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Strategies for Enhancing Food Security among Rural Farmers in Abakaliki, Ebonyi State, Southeast Nigeria

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Abstract

Food security is dire necessity, which is why it is a global concern gaining appreciable scholarly attention in recent years. It is yet to gain such an attention among scholars in Abakaliki in particular and Ebonyi as a whole. To that end, this study is aimed at examining strategies for enhancing food security among rural farmers in Abakaliki Local Government Area (LGA) of Ebonyi State, Southeast Nigeria. A structured questionnaire was used to gather data from 100 respondents across 10 major agrarian areas of the LGA. They were randomly selected, using purposive sampling technique. Mean score derived from four-point Likert rating scale, logit regression analysis, and factor analysis were used for the analysis of the data. The results show the following strategies for enhancing food security among the farmers: introduction and adoption of modern sustainable farming practices with mean of $\bar{x}$ = 2.98, upward review of budget allocation to the agriculture sector ($\bar{x}$ = 2.96), application of sustainable agricultural practices ($\bar{x}$ = 2.95), and repurposing agricultural and food policy support ($\bar{x}$ = 2.94). Besides, these strategies are found having significant effects on food security among the farmers. The study concludes that rural farmers in Abakaliki LGA significantly deploy effective strategies for enhancing food security. Among others, the study charges stakeholders in agricultural sector and political realm of public affairs to popularize food security among rural and urban farmers alike, towards ensuring food safety and healthy living among individuals in and outside agrarian societies.

Keywords: Strategies, Food security, Enhancing, Rural farmers, Abakaliki.

Introduction

Food insecurity and poverty remain widespread in several sections of the country. The food insecurity situation in Nigeria is worsening as a result of the substantial discrepancy between the country's food supply and demand. For example, the percentage of households facing food insecurity rose from 40% in 2005 to over 65% in 2019 (Smith et al., 2021). Although Nigeria possesses considerable agricultural potential and abundant natural resources, various indicators of economic prosperity remain at a markedly low level. At present, the rate at which the population is increasing has surpassed the rate at which agricultural productivity is growing (Okunola, 2021). Consequently, the nation is grappling with a state of insufficient access to food, sometimes known as food insecurity. Presently, Nigeria's economic structure is predominantly oriented towards consumption rather than production, which has significantly exacerbated issues of food insecurity and poverty inside the country. The Nigerian agriculturists' failure to adequately supply food to meet the growing population's needs has led to food shortages, undernourishment, malnutrition, starvation, hunger, and poor health.

The prevalence of food insecurity is widespread among Nigerians, encompassing both urban and rural people, while the rural areas have a higher incidence of food insecurity (Oni, 2023). A country's industrialization is contingent upon the prior modernization of its agricultural sector (Ini et al., 2023). It plays a crucial role in promoting economic growth in sectors other than agriculture. According to Akpabio (2023), each dollar of extra value created in agriculture leads to an additional 30-80 percents in revenue gains in other sectors of the economy. An enhanced agricultural sector is a crucial factor in the pursuit of economic development and inclusive economic growth in any developing economy (Akpabio, 2023). It guarantees the availability of food, encourages the development of industries, generates employment opportunities, enhances the ability to withstand external threats, and promotes collective economic well-being. Food remains vital and fundamental to human existence. People are said to be food secured when the quality and quantity of food available to them is sufficient. It is a situation that exists when all people have physical, social and economic access to adequate, safe and nutritious food.

Food security is a global concern, accorded high relevance at global, regional, national, state, household and individual levels. A country, state or household is food secure when the majority of the population has access to food in adequate quality and quantity at all times. Okpolu et al., (2018) stated that

food insecurity boils down to inability of households to have reliable access to food in sufficient quantity and quality to enjoy active and healthy life. The transformation of the agricultural food systems for sustainability and inclusivity holds the key to sustainable food security both at national, regional, and global levels. Government realized the declining nature of Agriculture over the years and decided to put in place certain policies, measures and/or programmes with a view to increasing the Agricultural output and export.

As Nwoye and Nwalieji (2019) rightly note, some of the agricultural programmes put in place by the government Third National Fadama Additional Financing Programme (Fadama III-AF), Value Chain Development Programme (VCDP) initiated by International Fund for Agricultural Development (IFAD) with the target of supporting smallholder farmers in the six benefiting states of Benue, Anambra, Ebonyi, Taraba, Niger and Ogun in rice production, Agricultural Development Programme (ADP), National Programme for Food Security (NPFS), FADAMA II, Root and Tuber Expansion Programme (RTEP), Nerica Rice Production, and Community-based Agricultural and Rural Development Programme (CBARDP). Others include Agricultural Enhancement, African Development Foundation, and Commercial Agricultural Development Project (CADP), Green Alternative, which is the Agricultural Promotion Policy (APP) of the FAMARD, and the Economic Recovery and Growth Plan of the Federal Government of Nigeria (Lawal, 2018).

These programmes were aimed at increasing food production and reducing poverty among rural dwellers, increasing food security, and contributing to the achievement of key millennium development goals. Of course, farming is the primary source of livelihood for majority of people in the rural areas (Prince et al., 2016). Given the inefficacy of the policy attempts at attaining food security, other strategies, other than policy-based measures, ought to be evolved, imbibed and sustained. Such strategies include general expansion strategies; improved crop varieties; use of improved breed of livestock; value addition through food processing; and strategized time of planting. In view of the foregoing, this study seeks to assess rural farmers' strategies for enhancing food security in Abakaliki Local Government Area (LGA) of Ebonyi State, Southeast Nigeria. Its objectives are to examine the strategies for enhancing food security in the area, and establish the effects of the strategies on food security in the LGA.

Concept of Food Security

Food security is a concept that has been variously defined by scholars and authors. According to Economic Intelligence Unit [EIU] (2018), food security is a complex, multifaceted concept usually influenced by culture, environment, and geographical location. According to the FAO (2022), food security connotes a situation that exists

when all people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences for an active and healthy life. FAO (2022) describe food security from the above perspective to encompass four dimensions: food availability, economic and physical access to food, food utilization, and stability over time. Perez-Escamilla et al. (2017) citing the Food and Agriculture Organization of the United Nations (FAO) gave a clear definition of "food security at five different levels - individual, household, national, regional, and global levels.

The High-Level Panel of Experts (HLPE) (2020) of the Committee on World Food Security describes in detail the four key dimensions of food security and added two additional dimensions, which are agency and sustainability. The availability dimension addresses whether or not food is actually or potentially physically present, including aspects of production, food reserves, markets and transportation, and wild foods; while access describes whether or not households and individuals have sufficient physical and economic access to that food. Food utilization considers whether or not households are maximizing the consumption of adequate nutrition and energy; while stability is the condition in which the whole system is stable, thus ensuring that households are food secure at all times. According to the HLPE (2020), stability raises issues related to short- term instability which can lead to acute food insecurity, or medium to long-term instability which can lead to chronic food insecurity.

Agency refers to the capacity of individuals or groups to make their own decisions about what foods they eat; what foods they produce; how that food is produced, processed, and distributed within food systems; and their ability to engage in processes that shape food system policies and governance. Sustainability refers to the long-term ability of food systems to provide food security and nutrition in a way that does not compromise the economic, social, and environmental bases that generate food security and nutrition for future generations (HLPE, 2020). The issue of sustainability calls to question the sustainability of the entire agricultural food system. The absence of one or more of the dimensions or components of food security may technically be referred to as food insecurity. According to FAO (2008) and Jones et al. (2013), food insecurity is conventionally classified into two categories; chronic and transitory, while seasonal food insecurity falls in between the two.

Chronic food insecurity is a long-term or persistent situation where people can no longer meet their minimum food requirement over a sustained period while transitory food insecurity is commonly short-term or temporary and it relates to short periods of extreme scarcity of food availability and access (Barrett and Sahn, 2001). Food security at all levels is essential because food is a necessity for human beings. Where there is food security, children are properly nourished, people can lead healthy and

productive lives, and society can prosper. When a society has enough food and healthy food, the citizens tend to lead a happier and more fulfilling life and an enhanced standard of devoid of health and societal ills. According to Amaechi (2018), food security presents a favourable image of a people and country to the international community and contributes to creating a veritable atmosphere for healthy governance.

Related Studies

Studies have identified strategies for food security and promoting sustainable agriculture production. Accordingly, one way of maintaining the quality of the environment and improving crop yields, farm incomes, and food security at the same time is to promote the adoption of sustainable agricultural practices. According to Issahaku and Abdulai, (2019), the adoption of SAPs correlates with food security. Morugán-Coronado et al. (2020) showed that various combinations of sustainable agricultural practices (SAPs) including minimum tillage, use of organic fertilizers, and alley cropping resulted in positive crop yield response, as well as soil organic carbon and nitrogen accumulation. Another strategy for attaining food security and promoting sustainable agriculture production is re-purposing agricultural and food policy support. According to a joint report published by the Food and Agriculture Organization of the United Nations (FAO), United Nations Development Programme (UNDP), and United Nations Environment Programme (UNEP) (2021), repurposing entails the reduction of support measures that are inefficient, unsustainable and/or inequitable, to replace them with support measures that are the opposite. In other words, support is not eliminated but reconfigured. In this way, repurposing will always imply reforming. According to FAO, IFAD, UNICEF, WFP, and WHO (2022), rethinking the allocation of public spending to repurpose food and agricultural policies is urgently needed.

According to Amaechi (2018), development of post-harvest technology assumes particular importance, especially in the case of perishable commodities like fruits, vegetables, milk, egg, fish, and other animal products and processed food. There must not be a mismatch between production and post-harvest technology if the goals of promoting sustainable agriculture, eliminating hunger, and ensuring food security at all levels are to be achieved. Promoting the post-harvest sector also has multiplier effects on rural income and poverty reduction. Next, systematic development of the farming system is important to consider the composition of the farming system such as soil components, water availability, agro-climatic features, home needs, and above all marketing facilities and opportunities in the choice of crops, farm animals and unique culture systems to adopt. Climate resilience is another strategy. Climate resilient practices should be integrated into agricultural and food system policies and programs. Efforts should be made to promote climate-smart agriculture through

targeted extension services, improved crop choices, investment in machinery, and increased access to improved animal feed and breeds to protect soils and biodiversity, conserve water, and limit land-cover change. Donor support should be targeted to greenhouse gas emissions-reduction efforts, thus contributing to the more ambitious mitigation target reflected in Nigeria's updated nationally determined contribution, which is conditional on such support (FRN, 2021).

Furthermore, the agricultural system need to accept and adopt modern sustainable farming such as planting better seeds and seedling, the use of safe chemical for pest and insect control, as well as disease control among others. Oni (2013) recommended the promotion of sustainable cultural practices with various technologies recommended by experts; the adoption of new technologies use for post-harvest work to improve productivity and minimize waste as well as control environmental pollution. There is also the need to monitor weather and market events: Real-time actionable intelligence, such as weather and climatic conditions, should be provided to farmers through a specialized channel of the Nigerian Meteorological Agency. According to World Bank cited in FAO, IFAD, UNICEF, WFP and WHO (2022), farmers should in addition to climate and weather events, be made aware of labour data and market conditions so that they can protect themselves and their products from price volatility which impacts their earning abilities.

The budget for the agriculture sector should be revisited and increased to reflect the current situation of the sector. Nigeria is a signatory to the Maputo Declaration of 2003 where African countries committed to spending at least 10% of their annual budget on agriculture. However, the budgetary allocation has been significantly lower than this at 1.7% in 2017, 2.0% in 2018, 1.56% in 2019, 1.34% in 2020, and 1.37% in 2021 (Izuaka, 2021). In addition, the government should immediately revisit dead or dilapidated agro-agencies. Most of these agencies were the powerhouse driving progress within the agro-sector of Nigeria but have unfortunately become neglected and abandoned (Voh Jr, 2017). Besides, research institutes should be reequipped and repositioned to carry out their mandates effectively. Further, efforts should be made and strategies evolved for effective communication of research findings and innovations to stakeholders in the agricultural and food system. These institutes, such as the Institute for Agricultural Research, offer extension services to farmers and other stakeholders in the agricultural value chain and drive the utilization of green and sustainable approaches in agricultural production, processing, and research (Voh Jr, 2017).

Methodology

Descriptive survey design and mixed methods are employed. The area of study is Abakaliki Local Government Area (LGA) of Ebonyi State. Farming is one of the major

occupations of Abakaliki people, particularly those in the rural areas. They farm crops and rear animals in large quantities. While some of them are subsistent farmers, others are commercial farmers. Other economic activities include animal production (livestock), hunting, petty trading, and civil service. Data were sourced through the use of structured questionnaire.

A total of 100 respondents were drawn from across 10 autonomous agrarian areas of Abakaliki LGA. Thus, 10 respondents were randomly selected using purposive sampling technique. Data were analyzed using relevant analytical techniques such as descriptive and inferential statistics. These involve mean score derived from four-point Likert rating scale, and logit regression analysis and factor analysis. The logistic regression model computed the maximum likelihood estimates of β_i given the non-linear probability distribution of the random error μ_i. The logistic regression model was expressed as:

$$\text{Prob } (y^* = 1) = 1 - F * (\sum X_i\beta_j) = \frac{e^{\sum Xi\beta j}}{1+e^{\sum Xi\beta j}} \quad (1)$$

$$\text{Prob } (y^* = 0) = F * (\sum X_i\beta_j) = \frac{e^{\sum Xi\beta j}}{1+e^{\sum Xi\beta j}} \quad (2)$$

$$Y^* = (- \sum Xi\beta j) + \mu_i \quad (3)$$

Explicitly, this model can be linearized as:

$$Y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \ldots + \beta_{10} x_{10} + et \quad (4)$$

Where,

Y = Food Security (Yes = 1, No = 0)

X_1 = Application of sustainable agricultural practices (SAPs) (Yes = 1, No = 0)

X_2 = Repurposing agricultural and food policy support (Yes = 1, No = 0)

X_3 = General expansion strategies (Yes = 1, No = 0)

X_4 = Improved crop varieties (Yes = 1, No = 0)

X_5 = Climate resilience practices (Yes = 1, No = 0)

X_6 = Introducing and adopting modern sustainable farming practices (Yes = 1, No = 0)

X_7 = Use of improved breed of livestock (Yes = 1, No = 0)

X_8 = Value addition through food processing (Yes = 1, No = 0)

X_9 = Strategized time of planting (Yes = 1, No = 0)

X_{10} = Repositioning of research institutes (Yes = 1, No = 0)

β_0 = Constant

$\beta_1 - \beta_{10}$ = Parameters

et = Error term.

Mean Score Analysis is done viz:

$$\bar{X} = \sum \frac{fx}{N}$$

Where;
$\bar{X}$ = mean score
$\sum$ = summation
X = likert value
F=frequency
N = number of respondent.
Decision point for the four-point Likert scale:
4= strongly agree, 3 = agree, 2 = disagree, and 1 = strongly disagree.
$X = \frac{4+3+2+1}{4} = \frac{10}{4} = 2.5$
This implies that using 2.5 as decision point, any item that has mean score less than 2.5 will be rejected while those with mean score of 2.5 and above will be accepted.

Data and Results

Table 1: Mean Score Responses on Strategies for Enhancing Food Security in Abakaliki

Practices	Mean ($\bar{x}$)	Decision Rule ($\bar{x}$ = 2.5)
Application of sustainable agricultural practices	2.95	Accepted
Repurposing agricultural and food policy support	2.94	Accepted
Development of post-harvest technology	2.87	Accepted
Systematic development of the farming system	2.56	Accepted
Climate resilient practices	2.78	Accepted
Introduction and adoption of modern sustainable farming practices	2.98	Accepted
Monitoring of weather and market events	2.68	Accepted
Upward review of budget allocation to the agriculture sector	2.96	Accepted
Reactivate dead agro agencies	1.71	Rejected
Repositioning of research institutes	2.64	Accepted
Average mean	**2.80**	**Accepted**

Source: Researcher, 2023

The strategies for enhancing food security are identified and presented with the results in Table 1. The data in the table show that the major strategies for enhancing food security in Abakaliki were introduction and adoption of modern sustainable farming practices with mean of $\bar{x}$ = 2.98, upward review of budget allocation to the agriculture sector ($\bar{x}$ = 2.96), application of sustainable agricultural practices ($\bar{x}$ = 2.95) and repurposing agricultural and food policy support ($\bar{x}$ = 2.94). Followed by development of post-harvest technology ($\bar{x}$ = 2.87), climate resilient practices ($\bar{x}$ = 2.78) and

monitoring of weather and market events ($\bar{x}$ = 2.68). Others are repositioning of research institutes ($\bar{x}$ = 2.64), systematic development of the farming system ($\bar{x}$ = 2.56). Generally, the average mean response was $\bar{x}$ = 2.80 which imply that the strategies considered for enhancing food security in the area were significant.

Table 2: Summed up Logit Regression Results on the Effects of the Strategies

Variables	Estimated coefficients	Standard error	Z	Probability
Constant	0.754	0.164	4.586	0.000***
General expansion strategies	0.059	0.077	0.760	0.004***
Food policy supports and optimizing agricultural practices	0.017	0.035	0.485	0.063*
Development of post-harvest technology	0.096	0.073	1.324	0.019**
Systematic development of the farming system	0.143	0.064	2.255	0.026**
Improved crop varieties	0.006	0.059	0.096	0.092*
Introducing and adopting modern sustainable farming practices	0.119	0.982	0.121	0.000***
Use of improved breed of livestock	0.117	0.308	0.380	0.006***
Value addition through food processing	0.487	0.262	1.859	0.071*
Strategized time of planting	0.329	0.232	1.418	0.041**
Repositioning of research institutes	0.745	0.231	3.225	0.002***
LR chi-square	17.290			
Log Likelihood	42.823			
PseudoR^2 (Nagelkerke)	0.764			

Source: Researcher, 2023 *, **, ***= Significant 10%, 5% and 1% respectively

Logit Regression Analysis was carried out to determine the effects of the strategies on food security in Abakaliki. The analysis showed that all the variables considered have positive effects on food security. This was also confirmed as variables were all significant at various levels of confidence. The overall fit of the logit model was explained by the LR chi-square which was 17.290 and statistically significant at 1% ($P < 0.01$). The application of sustainable agricultural practices (X_1) was found to be significantly influencing food security status at 1% ($P < 0.01$) level of probability. However, the application of sustainable agricultural practices was positively signed implying that application of sustainable agricultural practices will increase food security status of the farm households. The marginal value of 0.059 implies that if application of sustainable agricultural practices increased by one unit the likelihood of farm households to be food secure will increase by 0.059.

Furthermore, repurposing agricultural and food policy support (X_2) displayed a positive and significant relationship with farm households' food security status at 10%

($P < 0.1$) probability level. The marginal effect shows that as repurposing agricultural and food policy support increases by one unit, the likelihood of farm household food security will increase by 0.017. The results of the analysis also revealed that the coefficient of development of post-harvest technology (X_3) was positively related to food security status of the farm households and was statistically significant at 5% ($P < 0.05$) level of significance. This shows that development of post-harvest technology have direct positive relationship with food security status of the farm households. The results further showed that systematic development of the farming system (X_4) increased the probability of farm households to be food secure by 0.143, suggesting that systematic development of the farming system have positive relationship with food security status of farm households. Systematic development of the farming system is correlated to food security and under most circumstances impresses production and income.

Further, the results also showed that climate resilient practices (X_5) was also positively and significantly influencing farm household food security at 10% ($P < 0.1$) probability level. The marginal effect shows that as climate resilient practices increases by one unit, the likelihood of farm household food security will increase by 0.006. The coefficient of introduction and adoption of modern sustainable farming practices (0.119) was positive and statistically significant at 1% level of significance. This implies that introduction and adoption of modern sustainable farming practices has direct positive relationship with farm household food security. Hence, its increase will bring about increase in food security by 11.9%.

The coefficient of monitoring of weather and market events (0.117) had positive sign and was statistically significant at 1% alpha level. This indicates that monitoring of weather and market events was directly related with food security. It can also be adduced from the result that increase in monitoring of weather and market events will lead to a corresponding increase in food security by 11.7%. Besides, the coefficient of upward review of budget allocation to the agriculture sector (0.487) was also positive and statistically significant at 10% level of probability. This infers that increase in upward review of budget allocation to the agriculture sector will lead to increase in food security by 48.7%.

Reactivate dead agro agencies had an estimated coefficient of 0.329 and this implies that reactivating dead agro agencies was positively related to food security in the study area and was statistically significant at 5% probability level. This means that its unit increases would increase food security by a magnitude of 32.9%. That is to say, the higher the reactivation of dead agro agencies the higher the food security of farming households. Repositioning of research institutes (0.745) showed a positive relationship with food security. This implies that increase in repositioning of research institutes would lead to increase in food security in the study area. This result supports the

argument that increased repositioning of research institutes increases food security by 74.5%. This result was significant at 1% level of significance and agrees with.

Conclusion

Food security is a practice upheld by many rural farmers in Abakaliki. As farming is a major economic activity in Abakaliki LGA of Ebonyi State, the farmers deploy various strategies for farming and practicing food security. They largely engage in practices that promote food security. The major strategies for enhancing food security in Abakaliki LGA were introduction and adoption of modern sustainable farming practices with mean of $\bar{x}$ = 2.98, upward review of budget allocation to the agriculture sector ($\bar{x}$ = 2.96), application of sustainable agricultural practices ($\bar{x}$ = 2.95), and repurposing agricultural and food policy support ($\bar{x}$ = 2.94). These strategies have effects on food security in the area. There is the dire need for enlightening farmers of the LGA on other strategies for enhancing food security. Given their poor income, they should be genuinely empowered by the government with financial and agro-material supports. These should include providing farm inputs, grants and advisory services by well trained and experienced Agricultural Extension workers. Food security is a practice that must be popularized among farmers and non-farmers in both urban and rural areas.

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