean score of 2.92, and Item 11 has mean scores of 2.93. The grand mean of 3.02 was recorded above the criterion mean of 2.50. This pointed out that the respondents were in strong opinions that agricultural extension programme play key role in education of farmers on new farming techniques to promote food security in Ikwerre in Local Government Areas of Rivers State

Research Question 3: What is the role of agricultural extension programme in training farmers on crop diversification to promote food security in Ikwerre Local Government Areas of Rivers State?

Table 3: Mean Responses on the Role of Agricultural Extension Programme in Training Farmers on Crop Diversification to Promote Food Security in Ikwerre Local Government Areas of Rivers State

S/N	Items	Responses				Total	Mean ($\overline{X}$)	Remark
		SA (4)	A (3)	D (2)	SD (1)			
12	training on how to plant multiple crops on the same land to reduce dependence on a single crop increases farmers knowledge on soil and ecosystem health for food production	70 (280)	230 (690)	38 (76)	22 (22)	360 (1068)	2.96	Agree
13	Knowledge of crop rotation enable farmers to Plant different crops on the same land in a specific order to improve soil fertility and reduce pests	84 (336)	206 (618)	40 (80)	30 (30)	360 (1064)	2.95	Agree
14	Training on cover cropping has improved my knowledge on Planting crops between cash crops to reduce soil erosion,	110 (440)	157 (471)	53 (106)	40 (40)	360 (1057)	2.93	Agree
15	Enable farmers to reduce staple crop failure risk to ensure food security	93 (372)	197 (591)	41 (82)	29 (29)	360 (1074)	2.98	Agree
16	Knowledge of fertilizer application to optimize nutrient delivery and reduce environmental impact. Has made me more resilient to food insecurity	74 (296)	206 (618)	55 (110)	25 (25)	360 (1049)	2.91	Agree
17	Acquisition of knowledge on intercropping reduce the need for pesticides and excessive water usage, lowering overall costs for farmers	93 (375)	217 (651)	40 (80)	20 (20)	360 (1126)	3.12	Agree
	Grand mean ($\overline{X}$)						2.97	Agree

Source: Research's Field Result, 2024

Table 3 shows the mean response of respondents on the role of agricultural extension programme in training farmers on crop diversification to promote food security in Ikwerre Local Government Areas of Rivers State. Item 12 has mean score of 2.96. Item 13 has mean score of 2.95. Item 14 has mean score of 2.93. Item 15 has mean score of 2.98, item 16 has mean score of 2.91, while item 17 has mean score of 3.12 and the grand mean of 2.97 recorded was above the criterion mean of 2.50 which indicated that respondents agreed that agricultural extension programmes help in

training farmers on crop diversification to promote food security in Ikwerre Local Government Areas of Rivers State.

Research Question 4: What is the role of agricultural extension programmes in enhancing farmers knowledge on sustainable agricultural practices to promote food security in Ikwerre Local Government Areas of Rivers State?

Table 4: Mean Responses on the Role of Agricultural Extension Programme in Enhancing Farmers Knowledge on Sustainable Agricultural Practices to Promote Food Security in Ikwerre Local Government Areas of Rivers State.

S/N	Items	Responses				Total	Mean ($\bar{X}$)	Remark
		SA (4)	A (3)	D (2)	SD (1)			
18	conservation of tillage and crop protection by farmers promote food security	72 (288)	230 (690)	38 (76)	20 (20)	360 (1,074)	**2.98**	Agree
19	The use of high-yielding and disease-resistant seed varieties improve farmers crop productivity to ensure food security	102 (408)	200 (600)	33 (66)	25 (25)	360 (1099)	**3.01**	Agree
20	The use of organic farming by using natural methods to control pests and diseases, promote food security	58 (232)	252 (756)	32 (64)	18 (18)	360 (1070)	**2.97**	Agree
21	Sustainable agricultural programme make farmers aware that more crops can be grown on an area of land, and at the same time, more nutritious produce can be grown to ensure greater supply of food	77 (308)	210 (630)	38 (76)	35 (35)	360 (1049)	**2.91**	Agree
22	use greenhouse technology to cultivate plants without using soil or water help to ensure adequate food production and security	85 (340)	200 (600)	44 (88)	31 (31)	360 (1059)	**2.94**	Agree
23	The use of machines and modern tools in farming improve agricultural productivity and efficiency that promotes food security	106 (424)	199 (597)	34 (68)	21 (21)	360 (1110)	**3.11**	Agree
	Grand mean ($\bar{X}$)						**2.99**	Agree

Source: Research's Field Result, 2024

Table 4 shows the mean response of respondents on the role of agricultural extension programme in enhancing farmers' knowledge on sustainable agricultural practices to promote food security in Ikwerre Local Government Areas of Rivers State. Item 18 has mean score of 2.98, item 19 has mean score of 3.01, item 20 has mean score of 2.97, item 21 has mean score of 2.91, item 22 has mean score of 2.91, while item 22 has mean score of 3.11. The grand mean of 2.99 recorded was above the criterion mean of 2.50 which indicated that the respondents agreed that sustainable agricultural programme for farmers promote food security in Ikwerre Local Government Area of Rivers State.

Research Question 5: What is the role of agricultural extension programme in the provision of credit and Markets programme for farmers to promote food security in Ikwerre Local Government Area of Rivers State?

Table 5: Mean Responses on the Role of Agricultural Extension Programme in the Provision of Credit and Markets Programme for Farmers to Promote Food Security in Ikwerre Local Government Area of Rivers State

S/N	Items	Responses				Total	Mean ($\bar{X}$)	Remark
		SA (4)	A (3)	D (2)	SD (1)			
24	Provision of credit Programme has enable me to have access to grants and loans from bank of agriculture which has improved my production level to ensure food security	106 (424)	200 (600)	32 (64)	22 (22)	360 (1,110)	**3.08**	Agree
25	Providing farmers with access to markets to sell their produce promotes food security by improving farmers' income, and incentive to produce more food.	122 (488)	180 (540)	38 (76)	20 (20)	360 (1124)	**3.12**	Agree
26	Through participation in credit Programme, I have gained knowledge on how to access loans to increase my farm business to ensure food security	108 (432)	202 (606)	18 (36)	32 (32)	360 (1106)	**3.07**	Agree
27	Provision of credit and markets Programme has changed farmers' perception towards issues on grants and loans that enhance their productivity for food security	77 (308)	210 (630)	38 (76)	35 (35)	360 (1049)	**2.91**	Agree
28	With access to funds, farmers can invest in better inputs, modern farming techniques, and technology, leading to income and increased yields for food security	185 (740)	100 (300)	41 (82)	34 (34)	360 (1156)	**3.21**	Agree
29	Credit availability enables farmers to adopt innovative methods and technologies, such as precision agriculture, which can improve productivity and resource efficiency for food security	169 (676)	141 (423)	20 (40)	30 (30)	360 (1169)	**3.25**	Agree
	Grand mean ($\bar{X}$)						**3.11**	Agree

Source: Research's Field Result, 2024

Table 5 shows the mean response of respondents on the role of agricultural extension programme in the provision of credit and Markets programme for farmers to promote food security in Ikwerre Local Government Area of Rivers State. Item 24 has mean score of 3.08, item 25 has mean score of 3.12, item 26 has mean score of 3.07, item 27 has mean score of 2.91, item 28 has mean score of 3.21, while item 29 has mean score of 3.25. The grand mean of 3.11 recorded was above the criterion mean of 2.50 which indicated that farmers in the study area agreed that provision of credit and markets programme for farmers promote food security in Ikwerre Local Government Area of Rivers State.

Discussion of Findings

Result in research question one revealed that the respondents were in agreement that introduction of new farming technologies programme to farmers promote food security in Ikwerre Local Government Areas of Rivers State to a high extent. This is evidenced in the grand mean of 2.94 recorded which indicated that introduction of crop technologies has increased farmers knowledge on fertilizer application, and planting of crops in rows to increase farmers productivity to ensure food security, precision farming, drip irrigation, and mechanisation, have helped to improve agricultural productivity and enhance food quality and security, introduction of agro-forest production technologies increase farmers knowledge on agro-forest crops, snail rearing, bee keeping, Ogbono, and Okazi cultivation to ensure food security, livestock production technologies has improve farmers skills and knowledge on confinement of sheep and goat, swine production, poultry production, rabbit rearing, and rearing of grass cutter, introduction of new fisheries production technologies has improved farmers skill and knowledge on homestead fishpond construction, management, and fingerling production to ensure food security, and agro-processing technologies has enhanced farmers skills and ability on the modern ways of processing soya bean into milk, processing of cassava into odorless fufu flour and mash, and storage of maize in cribs to ensure food security. This finding corroborate with the finding of Tsegaye, and Almas (2023) who find that the adoption of these technologies has a significant impact on both per capita consumption expenditure and child nutrition. In addition, the results of the differential impact analysis confirmed that impacts differed across the different segments of the households (quartiles based on area under improved technology and gender. The finding of the study also relate to the discovery of Sissoko, Synnevag, and Aune (2022) who found that technology adoption is a key activity to achieve food security.

The finding in table two for research question two revealed that respondents were in agreement that educational programme for farmers on new farming techniques promote food security in Ikwerre in Local Government Areas of Rivers State. This is evidenced in the High means recorded for item 7, 8, 9, 10, and 11, which affirmed that educational programme boosts farmers' access to information that enhance their knowledge and skills on post-harvest processing that promote food security, improved knowledge, skills and practices by farmers on soil and water management that ensure production of safe, nutritious, and sustainable food., equip farmers with knowledge and skills that has increased their crop yields and animal productivity to ensure food security, improved farmers knowledge and skills on how to reduce waste, and optimise the use of fertilizers and

pesticides to ensure food security, and equipped farmers with knowledge and skills on how to produce quality and safe food that meets high standards in ensuring food security. The finding of this study in table two is related to the discovery of Mbu (2019) that household agricultural training strongly correlates with food crop production, and that professional workshop on the farm training strongly affects agricultural production, therefore, farm education/training of farmers becomes a high priority for increasing agricultural production to ensure food security. The finding also agrees with the position of Oduro-Ofori, Aboagye, and Acquaye (2014) that education is important to the improvement of agricultural productivity such that formal education opens the mind of the farmer to knowledge, non-formal education gives the farmer hands-on training and better methods of farming and informal education keeps the farmer abreast with changing innovations and ideas and allows farmer to share experience gained.

The data analysis in research question three showed that respondents agreed that crop diversification programme for farmers promote food security in Ikwerre Local Government Areas of Rivers State to a high extent. This is confirmed by the high mean records in table three with items that recorded a grand mean of 2.97 which was above the criterion mean of 2.50. This indicated that crop diversification programme increases farmers knowledge on soil and ecosystem health that enhances sustainable food production, improves farmers knowledge on how to safeguard the production from climate change, equip farmers with knowledge and skills to cultivate more crops to maintain food supply, enable farmers to reduce staple crop failure risk to ensure food security, makes households more resilient to food insecurity, and that multi-cropping and intercropping reduce the need for pesticides, chemical fertilizers, and excessive water usage, lowering overall costs for farmers. This finding is in line with the finding of Mango, Makate, and Mapemba (2018) that crop diversification improves food security through improving food stocks in terms of quantity and variety and also in improving income through sale of crop produced from a variety of grown crop species which then is used to further improve consumption patterns. The finding is also in tandem with the discovery of Anamika, Priyanka, Shashank, and Anurag (2022) that crop diversification has the sound capacity for achieving the goal of nutritional security, income growth, food security, employment generation and sustainable agriculture development.

Result in research question four revealed that the respondents agreed that sustainable agricultural programme for farmers promote food security in Ikwerre Local Government Area of Rivers State to a high extent. This is evidenced in high mean scores in items 18, 19, 20, 21, 22, and 23 with a

grand mean score of 2.99 above the criterion mean of 2.50 which indicated that sustainable agricultural programme improves farmers knowledge on conservation of tillage and crop protection that promote food security, empowers farmers with knowledge and skills on how to conserve our resources to ensure food security, equip farmers with knowledge and skills required to mitigate the impacts of climate change to ensure adequate food production and security, make farmers aware that more crops can be grown on an area of land, and at the same time, more nutritious produce can be grown to ensure greater supply of food, equip farmers with knowledge on how to use greenhouse technology to cultivate plants without using soil or water to ensure adequate food production and security, and expose farmers to Organic farming practices that enhance healthier and tastier crops, thereby increasing the supply of food. This finding is in agreement with the position of Abdul, and Hira (2023) who acknowledged that implementing sustainable agriculture practices through the use of renewable energy sources, promoting organic farming, and reducing pesticide use can significantly reduce environmental impact and promote food security. Consequently, the finding of this study is also related to the finding of Ademola, Karin, and Hossein (2019) that promotion of sustainable agriculture is key to improved agricultural productivity for sustainable food security.

The data analysis in research question five showed that respondents agreed that provision of credit and Markets programme for farmers promote food security in Ikwerre Local Government Area of Rivers State to a high extent. This is evidenced in the grand mean of 3.11 recorded which was above the criterion mean of 2.50 and indicated that farmers in the study area agreed that provision of credit and markets programme enable farmers to have access to grants and loans from bank of agriculture which improves their production level to ensure food security, empowers farmers to better manage risks, such as crop failures due to weather events or price fluctuations in the market that affect food security, enable farmers knowledge on how to access grants and loans to increase farm business to ensure food security, changed farmers' perception towards issues on grants and loans that enhance their productivity for food security, With access

to funds, farmers can invest in better inputs, modern farming techniques, and technology, leading to income and increased yields for food security, and that credit availability enables farmers to adopt innovative methods and technologies, such as precision agriculture, which can improve productivity and resource efficiency for food security. This finding is related with the finding of Dia and Kobani (2024) that agricultural extension programmes play a positive role in sensitising farmers on how to access grants and loans, to increase their productivity towards food security,

and also in agreement with the position of Nlebem and Raji (2019), who discovered that educational levels and awareness determines the willingness and resilience in farmers readiness to sought for grant and loan to expand their farm and productivity.

Conclusion

Based on the findings of this study, it was concluded that agricultural extension programmes such as introduction of new farming technologies programme, education/training programme for farmers on new farming techniques, crop diversification/intensification programme, sustainable agricultural programme, and provision of credit and markets programme for farmers promote food security in Ikwerre Local Government Area of Rivers State. This means prioritising agricultural extension programmes contribute to addressing food security challenges by building a more equitable and sustainable food system. Through education, awareness, and the adoption of alternative food options to protect our planet, support local communities, and create a healthier future for ourselves and future generations.

Recommendations

In view of the findings of the study, the following recommendations were made.

1. Government at all levels should mobilise farmers to participate in introduction of new farming technologies programme designed to equip farmers with modern knowledge and skills in technology to ensure sustainable food security.
2. Government should engage more adult educators as extension workers through Agricultural Development Programme to continue to educate and train farmers on new farming techniques that promotes food security
3. Ministry agriculture and rural development should partner with agricultural cooperative societies in mobilising rural farmers to continue to actively participate crop diversification/intensification programme to enhance their agricultural productivity to ensures sustainable food security
4. Government and development agencies through ministry of agriculture sensitise farmers on the need for sustainable agricultural programme to promote food security
5. Ministry of agriculture should partner with agricultural cooperative societies to increases farmers access to grants and loans for increased food production amongst farmers to ensure sustainable food security.

References

Abdul, R. J. & Hira, J. (2023). Agriculture Practices for Sustainable Agriculture and Food Security. Retrieved on 24th March, 2024 from https://www.linkedin.com/pulse/sustainable-agriculture-food-security-abdul-rehman-twacf.

Adeola, R. G., Ayoade, A. R. (2011) Extension Agents' Perception of the Information Needs of Women Farmers in Oyo State, Nigeria. *Global Journal of Human Social Science,* 11 (10), 102-120.

Agunga, R. (2012). Communication for development: A personal experience with implications for development policy. *Journal of International Agricultural and Extension Education,* 18 (5), 507-521.

Ajeigbe, H.A., & Dashiell, K. (2010). *Participatory Research Extension Approach: Africa Extension Method.* Nigeria, Ibadan: International Institute of Tropical Agriculture (IITA).

Anamika, B, Priyanka, S, Shashank, P. &l and Anurag, B. (2022). Crop Diversification an Effective Strategy for Sustainable Agriculture Development. *Accessed on 20th March, 2024 from https://www.intechopen.com/chapters/81179*

Asghar, N., Salman, & Aneel (2018). Impact of Agriculture Credit on Food Production and Food Security in Pakistan, *Pakistan Journal of Commerce and Social Sciences*. 12 (3), 851-864

Dia, T.H., & Kobani, D. (2024). Role of Agricultural Extension Programmes in Promoting Food Security in Akuku-Toru Local Government Area of Rivers State. *International Journal of Research Publication and Reviews*. 5 (4), 286-296.

Downie, R. (2017). Growing the agriculture sector in Nigeria. A Report of the CSISGlobal Food Security Project. Retrieved fromhttps://csis-

Ibrahim, A. (2016). Roles of Agriculture Extension to Achieve Food Security and Improve Rural Livelihood. Proceedings of International Conference, Abu Dhabi, UAE, 07th March 2016.

Karolina, P & Małgorzata, K. (2020). The Role of Agriculture in Ensuring Food Security in Developing Countries: Considerations in the Context of the Problem of Sustainable Food Production. *Journal of Sustainability*. *12* (13), 54-68

Khonje, M., Manda, J., Alene, A. D., & Kassie, M. (2015). Analysis of Adoption and Impacts of Improved Maize Varieties in Eastern Zambia. *Journal of World Development,* 66, 695–706.

Khonje, M. G., Manda, J., Mkandawire, P., Tufa, A. H., & Alene, A. D. (2018). Adoption and welfare impacts of multiple agricultural technologies: Evidence from eastern Zambia. *Agricultural Economics*, 49 (5), 599–609.

Madu, M.O (2014)**.** "Role of Agricultural Extension Services in Farmer's Multipurpose Cooperative Societies in Ezeagu Local Government Area of Enugu State" (Unpublished Thesis of University of Nigeria, Nsukka).

Mango, N., Makate, C., Mapemba, L. *et al.* (2018). The Role of Crop Diversification in Improving Household Food Security in Central Malawi. *Journal of Agric & Food Security* 7, (7), 2-10

Mbu, D. T. (2019). Agricultural Training and Its Impact on Food Crop Production in Cameroon *Journal of Socioeconomics and Development*. 2: (1), 1 – 11

Mohamed, F. A. S. (2014). *Role of Agricultural Cooperatives in Agricultural Development – The Case of Menoufiya Governorate, Egypt.*aus Menoufiya , Ägypten.

Mohammed, N. & Lee, B. W., (2014). Nigerian Agricultural Cooperatives and Rural Development in Ivo Local Government Area, Ebonyi State Nigeria; *Journal of Developing Country Studies* 4 (19): 32-39.

Nnadozie, A.K., Oyediran, A.G., Njouku,I.A., & Okoli, K.C., (2015) Role of Cooperatives In Rural Development, the Case of South Nations Nationalities and People Region, Ethiopia. *Global Journal of Management and Business Research: Interdisciplinary* 15 (4), 34-43.

Nlebem, B. S & Raji, W. I. (2019). Impact of Agricultural Cooperative Societies on Farmers Productivity and Rural Transformation in Etche Local Government Area of Rivers State. *Global Scientific Journal* 7, (11) 353-367

Nlebem, B. S. (2018). *Introduction to Principles of Vocational Agricultural Education*. Chi's Publication, Diobu. Port Harcourt.

Oboh, V. U. (2018). Farmers' Bellocative behaviour in Credit Utilisation: A Case Study of Arable Crop Farmers in Benue State, Nigeria. PhD Dissertation, Agricultural Economics and Extension Programme, Abubakar Tafawa Balewa University, Bauchi, Nigeria.

Oduro-Ofori, E, Aboagye, A. P. & Acquaye, N. A E (2014). Effects of Education on the Agricultural Productivity of Farmers in the Offinso Municipality. *International Journal of Development Research*. 4 (9), 1951-1960.

Oluwasanmi, O. I., Ikechukwu, A. P., Nebechi, O. F., & Ichaba, A. (2021). Agriculture: A panacea to economic growth and development in Nigeria. *Journal of Economics and Allied Research,* 6 (2), 134-146.

Ortman, G. F. & King, R. P. (2017). Agricultural Co-Operatives: History, Theory and Problems. *Journal of Agricultural cooperatives, Agrekon,* 46 (1): 40-52.

Sissoko, P., Synnevag, G., & Aune, J. B. (2022). Effects of low-cost agricultural technology package on income, cereal surplus production, household expenditure, and food security in the drylands of Mali. *AIMS Agriculture and Food,* 7 (1), 22–36.

Tunji, S. (2022). Food Crisis to Worsen as Bandits Kill, Kidnap 352 Farmers in 12 Months. Punch. Retrieved on 23rd March, 2024 from http://punch.com/food-crisis-toworsen-as-bandits-kill-kidnapp-352

Taiwo A. O, Agbasi O. E, Lawal K, & Okaf I. P, (2015). Evaluating Farmers Access to Productive Resources Through Cooperative Societies and its Effects on Their Performance In Rural Communities of Anambra State, Nigeria; *International Journal of Scientific & Technology Research* 4 (09): 37-44

Toluwase S. O. & Apata O. M (2013), Impact of Farmers' Cooperative on Agricultural Productivity in Ekiti State, *Nigeria Greener Journal of Agricultural Sciences* 3 (1), 63-67.

Wobo, T.Q.E. & Kobani, D. (2024). Role of Family Life Education Programmes in Reducing Drug Abuse Among Youths in Yenegoa, Bayelsa State, *International Journal of Educational Research (IJO),* 7(5): 46-65.

Zheng, S., Wang, Z., & Song, S. (2011). Farmers' Behaviours and Performance in Cooperatives in Jilin Province of China. *International Social Science Journal*, 48 (3), 449–457