# Achieving Sustainable Food Security in Nigeria: Challenges and Way Forward

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***Abstract*—One of the goals of Nigeria's agricultural development policy is to ensure that the nation produces enough food and less dependent on importation so as to ensure adequate and affordable food for all. Using descriptive statistics, this study is an attempt to evaluate food security situation in Nigeria from 1991 to 2015. The paper shows that there is a shortfall in domestically produced food in Nigeria because the growth in the population of Nigeria is at the rate of 3.2% while the growth in food production has been less than one. This shows that demand for food (population) is greater than the supply (agricultural production) because of factors such as inconsistent government policies, environmental degradation and non-sustainable agricultural production. The paper also shows that Nigeria depends so much on food importation. To achieve sustainable food security in Nigeria, the paper recommends an improvement in environmental management in other to increase agricultural productivity.**

***Keywords—availability; environment; food security; sustainable.***

## I. INTRODUCTION

Sustainable food security is an access by all people at all times to enough food for an active healthy life at present plus the ability to provide enough for future generation. Issues on food security was brought to lime light in 1974 during the world food conference when it downed on the governments that nations all over the world needs to strategize on how best to improve agricultural production so as to match the per capita needs of the population. Ban Ki Moon, the UN Secretary-General at a World food summit in Rome in 2009, warned that six million children die of hunger every year; 17,000 die of starvation every day and by 2050 the world will need to feed two million more mouths. This has rekindled the idea of achieving sustainable food security in all countries of the world including Nigerian.

Nigeria is blessed with abundant natural and human resources, but despite its significant natural resources, majority of the citizens are living below the poverty line. For instance according to WDI, (2015), an estimated 60% of Nigerians live on less than US$1.25 per day. Nigeria was also ranked 91stout of a total of 104 counties on the 2015 Global Hunger Index and 153rdout of a total of 187countries on the 2012 UNDP Human Development Index. Malnutrition and hunger which is linked to poverty have been ravaging most developing countries and affecting their productive capacity. Classifying Nigeria as one of the poorest countries testifies to our failure to achieve our development policy as well as national food security. It once more awakened the government to the realities on ground, that is, the need to achieve the first sustainable development goal of no hunger before the year 2030.

World Bank (2012) estimates the population of Nigerian to above 160 million people, the largest in Africa almost accounting for 47% of West Africa's total population. As the population increases, the country's demand for food increases, while the ability to produce food diminishes because pressures from the growing population in form of desertification, climate change and erosion are also impacting on the already diminishing resources and further threatening food production.

Food security involves access and availability of food stuff, stability of supplies and the quality of the diet (Honfoga & Van den Boon, 2003). According to FAO, International Fund for Agricultural Development (IFAD) and World Food Programme (WFP) (2013), Nigeria have an energy intake of 1730Kcal and an average protein supply of 64g capita per day far below the 2500 – 3400Kcal minimum recommended daily intake per day. This shows that Nigeria is facing the challenge of unbalanced diet leading to various deficiency symptoms. Also among the 109 countries assessed by Global Food Security Index (GFSI) (2015), Nigeria is 91stwith 37.1 score based on indices of affordability, availability, quality and safety.

One of the goals of Nigerian's agricultural development policy is to ensure that there is enough food reserve at household, state and federal government levels to forestall any threat to the level of food security. Since domestic agricultural production has failed to meet up with the increasing demand for food, the government had to spend on importation to feed her teeming population. For instance, food import increased from 19.9% in 2000 to 30.6% and 22.7% in 2011 and 2012 respectively while food export is barely 5.3% of merchandise (World Development Indicator, 2016).

The second sustainable development goal of zero hunger incorporates the need to achieve food security and improved nutrition, promote sustainable agriculture, ending rural hunger, empowering small scale farmers especially women, ensuring healthy lifestyle by 2030. The Nigerian government is working assiduously to achieve these goals.

The main objective of this paper is to evaluate food security situation and the challenges of achieving sustainable food security in Nigeria. To achieve this objective, the paper is divided into subsections. Following the introductory overview

is theoretical literature review. The third section discusses food production, food supply and nutritional status in Nigeria while section four discusses challenges to achieving sustainable food security in Nigeria. Section five is way forward for achieving food security and conclusion.

## II. LITERATURE REVIEW

Sustainable food security has been defined in various ways by different scholars. According to WHO (1995)and FAO, et al. (2013) food security is access to the food needed by all people to enable them live a healthy life at all times. A country is said to be food secured when there is access to food of acceptable quantity and quality consistent with decent existence at all times for the majority of the population (Reutlinger, 1985; Idachaba, 2004). This means that food must be available to the people so as to meet the basic nutritional standard needed by the body. But it should be noted that availability of food does not mean accessibility to food. Availability depends on production, consumer prices, information flows and the market dynamics.

World Bank (1986) defined sustainable food security as an access to enough food for an active, healthy life at present as well as ability to provide enough in the future. Abudullahi (2008) defined sustainable food security as when people have physical and economic access to sufficient food to meet their dietary needs for a productive healthy life at present as well as in the future. This definition outlines some indices for measuring the extent or degree of food security to be achieved by any country and the indices are adequate national food supply, nutritional content, accessibility, affordability and environmental protection.

Absence of food security is food insecurity; food insecurity on the other hand represents lack of access to enough food and can either be chronic or temporary. Adeoti (1989) opine that chronic food insecurity arises from lack of resources to acquire and produce food thereby leading to persistent inadequate diet. FAO (2010) refers to food insecurity as the consequences of inadequate consumption of nutritious food bearing in mind that the physiological use of food is within the domain of nutrition and health. When individuals cannot provide enough food for their families, it leads to hunger and poor health. Poor health reduces one's ability to work and live a productive healthy life. Poor human development destabilizes a country's potential for economic development for generations to come (Otaha, 2013).

According to FAO, et al. (2013), the core determinants of food security are availability, accessibility, utilization and stability.

Food Availability:- Availability of food plays a conspicuous role in food security. Having enough food in a nation is necessary but not adequate to ensure that people have satisfactory access to food. Over the years, population has increased faster than the supply of food thus resulting in food unavailability per person.

Food Accessibility: - The ability to have access to food depends on two major conditions: - Economic access and physical access. Economic access depends on one's income, the price of food and the purchasing power of the people. Physical access depends on the availability and quality of infrastructure needed for the production and distribution of food. Lack of economic access to food is as a result of the increase in the rate of poverty.

Food Utilization: - Food utilization is measured by two outcomes indicators which reflect the impact of inadequate food intake and utilization. The first outcome is measured by under-five years of age nutrition level while second measurement is quality of food, health and hygiene. According to FAO measuring the nutritional status of under-five years of age is an effective approximation for the entire population. The indicators for the measurement of under-five years of age are wasting (too thin for height); underweight (too thin for age) and stunting (too short for age).

Most times, progress in terms of having accessing to food is not always accompanied by progress in the utilization of the food. A more direct indicator of food utilization is underweight because it shows improvement more promptly than stunting and wasting whose improvement cantake a longer time to be noticeable. Since 1990, the prevalence rates of under-five stunting and underweight have declined in some developing countries, while some countries still report a prevalence rate of 30% or more and WHO categorizes this as being high (WHO-UNICEF, 2011).

Stability: - Stability has to do with exposure to short-term risks which have a way of endangering long-term progress. Key indicators for exposure to risk include climate shocks such as droughts, erosion and volatility in the prices of inputs for food production. The world price shocks leads to domestic price instability which is a threat to domestic food producers as they stand the chance of losing invested capital. Nigerian farmers are mainly smallholders farming mainly for subsistence, this makes it difficult for them to cope with changes in the prices of inputs, and it also lowers their ability to adopt new technologies thereby resulting in reduced overall production. Changing weather patterns as a result of climate change have played a part in reducing food supply, for instance flood in the southern parts of the country and drought in the northern parts leads to substantial losses in production and income.

The interplay of all these variables determines whether an individual, household, state or nation is food secured or not. This is because sustainable food security at the household level does not guarantee sustainable food security at the state or national level.

The theoretical framework is based on Malthus theory on population, Thomas Malthus in his writing in the 18th century warned that global population would exceed the earth's capacity to grow food. Malthus suggested that population grows in geometrical progression while food production grows in arithmetical progression. Despite having been largely debunked, this theory has remained prominent in the discourse regarding hunger, the world's population carrying capacity and the need for increased agricultural technology. Malthus argument was a warning about population increase especially among the poor because he described the poor as breeding too rapidly and depriving the rest of the population of food; famine was seen as a natural defense against overpopulation. In the Nigerian situation, current production of food is far below the

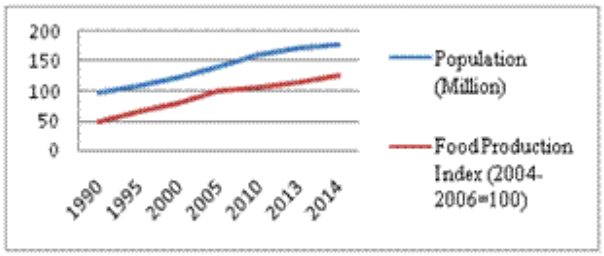
population requirement. Therefore, food distribution continues to be a problem in solving food security in Nigeria.

## III. FOOD PRODUCTION, FOOD SUPPLY AND NUTRIENT STATUS IN NIGERIA

An incisive discussion on the demand for food, supply of food as well as the nutrient status will give a better understanding of food security situation in Nigeria. A food secured situation is said to exist when the demand side is balanced with the supply side, anything contrary suggests food insecurity (Egbuna, 2001).

Nigeria produced all its food needs and surpluses for its agro-industries in the 1970s and showed remarkable trend that Nigeria was, and could remain self-sufficient in terms of the food requirements for its citizens and for exportation. In recent years, there is low agricultural productivity in Nigeria, the expected yields from crops, soils, rivers, lakes, livestock and forests are far below potentials. Even with low productivity in agriculture, a significant proportion of the output is lost or wasted during storage and transportation. There is lack of efficient and effective storage facilities to preserve the produced foods; also the roads are so bad that most of these foods are lost before they get to the consumers.

From Figure 1, food production index and population growth in the period under review shows an increasing trend, but the rise in population is faster than the rise in food production. Food production, a proxy for food supply of food increased from 48.23 in 1990 to 114.93 in 2013;while the population, a proxy for food demand increased from 98.08 million in 1991 to 177.82 million in 2014.Nigeria food equation is not balanced because the demand for food is rising faster than the supply of food. This shows that Nigeria is not food secured in terms of availability.




Source: World Development Indicator (2016)
Fig. 1. Demand for and Supply of Food in Nigeria (1990 -2014)

The inability of food supply to match up with demand is attributed to low productivity in agriculture leading to a shortfall in domestically produced food in Nigeria. To supplement the shortfall in domestic food production, Nigeria depends so much on food importation as shown below.

Table 1 presents the increase in food import. Percentage of food import increased from 1.6% in 1991 to 30.6% in 2011 and decreased to 17.8% in 2013 while food export also witnessed an improvement between 2012 and 2013. This may be attributed to different agricultural policies/schemes established by the government. But the gap between food import and food export is a clear indication that domestic agricultural production is not sufficient for the domestic food needs as well as raw materials for our industries.

TABLE 1. Value of Import and Export of Food in Nigeria (%) (1991-2013)

| Year | 1991 | 1996 | 2001 | 2006 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|
| Import (% of Merchandise) | 1.6 | 17.5 | 21.7 | 18.0 | 30.6 | 22.7 | 17.8 |
| Export (% of Merchandise) | 1.5 | 1.7 | 0.0 | 0.1 | 1.8 | 5.3 | 5.1 |

Source: WDI, (2016)

Depending so much on food importation is not good for any economy, it could only lead to vulnerability and in case of down turn in the economy as we are expressing recently, the country will be left with no option than to depend on food aid and further exposing the country to a chronic food insecure situation.

Since 2000, the prevalence of undernourishment in Nigeria has been decreasing even though the country did not achieve the millennium development goal of eradicating poverty and hunger in 2015. The downward trend in the prevalence of undernourishment maybe attributed to the improvement in food production during the period.

Table 2 shows that the proportion of undernourished in total population decreased from 20.8 million in 1992 to 8.9 million in 2008 and increased again to 11.9 million in 2015. The quality of the diet of the nation shows an imbalance as a result of heavy dependence on root crops, tubers and cereals. Major contribution to availability of food does not come only from agricultural crops, fisheries and forest products also have high nutritional content. Forest foods and aquatic animals are highly nutritious and can be used as supplement for food lacking essential vitamins and minerals. It is estimated that between 15% and 20% of animal protein consumed is derived from aquatic animals (FAO, et al., 2013). In Nigeria, forest foods constitute an important share of our diets such as nuts, wild animals and insects, but over dependence on wood as fuel for cooking and preserving food leads to deforestation thereby worsening the food availability situation in the country.

DES derived from cereals, roots and tubers increased from 113% in 1992 to 123% in 2015 indicating an improvement in dietary supply. The minimum dietary energy requirement increased from 1710Kcal in 1992 to a paltry 1730Kcal in 2008 yet far less than 1800 Kcal (7500KJ) average minimum daily energy requirement per person as recommended by FAO, et al. (2013). The current calories value can be attributed mainly to carbohydrate consumption. Other food values such as proteins, vitamin and minerals fall far below the component directory requirements.

TABLE 2. Minimum Dietary Energy Requirement (DER), Share of Dietary Energy Supply (DES) and Prevalence of Undernourishment in Nigeria (1992 – 2015)

| Year | Minimum DER (Kcal) | DES (%) | Prevalence of undernourishment (%) | Number of people undernourished (million) |
|---|---|---|---|---|
| 1992 | 1710 | 113 | 17.9 | 20.8 |

| | | | | |
|---|---|---|---|---|
| 1997 | 1720 | 118 | 11.2 | 13.2 |
| 2002 | 1720 | 121 | 9.0 | 11.2 |
| 2008 | 1730 | 126 | 5.7 | 8.9 |
| 2015 | n.a | 123 | 7.3 | 11.9 |

Source: WDI, 2016

Although the government is trying to meet the sustainable development goal of no poverty in 2030, with an increase in GDP from $369.1 in 2010 to $ 568.5 in 2014; 60% of the population still lives on less than $1.25 a day (WDI, 2014). Government expenditure on health has not been encouraging, as poor people are mostly the ones accessing government health facilities. For instance, expenditure on health as a percentage of GDP in Nigeria decreased from above 7% in 2003 to 3.88% in 2013.

In terms of food utilization, Nigeria has not performed very well. NDHS, (2013) reports that37% of Nigerian children are stunted, 29% are underweight while 18% are wasted and out of these percentages that are stunted and underweight, more reside in the rural areas than in the urban areas, precisely 43% and 26% respectively. All these are signs of acute and chronic malnutrition caused by high poverty rate in the country. High poverty rate as well as poor sanitation leads to poor nutrition.

There are also regional differences in nutrition outcomes across the country, for instance, Adamawa state has an absolute and food poverty rate of 74.2 and 55.4 respectively, while Anambra state has 56.8 and 34.2 respectively (NBS, 2010). Different ethnic disturbances in different parts of the country have all disrupted food production and supply in the country. The prevalence of food insecurity can be said to be predominant in the rural areas than in the urban areas but with differences across states and regions.

## IV. CHALLENGES OF SUSTAINABLE FOOD SECURITY IN NIGERIA

Poverty is the major problem of food accessibility, availability and utilization. Poverty leads to insufficient income needed to meet household basic need. There are also other political and socioeconomic problems leading to food insecurity and these are discussed below:

### A. Government Policy:

Nigeria depended so much on agricultural productivity for its revenue until the exploration of oil in 1970s. The oil boom led to the negligence of the non-oil sectors especially the agricultural sector which used to be the major source of revenue for the country. The attention given to agriculture reduced drastically, farming reduced drastically, farmers needs were not attended to and the worst of all was that research and development in the sector slowed down causing a stagnation in food production.

Government policies with regard to agricultural production were rapid with plans hastily put together and little or no participation from those who are engaged in agricultural productivity. Moreover, policy change that championed increased incentive for local farmers for improved local food productions were neglected. Urban and community farming and even home gardening were no longer encouraged as land agents made it too difficult for people to obtain land for building as well as for agricultural productivity.

### B. Agricultural Practices:

The type of farming system prevalent in Nigeria is the traditional subsistent farming. This system is characterized by use of simple farm tools, small farm holdings, restricted access to credit facilities and low agricultural inputs, inadequate storage facilities, insecure markets for post-harvest products and exploitation of farmers by the middlemen. In terms of technology, Nigeria is still lagging behind when compared to other nations in Europe and Asia. Due to poverty and illiteracy, farmers do not have access to modern communication system with which they can access information regarding new technologies. Also there are few extension officers to transfer new technology to the farmers. Funding for agricultural research is still low in Nigeria. Also heavy importation of food crops affects productivity of local farmers because the small farmers cannot compete with the imported crops.

### C. Population Increase:

The demand for food exceeds the supply of food because the rate of growth of population is higher than the growth in agricultural productivity. Also the large population continues to relocate to the urban areas in search of white collar jobs which do not exist. This youth rural-urban drift makes it difficult for the country to be food secured.

### D. Environmental Issues:

Flood, drought, desertification are environmental issues affecting availability of food in Nigeria. Climate change affects food supply through loss of farmland, fluctuating food prices, increases in food borne illnesses and other food utilization issues (GCF, 2016).The recent environmental degradation through deforestation and flooding has wide negative implication for food production. For instance, in 2012 the country witnessed an unprecedented rainfall as a result of extreme weather. The rainfall resulted in severe flooding causing loss of agricultural crops, live stocks and human lives. According to Metu, Kalu and Ezenekwe (2015), the estimated loss of the country's GDP was worth N2.6 trillion. In the same period, share of agriculture value added to total GDP declined from 23.89% in 2010 to 22.05% in 2012 (WDI, 2014). Other environmental factors that may affect food security includes soil degradation, soil pollution and deforestation. Also air and water pollution from industrialization threaten both human and natural resources to an extent that food securities capabilities are damaged.

### E. Corruption:

Corruption in Nigeria has been on the increase leading to money budgeted for public utilities being siphoned for private use. This leads to decay in infrastructure especially rural infrastructure where majority of the farmers live and operate from. For instance, we have seen situations where money meant for importation of fertilizers are siphoned.

## V. WAY FORWARD TO ACHIEVING SUSTAINABLE FOOD SECURITY IN NIGERIA.

It should be noted that food production is only a means to an end. Solution to achieving sustainable food security must include reduction in the level of poverty because income must be improved to enable people meet the basic necessities of life, including food. However, reduction in poverty level takes a long time to be achieved; therefore, immediate solvable solutions must be taken and they include the following:

### A. Improved Agricultural Productivity:

Different projects/schemes have been established by different governments in the country in order to improve agricultural productivity, but they have failed because poor policy implementation. Agricultural productivity can be improved through encouragement of research. Research Institutes should be funded so as to encourage innovation and participatory research. Through research, foreign technology can be modified and applied in Nigeria. Inorganic fertilizers and chemicals can be replaced with alternatives such as cow waste and composite manure which are environmentally friendly. Also extensions services should be encouraged and strengthened because through the extension services new technology can be transferred to the farmers.

There should be storage facilities to enable farmers store their post-harvest crops. Farm products are perishables; farmers are forced to sell their products so quickly thereby making revenues that do not meet their daily need. The storage facilities can help them preserve their products before taking them to the market for sale. The storage facility will also help provide enough food reserve for the country.

### B. Agricultural Biodiversity:

Improved agricultural biodiversity through improved agricultural practices will also increase food supply. Large scale farming involves planting one type of crop on a large piece of land, but with improved farming different genetically improved crop types and species may be planted on a piece of land. Mono-cropping also exposes crops to both pests and diseases and also increases the use of organic fertilizers and pesticides that erode soil biodiversity. In other to achieve sustainable food security, Nigeria farmers as well as government should embrace this modern food production technique that comes in form of agricultural biodiversity aimed at increasing livestock and crop production.

### C. Environmental Management:

Efforts to increase productivity have led to pressure on natural resources as well as environmental damage. There should be effective management of the environment by reducing the rate of deforestation. Trees should be planted as often as possible especially in the desert. Providing habitat for agricultural pests and increasing resilience to shocks and long-term climate change can help in the improvement and management of natural resources. Tree planting should be encouraged because forest trees outside the forest helps in protecting soil and water resources, promotes soil fertility and provides protection from extreme weather events.

### D. Policy Changes:

Sustainable food security can be achieved if the government adopts inclusive growth in its development efforts. Development should be participatory and environmentally friendly. People-Centered agricultural development puts the farmers first and attacks poverty with opportunities and education. It requires involving the rural people in decision making stages of agriculture productivity. The inability of government to involve these sets of people in defining and designing projects has led to the failure of some of these projects. There should be well designed social protection systems -such as risk insurance scheme and community empowerment- to help households sustain their resilience to shocks.

## VI. CONCLUSION

This paper is an attempt to evaluate food security in Nigeria. The factors responsible for food insecurity are also discussed as well as recommendations proffered for ensuring food security in Nigeria. Achieving sustainable food security means ensuring continuous access to food both quantity and quality for the present generation as well as the future generations. Nigeria is food insecure just like most sub-Saharan African countries because food production falls below the demand for food even though the government tries to supplement through importation of food.

The major challenge of food security in Nigeria is poverty. Poverty reduces the purchasing power of the people making it difficult for them to acquire their daily minimum requirement of food. Other causes of food insecurity are environmental factors, inconsistent policy pronouncement, unsustainable agricultural productivity and underdeveloped infrastructural facilities, especially in the rural areas. The situation is not insurmountable. The paper recommends intensive promotion of research which will help to increase food production, environment friendliness as well as policy change in order to achieve sustainable food security.

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