



## Food insecurity; Consequences and coping mechanism among rural farm households in Nigeria

Ume SI<sup>1</sup>, Ezeano CI<sup>2</sup>, Gbughemobi BO<sup>3</sup>, Chukwuigwe O<sup>4</sup>

<sup>1</sup> Department of Agricultural Extension and Management. Federal College of Agriculture, Ishiagu Ivo Local Government. Area of Ebonyi State, Nigeria

<sup>2,3</sup> Department of Agricultural Economics and Extension. Nnamdi Azikiwe University Awka. Anambra State, Nigeria

<sup>4</sup> Department of Agricultural Economics and Extension, River State University of Science and technology. Port Harcourt. River State, Nigeria

### Abstract

Food insecurity is a global phenomenon and the farm households in rural areas of most developing countries are the most vulnerable. Programmes by governments in such countries, Nigeria inclusive to combat the effects have failed to achieve the desired impacts. Under such precarious situation, farm households had adopted diverse adaptation alleviation strategies in order to cushion the effects. Therefore, there is need for all concern to put up appropriate measures to take food insecurity in the household, national and regional levels for any consequential development to be achieved.

**Keywords:** food insecurity, consequences, rural, house holders, coping mechanism, Nigeria

### Introduction

The right to food is a fundamental human right and has dominated debates in conferences and world summits, yet food insecurity is unresolved especially in the most rural areas of sub Saharan Africa [1, 2, 29]. Food insecurity according to [8] is when one has limited food for existence and healthy livelihood. However, literatures show that although food insecurity is a global problem, the consequences are more severe in developing countries. For instance, the United Nations estimated that of 840 million of undernourished global, 744million reside in developing countries of the continents of Africa and Asia [20, 22]. The U.S. Department of Agriculture estimated that nearly 11 percent of U.S. households are food insecure, with approximately one-third of these households experiencing moderate to severe hunger [33]. The indications of food insecurity as asserted by [4, 9] are reduction in both capacity and attitude to work, poverty, corruption, low life expectancy, high rate of crime, infant mortality, maternal mortality, hunger and malnutrition. Essentially, among farming house holdin Nigeria, the causes of food insecurity are low productivity in agriculture combined with fluctuation in food supply and low income. The above scenario is exacerbating by the failure of food production to keep pace with our rapid population growth [27, 29].

The food crisis in Nigeria is alarming and needed serious policies by government to checkmate the trend as the situation has degenerated to epidemic and social vices. For instance, commenting on food insecurity in Nigeria, the United Nations Children's Fund, (UNICEF), in July 2015 reported that over 2.5 million Nigerian children were suffering from Severe Acute Malnutrition [29]. Similarly, Food and Agricultural Organization (FAO) of the United Nation reported that about

7.1 million people are now severely food insecure across four countries including Cameroon, Chad, Niger and Nigeria [7]. Globally, the most vulnerable groups to food insecurity are victims of conflicts (refugees and internally displaced people), migrant workers, marginal population (school dropouts, unemployed people and orphans) and dependent population (elderly, children under five years, women of reproductive age and low illiterate household) [68, 70]. These groups of vulnerable are found most in the developing countries than developed countries [6]. Beside, to the farming house hold types, food insecurity differs among regions and locality. In Nigeria and other developing countries, the most vulnerable farm household are subsistence farmers who produce marginal or inadequate amounts of food; landless wage earners lacking adequate resources to produce food or income to obtain food; female headed household; households with a large number of dependents; households situated on marginal lands and households with insufficient income to enable continued access to adequate supplies of safe and good-quality food [15, 51]. However, maintaining food security is still a major challenge for many developing countries, Nigeria inclusive [5, 9, 41].

Food security is a situation "when people, at all times, have physical and economic access, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life [8]. By this definition, three important components of food security exist; availability, accessibility and utilization. Food security can occur at the national, community and household levels. At the national level; it is perceived mainly in terms of food available for consumption as derived from food balance sheets, while at the household or individual level, the emphasis has shifted from simple "availability of food" to a more complex system of "food

access<sup>[13, 15]</sup>. The ability to ensure adequate food security hinges on the ability to identify vulnerable households. The degree of vulnerability of an individual, household or group of persons is determined by their exposure to the risk factors and their ability to cope with or withstand stressful situations<sup>[12]</sup>. In most developing countries, the food security of house hold or individual is affected by poverty, war and civil conflict, corruption, national policies that do not promote equal access to food for all, environmental degradation, barriers to trade, insufficient agricultural development, population growth, low levels of education, social and gender inequality, poor health status, cultural insensitivity, and natural disasters<sup>[5, 14, 26]</sup>. In Nigeria, poverty is the most outstanding cause of food insecurity despite her abundant natural resources. For instance, in Nigeria, between, 1993 and 2006, the share of the population living in extreme poverty (US\$1/day income) rose from 59 to 71 percent, and the share living in moderate poverty (US\$2/day income) rose from 85 to 92 percent<sup>[10]</sup>. Studies on poverty in Nigeria, attested that poverty in the country could be as result of loss of livelihood as result of economic recession, sudden poverty as result of disaster or conflict or low wage workers, destitution of who fall outside family support system and social institution and safety net. It is import to state that the greatest number of these Nigeria poor dwell in rural areas where social and infrastructure are limited or non-existence<sup>[5, 28, 39]</sup>.

In Nigeria, its only when the ugly faces of food insecurity start to unfolding that government started setting out programmers and policies to either alleviate or eradicate it. Such socio, political and economic consequences of food insecurity in Nigeria, including the high cost of food commodities across the nation, lack of infrastructures, high cost of production, poor/lack of storage facilities, lack of markets, limited/non-existent extension officers across the states, poor security of lives occasioned by insurgency in the Northeast, and the constant clashes and invasions between farmers/herds men, poor /insufficient fertilizer and continual importation of agricultural commodities which denies local farmers access to markets<sup>[27, 36, 45]</sup>. The other hints are natural disasters including flooding and the unmitigated effects of climate change, aging population of farmers and use of crude methods of production, which translate at the household level into low purchasing power, lack of access to food by vulnerable groups, rampant malnutrition and poor access to health facilities<sup>[26, 28]</sup>.

In Nigeria, diverse food security alleviation programmes have been instituted by various governments, chieflyare Directorate of Food Roads and Rural Infrastructure (D.F.R.R.I) (1986), Go back to land programme (1980), National Accelerated Food Production Programme (NAFPP) (1981), Operation Feed the Nation (OFN) (1976), Green Revolution (1980), National Economic Empowerment and Development Strategies (NEEDS) (2003-2007) ( 4; 8, 32). A critical analysis of these programmes show that most of them failed woefully to achieve the desired impact as they are polarized by corruptions, politics and among others (48). The above scenario, worsen poverty in the country, particularly in the rural areas and in effect, the rural poor households have adapted over years survival strategies to cope with food insecurity. The survival strategies include reduction in meal frequency, reducing other expenditure, withdrawing of

children from school, selling of small animals, selling farm equipment, over reliance on remittance, working more in off farm and migration in the case of Fulani cattle rearer and receiving food aids<sup>[21, 34]</sup>.

## **Concept of Food Security. Theoretical framework and its Assessment in Nigeria**

### **Concept of Food Security in Nigeria**

Apart from the FAO generally accepted definition of food security, other definitions exit. Food security as defined by Reutlinger, *et al*;<sup>[38]</sup> as economic and physical access to food to all people and at all times without depending on import and food aids. According to<sup>[27]</sup>, food security is the ability to meet consumption level in the face of fluctuating production and income together to ensure absolute availability at any price. The implication of food security is that food should be made available throughout the year to sustain household energy, health and to meet their nutritional requirements. The food security elements concept developed by USAID are food availability, food accessibility, food utilization and not loosing such access which are hierarchical in nature<sup>[46]</sup>.

**1. Food Availability:** *Food Availability* refers to the physical presence of food which may come from own production, purchases from internal market or import from overseas<sup>[1]</sup>.

**2. Food Accessibility:** Food access is determined by the ability of the households to obtain food from their own production and stocks, from market and other sources. These factors are in turn determined by the resources endowment of the household which defiles the set of production activities they can pursue in meeting their income and food security objectives<sup>[50]</sup>.

**3. Food Utilization:** This reflects the nutritional status of an individual which is determined by the quality and quantity of the dietary intake, general child care and feeding practices, along with health status and its determinants. Poor infant care and feeding practices or inadequacy access to or the poor quality of health service are also major determinant of poor health and nutrition<sup>[30]</sup>.

A nation is food secured when the majority of the population has access to food of adequate quality and quantity in consistent with decent existence at all times<sup>[3]</sup>. Reports had it that less than 5% of Nigerians has attained the food security status, 65% semi food secured, while over 20% are food unsecured<sup>[10]</sup>. The social, institutional and economic factors within the household, community or nation as asserted by<sup>[46]</sup> and<sup>[49]</sup> can influence the quality and quantity of available foods and their affordability.

The concept of food security is generally accepted as entailing not only food accessibility through domestic production, storage and trade but perhaps more importantly, food access through home production, purchase in the market or food transfer (Benson, 2004). Nevertheless, underlying this concept of food security are two assumptions, in which according to Abalu, (1) are:

1. Distinction must be made between permanent and temporary food insecurities, and
2. Famine, hunger and malnutrition are in most cases, as much problem of poverty as of shortage of food supplies.

Temporary food insecurity is as a result of short term fluctuation in production brought about by fluctuation in household income, food consumption and in the availability of food at the national and global levels. The temporary food insecurity is orchestrated by or manifested by temporary lack of sufficient food and without good stocking policies, such food insecurity can be eliminated <sup>[8]</sup>, while permanent or structural food insecurity according to <sup>[30]</sup> is a state of continuous inadequate access to food, which is due to long term structural deficit in production and chronic inadequacy of poor purchasing power. The national food security will be enhanced through increased productivity and expanded production of food crops not through imports or food aid <sup>[39]</sup>.

### **Theoretical Framework of Food Security**

Malthusian and Anti-Malthusian theory and the entitlement approach to food security are propounded as theories for food security.

#### **Malthusian and Anti-Malthusian theory**

The food problems theory raised by Malthus is when increasing population are not balanced by the increase in food production. Malthus theory predicted that population growth will follow a geometric progression, while food production increases arithmetically <sup>[43]</sup>. Nevertheless, the anti Malthusian theory did not accept the Malthusian theory idea, pointing that humans can afford to control the population growth through family planning programs, and food can be increased many folds not arithmetically as the theory postulated. This is because there are various continually food increment efforts made by people, government and non - governmental organization to ensure adequate food availability <sup>[16]</sup>.

#### **The entitlement approach to food security**

The entitlement approach to food security was postulated by Sen and defined entitlements as the set of alternative commodity bundles that a person can command in a society using the totality of rights and opportunities that he or she faces. The entitlement is divided into (a) production-based entitlements, (b) own-labour entitlements, (c) trade-based entitlements, and (d) inheritance and transfer entitlements. He argues that people do not usually starve because of an insufficient supply of food at the local, national, or international level, but because they have insufficient resources, including money ('entitlements') to acquire it <sup>[42]</sup>

Some of the limitations of Sen's work include; the entitlement approach which views famines and other food-related emergencies as economic disasters and his approach concentrated on rights within the given legal structure in that society, but some transfers are illegal acts, and therefore not accommodated by the entitlement approach and cannot be measured easily <sup>[31]</sup>.

Entitlement theory has been criticized on two further counts. First, it implies a straightforward sequence of entitlement failure leading to hunger and then to malnutrition, starvation and death. Second, it implies that people's actions are largely determined by their need to consume food <sup>[16]</sup>.

##### **(a) Production based Entitlement**

Improving agriculture technology will result in increase in the availability and affordability of food by poor people and

providing job and income that will provide poor people the means to access increased food crop production.

(b) Inheritance and transfer entitlements (from the state, or private gifts and loans).

Transfer entitlement provides a mechanism of social order and cooperation governing the behaviour of set of individual within a given community. Transfer entitlement support values and produce and protect interests. Thus, can help mitigate food insecurity at the household level.

(c) Trade-based entitlements

Food prices vary seasonally, but poor households often dispose their farm produce just after harvest at low prices in order to upset their financial liquidity. Market forces in terms of supply and demand for food affect food prices and the accessibility. The supply of food is functions infrastructure, or integrated food markets situation and the transportation costs and risks. In Nigeria, many other developing countries, high transport costs, small markets and lack of infrastructure are the main common factors limit agricultural production and food security.

(d) Own-labour entitlement (waged labour and professions)

Own-labour entitlement enhances people's access income and high propensity to access food. This is capable of improving agricultural productivity, thus imparting positively to farmers' incomes through increasing rural employment opportunities and rural wage rates. To abate possible decline in people's entitlements, people actively try to protect their livelihoods and which is termed among literatures as coping strategies <sup>[17, 34]</sup>.

#### **Measurement of Food Security**

Several food security measures exist direct and indirect measurements of food security and a single indicator may not adequately capture the complexity of food security. Some of the food security measurements can used direct or indirect, include socioeconomic measures, food consumption, anthropometry and coping strategies <sup>[37]</sup> Household food insecurity can be assessed using direct and indirect measurements. Food Sufficiency Status Question, Community Childhood Hunger Identification Project Instrument, Radimer/Cornell Hunger and Food Insecurity Instrument, Food Security Core Model and Cumulative Food Security Index are among questionnaire-based instruments designed to directly measure core behaviors and experiences related to food sufficiency or food insecurity and to be administered to the person most responsible for food and food provision in the household <sup>[17, 49]</sup>. The indirect measurements of food insecurity which include income-based measures of poverty, utilization of food security-related program, indicators of financial hardship, anthropometric measurements, dietary intake and other health and nutrition parameters, indicate the level of vulnerability in which food insecurity may be reasonably inferred <sup>[31]</sup>. In the developing countries, the indirect indicators are commonly used to gauge the prevalence and severity of food insecurity, however, the use of direct indicators are limited to several settings <sup>[46]</sup>.

#### **Assessment of Food Security in Nigeria**

Ideally, assessment of food security of a country is through regular nationwide consumption survey. But because of both

logistic and cost considerations, survey method is rarely conducted <sup>[1]</sup>. In short and medium term, the measurement of food security has to take the variability of staple food production, the degree of preparedness of the country to foresee and cope with widespread of acute food shortage and the country's ability to quickly obtain access to commercial food stuff in the world market into consideration <sup>[36]</sup>. In the past, Nigeria food security system was focused on stocking and import policies for food grain, particularly cereals. This is a faulty idea no matter that cereal constitutes more than 64% in the staple diet of average Nigerian but one should realize that other food groups contribute to the staple diets. Such other food groups include roots and tubers, nuts, oil seeds, fruits and even alcohol beverages <sup>[16]</sup>.

Although, that food insecurity is claimed to be measured by a consideration of consumption patterns and that consumption could be taken as national production plus net import taking into consideration any changes in stock level. In practice, it is difficult to get necessary data on these variables in time series <sup>[39]</sup>. The two main factors that affect the magnitude and direction of food insecurity are production variability and variability on the price of import. The most recent assessment of the situation of food supplies in Nigeria shows the need for cereal import <sup>[10]</sup>. The total cereal import in the year 2005 for instance, was 395 8947 tons costing about 772983 million US Dollars.

The fact that these escalating import costs are occurring at a time when the country continues to be saddled with high external debt burden and higher interest rate, is a reason for concern. Although significant efforts were made in the country to cope with the food demands of the increasing population, but long term trend clearly suggests that it is not yielding the needed dividends. For instance, according to <sup>[10]</sup>, the nation's food growth was 2.5 percent with population growth of 3.5 percent, leaving a food deficit of 1 percent. As the population pressure has increased, the amount of arable land per capita decreased, limiting fallow periods and the possibility of increasing production through extensive cultivation as was done in the past. Nevertheless, the country is facing seriously the problems of either feeding the teeming population or paying its debt <sup>[15]</sup>.

The essential pre-condition for overall social and economic growth of the country is through dynamic agriculture sector. This will be propelled through steady increase in agricultural productivity resulting from technological change by the small scale farmers that constitute the bulk of the nation farmers <sup>[38]</sup>. For the country to get out of their food and debt trap, domestic food production must increase so as to feed the growing population and for export to generate substantial foreign exchange to pay off the nation's debts and meet essential import needs <sup>[35]</sup>.

### **Food Insecurity: Causes, Remedies and Implications to Rural Farm Holders in Nigeria**

Food insecurity is a global issue, as one billion people are food insecure with concentrations in the lowest income countries <sup>[19]</sup>. For instance, studies in 2011 revealed that 14.9% of U.S. households, or 17.9 million families, were food insecure at some point during the year. The majority of food insecure households were able to avoid substantial reductions

in food intake but in many cases households relied on a limited variety of foods and often compromised their food choices <sup>[46]</sup>.

Food insecurity which could occur in household, regional, and national levels can be chronic or transitory. Chronic food insecurity is when food supplies are persistently insufficient to supply adequate nutrients for all individuals while transitory food insecurity occurs when there is a temporary decline in access to adequate food because of instability in food production, food price or income short fall. Both chronic and transitory food insecurities can be reduced through household food insecurity <sup>[1]</sup>.

### **Causes of Food Insecurity in Nigeria**

Food insecurity could be attributed to among others;

1. **Poverty:** Poverty, which can be defined as limited income is a major threat to household food security. Income is the critical determinant of household ability to obtain food <sup>[28]</sup>.
2. **Transportation Problem:** Most of rural roads of many developing countries are not tarred and in many places, non-existent with fewer vehicles applying them. Transportation fares are very high resulting in farm produce being rarely transported to urban areas, hence threatening urban food security <sup>[30]</sup>.
3. **Civil Strike/ war and Political Instability:** The prolonging of the civil strike/war and political instability could bring serious economic consequences to the people/counties affected. For instance recurring wars or quarrels over land ownership affect agricultural production as farm lands are destroyed and abandoned. The youths that are energetic to work are sent to war front, hence, leaving farming to the aged and sickening men and women <sup>[34]</sup>.
4. **Market:** Market in this regard is a facility which has to be provided to encourage production. Transaction has to take place at a location in which there are structure of convenience, such as market stores, warehouse, cottage industries (market oriented). Although, produce are sold at the farm gate, organized markets tend to increase the volume of trade and the net return of producers (market margins). The existence of these facilities, therefore, encourage agricultural production in many ways ranging from accessibility of modern inputs, utilization of modern inputs, increased demand for farm produce processing and storage <sup>[38]</sup>.
5. **Infrastructure:** These include good roads, rural electrification, schools, storage and processing structures. Provision of basic infrastructures in the rural area helps in the movement of farm inputs and evacuation of farm produce, increased processing of food products and storage as well as minimizing rural-urban migration <sup>[38]</sup>. The dearth of processing and storage facilities leads to heavy losses of farm produce. Processing gives value addition to the product resulting in higher financial returns to the produce and process <sup>[1]</sup>.
6. **Farm Mechanization and farm inputs:** Farm mechanization is the application of engineering principles and technologies in agricultural production, storage and processing of farm products. They stated among importance of farm Mechanization to include, reduced

- farm drudgery, timeliness of farm operations is enhanced, increased productivity, encourages large scale farming, saves time and reduction in cost of agricultural operations per unit output<sup>[46]</sup>.
7. Nevertheless,<sup>[34]</sup> reported that the inability to develop indigenous mechanization technology and farm inputs in agriculture in developing countries, lead to food crisis.
  8. **Extension Services:** Extension services help to create awareness, assists in input procurement and distribution, training of farmers, supervision and feed back. But extension workers are few in number and majority of them have no means of transport to ensure regular visits to the farmers and the farmers' farms. In addition, most of the rural farmers themselves are not literates. This affects their adoption rates and hence, low productivity result<sup>[29]</sup>.
  9. **Credit and Subsidies:** These facilities enable producers, processors and others to adopt improved farm practices and other innovations as well as to expand operations<sup>[38]</sup>. Credits are not easily available to most of the farmers because they cannot provide the necessary collateral security which commercial banks or credit institutions demand. More so, problem of high interest rate which the farmers cannot cope with is another deterrent to their loan acquisition, hence affects farmers productivity<sup>[45]</sup>.
  10. **Natural hazards:** Natural hazards are very unpredictable event, including flooding, bush fire, oil spillage, erosion, drought and earthquake which cause reduction in agricultural production (Hollyway, 2003). Because of the destructive nature of these natural hazards, farmers have been encouraged to ensure against these, but the response is very negative among small holder farmers<sup>[40]</sup>.
  11. **Land Problems:** As land tenure system varied in different localities of Nigeria, hence making land acquisition for agriculture difficult in varied degrees or forms. For instance, in communities where land is owned by individuals, land fragmentation results, thus, leading to low agricultural production, while in communal land ownership, available cultivable lands are usually limited with increasing population. More so, substantial agricultural lands are used for non-agricultural sector<sup>[14]</sup>.

### Social economic Characteristics and food security

Socio-economic status can be defined as the economic and social components of status that distinguish and characterise people. They include, gender, age, education, household size, marital status, and farming experience that could influence household food security.

#### Gender of the household head

The relationship between gender and food security is mixed relationship. On the positive side, women are the primary caregivers in the family and possess a wealth of knowledge on the causes and effects of food insecurity, since they are basically responsible for food production, purchase and preparation in the household<sup>[15]</sup>. Furthermore, women allocate substantial shares of their resources to basic necessities at the household level, thus boosting household welfare<sup>[9]</sup>.

Conversely, FAO,<sup>[19]</sup> report on women and food security attainment, revealed that women have superior managerial skills, although weighed down by child care, household

maintenance, and economic production, hence could affect their food security status negatively<sup>[20]</sup>. Also, studies shows that increased poverty reduced income, leading to malnutrition as a result of decreased food consumption at the household level, which further perpetuates these vulnerabilities<sup>[1]</sup>. Furthermore, the impact of the crisis is stronger among women because they oversee food production and introduce different coping strategies with decreasing resources to ensure food is available at household level during times of crises. This leads to more stress for women as they internalize and feel the pressure of increased responsibility more than is the case with men<sup>[14, 19]</sup>. Studies show that female headed households have potentials of being more vulnerability to food insecurity than male headed household, as the latter has access to productive resources such as land, capital and labour than the former<sup>[24]</sup>. Furthermore, when food is scarce or food prices rise, women are often responsible for taking on the increased workloads and often sacrifice their own nutrition first to ensure that their children and families eat. Nevertheless, studies have shown that women do more to help their household meet basic food needs, despite having less access to resources<sup>[14]</sup>.

#### Age of household

The effect of age to food security is likely to be either positive or negative. As age increases, other factors such as farming experience may influence food security status of the households. This could be because age had a direct relationship with technology adoption. The relationship is expanded from accumulated knowledge and experience obtained from years of observations and experimentations with various technologies, resulting in high production and productivity<sup>[45]</sup>. On the negative side, aged people are often described to be conservative, not receptive to technology adoption, not innovative and motivational. These features are capable of affecting food security status of such households<sup>[26]</sup>. In addition, in a related studies, although young families may be associated with low dependency ratios, the dynamic nature of the youth considered with the fact that they are less experienced suggest that the effect of age of the respondent on household level food security is an empirical question<sup>[4]</sup>.

#### Education of the respondent

Education is the number of years spent in schooling and this is expected have positive impact on food security. For instance, farmers with high educational level as affirmed by<sup>[35]</sup> are more likelihood of having more access to price, nutrition as well as agricultural information through newspapers and other sources available compare to less educated ones. Furthermore, educated people are more prudent in resource management and adoption of technologies that could boost their farm output for high food security status<sup>[27]</sup>. In addition,<sup>[44]</sup> reported that education is associated with greater participation in non-farm activities, accessing credit, making decisions related to production and use of crop produce at the household level, manage food demands in their households and increase ones related skills and, hence, the ability to acquire new skills.

#### Marital status

The impact of marital status on agricultural production and

food security can be explained in terms of proxy of the supply of agricultural family labour. Family labour is expected to be more available where the household heads are married and of productive age <sup>[45]</sup>.

### Household size

Household in this context refers to the number of individuals: wife/wives, children, and grandchildren that feed from the same house. Household size is desirable and of great importance in most developing countries, since most rural households relied more on members of the households than hired labour to work in their farms in order to save money that would have been paid to hired labour <sup>[46]</sup>. This implies that households with a greater endowment of labour are likely to farm more intensively and undergo important farm operation at the right time than is the case with households that are dependent on hired labour <sup>[46]</sup>. More so, many poorer households according to <sup>[23]</sup> engage their members into hired labour in order to generate income for improvement of family welfare. However, the impact of household size to agricultural production depends on the magnitude, age structure and available farm labour among members.

### Farming Experience

It is the number of years spent in farming, which could be positive or negative to food security. On the positive side, Studies reveal that an experienced farmer is expected to have more insight and ability to diversify his or her production and minimize risk of food shortage. In addition, an experienced farmer is more likely to have adequate knowledge on pest, disease management and weather. Therefore, effect of farming experience on food security is likely to be positive. All will consequently enhance the household food security status <sup>[2]</sup>. The negative effect of the variable could be derived from the reluctance to change from old and familiar farming practices and techniques to modern and improved farming practices <sup>[5]</sup>.

### Access to credit

Studies show that paucity of fund for adoption of the technology by farmers for high production and productivity is a persistent problem in agricultural development in most countries in developing, hence causing persistence poverty and food insecurity among the farm households. The design and delivery of financial services in many countries of sub-Saharan Africa greatly affects its accessibility particularly for the smallholder farmers. For instance, financial institutions often require traditional forms of collateral property like land, house for which smallholder farmers frequently lack titles <sup>[8]</sup>. Furthermore, complicated application procedures and documentation requirements prevent poor farm household with lower education and inadequate skills from applying <sup>[45]</sup>. Studies on smallholder farmers accessibility reveals that commercial bank and other financial institutions are reluctant to lend to smallholder farmers because of associated risks. This is attributed to several factors like, the high risk associated with the main economic activity, rain fed agriculture, and the absence of traditional physical collateral normally required by the banking system. These situations have made the cost and risks associated with the delivery of lending services in rural areas to be high, hence affecting

farmers' adoptability of technology no matter how the technology could boost their wellbeing in terms of having high food security status <sup>[26]</sup>.

### Access to extension Services

Extension services help to disseminate innovations to farmers through among others provision of technical assistance and sources of improved inputs, consequently high productivity will ensure. Also, it is expected that extension services provide farmers and opportunity to get useful information on input and output prices, healthy consumption and other forms of farm and nutritional advice. It is expected that extension services would be positively related to food security <sup>[44]</sup>.

### Dependency Ratio

It is the consumer worker ratio at the household and calculated as household size divided by number of people who contribute to the household's labour supply. The international dependency ratio formulation of dependents per worker can be derived from this definition by subtracting unity <sup>[1]</sup>. The dependency ratio herein is defined as

$$DR = \frac{W + d}{W} = 1 + \frac{d}{W} \quad (1)$$

where  $DR$  is the dependency ratio and  $w$  and  $d$  are workers and dependents (children who are less than 10 years and older people who are over 65 years) respectively. The international definition is equivalent to  $DR - 1$ . A higher dependency ratio implies that there is less production per individual in the household and consequently it is expected that dependency should be negatively related to food security <sup>[33]</sup>.

### Market proximity

This refers to the distance to markets/trading centre from the household residence. The proximity to market has positive relationship to market information. Inadequate information about market prices could make farmers to sell their produce at times when prices are low and buy when prices are high. It is expected that food security is negatively related to distance to the market <sup>[36]</sup>.

### Remedies to Food Insecurity

There are majorly four forms of interventions to food insecurity by Nigeria government, namely; agricultural production, employment and income generation, food-based assistance and human resource development.

### Agricultural production

Agricultural production is an important means for accomplishing the Millennium Development Goal (MDG) of reducing poverty and hunger, especially when directed at large number of small holder farmers facing land constraint. The common interventions to farmers in liberalized trade agreement in order to cushion the income shock are *direct purchases* of food crops and *direct payments* <sup>[47]</sup>. In Nigeria, to boost their food production in order to cushion the effects of food insecurity among the citizenry, there is need to provide inputs to farmers at affordable prices and at right time, development of dams and irrigation facilities to augment inadequate rainfall, farmers should be encouraged into

insuring their farms against natural hazards, development of appropriate and workable technologies, provision of quality and frequent extension contacts <sup>[1,3,7]</sup> Furthermore, there is call for provision of pesticides for insects and weed control at right time and moderate prices, development of good marketing to ensure appropriate pricing system, enactment of workable land use decree and land redistribution policy as well as proper land planning and conservation management such as erosion control <sup>[34, 39]</sup>

### **Employment and Income generation**

Employment generation gives people a wager in the peace process by providing young men and women with alternatives to violence, provides income to poor families, revives domestic demand for goods and services, promotes social healing and improves social welfare. In addition, more jobs to the citizenry connote more economic activities, more tax revenues for the government, and less idle time <sup>[24]</sup> The present employment situation in Nigeria is very suicidal, consequently poverty, crime, youth restiveness and insurgencies such as Boko Haram, Niger Delta militants, kidnappers and tribal conflicts are widespread <sup>[5, 7]</sup>. In Nigeria, various governments had initiated various employment generation programs to keep citizenry eventful and among them are National Directorate of Employment (NDE) (2005), Operation Feed the Nation (1976), Youth Empowerment Scheme (2002), National Economic and Empowerment Development Strategy (2004), Fadama Development (2014) Project Root and Tuber Expansion Programme (1998) Special Programme for Food Security (SPFS) (2006) (16, 21, 35).

### **Human capital development**

Human capital is concerned with knowledge, skills competitiveness and attributes embedded in an individual that facilitates the creation of personal, social and economic wellbeing (28). A well developed human capital ensures for better employment opportunities and to fulfill their earning potential, as poor investment on human development is capable of breeding mass unemployment, low per capita income and poor standard of living <sup>[4, 7, 9]</sup>. The achievement of three pillars of sustainable development cannot be attained if human capital development is given a lip service, as observed in many in many developing countries of the world. Nigeria as a case in point, the annual federal government budget (in percentages) to educational sector which is one of the avenues for booting human development is meagre. For instance, between the year 2005– 2007, the Nigeria budgets were 6.3%, 7.8%, 8.7% respectively and very low compares to the United Nations Educational Scientific and Cultural Organization's (UNESCO) recommendation of 26.0% of the nation's budget (3). Globally, the methodology of in achieving human capital development differs. For example in Nigeria, the free meal school feeding programme has the intension of encouraging attendance of children to schools <sup>[12]</sup>. Nicaragua's Red de Proteccion Social, and Brazil's *Bolsa Família* all provide direct payments to low-income women in exchange for attendance of their children in schools and health clinics. The payments have been shown to increase access to food in the short-run and have the potential to reduce long-term poverty

and food insecurity (44).

### **Food-based assistance**

This programme is aimed at solving food deficiency among vulnerable groups such as pregnant women, refugees, infants, and children through supplemental food in maternal and child health clinics. In Nigeria, such programmers are;

#### **(i) Women in Agriculture (WIA)**

Women in Agriculture (WIA) is an arm of extension services of Agriculture Development Programme (ADP) of Ministry of Agriculture and Natural Resources with specialty in ensuring women and households' access to food security and nutrition <sup>[1]</sup>.

(ii) Home Grown School Feeding (HGSF) programme; It has agenda of; first, providing delicious hot meal a day for primary school children. The programme had according to reports has provided nutritious hot meal a day to over 24 million primary school children in Nigeria between 2015 – 2015 <sup>[49]</sup>. Second, to offer a 'win-win-win' for children, farmers and communities alike and help school pupils become better students, boost the local economies and create new jobs <sup>[41]</sup>.

(iii) Third, United Nations World Food Programme (WFP) under the leadership of Nigeria government uses either food or cash transfers to support displaced people living in camps or with host communities, as well as vulnerable host populations in Northeast Nigeria where Boko Haram violence has led to one of the most acute and largely forgotten humanitarian crises in the world. WFP is working with the Government and other agencies such as United children emergence fund (UNICEF) to urgently reach the most vulnerable" in places in Borno and Yobe states of Nigeria where markets are not still functioning, Also, report shows that WFP aims to provided cash-based assistance to 267,000 people over a period of six months in 2016, in order to purchase food. This initiative could also help to strengthen local economies (48). The developed countries live the United States of America (USA) is enjoying the services of food – based assistance through the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). WIC provides a form of social protection to USA and this has shown to improve birth outcomes and reduce hospital costs due to a reduction in 'low-birth weight babies' <sup>[47]</sup>.

### **Negative Implications of Food Insecurity**

The goal of halving hunger and extreme poverty by 2020 is the ultimate priority of the millennium development goals (MDGs) in many developing countries of the world. Yet, persistent hunger is still prevalent in most part of the region particularly among farming households where food supplies fluctuate widely. The fluctuation depends on the degree of production variability and the extent to which this variability is compensated by changes in import and stocks <sup>[1, 3]</sup>. Such food fluctuations in supply have immense impacts on the poor in varied form;

Food insecurity often breeds negative behavioural outcomes in children. These include; poor development and impaired academic performance which may diminish national productivity and future human capital, compounded pre-

existing levels of health disparities (more colds, anaemia, and earaches) <sup>[1]</sup>. The other negative behavioural problems outcome in children are higher levels of aggressive or destructive behavior, hyperactivity, anxiety, difficulty with social interactions (e.g., social misfit) and a greater need for mental health care services (e.g., for depression or suicidal behaviors) <sup>[1, 24]</sup>.

Furthermore, malnutrition among adults and youths as result of food insecurity can lead to decreased energy levels, delayed maturation, growth failure, impaired cognitive ability, decreased ability to resist infections and illnesses, shortened life expectancy, increased maternal mortality, and low birth weight <sup>[42]</sup>. For example, persistent malnutrition leaves children weak, vulnerable, and less able to fight such common childhood illnesses as diarrhea, acute respiratory infections, malaria, and measles. Even children who are mild to moderately malnourished are at greater risk of dying from these common diseases <sup>[37, 46]</sup>.

In addition, lack of food in most household is a source of conflict within normal family relationships, especially between parents and children. As result, parents are less available to children due to increased time spent trying to procure food and having conversational gaps with their children because they were unable to face their incapacity to adequately feed their children. These parental stresses may negatively impact on parents' motivation and ability to improve their family's condition, making it more difficult to enhance their food security status <sup>[1, 7]</sup>.

Moreover, food insecurity is associated with sub-optimal food and nutrient intake, as well as risk for specific nutrient deficiencies by adults in the household. To buttress further, HIV/AIDS epidemic is both a cause and effect of food insecurity. Rates of infection, viral loads and opportunistic infections will rise with malnutrition, which lowers immunity. In turn, the epidemic is likely to contribute to food insecurity as those living with the virus lose labour, time and capital to the effects of the disease <sup>[47]</sup>.

As well, the phenomenon of "child preference" which is the management of household food such that at low levels of food security, adults sacrifice their own food to maintain adequate levels for children is a common practice in many food insecure household. This practice is capable of affecting the adult food security status, thus making them vulnerable to disease infestation as result of breaking down of their immune system. <sup>[16]</sup>.

Beside, food insecurity creates a heavy burden for individuals, as well as an exorbitant economic cost to the Country. The costs of hunger and food insecurity resulting from direct health problems and indirect consequences of among others; loss of worker productivity could affect national development. To illustrate burden of food insecurity on the nation, World Bank, <sup>[50]</sup> reported that its adverse effects can be linked to payments of high food import bills countries facing food insecurity often forgo other needed import or cut back investments including those designed to recede long run deficit or export earnings. On food security on individual, the poor segment of the population spends a high proportion of their income on food with other well beings virtually starve <sup>[32]</sup>.

<sup>[4]</sup>. Also, poor nutrition in childhood has also been linked to

"programming" effects that may influence chronic diseases in adulthood <sup>[13]</sup>. Too, members of food insecure households may in fact be consuming enough energy but primarily from energy dense, nutrient-poor sources, leading to severe nutrient imbalances. For instance, research found that when compared to higher-income food-sufficient households, children from low-income food-insufficient households consume slightly fewer calories and total carbohydrates but had significantly higher rates of cholesterol intake <sup>[21]</sup>. Furthermore, research showed that food insecure elderly adults in developing countries are less likely to consume foods rich in iron, zinc, magnesium, riboflavin, vitamin B-6, vitamin B-12 and niacin compared to food secure elderly adults <sup>[24]</sup>.

### Coping Mechanism/ Strategies

Food insecurity coping strategies are activities undertaken in order to maintain food security or combat food insecurity that has occurred at the household level. Coping strategies are directly attributed to household activities rather than external factors, and varies among households, nations and regions. According to literature households adopt both *ex ante* and *ex post* coping strategies in their endeavour to be food secure <sup>[21, 41, 50]</sup>. In Nigeria, various household adopts varied coping mechanism/ strategies adopted to cushion against the effects of food insecurity, including;

**1. Decrease in meal frequency:** Studies show that hunger, and malnutrition are prevalent in many poor resource households in rural areas of Nigeria <sup>[2, 7, 41]</sup>. This is common during lean period which is common immediately after planting of crops. In effect, most households eat once or twice daily. More-so, <sup>[45]</sup> pointed that participatory rural appraisal of representative sample of states in the South East agro-ecological zone, of Nigeria revealed that most household of the zone consume cassava (in different forms) during breakfast, lunch and dinner. FEWS, <sup>[21]</sup> opined that low market stocks and high prices of major staple foods lead to limited food access, causing reduced meal frequency.

**2. Sales of farm assets and land:** The rural households resort to this measure in order to cushion the effects of food insecurity, especially when the natural shock on the production system last for over extended period <sup>[44]</sup>.

**3. over reliance on remittance:** Income remittance is monies that migrants' workers send back to the home country. Remittance help poor families to deal with negative economic shock, increase their savings, better access to health and education and increase in entrepreneurship <sup>[40]</sup>. The negative effect of remittance according to Babatunde <sup>[5]</sup> include: potential loss of income associated with migrants absence from their families and communities, reduction in labour force from country of origin and over valuation of the real exchange rates. FEWS <sup>[21]</sup> pointed out that the cause of food insecurity is as result of poverty, over reliance of over 40 percent on remittance by household as against 10 percent under normal time.

**4. Withdrawal of children from school:** Hill and kings <sup>[25]</sup> asserted among the reasons for household heads for not

sending or withdrawals of their children from school are poverty and the need for the income that children will bring into their household. More so, Eme <sup>[14]</sup> cited the need for domestic responsibilities including care of young ones, which releases the mother to take to more ruminative works particularly poorer households as reason for withdrawal of children from school.

**5. Reduction in other expenditures:** Food according is a basic means of sustenance and adequate food intake in terms of quantity and quality is a key for healthy and productive life. It is because of this importance that food accounts for substantial part of the nations and typical household budget <sup>[27]</sup>. World Bank, <sup>[49]</sup> asserted that poorer households mostly in the rural areas of developing countries spend more than 75 percent of their income is food and the remaining 25percent in other expenditure.

**6. off farm income:** The importance of off farm income cannot be over emphasized, off farm income helps not only to improve the calorie consumption but also the dietary quality and micro-nutrient supply <sup>[39]</sup>. More so, where there is shortage of capital, off farm income can contribute to more intensive farming through purchasing of improve production inputs for higher food production and income <sup>[38]</sup>

**7. Food aid:** Food aid is the provision of food and related assistants to tackle hunger either in emergency situations or to help with deeper longer term hunger alleviation and achieve food security). According to <sup>[23]</sup>, about 70 percent of food aid is sold at market price to importing government and the proceeds used to finance development projects. The remainder described as project food aid is supplied free and distributed in various ways as school free meal, in health centres for mother and young children and labour in land improvement scheme. Numerous criticisms against food aid <sup>[6, 21]</sup> include; first, import of concessionary grain for instance as in some cases reduce the prices of local products and hence a disincentive to increase in domestic food output. Second, some food aid does not always benefit the recipients. Thirdly, many governments in developing countries have relaxed their efforts to increase food production because of certainty of obtaining food aid to supplement meager domestic production. Fourthly, most of the food items found its way to the urban markets and do not usually reach the poor and undernourished rural people and peasant farmers for whom they are intended.

**8. Migration:** Herders in the far northern part of Nigeria are often confronted with scarcity of fodder and water during certain periods of the year these affect their livestock body condition, their market prices and death in some worse conditions, which often threaten their food security status. As a result the herders migrate southwards where these resources are abundance to cushion the effect <sup>[21]</sup>.

## Conclusion and Recommendation

### Conclusion

food insecurity is associated with sub - optimal food and nutrient intake, as well as risk for specific nutrient deficiencies have resulted in under development of the countries inform of;

negative behavioural outcome among the citizenry, high economic cost to individual and the nation at large, increases the rates of infection, viral loads and opportunistic infections as immunity lowers and among others. Nevertheless, since many government programmes implemented to arrest the situation was to no avail, which are chiefly due to political reason and corruption. Hence, there is urgent need to address these factors in order to circumvent our dear nation from drifting further into recession

### Recommendation

The following recommendations were made:

1. There is need to impact appropriate and improved technology to the farmers for rapid adoption for high yield and subsequent more income to attend to other needs.
2. The need to intensify capacity building programmes (empowerment for reliance) among rural people in order to create employment opportunities which they will earn income to iprove on their food security status.
3. Farmers should be encouraged to diversify their income sources particularly through off farm income source as strategy against income risk in order to boost their income which have a correlate effect on their food security status.
4. There is need to boost farmers output through provision of credit through micro-credit institutions and other organizations as a way of addressing their production efficiency problem, which helps to break the vicious of poverty.
5. Agricultural shows and competitions should be encouraged among farmers in order to improve their productivities. Improved storage facilities such as silos and cribs should be made available to the farmers to curtail minimally high rate of post-harvest losses.
6. New feeder roads should be constructed and existing ones should be maintained to ensure easy evacuation of farm products and at a reduced cost which will subsequently increase their profits.
7. Farmers should be encouraged to form cooperative organization/society for easy accessibility to credit facilities from financial institutions, capacity building, and procurement of production inputs at reduced cost and at appropriate time.

(Farmers should be provided with formal education through adult and normadic education in order to increase their production level and income in terms of sharpening their production performance ability.

### References

1. Abalu G. The attainment of food security in Nigeria: The role of theresources constrained Nigerian farmers. Proceeding of National Farming System of Research Network (NFSRN) held at Calabar. 1998; 14:4-7.
2. Abo ME. The global food crisis: cause palliative measures and solution. Proceeding of the 43<sup>rd</sup> Annual Conference of the Agricultural Society of Nigeria (A.S.N) ‘Abuja. 2008-2006, 430-435.
3. Adepogu UA, Awoduntilla DJ. Economics cocoyam productionand marketing in Ekiti State, Nigeria. Research journal of applied science. 2008; 3(2):9- 13.

4. Amaka C. Women and poverty, 2007, <http://www.tigweborg.express/panorama/article.html>.
5. Babtunde R. Impact of remittances on food security and nutrition in rural Nigeria. *Journal of development economics*. 2008; 12(24):240-248.
6. Barrett BC, Maxwell DG. *Food Aid after Fifty Years-Recasting Its Role*; Routledge: London, UK, 2005.
7. Barrett BC. *Food Aid's Intended and Unintended Consequences Background*; Paper for Food and Agriculture Organization; Food and Agriculture Organization: Rome, Italy, 2006.
8. Benson T. Assessing Africa's food and nutrition security situation – 2020 African conference brief I International food policy research institute, Washington DC, 2004.
9. Bickel G, Nord M, Price C, Hamilton W, Cook J. Guide to measuring household.
10. food security. Washington, DC: USDA Food and Nutrition Service, 2012.
11. Broegaard RJ. Land tenure insecurity and inequality in Nicaragua. *Development and Change*. 2005; 36(5):845-864.
12. CBN. Central Bank of Nigeria annual report and statement of account for the year of, 2004, 142-156.
13. Chambers B. *International finance for food security* Baltimore: John Hoplan University Press, 2001.
14. Chang HH, Mistra A. Impact of off farm labour supply on food expenditures of the farm household. *Food policy*. 2008; 33(6): 657-664.
15. Da Janvry A, Sadoielet E. income strategies among rural households in Mexico: The role of off farm income. *World Development* 29(3):467-480.
16. Eme TA Poverty in the midst of plenty Sun Newspaper, 2002, 18.
17. FAO. The state of food security in the world, 4<sup>th</sup> edition. Available from, 2002. <http://www.centreonhunger.org>.
18. FAO. FAOSTAT Statistics Division of Food and Agricultural Organ 2006. <http://FAOstat;FA.org>.
19. FAO. FAOSTAT, 2005, <<http://faostata.fao.org/default.htm>.
20. FAO. FAOSTAT Statistics division of food and agriculture organ, 2007, <http://stex.FAC.org>
21. FAO. The state of food security in the world, 4<sup>th</sup> edition available from, 2009, <http://www.centreonhunger.org>
22. Feleke ST, Kilmer RL, Gladwin CH. Determinants of food security in Southern.
23. Ethiopia at the household level. *Agricultural Economics*. 2004; 33:351-363.
24. FEWS, Famine Early Warning Systems Network: Nigeria food security outlook, 2006, [Nigeriafew.net@yahoo.com](mailto:Nigeriafew.net@yahoo.com).
25. Garrett L, Ruel MT. Determinants of rural and urban food security and nutritional status different? Some Insights from Mozambique. *World Development*, 2009; 27(11):1955-1975.
26. Giles perspire S, Hadded L, Jackson K. HIV/AIDS and food security “impact and action: paper presented at the consultation on HIV and AIDS and rural livelihood. International Food Policy Research Institute, Washington D.C, 2001.
27. Guo B. Household Assets and Food Security: Evidence from the Survey of Program, 2010.
28. Dynamics. *Journal of Family and Economic Issue*, 2010; 32 (1):98-110.
29. Harvey P, HIV/AIDS what are the implications for human action? Draft report, humanitarian policy group, oversea department institute, United Kingdom, 2003.
30. Hill, King. Women. Food security and Agricultural in a Global ICRW. Llama and wood development project.
31. 1999. [www.icrw.org/files/production/A-S](http://www.icrw.org/files/production/A-S).
32. Ibrahim L, Geert B. Cross-border trade and food markets in Niger: Why market analysis is important for humanitarian action. *Humanit. Exch. Mag*. 2007; 38:24-27.
33. Idachaba FS. Food security in Nigeria: challenges under democratic dispensation. Lecture delivered at ARM 69<sup>th</sup> Lecture series, 2004.
34. Ijaiya GT. Absolute poverty Nigeria: An analysis of the future trend. *Journal of Agricultural Science*. 2003; 16(4):14-16.
35. Iwunna CL. Africa: Achieving food security in the country. Daily Trust, 2016, 13.
36. Khan MN. Rural Poverty in developing countries finance and Development, 2000, 17.
37. Kivat K, Babira W. Technology assessment and transfer towards food security and poverty alleviation in Sub-Sahara Africa. *Journal of Economic development*. 2009; 14(4):350-362.
38. Kolawole K. Determination of profit efficiency among rice farmers in Nigeria. *Mendel Journal. Millennium development Goals indicators*. 2009; 6(12): 130-136. <http://ddpext:worldbank.org/ext/ddreports/viewshareport?&cf>
39. Lewin PA. Three Essays on Food Security, Food Assistance, and Migration. Unpublished PhD Dissertation, Oregon State University, Oregon. *Applied Econometrics and International Development*. 2011; 12-2(2012):186.
40. Mohammed YA. Diffusion of agricultural innovation among traditional farmers of western sudan. The case study of east Kordoofen and OL Fasher Districts. *GEO Journal, Akedemische Veria Sgealllschaft, Wesbada*. 2001; 6(1):31-40.
41. Ogundari K, Ojo SO. An examination of Technical, Economic and Allocative efficiencies of cassava farms in South West Nigeria. *Mendel Journal*. 2006; 7(6):22-27.
42. Ogundbile K, Olukosi J. An overview of the problems of resource poor farmers in Nigeria agriculture. A paper presented on appropriate technology for resource poor farmers. The processing of NFSRN held in Calabar, Cross River State, Nigeria, 19, 14-17.
43. Ogunlela VB, Ogungbile AO. Alleviating rural poverty in Nigeria: a change to the National Agric Research system. *Mendel Journal*. 2005; 6(4):320-327.
44. Okorji EC. Creating an enabling environment for increased agricultural Production. Proceeding of the 16<sup>th</sup> Annual zonal research extension farmer linkage system, (REFILS) workshop South East/ South zones of Nigeria, 2003.
45. Okuneye PA. Rising cost of food prices and food insecurity in Nigeriaand its implication for poverty

- alleviation. Paper presented at workshop on poverty alleviation in Nigeria, Abeokuta, Ogun State, Nigeria. 2001; 35-42.
46. Reutlinger S, van Holst Pellekaan J. Poverty and hunger: issues and options for food security in developing countries. WB Policy Study n° 9275. Washington (DC): The World Bank, 1986.
  47. Sanusi MA. Poverty Alleviation Programmes in Niger delta states of Nigeria. Proceedings of Agricultural Society of Nigeria, Abuja, 2006.
  48. Sen AK. Poverty and Famines: An Essay on Entitlement and Deprivation Oxford., Clarendon Press.1981.
  49. Sijm J. Food Security and Policy Interventions in Sub-Saharan Africa. Amsterdam, TheNetherlands.: Thela Publishers, Prinseneiland,1997.
  50. Tschirley DL, Weber MT. Food security strategies under extremely adverseconditions: The determinants of household income and consumption in rural Mozambique, 1994.
  51. World Development. 1994; 22(2):159-173.
  52. Uchechi A, Okewole JA. Food insecurity among rural dwellers in Nigeria: a case study of Abia State. Proceedings of Agricultural society of Nigeria, Ladoke Adegoke University of Science and Technology Ogbomosho, Oyo State.
  53. Ume SI, Onunka BN, Nwaneri TC, Okoro GO. Socio-economic Determinants of Sweet Potato Production among Small Holder Women Farmers in Ezza South Local Government Area of Ebonyi State, Nigeria. Global Journal of Advance Research. 2016; 3(9):972-883. Available at [www.gjar.org](http://www.gjar.org)
  54. Ume. SI, Ochiaka CD. Analysis of Poverty Determinants and the Coping Strategies among Rural Farming Households in Afikpo South localgovernment Area of Ebonyi State, Nigeria. Impact Factor 3.582 Case Studies Journa L Available online at. 2016; 5(9):129-134. [www.jpsscscientificpublications.com](http://www.jpsscscientificpublications.com)
  55. USAID Population report in Series Maryland, USAID, 2012, 9.
  56. WHO. (World Health Organization: Nutrition Research: Pursuing Sustainable solutions. Update 2012. Available from
  57. <http://www.who.int/en>
  58. World Bank. Nigeria-Policies for Poor Agricultural Growth. African Region, 2013.
  59. United Nation World Food Programme (WFP) Government Of Nigeria And WFP Step Up Assistance To People Bearing Brunt Of Boko Haram Violence. [Http://www.wfp.org/news/newsrelease](http://www.wfp.org/news/newsrelease) government=NigandWFP- step.
  60. Retrieved on, 2016.
  61. World Bank Nigeria. Poverty in the midst of plenty. The Challenges of Growth with inclusion, 2013.
  62. World Bank Poverty Assessment Population and Human Resource, Division Report, 2014, 14733.
  63. World Bank Human Development Report. Oxford University, 2009.