APPRAISAL OF SUSTAINABLE STRATEGIES FOR INCLUSION IN AGRICULTURAL EDUCATION CURRICULUM FOR ENHANCED FOOD SECURITY IN NORTH-CENTRAL, NIGERIA

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ABSTRACT

This study appraise sustainable strategies for inclusion in agricultural education curriculum for enhanced food security in North-Central Nigeria. Four (4) specific objectives and research questions each guided the study. The study used the survey research design. The population was five thousand and forty (5,040) households. A sample size of one thousand and eight (1008) households was drawn from the population using the multi-stage procedure for sampling. The instrument for data collection was a 47-item structured questionnaire titled – Agricultural Education Curriculum and Food Security Questionnaire (AECFSQ) which had four point response options of Highly Important (HI), Moderately Important (MI), Slightly Important (SI) and Not Important (NI). The instrument was validated by three experts. The Cronbach alpha reliability coefficient of the instrument was 0.89. The instrument was administered on the respondents by the researchers and four research assistants. Mean and standard deviation were used to answer the research questions. The study revealed that economic, social, environmental and technological strategies were required for improving agricultural education curriculum for enhanced food security. On the basis of the findings, there is an urgent need to improve the curriculum of agricultural education to position it on the path of sustainable food production and enhanced food security in North-Central Nigeria.

Keywords: *appraisal, strategies, agricultural education, curriculum, food security.*

DOI:10.5281/zenodo.12779386 **Manuscript ID # 159**

INTRODUCTION

Nations across the globe strives to secure both its human and natural resources. The success of human existence and development is determined by the extent to which the various components of human lives are secured including food security. Matemilola and Elegbede (2017) stressed that food is no doubt, the most basic of all human survival needs. Although, so many efforts have been sunk in improving the quality as well as production of food supplies, food insecurity remains prevalent, particularly in Africa and in Nigeria. Malnutrition has resulted in the death of many citizens both among rural and urban households, because about 70 percent of the population lives on less than ₦100 (US$ 0.70) per day, suffering hunger and poverty (Nwajiuba, 2013).

Nigeria's rapid rate of population growth has posed a serious threat to food security therefore food availability, affordability, accessibility, and utilization must significantly and consistently improve to prevent food insecurity and malnutrition (Bill and Melinda Gates Foundation 2014; Global Food Security Index 2014; and Atehnkeng, Augusto, Senghor, Bonkoungou, Diedhiou, Akande, Akello, Mutegi, Cotty and Bandyopadhyay 2015). Similarly, Chris Toe (2018) stressed that humanitarian funding needs in four countries of South Sudan, Nigeria, Somalia and Yemen with the most severe food crises stood at over US$6.5 billion in 2017 and about 29 percent of humanitarian requirements remained unmet and longer-term investments were well below projected needs. The above scenario and many others have attracted global discourse on food security among households in both rural and urban communities, especially in Nigeria.

Food security is the condition in which 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 (Committee on World Food Security 2012; Rwanda National Food and Nutrition Policy 2014; and FAO in Zakari, Ying and Song 2014).

Food Security in the opinion of Resilience (2015) means that all people at all times have physical and economic access to adequate amounts of nutritious, safe, and culturally appropriate foods**,** which are produced in an environmentally sustainable and socially just manner, and that people are able to make informed decisions about their food choices. In 2017, almost 124 million people across 51 countries and territories faced crisis levels of acute food insecurity and required urgent humanitarian action (Global Report on Food Crises, 2018. This study see's household food security as the ability of households to gain access to adequate food (both in quantity and quality) to meet its nutritional requirements for an active life throughout the year (Ministry of Budget and National Planning, 2016).

The International Fund for Agricultural Development, IFAD (2012), rates Nigeria as the number one producer of yam, cassava and cowpea in the world; yet Nigeria remains a food insecure nation and relies heavily on importation of grains, livestock products, and including fish. To achieve sustainable food security, there must be a balance between production and education. This is because, education the world over is considered an important tool for effective and sustainable human capital development. According to Dike in Igbokwe (2015), the world today is undergoing major transformations which are multidimensional, affecting the technological, economic, social, cultural and political development of human communities particularly those of developing societies like Nigeria. The focus of education system all over the world is the development of human capital required to meet present and future challenges of globalization and knowledge economy.

The aspect of education that has the potentials for enhancing food security is the Technical Vocational Education and Training (TVET) particularly Agricultural Education. Agricultural Education according to Ejiofor and Nwakile (2013) is the transmission or communication of ideas, principles and beliefs about agriculture to a group of people to educate them about agricultural practices and its operations. In Nigeria, formal Agricultural Education is carried out both at the primary, secondary and tertiary levels of education. However, for agricultural education to be position to the point of achieving food security, deliberate efforts must be made to make agricultural education curriculum more production-driven and production-centred.

Curriculum involves all the learning experiences provided for the learner in the school under the guidance of the teacher in the school system. Ahmadi and Lukman (2015) describe curriculum as an organized plan of course outlined with the objectives and learning experience to be used for achievement of these objectives. It is a way of preparing individuals to become productive citizens and useful members of the society to which they belong. There is therefore, the need for intensified discourse on curriculum improvement and curriculum review.

However, curriculum improvement is a deliberate and continued process of reviewing or re-inventing the curriculum to bring in new ideas and possibly drop obsolete ideas from the curriculum. This must take into consideration, the realities of the day so that, the renewed or redesigned curriculum could produce people who

will be more productive and compete favourably in the global market. Osagiede (2014) emphasised that, curriculum reforms are not necessarily new policies but rather action plans geared towards improving the existing curriculum.

Furthermore the need for curriculum reforms could be justified by the opinion of Alade (2011) that curriculum innovations have been so content-driven and examination-centred. Teachers' efforts are geared towards covering the content of the curriculum within approved timeframe of the school calendar. This has made the Nigerian children to be faced with the challenge of the work-force of the twenty-first century, which require manipulative skills and great ability to solve problems on their own than it had been in the past. Therefore, Salami (2013) suggested a refocusing of curriculum to make it more functional, scientific, technical, informative, global and cultural, with emphasis on skills development in addition to being inventive, adaptable, curious, creative and risk taking.

The theoretical framework for this study was anchored on Functional Curriculum Theory and Wheeler's model of curriculum design. According to Ofoha, Uchegbu, Anyikwa and Nkemdirim (2009) functional curriculum theory as postulated by Obanya contended that for Africa to get to the level at which it could contribute to the world pool of knowledge, ideas, inventions, human and financial capitals and become fully participating member of the global economy, it has to embrace a curriculum that is tripartite in nature and practical. Furthermore, in the opinion of Alfred (2013), Wheeler advocated that the curriculum which seems a continuous and dynamic process should be subject to change as the needs and interests of the society changes. These theory and model were applicable because the study sought an improvement in the curriculum of agricultural education to make it more competitive globally and inculcate into the learners, skills for sustainable food production to achieve food security and combat hunger which are the changing needs and interests of today's Nigeria society.

Statement of the Problem

Nations all over the world strives to secure both their human and natural resources, food security and improved nutrition are the concern of many nations today, including Nigeria. Research have shown that about 795 million people, or every ninth person, is undernourished, with the vast majority of them living in the developing regions, notably in Africa (Nigeria) and Asia. The continued increase in human population, there is every indication that, food insecurity have become a killer monster not only in developing nations which Nigeria is one, calling for definite steps to be taken. In order to ensure sustainable production and enhanced food security, there is need for improvement in the existing agricultural education curriculum so that it can contribute effectively to both economic and human capital development in the society. This study is therefore significant to curriculum planners, agricultural educators and future researchers.

Purpose of the Study

The purpose of this study was to examine the mechanisms for improving agricultural education curriculum for enhanced food security in North-Central Nigeria. Specifically, the study sought to:

i. determine the economic strategies for achieving food security in North-Central, Nigeria
ii. examine the social strategies for achieving food security in North-Central, Nigeria
iii. assess the environmental strategies for achieving food security in North-Central, Nigeria
iv. examine the technological strategies for achieving food security in North-Central, Nigeria

Research Questions

i. What are the economic strategies for achieving food security in North-Central, Nigeria?
ii. What are the social strategies for achieving food security in North-Central, Nigeria?
iii. What are the environmental strategies for achieving food security in North-Central, Nigeria?
iv. What are the technological strategies for achieving food security in North-Central, Nigeria?

Methodology

Design of the Study

Survey research design was used for the study. The design was appropriate for this study since data was collected from a large number of households on practices that could be adopted to improve agricultural education curriculum to achieve sustainable food security.

Area of Study

The study was conducted in North-central Nigeria. The study area is one of the six (6) geopolitical zones of Nigeria. The Zone has six (6) states including Benue, Nasarawa, Kogi, Kwara, Plateau and Niger States and the Federal Capital Territory (FCT) Abuja. The Zone played host to the two major rivers in Nigeria, the Rivers

Niger and Benue. The major occupation of the people of the study area is farming. The zone has potentials for both crop and livestock production including fishing. The zone lies in the Guinea Savannah region.

Population of the Study

The population for the study was five thousand and fourty (5,040) households. This figure represents the 720 households from each States of North Central Nigeria including FCT Abuja that participated in the National Nutrition and Health Survey 2018 which was conducted by the National Bureau of Statistics (National Bureau of Statistics, 2018).

Sample and Sampling Technique

The sample size of one thousand and eight (1008) households was obtained using Taro-Yamen's formula. Multi-stage sampling procedure was adopted for this study. In the first stage, purposive sampling technique was used to select five (5) states namely: Benue, Kogi, Kwara, Nasarawa and Plateau. Secondly, simple random sampling technique was used to select the 1008 respondents from the selected States. Simple random sampling was used because it gave each element of the population equal and independent chance of being included in the sample.

Instrument of the Study

The instrument used for data collection was a 47-item structured questionnaire which was developed from literature review titled "Agricultural Education Curriculum and Food Security Questionnaire (AECFSQ)". The instrument had four point response options of Highly Important (HI), Moderately Important (MI), Slightly Important (SI) and Not Important (NI). The 47-item covered information on strategies for achieving food security in the North central, Nigeria.

Validation of the instrument

The instrument was validated by three experts. Two of the experts where from the Department of Agricultural Education, University of Agriculture Makurdi and one expert from the Department of Vocational and Technology Education, Taraba State University, Jalingo. The experts were given a draft copy of the instrument and the specific objectives of the study. They corrected both technical and spelling errors and also ascertain the accuracy of the content. All the corrections made were effected in producing the final copy of the instrument.

Reliability of the Instrument

A trial testing of the instrument was carried out by administering 15 copies of the questionnaire to 15 households in Jalingo and Ardo-Kola Local Government Areas of Taraba State. Taraba State is not part of the study area; however, the respondents have similar characteristics with the target respondents for this study. Cronbach-Alpha reliability method was used to determine the internal consistency of the items. The reliability coefficient of the instrument was .89; hence the instrument was adjudged reliable and suitable for the study.

Method of Data Collection

The researcher engaged four (4) research assistants in administering the instrument on the respondents in their respective locations. A total of 1008 copies of the questionnaire were distributed to the respondents. However, 716 copies of the administered questionnaire were retrieved and analyzed. This represents 71.03% retrieval rate.

Method of Data Analysis

Mean and standard deviation were used to answer research questions. Any item with a mean value of 2.50 and above was regarded as important whereas any item with a mean value less than 2.50 was regarded as not important.

Results and Discussion

Table 1: Mean and Standard Deviation of the responses of respondents on the economic strategies for achieving food security in North-Central, Nigeria

S/N	Item	$\bar{X}$	SD	Decision
1	Promoting decent employment in the agriculture sector	3.83	0.51	Important
2	Policies and programmes should be implemented to facilitate equitable market place for the informal farmers	3.66	0.37	Important
3	Adequate training of farmers should be put in place	3.92	0.48	Important
4	Promoting the non-farm economy in the rural areas	2.58	0.83	Important
5	Provision of enabling environment for diversification of rural economies	3.26	1.09	Important
6	Provision of credit facilities	3.50	0.39	Important
7	Provision of subsidy on fertilizers and other farm inputs	3.76	0.45	Important

Results from Table 1 indicates that, all the seven (7) items had their mean value ranged between 2.58 and 3.92 indicating that, the respondents have agreed that they are the economic strategies for achieving food security in the North-central Nigeria. The standard deviation ranged between 0.37 to 1.09, indicating that the respondents were not too far from each other in their responses. The findings agrees with Oni, Nkonya, Pender, Phillips and Kato (2009) who stressed that access to credit facilities has been shown empirically in various studies to have improved farmer's productivity. Other incentives such as subsidy on fertilizers can also help improve farmers' productivity. Furthermore, Matemilola and Elegbede (2017) highlighted the promotion of decent employment in the agriculture sector and the non-farm economy in the rural areas as key drivers to food security.

Table 2: Mean and Standard Deviation of the responses of respondents on the social strategies for achieving food security in North-Central, Nigeria

S/N	Item	$\bar{X}$	SD	Decision
1	Social networking and organized farmers cooperation	3.50	0.59	Important
2	Access to adequate farmer education opportunities	3.33	0.73	Important
3	Provision of capacity building platform for farmers	3.16	0.49	Important
4	Provision of basic infrastructure	3.67	0.35	Important
5	Provision of education opportunities for farm families	3.43	0.44	Important
6	Provision of basic social amenities	3.58	0.81	Important
7	Provision of recreation facilities in farming communities	2.39	0.57	Not important

Results from Table 2 indicates that, six (6) items had their mean value ranged between 3.16 and 3.67 indicating that, the respondents have agreed that they are important social strategies for achieving food security in the North-central Nigeria. The standard deviation ranged between 0.35 to 0.81, indicating that the respondents were not too far from each other in their responses. The findings agrees with Reddy, Rao, Alur, Reddy, Birajdhar, Kumar, Reddy, and Gowda, (2010) who emphasized that social networking and organized farmers cooperation can serve as a viable capacity building platform for farmers and other social groups to form a force and gain access to credit facilities, inputs, markets and other resources.

Table 3: Mean and Standard Deviation of the responses of respondents on the environmental strategies for achieving food security in North-Central, Nigeria

S/N	Item	$\bar{X}$	SD	Decision
1	Improved management of industrial waste	3.33	0.48	Important
2	Deliberate effort in mitigating impact of climate change on agricultural production	3.06	0.57	Important
3	Regulation in the use of fertilizers and synthetic agro-chemicals	3.00	0.49	Important
4	Adoption of soil erosion control measures	3.52	0.43	Important
5	Promotion of irrigation farming	3.49	0.29	Important
6	Provision of drainage facilities where necessary	3.50	0.73	Important
7	Use of organic fertilizers in crop production	3.36	0.99	Important
8	Avoid the use of chemicals for fishing	3.70	0.55	Important

Results from Table 4 indicates that, all the eight (8) items had their mean value ranged between 3.00 and 3.70 indicating that, the respondents have agreed that they are important environmental strategies for achieving food security in the North-central Nigeria. The standard deviation ranged between 0.29 to 0.99, indicating that the respondents were not too far from each other in their responses. Islam *et al* in Matemilola and Elegbede (2017) stressed that industrial effluents significantly deplete the nutrient content of soil which reduces the growth, yield, and nutrition of agricultural products. Similarly, Elliott (2015) opined that phosphorus facilitates the accumulation of algae in water bodies thereby depriving fishes of oxygen leading to suffocation.

Table 4: Mean and Standard Deviation of the responses of respondents on the technological strategies for achieving food security in North-Central, Nigeria

S/N	Item	$\bar{X}$	SD	Decision
1	Provision of mechanized crop farming system	3.66	0.68	Important
2	Promotion of agricultural biotechnology	3.47	0.47	Important
3	Production of crops using greenhouse technology	3.33	0.51	Important
4	Production of crops using hydroponics technology	2.40	0.37	Not Important
5	Use of automated livestock farming facilities	3.12	0.88	Important
6	Provision of cold rooms for off-farm storage of perishable farm produce	3.34	0.83	Important
7	Encourage and support integrated farming	3.81	1.19	Important
8	Promote adoption of improved and cost-effective on-farm food storage technologies	2.92	0.59	Important

Results from Table 4 indicates that, seven (7) items had their mean value ranged between 2.92 and 3.81 indicating that, the respondents have agreed that they are important technological strategies for achieving food security in the North-central Nigeria. However, one (1) item had a mean value of 2.40 indicating that it is not an important technological strategy for achieving food security. The standard deviation ranged between 0.37 to 1.19, indicating that the respondents were not too far from each other in their responses. The findings is in line with United Nations Economic and Social Council (2017) which emphasized that the adoption of new and existing technologies to combat biotic and abiotic stresses, raise crop and livestock productivity, improve soil fertility and make water available can potentially increase the amount of food produced. Meanwhile, storage, refrigeration, transport and agro-processing innovations can address the dimension of food accessibility. Furthermore, Ojo and Adebayo (2012) stated that agricultural biotechnology represents one of the success stories of science and technology in recent times which has an immense potential to significantly reducing the global food security challenges.

Conclusion

Food security is the availability of quality and affordable food and the ability of the citizens to access it at all times and in the right quantity thereby enhancing sustainable social and economic development both at the national and household levels. Food security can be achieved through a multi-dimensional approach that includes various interventions ranging from economic, environmental, technological and social aspects. These interventions must however be capture through an improvement of the existing curriculum of agricultural education.

Recommendations

On the basis of the findings of the study, it is recommended as follows:

i. Curriculum planners and agricultural educators should include into the curriculum of agricultural education, diversification of rural economies to enhance better economic status for farmers
ii. Agricultural educators should inculcate into the learners, regulation in the use of fertilizers and synthetic agro-chemicals to ensure safety environment in farming communities
iii. There is an urgent need to improve the curriculum of agricultural education to position it on the path of sustainable food production and enhanced food security in North-Central Nigeria.

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