

Food Insecurity at the Grassroots: A Challenge of College of Agricultural Sciences, Joseph Ayo Babalola University, A Nigerian Private University

J. A. Ayo¹ and A.O. Adeola²

¹*Department of Food Science and Technology,* ²*Department of Crop Science College of Agricultural Sciences, Joseph Ayo Babalola University, Ikeji-Arakeji, Nigeria*

KEYWORDS Food. Insecurity. Challenge. Private. University

ABSTRACT The paper researches the progress of food insecurity in developing countries with special reference to Ikeji-Arakeji in Nigeria, and immediate environ of the Joseph Ayo Babalola University, a private university. The work is aimed at challenging educational institutions to redirect their program to solve problems of their immediate environment. Poverty, illiteracy, government negligence, taboo and underutilization of the agricultural resources were among the prevalent problems confronting the environment. The potential of the institution in terms of human, equipment facilities and availability of funds were also x-rayed to assess the challenge posed to the environ. Recommendations ranging from immediate (preliminary investigations to nutritional needs, disbursement of agricultural loans, road connections to the interior, setting up of University farms) and long (educating the populace with reference to nutrition, land use and job creation) term were highlighted. The College of Agricultural Science of the University is well able to alleviate the poverty posed by food insecurity on her environ if the recommendations could be implemented.

INTRODUCTION

The world population is expected to surpass nine billion people by 2050. Will we be able to feed this large increase or succumb to disaster as the Malthusians predicted? Human ingenuity has surmounted previous doomsday prophecies that the world would run out of food in the face of rapid growing population (Halilu 2010).

Africa's economic malaise is first and foremost, a malaise of food production stagnation. The chronic food shortages have, over the years, become synonymous with its mismanagement and social decline and contribute greatly to the continent's marginalization in the world. The number of people without enough food to eat on a regular basis remains stubbornly high, at over 800 million, and is not falling significantly. Over 60% of the world's undernourished people live in Asia, and a quarter in Africa. The proportion of people who are hungry, however, is greater in Africa (33%) than Asia (16%). The latest FAO figures indicate that there are 22 countries, 16 of which are in Africa, in which the undernourishment prevalence rate is over 35 % (FAO 2007). Food price index of food commodities over the years (2002-2010), particularly for cereals, sugar, meat, dairy and oil foods has been continuously rising (FAO 2010).

Population growth, droughts, crop failures and accelerating food imports in the face of mounting foreign exchange problems and a crippling

debt burden, have now moved the issue of food security and self-sufficiency in West Africa into a position of prominence and top priority (FAO 2010).

There is also the fundamental problem of African countries' inability to produce enough food from their own natural resources as well as the related problem of the inability of their economies to generate enough income to permit their households to produce or buy adequate amounts of food either from their own countries or from other sister African countries (FAO 2010). Nigeria is the most populous country in Africa, with a population of about 140 million (NPC 2007), with growing rate of 3.1% per annum (Adeola 2008).

Approximately 75% of the population is women and children with over 70% residing and securing their livelihood in the rural areas. Nigeria has a location that cuts across the tropical forest and savannah (Fig. 1), and is blessed with the potential to produce her own food.

Nigeria's soil and climate allow cultivation of a wide variety of food crops, including cassava (of which Nigeria is the largest world producer), millet, sorghum and maize. Agriculture is Nigeria's biggest employer, accounting for about 60 per cent of the workforce, working mainly in small-holdings using basic tools. Together with livestock rising, it provides a third of gross domestic product (African Recovery 1999).

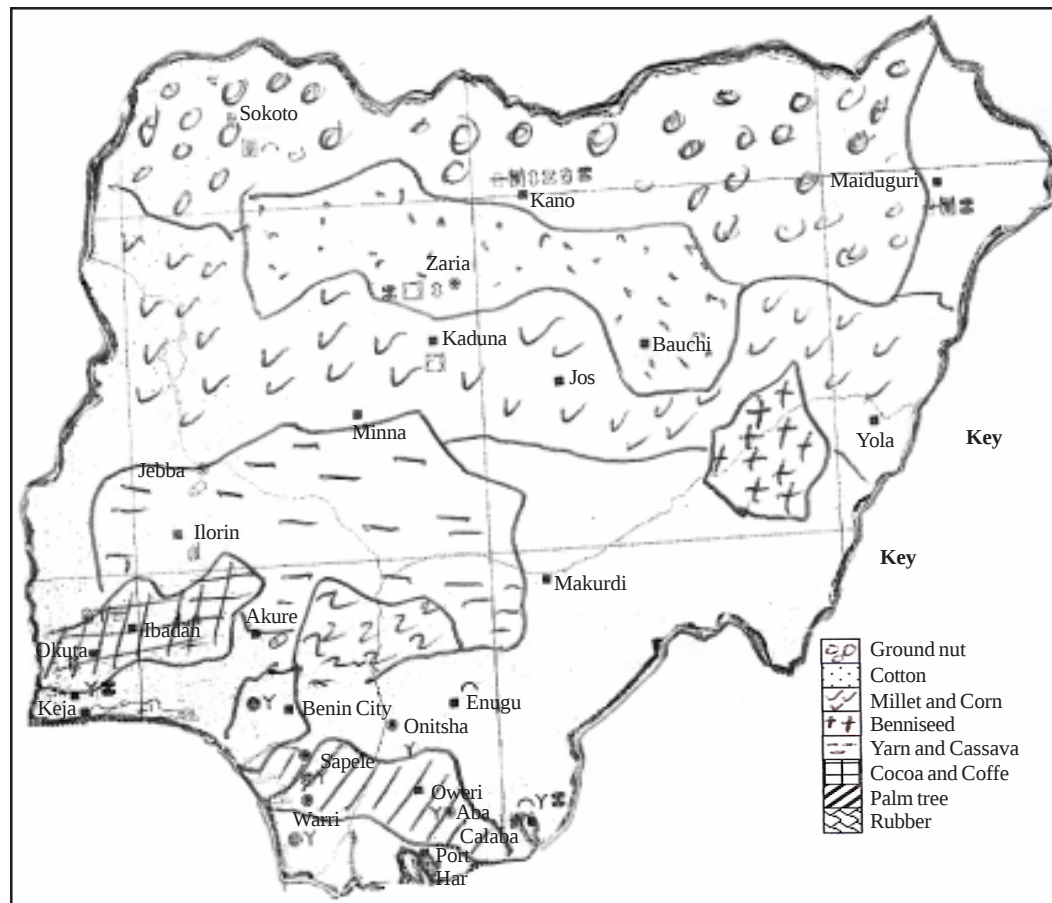


Fig. 1. Nigeria: Principal food crops

Though lying in the midst of abundance of foods, Nigeria as a nation is still suffering from malnutrition, a principal manifestation of food insecurity (FGN/NUICEF 1994). The pride of any nation is the health of her citizen. A hungry nation is a sick nation. The health of the citizen in no little way affects the economy, politics, education, and technical advancement of any nation.

The current world food and agricultural review showed that hunger and malnutrition continues to be widespread despite the global abundance of food supplied and application of different programs (FAO 2009; WHO 2010). Possibly 50 million people suffer severe under nutrition and these are joined by millions more who are unable to acquire enough food to enjoy an active and productive life in Nigeria (FAO 2008; Ayo et al. 2001). In spite of the country's

rich land and potential to be a wealthy agricultural nation (Figs. 1 and 2), less than 50% of arable land is cultivated and growth in the agricultural sector was about 1% per year for a long period from about 1970, as a result of low level of agricultural development (FGN/NUICEF 1994). The major staple crops produced in Nigeria are mainly ten- cassava, yam, maize, rice, beans, cocoyams, groundnuts, plantain and sorghum (Adeola 2008). Food demand has been on the increase for long as the production is becoming relatively low due to increase in the number of mouths consuming the same (Okoli 2006; CBN 2002).

Due to poor statistical evidence, it is not quite clear when exactly the problem of food shortage first reared its head in Nigeria (UNICEF 1994).

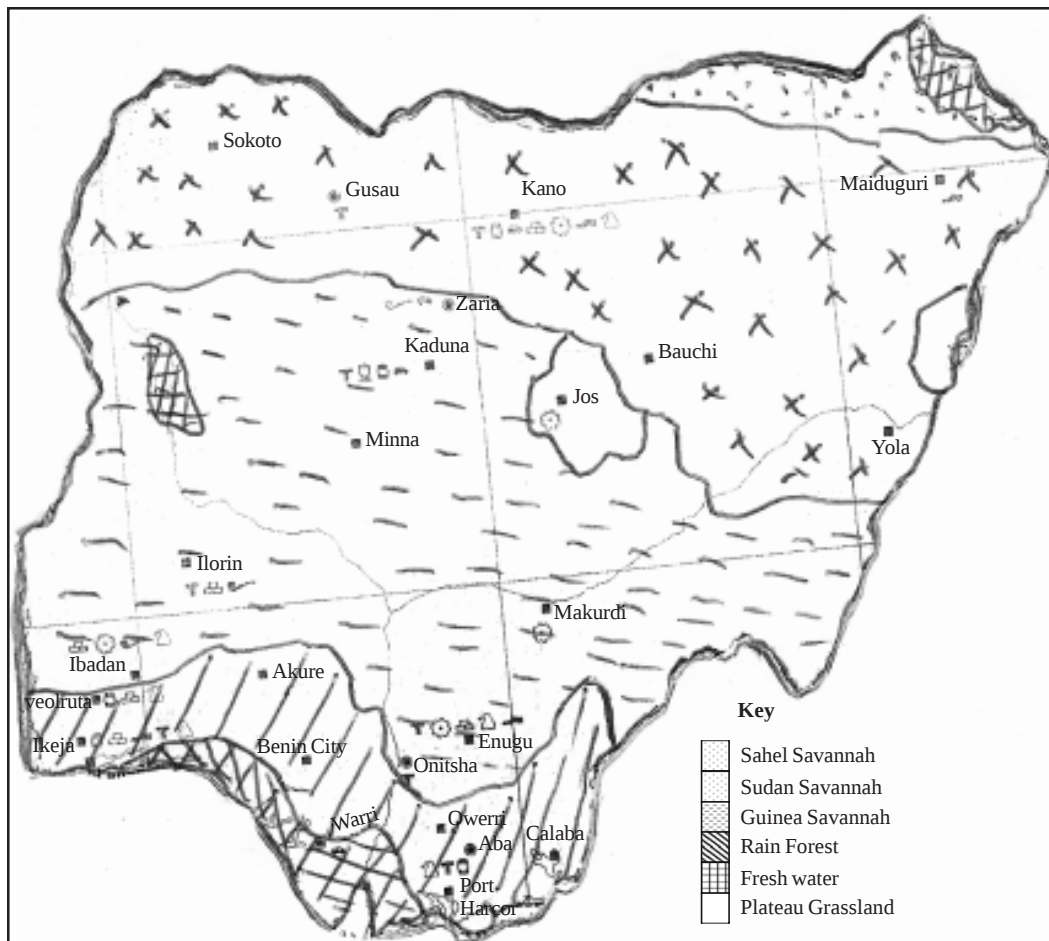


Fig. 2. Nigeria: Agro ecological zone

METHODS

Food Security

Definition: Food security has been defined as when all people at all times have both physical and economical access to sufficient, safe, nutritious food to meet and maintain a healthy and active life (FAO 1996).

Pillars of Food Insecurity: Food insecurity as defined is built on three pillars of variables which are central to the attainment of food security. These include:

1) *Food Availability*- is achieved when sufficient quantities of food are consistently available to all individuals within a country.

2) *Food Access*- is ensured when households and all individuals within them have adequate

resources (income) to obtain appropriate foods for a nutritious diet.

3) *Food Utilization*- is the proper biological use of food, requiring a diet providing sufficient energy and essential nutrients, potable water, and sanitation. Effective food utilization depends in large measure on knowledge within the household of food storage and processing techniques, basic principles of nutrition and proper child care (FAO 1996; WHO 1997).

The problem of insecurity of food in Nigeria can be conceptualized as cumulative product of a number of important factors (Adeola 2008):

a) The concentration of effort on export crops during colonial era and the early phase of Nigeria's economic development, the gradual move towards a mono-commodity economy during the

period of oil boom, the small scale of production of food crops rising from cultivation of small plots and the use of traditional technology has greatly resulted into low agricultural output which has been the major factor in the world hunger equation. In Africa, for example, food production increased by 33% in the 1980s (FAO 1996), but per capita output of food actually declined as population growth outstripped increased food production.

b) Food production in most rural households predicts food status of the individual household (FAO 2001). Research has shown land, technology, labor, climate, education and environment affect food production and food availability at national, community, household and individual levels, which in turn affects nutritional intakes (FAO 1996; Bellamy 1998; Nord et al. 2002).

c) Chronic poverty which is the persistent lack of economic opportunity either to produce adequate food or to exchange labor for the income to purchase adequate food has in no little way contributed to food insecurity in Nigeria. Poverty results from the unequal distribution of economic opportunities and benefits due to political exploitation or poor economic policies.

d) Perpetual problems of processing, storage and distribution of foods in Nigeria, particularly at the village level, have greatly reduced availability of food (FAO 1997; FAO 2001). The local methods of food processing, particularly the roots and tuber (yam, cassava, cocoyam, etc.) are still at the village level which does not allow commercial quantity production. Practically absent is the processing and storage of the fruits, which invariably allows wastage of the same during the harvesting session.

e) Rural to urban migration has resulted in a decrease in the level of available agriculture workers, which has led to a low level of food production.

f) Rapid growth of population in Nigeria inflates the number of the malnourished, and weakens the capacity of the country to become self-reliant in food through domestic production and commercial imports (UNICEF 1990).

g) Inappropriate agricultural policies result in disincentives to local production and marketing are other causes of food insecurity. Often local farmers have no incentive to invest in sound agricultural or environmental practices because of price controls, insecure land tenure

and/or centralized government structures which stifle local initiative.

h) The debt service ratio as a percentage of export of goods and services in no little way has reduced the development in the agriculture sector. Funds which are to be used for acquiring of agricultural equipments and expansion of production are directed to payment of debts incurred from chieftaincy ceremonies and burial ceremonies by the farmers leaving them poorer.

i) Carelessness and ignorance leads to greater losses of agricultural products. These include: inadequate control of pests and diseases in the fields, reducing the potential of harvest; poor harvesting and primitive processing techniques, increasing losses; wastages arising from poor packaging, handling and transportation from farm to market particularly perishable food crops; losses arising from poor storage both at the farm, and terminal market places, at the consumers' home; further losses are sustained due to lack of knowledge of modern techniques of food preservation, tangible loss of food nutrients arising from our food habits, over cooking and taboos; losses sustained in plate wastes at home due to over estimation of food required to feed a household.

j) Irrelevant and inappropriate researches and insincere researchers have in no little way robbed the country of her resources. Poor funding and concern for research in the research institutions has silently killed the interest of the young scientist in the country.

k) Poor infrastructure has been observed to reduce food productivity. Improved on-farm productivity will not increase food security if farm production is unable to make it to market. Farm-to-market roads are poor to non-existent, hampering distribution and access to food.

l) Ethnic conflicts also threaten food security by cutting off whole segments of a country's population from food supplies and disrupting traditional agriculture. The Takum and Tiv inter tribal clash, and the Jos Religion and political unrest are good examples.

Regional and Global Strategies

Regional and global strategies that have been put in place to tackle the food insecurity and insufficiency problem of Nigeria and the continent as summarized by Adeola (2008) include: the Green Revolution Programme, Operation Feed the Nation, 1980's and 1990's, several

World Bank and IMF supported Structural Adjustment programs with important food security components in African countries, The African Priority Program for Economic Recovery, United Nations Program of Action for African Economic Recovery and Development, the Food and Agricultural Organization's Regional Food Plan for Africa, the Plan of Action of the 1996 World Food Summit, Lagos Plan of Action, the Agenda 21 and the Abuja Treaty establishing the African Economic Community, establishment of National Food Security under the Presidency, New Millennium Gold (2006) and seven Point Agenda. All these programmes have failed to achieve the expectations.

Searching Questions

How the same Nigeria (other African countries) manages to produce so much coffee, groundnut, cocoa, cotton and other non-food commodities for export and use the export earnings to import food (rice, wheat and dairy products)? Why did the National Research Institutes, Universities and Polytechnics (Federal and State), Agriculture Development Programme, overseas trainings failed? What are the outcomes of the agricultural loans secured by the federal and state government? What should be the role of Nigerian governments, research institutions, Non-Government organizations, individuals in the renewed efforts to achieve food security? What new programs are needed and how should they be executed?

Effects of Food Insecurity

Food insecurity today has a devastating impact on the families and on the countries in which they live (FAO 1997; FAO 2001). These include: inability to lead healthy and fully productive lives, draining of the social service budgets of the poorest developing countries, lack of the simple physical energy needed to contribute fully to their own livelihood and increase in malnutrition resulting in: life-long medical complications including mental retardation, very high infant and children mortality, limiting body size as a way of adapting to low individual levels of energy (calories) adversely affects the health in three ways: i) premature failure of vital organs occurs during adulthood (for example, a 50-year old individual might die of heart failure because his/her heart suffered struc-

tural defects during early development), ii) stunted individuals suffer a far higher rate of disease and illness iii) severe malnutrition in early childhood often leads to defects in cognitive development.

JABU's Environ: The Challenge to College of Agricultural Science

Ikeji Arakeji town is about 100 years old with less than 50,000 in population and the Yorubas are the major dwellers and the Igedes are the minority. It is a farm settlement focusing principally on tree cash crops (cash crops-cocoa, palm nut). The dominating religions include: Christian, Muslim and Traditionalists with two secondary schools (1 public and 1 private) and three primary schools (2 public and 1 private)

Identified Principal Foods Crops in the Immediate Environ

The principal food crops identified in the immediate environment include fruits (palm nut, plantain/banana, pineapple, orange, pawpaw, pears, wall nut), root and tubers (cassava, cocoyam, yams), cereals (maize), vegetables (*amaranthus*, okra), other cash crops (cocoa, kola nut).

Problems of the JABU's Environ

- Poverty as reflected by the educational level of the populace, accommodation structures, social infrastructure (schools, hospital, market, water supply), quality and quantity of road networks and mode of transportation.
- Agricultural production majoring in cash crops (cocoa, kola nut, oranges), also growing substance crops which are seasonal, deforestation to support growth of food crops, poor storage facilities for the food products, poor road networks to the interior to collect crop products, low mechanizations of farm.
- Village technology of agro-processing methods (laborious, costly and with little turnover).
- Low nutritional knowledge (food management and preparation) of the populace, particularly the women.
- Low knowledge level of birth control and the implications.
- Attraction of the youth to job that fetches immediate money, for example, motorcycle

rider (*okada*), cutting and sawing of wood legally or illegally in the interior forest.

- Lazy and irresponsible couples (husband and wife).
- Low educational level of the populace: The majority in the settlement have no formal educational background and the others are just primary and secondary certificate leavers. These low levels of education have greatly affected the adaptation of new development in the agricultural and food sectors. The government did not encourage establishment of educational institutions in the farm settlements and the populace are too poor to establish private institutions.
- In summary, JABU environs could not produce enough food and have no gainful employment to earn enough to purchase food, hence food is secured.

Potential of the College of Agricultural Science-JABU

- Researchers- Qualified and well experienced staff in various field are available
- Seven (7) Professors, two (2) Associate / Reader Professors, five (5) Senior Lecturers, three (3) Lecturers 1, twelve (12) other categories of lecturers and four (4) technologists.
- Laboratories and equipments-Adequate
- Laboratories:- Food Processing, Food Analytical, Food Microbiology, Food Sensory, Animal and nutrition, Crop and Soil Science, Meteorological Station, University Central Laboratory and University Teaching and Research Field
- Equipments:- Flame Photometer, Gas Chromatography, Atomic Absorption Spectrophotometer, Infra-Red Spectrophotometer, High Power Liquid Chromatography, UV Spectrophotometer, Electrophoresis Apparatus, Shaker with Sieve (Aperture), Oven Furnace (Ash); Kjeldahl (Protein) Apparatus, Spectrophotometer, Soxhlet (Fat) Extraction Apparatus, Rotary Evaporator, Electrophoresis apparatus, etc.
- College Library (E-Library). The Electronic Library of the college enables the staff to update their knowledge with the current development in the technology of the related food materials in the environs.
- Finance- The University is directly sponsored and sustained by a Christian body

which makes finance assessment much easier and direct avoiding the bureaucracy as in the government institutions. The recent interest of Non-Government Organizations within and outside the country has brightened the future of the university.

- Policy- The financial policy of the University is direct which reduces administrative bottleneck work and reduces mismanagement.

CONCLUSION

The university is well-located and equipped, if focused, funded and determined will not fail to sustain the community and nation in term of qualitative and quantitative food if the aforementioned recommendation could be adapted as a blue print. The one battle most people lose is the battle over fear of failure. The day will come when the progress of nations will be judged not by their military or economic strength, nor by the splendor of their capital cities, and public buildings, but by the well-being of their people; by their levels of health, nutrition..... of their children.

RECOMMENDATIONS

- Preliminary Investigations.
- The assessment of nutritional status of the environs: Anthropometry methods, Dietary surveys, Clinical or Laboratory investigations (biochemical, physiological, radiography) and investigations into vital statistics (infant mortality rate, prenatal mortality, famine etc.).
- Food crop and cash crops survey of the environs.
- Proximate analysis of the food crops.
- Study of the local agro processing methods to identified critical, hazard and other points of interests that could be improved on.
- Land capability classification and land use (JABU Environs).
- Extension of the shelf life of the perishable fruits by storing in special but locally fabricated materials.
- Processing of the perishable food crops (pineapple, orange, mango, plantain, yam etc.) into intermediate/ final products such as juice/ drink, jam, marmalade for the fruit based and flours for yam and plantain. Composite

- fruit drink and chips (plantain, cocoyam) can be produced.
- Modifying the local methods of the food processing to improve the efficiency (Palm oil, *garri* etc.).
- Enriching/fortifying some of the locally produced foods (*garri*-soybean, yam-plantain, etc.).
- Educating the local women as to the handling of foods (cooking, frying, and freezing) to reduce destruction of some important nutrients. Management of available food to meet the nutrient needs of the populace.
- Application of modern methods (biotechnology, genetics, engineering fabrication of food) to improve the quality and quantity of foods.
- production of spices/variety of cassava that has uniform shape and sizes. This will improve the mechanization of commercial production of *garri*,
- production of starter culture for *garri*, *fufu* and *akamu*,
- production of variety of fruits that can produce all round the year. This will stabilize fruits in the market and also affordable.
- improving the production and packaging of locust bean (richer than magi),
- production of modified bees for qualitative and quantitative honey production,
- production of modified bees for specific pollination of crops,
- organic manure production at village level technology.
- Develop and evaluate new information technologies and nutrition promotion strategies to deliver nutrition information to consumers and producers so that it can be used effectively in making food choices.
- Integrated farming.
- poultry-fishing-farming of maize/soybean (to feed the poultry),
- poultry/goat/sheep keeping, fadama farming (vegetables-spinach, tomatoes, okra, garden egg),
- cassava farming-goats/sheep keeping/ pig-gery,
- Transforming the viable researches into pilot scale located outside the campus where farmers can be challenged.
- Employing the indigenes under proper supervision to run the pilot research centers.
- Establishing a functioning forum for disseminating relevant information to the farmers and household.
- Conducting free short training program for the environ- educating farmers/household as to improved methods of producing and handling foods.
- Research into wild fruits/crops (lesser used crops)
- Establishing National Annual Agriculture Conference/Workshop
- University ventures/ consult outlets (bread, table water).
- taking over the technological operations to improve the quality of products to the environs.
- adding to the products outlets, for example, plantain chips, fortified *garri*, quality fruit juice, animal feeds etc.,
- establishing agro-business partnership with environs, for example, poultry, piggery, palm and cassava farming and processing.

REFERENCES

- Adeola AO 2008. *Food Crisis-Environment Degradation: Possible Solution*. College of Agricultural Sciences, Joseph Ayo Babalola University, Ikeji-Arakeji, Nigeria, pp.4-6.
- Ayo JA, Onuorah CA, Keswet I 2001. War Against Malnutrition: A Task for the New Millennium. A Case Study of Bauchi State, Nigeria. *Journal of Technical Education*, 4:55-61.
- Bellamy C 1998. The State of the World's Children 1998: Focus on Nutrition. United Nations Children's Fund. From <<http://www.who.foodsecurity.african.countries.nz>> (Retrieved 23 May, 2010).
- Central Bank of Nigeria 2002. CBN Annual Report and Statement of Account, Account 2002, Federal Republic of Nigeria. *CBN Statistical Bulletin, Lagos* 13(1): 14.
- Fund (FGN/UNICEF) 1994. *The Nutritional Status of Women and Children in Nigeria*. National Planning Commission/Child Nations Children Food Lagos, Nigeria, pp. 1-2.
- Food and Agricultural Organization 1996. The State of Food and Agriculture, FAO, United Nations. *Agric. Series No. 21*, Rome: FAO.
- Food and Agricultural Organization 2001. Improving nutrition through home gardening. A training package for preparing field workers in Africa, pp.11-22.
- Food and Agricultural Organization 1997. *Agriculture, Food and Nutrition for Africa. A Resource Book for Teachers of Agriculture*. FAO, Rome, pp. 139-148.
- Halilu M 2010. Population and agriculture. *Spore-The Magazine for Agricultural and Development*, August 2010, p. 2.
- International Institute of Tropical Agriculture 2004. *Nigerian Food Consumption and Nutrition Survey 2001-2003 Summary*. IITA Ibadan, P. 1.
- Nord M, Andrews M, Carlson S 2002. Household Food Security in the United States, 2001. Economic Research Service, U.S. Department of Agriculture. From, <<http://www.fao.foodsecurity.subsahararegion.westafrica.nz>> (Retrieved 23 May, 2010)
- United Nation Children Fund 1990. *The Situation of Women and Children in Nigeria*. UNICEF/FGN, Lagos, Nigeria.