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Sustainable Agriculture And Food Security In Nigeria

[1]Obo, Akor Ekpenyong oboakor@yahoo.com.	A	[1]Faculty of Environmental Science. University of Calabar, Calabar.
[2]Unaji, Ushie Odey (PhD) als4realo1@gmail.com.	B	[2]Faculty of Social Science University of Calabar.
[3]Etuki Eborty Egbonyi (PhD) etukieborty@gmail.com.	C	[3]Department of Environmental Education Faculty of Science Education University of Calabar, Calabar.

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Correspondence Email:
etukieborty@gmail.com.

Abstract

This study is a discourse on sustainable agriculture and food security in Nigeria. The current high prices of commodities including agricultural commodities has raised a concern on the state of agriculture and food security. Moreso because there is hunger in the land. High prices of agricultural commodities can be a consequence of poor farming systems that does not give good yields. When agricultural productivity is low, its supply is also low and low in the supply of a commodity causes increase in demand which results to increase in price. Sustainable agriculture is a good alternative to poor farming system. Sustainable agriculture is agriculture that involves practices that will result in good quality and quantity products with minimal disturbance to the environment in such a way that the present generation will benefit from it without compromising the ability of future generation to meet their own needs. Practices of sustainable agriculture include but not limited to; mixed farming, organic farming, crop rotation, integrated pest management. When these approaches are adopted by farmers, food production will increase, supply of agricultural products will increase, prices of food items will reduce and this will contribute to food security

	without degrading the environment. It appears that farmers especially Nigeria farmers lack the awareness of sustainable agriculture, which if correctly adopted will ensure self-sufficiency in agricultural commodities. The level of awareness and practices of sustainable agriculture by farmers in Nigeria is low. It's therefore recommended by the researchers that; government and non-governmental organizations should create awareness and assist farmers to practice sustainable agriculture which will contribute to food security with minimal environmental disturbance.

Introduction:

There is serious hunger in the land. Prices of things including agricultural products are rising. Prices of commodities are more than thrice what they were few years before now. There is also inflation, a situation where huge amount of money chases few goods, couple with decline in agricultural productivity especially due to unsustainable farming methods, effects of climate change and shift of attention from agricultural economy to oil-based economy, whereas agriculture is the bedrock and a fundamental basis of the food supply need of human beings. Agriculture does not only supply food but the raw materials needed in the production of other vital goods and services needed by the teaming population.

Agriculture basically involves the cultivation of crops, rearing of animals, management of the soil, education of the farming communities, management of farm economics and other agricultural businesses. Its involvement in cultivation and rearing of animals is not without environmental effects. The use and employment of various agricultural inputs such as fertilizers, pesticides and machines in agricultural activities contributes highly to negative environmental impacts like degradations, deforestations, desertification and several aspects of land, water and air pollution and low agricultural productivity, which is directly concerned with food insecurity. The level of awareness and practices of sustainable agriculture by farmers in Nigeria is low.

Gust (2022) reported that factory farming methods rely heavily on using pesticides to protect plants and diseases. That these contaminants pollute our environment and damage our health. According to the Food and Agricultural Organization of the United Nations FAO (2021) between January and March 2021, agriculture contributed 22.35 percent of the total gross domestic product in Nigeria, while over 70 percent of Nigerians engage in the agriculture

sector mainly at a subsistence level. (https://www.statista.com/statistics/1165865/contribution of oil-sector-to-gab-in-nigeria/). FAO (2021) further stated that, despite the contribution to the economy, Nigeria's agricultural sector faces many challenges which impact on its productivity. These include; poor land tenure system, low level of irrigation farming, climate change, land degradation, low technology, high production cost, poor distribution of inputs, limited financing, high post-harvest losses and poor access to market, adding that these challenges have shifted agricultural productivity affecting the sector's contribution to the country's GDP as well as increase food imports due to rise in population, hence declining levels of food sufficiency.

The government has implemented several initiatives and programmmes to address the situation including the , agricultural promotion policy(APP) , Nigeria- Africa trade and investment promotion programme, presidential economic diversification initiative, economic and export promotion initiatives and the zero reject initiative, reducing emission from deforestation and forest degradation (REDD+) , Nigeria erosion and watershed management project (NEWMAP) action against desertification (AAD) programme among others. All these efforts are aimed to increase agricultural productivity in order to provide sufficient quantities of food to meet domestic demand as well as export in the international market. They are also aimed at reversing forest loss and degradation, promoting sustainable management of natural resources, rehabilitation of degraded lands and reducing erosion and climate vulnerability.

With the increasing population estimated to reach 400 million by 2050, enhanced agricultural productivity through adaptation of new technology and innovation is necessary to ensure food security and nutrition. But without support from all stake-holders to the efforts by the Federal and State Governments the goal of self-sufficiency, export and food security will not be achieved. According to Guest (2022) to help address these issues we need to end the growth of factory farming and support a transition to sustainable healthy foods that are good for people, animals and the planet.

However, in as much as it is essential to produce food and other material needs, it is imperative to do so with minimum impact to the environment. Sustainable agriculture is therefore a fundamental requirement in the pursuit of the 21st century sustainable development, that will ensure food security.

Statement of the problem;

There is serious hunger in the land. The level of hunger in Nigeria is high. Prices of things including agricultural products are rising. Prices of commodities are more than thrice what they were few years before now. There is also inflation, a situation where huge amount of

money chases few goods, couple with decline in agricultural productivity especially due to unsustainable farming methods, effects of climate change and shift of attention from agricultural economy to oil-based economy, whereas agriculture is the bedrock and a fundamental basis of the food supply need of human beings. When farmers increase their farm land with the hope of increasing output, they end up destroying the environment and its fertility as a result of poor agricultural practices. Which type of agriculture will farmers adopt that will produce acceptable yields with minimal environmental degradation and contribute to food security in Nigeria?

Objective of the study:
The purpose of the study is to discuss the type of agricultural practices that will bring forth good harvest and contribute to food security with minimal destruction of the environment.

Methodology:
The study uses secondary data by reviewing literature related to the variables of the study to discuss agricultural practices that contributes to food security such as; Sustainable agriculture, Organic farming, Integrated pest management, mixed farming and crop rotation. Th study also uses figure to illustrate the connectivity of sustainable agriculture to the environment, economy and the society.

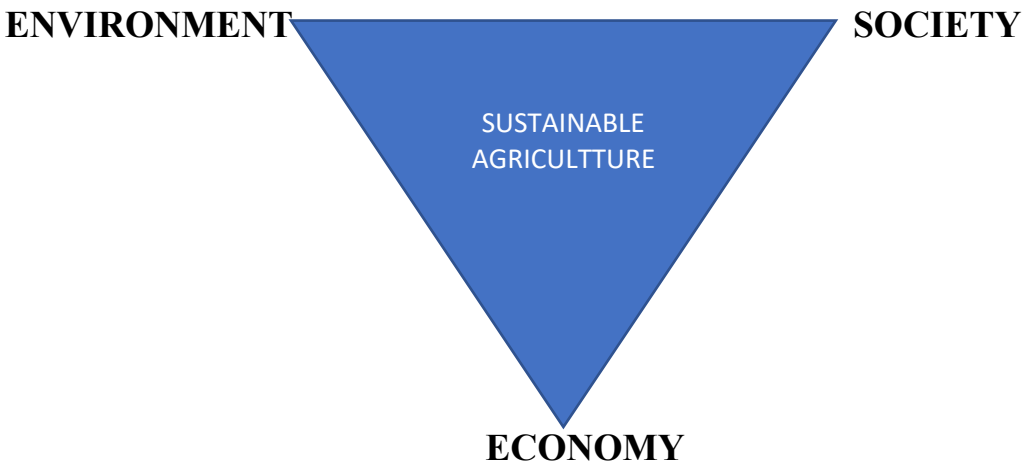
Sustainable agriculture:
Sustainable agricultural practices are those practices that ensures the availability of food for present generation without compromising the ability of the environment to provide the food need of the future generation. Sustainable agricultural management approaches according to Jhingan and Sharma (2011) includes, Sustainable land use management, which plays a significant role in soil and water conservation. The land use management in sustainable agriculture reduces direct raindrop impacts, run-off, soil loss and results in improvement of soil through intervention of trees on agricultural lands.

Approaches to sustainable agriculture according to Jhingan etal (2011) also include, agroforestry, organic farming and integrated pest management, whose goal is to reduce crop damage to a level where it is economically tolerance, using control measures whose economic and ecological cost are not excessive.

The practices of sustainable agriculture according to Schap and Cunningham (2023) are; crop rotation, drip irrigation, integrated pest management (IPM), planting cover crops, raising of heritage specie and small-scale agriculture. Sustainable agriculture according to Brodt, Six, Feenstra, Ingels and Campbell (2011) gives equal weight to environmental, social, and

economic concern in agriculture and it is rooted on the principle that we must meet the needs of the present without compromising the ability of future generation to meet their own needs. Sustainable agriculture is that agricultural practices that takes care of the society, the economy and the environment equally as illustrated in fig. 1.

Fig 1
Equal weight of sustainable agriculture to the environment, economy and society



According to UC Sustainable Agriculture Research and Education Programme Report (2021) practitioners of sustainable agriculture seeks to integrate three main objectives into their work; a healthy environment, economic profitability and social/economic equity. Adding that, every person involved in the food system-growers, food processors, distributors can play a role in ensuring a sustainable agricultural system.

According to Schap and Cummingham (2023) Sustainable agriculture is the engagement in farming practices that promote long-term food and livestock production while minimizing negative effects on the environment and it is undertaken by a society with the goal of producing the greatest quantity of food over the longest time in other to feed a growing human population while keeping the environment intact. Schap and Cummingham (2023) highlighted the practices of sustainable agriculture to include but no limited to crop rotation, drip irrigation, integrated pest management (IPM), planting of cover crops, raising of heritage species and small-scale agriculture. When these approaches are adopted by farmers, food production will increase, supply of agricultural products will increase, prices of food items will reduce and this will contribute to food security without degrading the environment. It appears that farmers especially Nigeria farmers lack the awareness of sustainable agriculture, which if correctly adopted will ensure self-sufficiency in agricultural commodities.

According to Brodt, Six, Feensra, Ingels and Campball (2011) Sustainable agriculture gives equal weight to environmental, social and economic concern in agriculture and it is rooted on the principle that, we must meet the needs of the present without compromising the ability of future generation to meet their own needs.
But when agricultural activities are done with attitude towards degradation of the environment (the environment losing its value), deforestation (cutting down trees during bush clearing without replacement), pollution of the soil, water and air as a result of application of chemical inputs, the environment will not have the potential to meet the needs of the future generation. As observed by Cummingham and Cummingham (2008) low input sustainable agriculture as an aspect of sustainable agriculture can benefit farmers, consumers and the environment, explaining that soil conservation, ground cover and reduce tillage are essential to sustainable agriculture. The fertility of the soil, the variety of plants and animals involved in agricultural businesses, the time of cultivation, management of the farm are all components that makes good yield. When agricultural output is increased, it is reasoned that food will be available for people. Availability of food for people is an important aspect of food security.

Food security:
Food security according to Food and Agricultural Organisation (2021) is defined as a state of affairs in which all people at all times have access to safe and nutritious food to maintain healthy and active life.

Akram and Farhad (2003) stated that food security is not just about growing more food. It is about who can buy food and where the food is available. It is about public health issues such as drinking, water supply and sanitation.

According to Jhingan etal (2011) Food security has three dimensions (a) availability of sufficient quantities of food of appropriate quality, supplied through domestic production or imports. (b) access by households and individuals to appropriate foods for a nutritious diet (c) optional uptake of nourishment in terms of sustaining diet, clean water and adequate sanitation together with health care.

This is why, it is important to practice sustainable agriculture that reduces the application of chemical fertilizers and pesticides especially those that pollutes the land, air and water, because pollution affects the quantity and quality of food produced and impacts directly and indirectly on people health.

Organic farming, integrated pest management, mixed farming and crop rotation among others are serious components of sustainable agriculture that farmers ought to practice for self-sufficiency and food security grantee.

Organic farming: Organic farming according to Raoul (2024) is a sustainable agricultural system that uses ecologically based pest controls and biological fertilizers derived largely from animal and plant wastes and nitrogen fixing cover crops. Raoul (2024) observed that, modern organic farming was developed as a response to the environmental harm caused by the use of chemical pesticides and synthetic fertilizers in conventional agriculture, and it has numerous ecological benefits. Organic farming uses, few pesticides, zero or minimum tillage, recycles animal waste among others.

Integrated pest management: Integrated pest management according to the North Carolina Extension Gardener Handbook (2022) is an approach that uses knowledge about pests and their life cycles, cultural practices, nonchemical methods and pesticides to manage pest problems. According to the North Carolina Extension Gardener Handbook (2022) pest management fall into four groups: cultural, mechanical, biological and chemical. The proper combination of these four make up an integrated pest management. With less emphasis on chemicals and mechanical approaches.

Mixed farming: Mixed farming is a type of farming system where a farmer cultivates crops and rear animal on the same piece of land. According to, the National (2023) mixed farming is one in which crop production is combined with the rearing of livestock. The livestock enterprises are complementary to crop production; so as to provide a balance and productive system of farming.
In mixed farming according to the National (2023) there is suppression of weed**,** inner soil quality increases as there is little or no use of chemicals such as fertilizer (because of availability of manure from the livestock)., suppression of pest, there is increase in productivity, and there is also less likelihood of total crop failure as a result of the fact that where there are lapses or natural occurrence affecting the productivity of either, the other will make up for the loss.

Crop rotation: Crop rotation is a cropping system where a farmer sub-divide his farm land into different sub-plots and plant different crops in the different plots in a definite order of rotation in every planting seasons. According to Guy (2023) Crop rotation is a common agronomic practice that involves the systematic sequencing of different crops in a specific field over several seasons. This technique according to Guy (2023) aims at enhancing soil fertility, control pests and diseases, and optimize crop yield.

Summary:
The practice of sustainable agriculture implies the engagement in farming practices that promote long-term food and livestock production while minimizing negative effects on the environment. Approaches to sustainable agriculture include but not limited to; Sustainable land use management, which plays a significant role in soil and water conservation, agroforestry, mixed farming, organic farming, crop rotation and integrated pest management, whose goal is to reduce crop damage to a level where it is economically tolerance, using control measures whose economic and ecological cost are not excessive.

All these approaches to sustainable agriculture will ensure continuous supply of agricultural products to meet up with the food need of the teaming population. This will contribute in no small measure to the achievement of food security.

Recommendation:
The researchers recommended that; (1) Government and non-governmental organizations should create awareness and assist farmers in the practice of sustainable agriculture that will contribute to food security with minimal disturbance to the environment.
(2) Farmers should ensure that they practice sustainable agriculture that yields more with less environmental disturbance.

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