

THOUGHTS ON FOOD-PRODUCING PLANT BIODIVERSITY OF NIGERIA

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ABSTRACT: *The paper is based on the United Nations theme for World Environment Day for year 2013, which is “Think. Eat. Save.” This paper focuses on the first issue of the theme: “Think.” The thoughts in the paper are devoted to how Nigeria can effectively manage the food-production potentials of the country’s plant biodiversity to assure sustainable feeding of the people and contribute to sustainable development of the country. The paper discusses the diversity of food-producing plants of Nigeria, the challenges facing them and the strategies that could be adopted to curb these challenges and ameliorate them. The diverse food-producing plants highlighted in the paper, include root crops, stem tubers, cereals and legumes. Others include vegetables, condiments, edible oils and spices. Mention is also made of fruit drinks, beverages and sugar. There are also comments on wines and beer got from plant products, and the edible fruits and seeds. The paper also considers the foods of livestock and farm animals, in forms such as live foods, browse plants, animal feedstuffs and food left-overs. The paper highlights the challenges facing food-producing plants of Nigeria to include over-exploitation, natural enemies, anthropogenic influences, natural disasters and climate change. Other man-made challenges facing food-producing plants of Nigeria, include the dwindling food-producing population, the ever-increasing populations of human and animal food consumers, that of food insecurity and that of in-appropriate policies on agricultural development in the country. Suggested strategies to curb the challenges facing the food-producing plants and ameliorate the challenges include encouraging large scale agriculture in the country, adopting the best practices in agriculture noticeable in all other countries across the globe and encouraging the youths to take to agriculture. Others include intensification of researches in crop producing, diseases and pest control, among others.*

KEYWORDS: Nigeria, Plant biodiversity, Food-producing plants, Challenges, Man-made Problems, Strategies.

INTRODUCTION

The world has come to accept climate change as “*the greatest crisis ever faced collectively by mankind*” (Foley, 1991). It is therefore not surprising that environmentalists in most parts of the world, presently devote much attention to how to curb emission of greenhouse gases that have been implicated as a major cause of climate change. Many others are working strenuously to mitigate its effects and others too on how to adapt to it. And so when the United Nations (UN) gave the world the theme: “**Think. Eat. Save**” for the 2013 World Environment Day, it serves as timely reminder to environmentalists, that there are other areas besides climate change where “**the shoe is pinching.**” One such area is in the area of foods of adequate quality and quantity for the teeming populations of human beings in the continents of the world. This itself, is also being threatened by the climate change phenomenon, as noted by Awotoye, et al (2009), Dada (2009) and Olaniyi, et al (2009).

The Yoruba people believe strongly in the saying that, once the food problem is taken care of in the multifarious challenges of people, such challenges have become lightened considerably. This is usually put this way:

“Bi ebi ba ti kuro ninu ise, ise buse”

This to some extent, underscores the prime importance the Yoruba people attach to food over other basic necessities of life. It is therefore surprising and strange, that the culture of the same tribe of people, encourages an unsustainable attitude of generosity, to the management of food. This is because the Yoruba people believe that it is only when there are left overs of food after a meal, that one is convinced that the people are adequately fed. This the Yoruba people put in this way:

“Ajeku ni a n mo ayo”

And so, they keep to this attitude in feeding members of their household in their homes, when they host visitors and when they host parties and get-togethers, all of which come up at every available opportunity among the Yoruba people.

The UN World Environment Day Theme of **“Think. Eat. Save,”** is a timely prompter to Yoruba people on their unsustainable and unacceptable attitude to food management. It is also a timely reminder to the world in general, that the time is right to:

- i. Give a thought to the all-important food issue, as the word **“Think”** in the theme suggests;
- ii. Make the people of the world utilize foods properly, as the word **“Eat”** in the theme suggests;
- iii. Conserve as much as possible, our foods as well as our food sources, as the word **“Save”** in the theme suggests.
- iv.

This theme in all its ramifications as analyzed above, reminds environmentalists once again about plant biodiversity and its involvement in food production. It also reminds environmentalists on the need to give thoughts to the issue of appropriate utilization of these food-producing plants and the all-important issue of their conservation, to assure the sustainability of their production. Plant biodiversity comes into the fore in food production, because no other source of foods can match plant biodiversity in the area of food production both for the people and their animals. This is so, not only in the ease with which they can be obtained, but also in their relative abundance, diversity and relative cheaper costs. This importance of plants is further corroborated by the fact that plants constitute the base in the food web of life (Fatubarin, 2009).

Diversity of Food-Producing Plant Biodiversity of Nigeria

In giving thoughts to plant biodiversity of any nation, one can not but thank God for plants. This is not only because of their diversity in terms of species, but also because of the richness in terms of the abundance or populations of the diverse species, particularly in the tropics (Adeyewa, 2009). Plants are also given preeminence over animal biodiversity, because of their biological, as well as their ecological, environmental, religious, cultural and economic importance (Fatubarin, 2009). Prominent among this economic importance of plants, are their

role in providing human beings as well as their livestock, poultry, farm animals and wildlife, with foods, in diverse forms.

Most people who have taken time to study Nigeria at close quarters, will be amazed at the bounty of nature in Nigeria, with this bounty of nature manifested in such things as the diverse ecological zones, which are capable of sustaining diverse crops, the diverse climate and soils of Nigeria, which are also capable of sustaining diverse crops. It can in fact be rightly claimed that all the food requirements of the country for her teeming human populations and livestock species, can be met adequately without resorting to importation to augment her food needs.

Fatubarin (2013), recognized the following diverse groups for the food-producing plants of Nigeria.

- i. **Root crops**, with cassava and sweet potato as the most notable examples. Cassava is reputable not only for being a popular food crop from which staple foods such as gari, eba and fufu are got, it is also a source of a large number of industrial products got from its starch. It is also attaining a reputation as a food type that can be incorporated as a component of bread, another staple food, which like eba and fufu, are common among the diet of most Nigerians irrespective of their social status. Its ability to be propagated with stem cuttings and cheaper maintenance costs, give it a major economic advantage over such other equally popular food crop as yams.
- ii. **Stem tubers** are represented in Nigeria by the yams, cocoyam and Irish potato, which is not as common as the other two, apart from the higher price needed to buy it in the market.
- iii. **Cereals** can be said to be next in importance to the root crops and stem tubers, as staple foods in Nigeria. They are got from the *Gramineae* – the grass family. Their common examples in Nigeria are maize, rice, guinea corn, millet and wheat. Like cassava and yam, maize and to a lesser extent rice, are produced in all the diverse agricultural zones of the country. The cereals are also cheap to propagate through their grains and relatively easy to maintain in the field. Cereals also have a major advantage of being capable of being preserved for a long time than any of cassava and yams.
- iv. **Legumes** probably comes next to the cereals in importance. They are obtained from the *Leguminosae* – the bean family. Their examples include groundnut – a prominent cash crop and others, such as cowpea, pigeon pea and soya beans. While the earlier listed food crops are richer in carbohydrates, the legumes are richer in proteins. In fact, they are the cheapest source of proteins. Groundnut is peculiar among them, for its high content of edible oil and its economic potential as a cash crop.

Besides the above-listed major food items, are others which must also be present to make the diet to be balanced. These other food items include the following:

- a. **Vegetables**, obtained from plants such as okro, spinach, pumpkin and lettuce. A number of other vegetables often described as leafy vegetables obtained from plants, exist. Such plants include *Amaranthus*, *Albizia zygia*, *Adansonia digitata*, *Gnetum* and *Pterocarpus* species. Others include *Vernolia amygdalina* (bitter leaf), which doubles as vegetable as well as a medicinal plant. The vegetables supply the mineral needs of people, as well as the roughage needed to assist digestion in human gut.
- b. **Condiments** are the ingredients that are usually added to vegetables and other forms of soup, for eating the food items earlier described. Prominent among the condiments are tomato, pepper and onion. Some other condiments often added to soup, include the seeds of locust bean (*Parkia clappertoniana*), the seeds of bush mango (*Irvingia gabonensis*), *Piper guineensis* and *Belischemedia manii*, which produce the condiments from their leaves.

- c. **Edible oils** are needed in human diet, to provide the oil needs of the body as well as assisting to make the soups and other food items needing them, to be in proper state which they should be, before eating them. Such oils also make food materials like soups, some cooked foods such as beans, attractive to sight as well as to taste. The main source of edible oils in Nigeria are oil palm (*Elaies guineensis*) and ground nut (*Arachis hypogea*). Other sources include *Monodora* sp, *Xylopia aethiopica*, *Piper guineensis*, *Tetrapleura tetraptera* and *Dennetia tripetala*.
- d. **Spices** as their name implies, help to add flavour to soups and other food items to which they are added. Examples of such spices in Nigeria, are red pepper, black pepper, ginger and garlic.

Besides the above listed groups of food materials got from plants, are others such as the following:

- i. **Fruit drinks**, got from mangoes, oranges, tangerine, lemon, avocado pear grapes, banana and pine apple. These fruit drinks besides being delicious, are rich in minerals and vitamins.
- ii. **Beverages**, which are non-alcoholic drinks, are stimulants which come in with other food items that form the main dish. These beverages are usually got from tea, coffee and cocoa.
- iii. **Sugar** is an item of food usually added to sweeten other foods such as the beverages and baked food products such as bread, biscuits and cakes. In Nigeria, sugar is got from sugar cane.

There are also other food plants such as **wines**, got from the juice of oil palm, raphia palm (*Raphia hookeri*) and to a lesser extent cola (*Cola nitida*). There is **beer** – a socially-acceptable alcoholic drink, got from the fermented grains of certain cereals such as wheat, barley, maize and guinea corn. There are also the **edible fruits and seeds**, such as *Cola nitida* (Yoruba: Gbanja; Hausa: Goro) and *Cola acuminata* (Yoruba: Obi Abata). Other edible fruits include the plantains and bananas and such others as *Vitex doniana*, *Dialum guineensis*, *Spondias mombin*, *Crysophyllum albidum* and *Landolphia* species. There are also the **food supplements** such as *Agaricus* species and *Lentinus edodus*, which one mushrooms. There is also the wall nut *Teracarpidium conoforum* (Yoruba: Ahusa or Asala), African pear (*Dacrynoides edulis*) and oil bean (*Pentaclethra macrophytta*).

It must be appreciated that besides producing foods for human beings, a large number of plants also produce foods for domestic and farm animals in the forms of cattle, pigs, goats and sheep (which are livestock species) and farm animals like camels and donkeys and of course horses, which are animals kept for special uses such as symbol of royalty, horse racing, polo and durbar. There are also the poultry species and the fishes. These animals are usually fed from **animal live foods** in the form of grasses, such as *Andropogon gayanus*, *Panicum*, *Cynodon*, *Agrostis* and *Pennisetum*. There are also the legumes in the form of *Centrosoma pubescens*, *Puereria phaseoloides*, *Stylosanthes* species, among others. These naturally growing plants that form part or the bulk of the vegetation in the savanna regions of Nigeria, are usually fed to these livestock and farm animals, as range, fodder and pasturage.

Beside the animal live foods are the **browse plants**, which provide foods for livestock and farm animals from their foliage, flowers, barks and branches of these woody species. **Animal feedstuffs** are also sourced from cassava peels, soya beans, cereals, ground nut and spent grains from breweries. To these are often added fish offals and other additives in form of vitamins and mineral supplements. All these are grounded in feed mills and packaged as artificial diets

for livestock and diverse poultry species, kept in enclosures. Mention must also be made of **food left-overs**, which are got in some households on regular basis in Nigeria. Taiwo (2013), noted that such left over foods are of diverse types, which wastes that could be avoided, with better management of the foods in each home.

It must be mentioned that many of these food-producing plant biodiversity of Nigeria, are now serving as the sources of raw materials for many agro-based industries in Nigeria. Examples of such industries are the breweries, sugar factories, bakeries and confectionaries. Many of them are also sources of small and medium enterprises, on which many hitherto unemployed youths and many retirees and rural men and women, are now making a living. In essence therefore, if the potentials of food-production plant biodiversity of Nigeria are optimally explored, chances are that they will adequately guarantee sustainable feeding of people and diverse animals in Nigeria. They can also contribute in no small measure to sustainable development of Nigeria, through providing employment for the teeming population of youths of the country. They can also contribute to making a large number of agro-based food industries to flourish, so much so that excess foods from the country, in both raw and processed forms, can be exported to earn foreign exchange for the country. But then, these food-producing plants and food production itself are faced with enormous challenges in our country Nigeria. These challenges are also worth giving thoughts to, as done below in other sections of this paper.

The Challenges Facing Food-Producing Plant Biodiversity of Nigeria

For any thought to be regarded as being deep enough on food – producing plant biodiversity of Nigeria, such a thought must of necessity, extend to all those issues that can affect their quantity and quality, both on a short-term basis and on a long-term basis. And by this long-term basis, is meant their sustainability.

The truth is that all is far from being well with the diverse groups of food producing plants of Nigeria. As part of the plant biodiversity of the country, they too are not insulated from the diverse problems that are accounting for loss of biodiversity in all parts of the planet earth – a loss manifesting in the gradual reduction in the population of each of the species of plants (Fatubarin, 2009b). Fatubarin (2009b), also listed the problems bringing about loss of plant biodiversity to include the following: over-exploitation, problems of natural enemies, certain anthropogenic influences, problems of natural disasters and problems of climate change. Besides these problems that are common to all forms of plant biodiversity, are some other man-made problems relating to dwindling food-producing population in Nigeria, the ever-increasing populations of human and animal food consumers that of food insecurity and that of inappropriate policies on agricultural development in the country. These problems are discussed in outlined below.

Problems of over – exploitation

The problem of over-exploitation when related to the food-producing plant biodiversity of Nigeria, only affects those plant groups that occur as part of the natural vegetation of the country, whose productivity may be adversely affected through unregulated harvesting of their products by the people, who need them as food items. Examples of these are **vegetables** such as *Albizzia zygia*, *Adansonia digitatum*, *Gnetum* and *Pterocarpus* species. There are also the **condiments**, some of which are sourced from plant species that occur as part of the natural vegetation. Their examples include the locust bean plant (*Parkia clappertoniana*), whose seeds are harvested for producing locust bean. Others include the bush mango plant (*Irvingia gabonensis*), whose seeds are also collected and used to spice soups. Others such as *Piper*

guineensis and *Belischemedia manii*, have their own leaves harvested and used as condiments. Certain **edible oil plants** also occur among the natural vegetation. Though they are less important as the oil palm and groundnut as sources of edible oils, people living around places where they are growing, may resort to over-exploiting them when there is a sudden increase in the costs of the regular sources. Such plants include *Monodora* sp, *Xylopia aethiopica*, *Piper guineensis*, *Tetrapleura tetraptera* and *Dennetia tripetala*.

Similarly, as a result of economic recession that is affecting all sectors of the human population, people of the farming communities, may be tempted to over-exploit natural sources of **edible fruits** such as *Vitex doniana*, *Dialum* species and **food supplements**, such as African bread fruit (*Treculia africana*), wall nut (*Tetracarpidium conoforum*, African pear (*Dacrynoides edulis*) and oil bean (*Pentaclethra macrophytta*), for their products, which they will sell to make some money.

Earlier on in the paper, certain **animals live foods**, are listed, which are used to feed livestock and farm animals. These plants include diverse species of grasses and legumes. There are also the browse plants, all of which are part of the natural vegetation of certain places in Nigeria. All these plants may be over-exploited by the diverse species of animals, when there are problems such as drought, affecting their widespread growth.

Problems of natural enemies

The natural enemies of the food-producing plants of Nigeria include the pathogens, the parasites, the pests and the weeds. These natural enemies affect the food crops and the cash crops. In fact, they more than any other problems, are contributing much to the decline in the production of these food-producing crops, on which much have been written. Fatubarin (2008), not only discussed these natural enemies extensively, he also discussed those that affect important food crops such as maize (*Zea mays*), yam (*Discorea* species), cassava (*Manihot utilissima*) and rice (*Oryza sativa*). Others include citrus, tomato, melon and pumpkin. The cash crops discussed by him include cocoa, ground nut and oil palm. His discussions on them include their diverse diseases, their causal agents, their symptoms and their control measures. He also discussed the diverse pests of these food and cash crops. Besides, all the diverse institutes of agriculture in Nigeria, regularly produce bulletins and newsletters on these crops and their diseases and pests.

Problems of some anthropogenic influences

The most remarkable of the anthropogenic influences that are bringing about large-scale destruction of the habitats of naturally occurring food-producing plants, are arbitrary use of fire to prepare farmlands for cultivation and massive land clearing for crop producing in monocultures, and establishment of housing estates for the ever-growing human populations. Besides these common anthropogenic influences, is the use of toxic chemicals in farmlands to control the pathogens and pests of these food producing plants. These chemicals besides poisoning some of the products of these plants, also poison those that live within the crops. Examples of these are some vegetables and mushrooms. These chemicals also find their way into the food web of this semi-natural ecosystem, where they do some damage to some useful animals, such as animal pollinators of plants and those that assist in humus formation in the soils, such as the earthworms (Fatubarin, 2009c).

Problems of natural disasters

Prominent among the natural disasters that affect food producing plants in Nigeria are floods, erosion, drought and desertification. These are problems that can wipe off communities of plants whether they are natural or man-made. These problems not only deplete natural vegetations in which some of these crops are growing, they also wipe off farmlands in which diverse crops are planted.

Problems of Climate Change

Climate change is a phenomenon which adversely affects not only climatic factors, but also other agronomic factors such as soils and lands in which plants are established, either as natural vegetation and as crops. So important is climate change that it has been rightly referred to as “**the greatest challenge ever faced collectively by humankind**” (Foley, 1991). As at now, much is available in the literature, on the diverse ways climate change is affecting agricultural production in Nigeria. Examples of these are Awotoye, Matthew and Makinde (2009) and Olaniyan, Adegbite, Ajiboye and Akinloye (2009), among several others.

THE MAN-MADE PROBLEMS OF FOOD-PRODUCTION IN NIGERIA

The problem of dwindling food producing population in Nigeria

The food-producing plants are not all found among the natural vegetation of the country. Most of them have to be planted in places where their farmers decide to plant them. Such farmers were very many in the past in Nigeria. That was when agriculture was the mainstay of the economy of the country and the farmers are accorded much recognition in the country, because of their contribution to the economy. Today, the story is quite different. The former farmers have now grown old, with many of them having died of old age. Sad enough, is the fact that the youth who should naturally step in to replace the aged farmers, are no longer interested in farming. They now opt for white-collar jobs, which are no longer there, as a result of the economic melt down that has descended on all nations of the world. The implication of this is that there are now fewer hands to work on the farms, to produce the foods needed for the people of the country and their animals.

The ever-increasing populations of human beings and animals in the country

he problem has become compounded by the fact that human populations that will feed on foods produced in the farms are now far more than they used to be in the past. The same goes for the populations of livestock species, poultry and farm animals. The nation is now faced with a situation in which the food consumers far out number the food producers. This has resulted in the Federal Government importing food materials, such as rice sugar and a number of other food materials that were thitherto produced in excess of demand in the country.

The problem of agro-based industries competing with human populations and animals for the products of the farms

Of recent, the problem of inadequate food for the populations of human beings and animals, is being compounded by the ever-increasing human populations and those of livestock and poultry and farm animals and the agro-based industries. These are industries that source the bulk of their raw materials from the farm produce in the form of materials that serve as food for human beings as well as their animals. Examples of farm produce that fall into this category include cassava, which produces food materials or human beings in the form of gari, eba and fufu and livestock poultry and farm animals, in the form of cassava peelings. The same cassava also provides starch for many industries such as those that produce industrial gum and in recent

times the starch component of bread and bakery products. Similarly the oil palm which is a component of the staple diet of most people in Nigeria, is also being used as a major ingredient in making soaps.

The problem of food insecurity

Nigeria is now faced with the problem of getting the bulk of its food requirements for the teeming populations of her people in adequate quantity and quality, all over the year round. Certain foods are produced in excess of demand at certain periods of the year and much of them are either wasted as a result of spoilage or are sold cheaply to buyers, just to dispose of them. The food materials in this category are the root crops, the stem tubers, vegetables, condiments and fruit drinks. The cereals and legumes that are preserved in silos, do not get to certain parts of the country where such silos do not exist, in good time. Where they do, their methods of distribution do not allow most people to get them and if they do, they are usually bought at exorbitant prices. The country is still lacking behind in the practice of food preservation, not only to make them available throughout the year, but more particularly, to make them available at stable prices all through the year.

The problem of in-appropriate policies in agricultural development of the country

Several governments have in the past initiated policies, which on paper, look good, but whose impact has not been felt much by the people. Besides, such policies do not last long enough to make people assess their impact. They are usually replaced by new ones. Nigeria has been treated to policies such as Operation Feed the Nation (OFN), Green Revolution and several agricultural initiatives, such as rice initiative, cassava initiative, soya bean initiative and cocoa initiative, among several others. Good as these initiatives may appear on paper, their impact has not been felt much by the people. This is because food prices are always on the increase, while scarcity of some of the food items, is still being experienced in the country.

Other problems of food production from plant biodiversity in Nigeria, include the following:

- a. Unsustainable farming system of shifting cultivation, that is still prevalent in many rural communities in Nigeria;
- b. Prevalence of small scale farming system, in many farming communities;
- c. Restriction of farming in many farming communities to the rainy season, instead of the irrigation farming system that is now popular around the world, as a veritable means of spreading period of farming round the year, as a result of availability of water for crop production all the year round;
- d. Inadequacy of storage facilities for the products, in the form of silos and other storage facilities;
- e. Inadequate means of transportation of the farm products, as a result of poor net work of roads in many rural communities, where farming is done extensively in the country;
- f. Over-dependence of the farmers on inorganic fertilizers in preference to organic manures, with the attendant consequences of the former;
- g. Lack of adequate incentive for farmers in the form of ready availability of planting materials and other inputs, as well as lack of insurance for the farmers, against crop failures that do occur occasionally as a result of floods, erosion, drought and desertification.

All the above-listed challenges must be adequately addressed, to ensure that the extremely impressive food-production potentials of plant biodiversity of Nigeria is realized.

POSSIBLE STRATEGIES TO TURN THINGS AROUND IN THE CHALLENGES FACING FOOD-PRODUCTION IN NIGERIA

Large-scale agriculture in Nigeria

With the current large population of the country and the rate at which the country's population is increasing, it is not out of place to recommend that Nigeria should by now be far more committed to large-scale agriculture. This large-scale agriculture is being suggested as a major way out for the country, not only to feed the massive human population of the country, but also to feed the equally massive population of the livestock, poultry and farm animals in the country. Nigeria should at all times be self sufficient in food production. She should be able to get enough food in periods of natural disasters and must be able to get enough to assist her neighbours in diverse countries in Africa, when they are facing urgent needs for food.

Much as the country will still need her people to get involved in small scale forms of agriculture within their households and neighbouring farmlands, it is only large-scale agriculture that can meet the nation's needs for massive food production. This is where the large-scale farmers both among the natives and foreigners come in. all the government should continue to do, is to make the conditions attractive for such farmers, to come in and invest massively in agriculture. Such attractive conditions must of necessity include bank loans, access to lands, access to farm inputs, machinery and other conditions that attract investors to farming.

Adopting the best practices in agriculture

To obtain the best from agriculture, efforts must be made to adopt the best practices in it. Such practices include those that will improve the soil of the agriculture lands, replace as much as possible, the vegetation removed from the land and ensure sustainable source of water for the crops. To achieve these, the following are being recommended:

- i. Ensure that a semblance of crop rotation is practiced on the land;
- ii. Ensure that agro-silviculture is practiced on the land. This will involve that the farmer should plant appropriate species of trees on the land. Such trees could be any proven species for that zone among the indigenous and exotic species;
- iii. That the farming should incorporate irrigation, which will make an all-year-round production of certain food crops such as maize, onion and vegetables possible on the land. It can also incorporate some fisheries.

Encouraging the youths to take to agriculture

The people in leadership positions in Nigeria, be they in government or outside government, must appreciate that the issue of youths must be attended to in Nigeria, to guarantee a safe-future for the country. It is an issue that deserves being handled thoughtfully, thoroughly and responsibly. It is not going to be easy to persuade any youth who has his or her hopes on white-collar job, to take to any thing sort of this, talk less of agriculture. If therefore they have to be persuaded to take to agriculture, this has to be done with a large measure of understanding and with some persuasion and encouragement.

Within the country, models are gradually evolving that will prepare the youths adequately for agriculture, while in institutions of learning. This is being done in Joseph Ayo Babalola University. Ikeji Arakeji in Osun State. This model involves making the students to combine

their academics with different aspects of practical agriculture, each student is interested in managing as pet projects, while still in the university. It is such projects that the students focus upon, after graduating from the institution. Such students are fully used to what such projects involve. They will therefore be able to stand on their own, as well as serve as effective extension officers, if they are so employed after their graduation. Another admirable model is the “**Leventis Foundation Model**,” which prepares youths in practical agriculture, within a few months. The “Leventis Foundation Model” is in Ilesa and in a number of other towns across the country. It is a model that involves making the students to receive some modest allowance while on such training, which involves diverse agricultural programmes. It is a model Federal and State governments can replicate across the country. The “OYES” programme of Osun State government, is also a model that can be adapted to draw in youths massively into agriculture and forestry. This model involves giving the youths participating in it, diverse training in different areas of community development, such as environmental sanitation, environmental beautification, road marshals among others. This model can be made to incorporate farming, as well as silvicultural practices. It can also be expanded to accommodate as many youths as each government can afford. It will not be difficult to persuade such youths to settle fully on agriculture, after their disengagement from such a programme, if they recognize that their state would guarantee sustainable assistance in diverse forms to them.

Other Strategies

Our governments should take full advantage of the location of International Institute of Tropical Agriculture (IITA) in Nigeria, to benefit from its numerous programmes aimed at boosting agriculture in the tropics. In particular, the cassava improvement and multiplication programme must be embraced, so that each state can derive the maximum benefit from it and similar programmes by other research institutes in the country. All establishments involved in researches in crop production, diseases and pest control, must be properly funded, irrespective of where they are based, either in the institutes or the universities. They must also be adequately coordinated, to make their impact felt in crop production in Nigeria.

CONCLUDING REMARKS

Food production is crucial to self pride, independence and dignity of each nation. Because of Nigeria’s population, status and growing importance in the comity of nations, the country can not afford to lack behind in food sufficiency. It is therefore imperative for the country to adopt all proven food-producing strategies, that are being adopted by other countries of the world that are blessed with massive populations like China and India. Nigeria should also borrow some leaves from those countries of the world, in the fore-front in all indices of development like United States of America, in their food production strategies. It must be remarked that Nigeria cannot be stripping her land of the much needed vegetal cover and expect sustainable food production from her plant biodiversity. Asiodu (2013), in his Chairman’s speech at a special forum on the all-important issue of Conservation of biodiversity, noted that the natural vegetation cover of Nigeria, estimated at well over 30% of the entire country in 1960, has at 2013, decreased to just over 4% of the vegetal cover of the country. This development is not in the interest of our lands and soils, which are through such exposure to idemencies of the weather, subjected to erosion hazards, as well as insolation from the heat of the intensive sunlight of the afternoons in our country. All these are not good for crop farming in a country. The PUNCH editorial of Wednesday, July 31, 2013, summarized the position of all patriots of Nigeria, on the food issue in Nigeria. The editorial with the caption “**That disgraceful food import bill**,” revealed that Nigeria spends 11 billion dollars in importing food each year, with

the bulk of the food materials being those that can be grown locally, with enough left over for exports. Worse still, the editorial noted, the monstrous import bill is rising by 11 percent annually. 60.9 percent of Nigerians as the editorial noted, are living in abject poverty, with youth unemployment put at about 50 percent and 75 percent of its 80 million youths under-employed. The bulk of the perishable foodstuffs in the country are rotting on the farms, or en-route from them as a result of bad roads within and between the farming communities and the market centres in major towns and cities. Farming activities which should attract youths in large numbers, are not made attractive to the youths. As a result of this development, the food-production potentials of plant biodiversity in Nigeria are not being realized. Hence sustainable feeding of the people from these crops is not being realized, neither are these food-production potentials of our plants being effectively harnessed to contribute to sustainable development in such things as producing enough raw materials for our agro-based industries. Pronouncements of bumper harvests are never translating into food abundance or lower prices. With this unfavourable scenario, the time for a deeper thought on the all-important food issue in Nigeria, is now. Tomorrow may be too late.

REFERENCES

- Adeyewa, Z.O (2009) Your Planet needs You – Unite to combat Climate Change. A Lead paper presented at the 2nd Annual Conference of the Institute of Ecology and Environmental Studies. Obafemi Awolowo University. Ile-Ife. Vol.2. 20 Pp.
- Asiodu, P (2013) Chairman’s Remark at the Green Lecture on Environmental Action. The PUNCH of May, 1st July, 2013.
- Awotoye, O.O, Matthew, O.J and Makinde, O (2009): Effects of Climate Variability/Change on Agricultural Production in the Tropical Sub-humid South West Nigeria. 2nd Annual Conference and Gold Environment Award of the Institute of Ecology and Environmental Studies. Obafemi Awolowo University. Ile Ife. Nigeria Vol.2: 67-74.
- Fatubarin, Ayo (2008): Plant Pathology. Keynotes Publishers Ltd. Ilesa. Nigeria. 78 Pp.
- Fatubarin, Ayo (2009a): Tropical Ecology. Keynotes Publishers Ltd. Ilesa. Nigeria. 127 Pp.
- Fatubarin, Ayo (2009b): Nigeria and The Global Problems of the Environment. Keynotes Publishers Ltd. Ilesa. Nigeria. 94 Pp.
- Fatubarin, Ayo (2009c): Ecosystem Ecology. Keynotes Publishers Ltd. Ilesa. Nigeria. 102 Pp.
- Fatubarin, Ayo (2013): Economic Botany. Keynotes Publishers Ltd. Ilesa. Nigeria. 131 Pp.
- Foley, G (199): Global Warming: Who is taking the heat? Panos Publications Ltd London. UK. 104 Pp.
- Gills, L. S (1988) Taxonomy of Flowering Plants. African FEP Publishers Ltd. Onitsha. Nigeria. 338 Pp.
- Oyaniyi, A.O, Adegbite, B.A, Ajiboye, A.J and Akinloye, K.F (2009): Implications of Climate Variability and Change on Food production in Nigeria. 2nd Annual Conference and Gold environment Award of the institute of Ecology and Environmental Studies. Obafemi Awolowo University. Ile-Ife. Vol. 2:75-80.
- Olorode, O (1984): Taxonomy of West African Flowering Plants. Longman Group Ltd. 154 Pp.
- Taiwo, K (2013) Lead Paper on the World Environment Day Theme of Think. Use. Save. Putting an End to Food Waste. 6th Annual conference of the Institute of Ecology and Environmental Studies. Obafemi Awolowo University. Ile-Ife. Pages 18 – 33.

Other Reference

The PUNCH EDITORIAL (2013): That disgraceful food import bill. The PUNCH, Wednesday, July 31, 2013.