



# Climate Change

## Africa's Shrinking Forests: A peep into Nigerian situation and its implications on socio-economic development

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### General Note



Article is recommended to print as color version in recycled paper. *Save Plants, Save Climate.*

### ABSTRACT

The study examines the state of Nigeria forests; it highlights the importance of forest as well as the implications of its loss. The implications include a general decrease in evapo-transpiration and a reduction in its ability as a carbon sink thereby contributing to global warming. It further examines some conservation strategies like biodiversity protection through the establishment of forest reserves and continuous improved felling techniques in order to achieve sustainable logging which will bring about sustainable forest management for economic development of the country. It also suggests ecotourism as a form of boosting economic development. Finally, the paper

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recommended that there should be development, implementation and enforcement of an integrated, holistic policies to change production and consumption pattern, development of the ecotourism industry as well as the preservation of bio-diversity by establishing more forest reserves where the exploitation of all forms of forest resources are prohibited.

**Keywords:** forest, shrinking forest, deforestation, conservation, economic development, forest resources

## 1. INTRODUCTION

A forest is a large area of land covered with trees or other woody vegetation. They are the dominant terrestrial ecosystem on earth which accounts for 75% of the gross primary productivity of the earth's biosphere and 80% of the earth's plant biomass (Pan, *et. al.*2013). Forests are essential for life on earth, their impact on the environmental system as a whole is overwhelming whether one thinks of the benefits as source of food, herbs or its micro or macro climatic benefits. The tropical rain forest is the largest biomass on the planet and it is home to the majority of animals and plant species. Lomborg (1998) asserted that the rain forest region has several hundred species of trees within just a few kilometers. It is quite unfortunate that a lot of tropical rain forests with all their vital resources are fast disappearing, shrinking alarmingly as a result of deforestation. According to the FAO (2005), deforestation worldwide in the 1980s was as high as 15 million hectares per year for the tropical forest alone, which further accelerated in the 1990s for most part of the world. It is one of the biggest problems currently faced by the world community.

In 1992, Africa's rainforests covered about 7% of its land surface and it is the most depleted of all the forests in the tropical regions with only 30% of its historical stands left (UNEP 1994). For example, Nigeria is endowed with huge natural resources which provide sustenance and foundation for her social and economic development. Unfortunately, these natural resources especially forests resources are misused due to ignorance, poverty, overpopulation and greed. This has led to series of environmental degradation in the form of soil, air and water pollution, and the degradation of land and plantation vegetation.

There is an urgent need to universally safeguard the forest resources in order to save it from total depletion. New approaches for effective management of the resources should be designed for its sustainable use and viable economic development.

## 2. DEFORESTATION IN NIGERIA

Nigeria's total land area of 923,773km<sup>2</sup> is richly endowed with abundant and diverse resources both renewable and non-renewable (Adeyinka, Bankole and Olaye 2005). It has a population of about 150,000,000 which is estimated to grow at about 2.5% per annum (Orimoogunje, 2012). The

country is blessed with mineral, physical and energy resources. The mineral wealth of the county is vast and should enable it to establish a firm industrial base for rapid economic development. The environment provides all life support systems in the air, water and on land as the materials for fulfilling all developmental aspirations. The mangrove and rainforest of the south and the savannahs and semi-arid ecosystems of the north are potentials for development. Unfortunately, this important and valuable resource is not sustainably used or managed. Weller, (2005) asserted that the current pace of environmental change is prompted partly by poverty and a large population which continues to grow at an alarming proportion. The Nigerian environment today is faced with many problems, arising from the impacts of human activities and natural phenomenon.

The FAO (2005) reported that Nigeria has the highest rate of deforestation of primary forests between 2000 and 2005. According to Abah (2011), Nigeria has lost 55.7% of its forest at an annual rate of 3.5%. Between 1990 and 2010, Nigeria have nearly lost half of her forest cover, decreasing from 17,234 to 9,041 hectares (<http://www.fao.org/forestry/sfm/24447/en>)

Odjugo (2010) in Abah (2011) reported that a study conducted from 1901 to 2005 showed an increase in temperature of 11<sup>0</sup>C in Nigeria while the global estimated temperature increase was only 0.74<sup>0</sup>C. There was also a decrease of 81mm in the amount of rainfall within the period.

About 65% of Nigeria's population lives in the rural area (Orimoogunje 2012) which shows that majority of them rely on fuel wood as source of energy mainly for cooking. Akinbani (2003) affirmed that the usage of wood for cooking is higher in rural areas of the country where more of the population is concentrated. 90% of Nigerian population was said to rely on kerosene as the main source of energy for cooking but because it is expensive and often unavailable, 60% of them use fuel wood instead. This coupled with illegal logging activities accounted for the high rate of deforestation in the country. The rural dwellers also see forest as a source of income, hence, the forest continue to shrink. Globally it is estimated that about 27,000 plant species were lost annually as a result of the destruction of the rain forest (Wilson, 2002 in Abah 2011).

### 3. FOREST AND ITS ENVIRONMENTAL ROLES

Forests play fundamental roles in the basic functioning of the planet earth. They generally contribute actively to the world's environmental stability and are used as economic resources to produce subsistence and industrial products. They have both cultural and recreational values. Forests provide many ecological functions among which are:

1. Protection of water sheds or stabilizing mountainous areas. It reduces the amount of rain water which runs down the slope thereby reducing siltation and increasing the amount which percolates deep down into the soil.
2. The forests and woodlands of the tropics are rich sources of edible and medicinal plants, shelter, fibers, bushmeat, honey and nuts are also gotten from the forests.

3. Lomborg (1998) wrote that the most obvious importance of forest is estimated to be about 5,000 commercial products ranging from construction, timber, furniture, paper and firewood.
4. Forests play crucial roles in climate regulation and constitute one of the major carbon reservoirs on earth (Adesina, 1997; NEST, 1991). They prevent increase in greenhouse effect that contributes to global warming by absorbing carbondioxide. They are carbon sinks.
5. Protection against desertification.
6. Provision of field for education/ scientific research and for tourism. They offer recreation for urban dwellers.
7. They are sources of revenue generation for the tourism industries.
8. They are direct sources of energy or its raw materials like charcoal and fuel wood.
9. Sources of employment in the labour intensive industries such as sawmills, plymills, industrial and residential constructions and in furniture manufacturing.
10. The bark of trees like Acacia produces Arabic gum which is used in the manufacturing of ink, hair glazing cream, and glue in the plywood industries. Latex produced from rubber tree is processed to produce tyres, gloves and hoses, and many plastic materials.
11. Various plant communities in the tropics support a wide range of wildlife which includes herbivores and carnivores such as monkeys, leopard, and cheetah. Wildlife provides sources of protein and also fetches the rural dwellers cash from the sale of forest products.

### *Causes of Deforestation*

Deforestation is the clearing of forested land either for agricultural purposes, for logging and for use as firewood without replacement. The world's tropical forests are vanishing at an alarming rate and its natural resources such as fossil fuels, and forest products are being used up at an astounding rate (Funmilayo, 2010a). According to the FAO's estimates, the world's forest decreased by some 180 million hectares between 1980 and 1985, this represents an annual loss of 12 million hectares (Awake, 2003). The world's natural forests are experiencing land use change due to both proximate (direct) and underlying (indirect) causes.

### *Direct Causes*

1. Fundamental human activities, or occupation in the form of agriculture, it is the conversion of forested land for agricultural and cattle raising, and the need for increase in food production.
2. Urbanization and industrialization: This has undoubtedly great impacts on the natural environment. Fields, farms and forests are being replaced as a result of urban development. Ayoade (2006) asserted that the high rates of population growth, urbanization and urban expansion create environmental problems especially as the urban growth and expansion are largely uncontrolled and unplanned which has effects on the natural forest. Urbanization brings about infrastructural development which involves road construction and others. The

resultant effect is the opening up of undisturbed, mature forests to pioneer settlements, logging and unsuitable form of agriculture.

3. Wood extraction in the form of commercial timber, electric poles, fuel wood and charcoal degrades mature natural forests.
4. Forest fire is also a direct cause of deforestation.

### *Indirect Causes*

1. Poverty brings about environmental degradation in the quest for their basic needs, the poor tends to fall back on his immediate environment for survival. Forest is their nearest point of contact which they destroy in order to get fuelwood, timber, charcoal and other resources for survival both for domestic and commercial purposes.
2. Absence of good Governance
3. Unsustainable consumption pattern
4. Lack of appreciation for the non-economic values of forests
5. Imperfect local, national or international markets. (Funmilayo, 2010a)

## 4. ENVIRONMENTAL IMPACTS OF DEFORESTATION

Regular and continuous destruction of forest resources has resulted to the loss of its bio-diversity. Some of the potential repercussions of degrading the forests are the loss of trees with its concomitant ecological values to the wood industry, decrease in evapo-transpiration with a resultant reduction in atmospheric moisture, changes in biochemical cycles and the alteration of local rainfall and consequently climate change and hydrological process (Aweto 2001). Others are destruction of wildlife resources, contribution to global warming, opening up of large areas of agricultural lands to the effect of sheet and gully erosion, reduction in the landscape capacity to intercept, retain and transport precipitation, and a reduction in timber and fuel wood production.

Continuous degradation of the forest reserves has major effects on other segments of the economy. This is manifested in the rapid disappearance of forest cover as a result of changes in land use which often leads to erosion, loss of biodiversity, soil degradation and unfavourable hydrological changes (Abah, 2011). Forest destruction greatly increases an area's vulnerability to natural disasters like flood and drought, crop failure, spread of diseases and water contamination (MEA, 2005).

Valuable ecosystem services are lost due to forest degradation. Destruction of species habitat has altered nitrogen, phosphorus, sulfur and carbon cycles (MEA, 2005), this has increased the frequency and severity of acid rain, algal blooms and fish kills in rivers and oceans and has contributed to global climate change. The loss of trees has led to a substantial reduction of the earth's ability to produce oxygen and use of carbondioxide by forest which is a main contributor to global climate change. It has also led to the loss of many species that provide valuable and unique

roles to the ecosystem. The loss of animals that could have served as biological control agents and plants that could potentially provide higher yielding crop varieties and pharmaceutical drugs to cure existing or future diseases is a major concern to environmentalists.

## 5. NIGERIA FOREST AND ECONOMIC DEVELOPMENT

Development is the process of improving the quality of all human lives and capabilities by raising people's levels of living, self-esteem, and freedom. To an economist, development means achieving sustained rates of growth of income per capita to enable a nation to expand its output at a rate faster than the growth rate of its population (Todaro & Smith 2011).

The livelihood of more than half of economically active population in the developing world like Nigeria directly depends in whole or partly on the environment through agriculture as well as animal husbandry, hunting, fishing, forestry and foraging. This is the foundation of the Seventh Millennium Development Goal: to "ensure environmental sustainability" because environmental quality affects, and is affected by economic development.

When deforestation is not checked, it can lead to a number of environmental maladies that overtime can greatly lower agricultural yields and increase hardships especially in the rural areas. Clearance of vegetation at high elevations may increase the exposure of cultivated lands at lower altitudes. Soil materials that have been transported by surface flow often silts rivers and pollute drinking water. This may limit the benefits derivable from the river as well as cause different type of water borne diseases. Plants help retain rainwater, which percolates through the soil into underground water reserves thereby replenishing it. The loss of forest leads to a decrease in the rate at which groundwater is replenished and can even cause a decrease in local rainfall. A drop in the water level may subsequently lead to the death of plants with shallow root systems, particularly young trees. This and other chain of events associated with forest degradation can have devastating impacts on both local and regional economy.

## 6. FOREST, TOURISM AND ECONOMIC DEVELOPMENT

Tourism can be referred to as any activity that voluntarily and temporarily takes a person away from his/her usual place of residence in order to satisfy a need, either for pleasure, excitement, experience and or relaxation (Ayodele, 2002). If tourism is properly managed, it could be a largest revenue yielding aspect of the economy of many nations both at local and international levels. The tourism industry, if fully developed in Nigeria, will help to diversify the economy from the current high dependence on oil.

Ecotourism or wildlife based tourism is nature-based tourism that involves education on and interpretation of the natural environment. It is one of the types of tourism that can help to boost the tourism industry and enrich Nigeria economy if sustainably managed. Boo, (1991) in Ayodele (2002) defined ecotourism as a type of tourism that involves travelling to relatively undisrupted

natural areas with the objective of admiring, studying and enjoying the scenery and its wild plants and animals as well as any cultural features found there. This implies that for any successful ecotourism to take place there must be a reserved area where there are undomesticated and untamed wild animals and uncultivated wild plants.

When forests are conserved, wildlife resources are also conserved. Protected areas in Nigeria that can boost ecotourism are the national parks controlled and financed by the federal government and the game reserves controlled and financed by the state governments. Ayodele (2002) asserted that Nigeria has 32 gazetted game reserves and 6 national parks. Aremu (2001) confirmed the addition of other two national parks.

Wildlife is a national asset that is expected to contribute in one way or the other to the National economy; unfortunately, it remains largely underdeveloped in Nigeria. The country is not getting its fair share of the world ecotourism market due to the following reasons according to (Marguba, 2001).

1. lack of international awareness on Nigeria's cultural and natural resources
2. lack of infrastructural development like lodging, catering, camping grounds, roads, and others.
3. poor reception at points of entry
4. lack of security
5. lack of political stability and continuity and so on
6. Wildlife-based tourism is an irreplaceable national heritage which can be harnessed for the transformation of the rural areas into model towns; through the provision of revenue and infrastructure for accelerated rural development. If national parks and other equivalent reserves are developed, they can help to transform rural areas into centres of attraction and generate revenue in foreign exchange.

## 7. THE WAY FORWARD

There is the need to conserve the earth's vitality and diversity. This can be done through the following:

*Conservation of life-support systems:* Conservation supporting systems are the ecological processes that shape climate, cleanse air and water, regulate water flow, recycle essential elements, create and regenerate soil and keep the planet earth fit for living.

*Conservation of renewable and non-renewable resources:* Resources are the base of all economies. These include soil, air, water, and forest product such as timber, fibre, nuts, herbs (medicinal plants), meat, skin, hooves, and horns of wild animals. It also includes ecological systems such as

those of rangelands, forests and water. The renewable resources will perpetually renew themselves if they are used sustainably.

*Conservation of biodiversity:* These include the species of plants, animals and other organisms. The diversity of nature is a source of beauty, enjoyment, understanding and knowledge. It is the source of all biological wealth and genetic materials for agriculture, medicine and other industries (Orimoogunje, 2012). The conservation of species of plants animals and micro-organism improve the health of the planet and its inhabitants.

The threat to deforestation and loss of habit can be minimized by providing training and assistance to farmers and rural dwellers in the management of the forests for sustainable uses (NERC, 2002). This can be attained through education and research programs to acquaint farmers with the right practices to boost food security (Mesike et al., 2015: Eludoyin, 2015).

In order to preserve biodiversity there should be the establishment of forest reserves where all forms of exploitation of forest resources are prohibited in order to preserve the natural plant communities. Communities should be involved in policing illegal timber felling through the ban of activities such as bush burning felling reserved trees, barking trees for making bee hives, settlement within the forest, and farming or grazing in non grazing areas within the forest.

Government should provide funds to facilitate employment of qualified and adequate number of forest rangers to manage the reserves. Necessary equipment for field and laboratory observation should be provided.

Environmental education should be given premium attention in Africa. Although in Nigeria, many farmers today are already aware to some extent that their actions in various ways degrade the environment. These farmers notwithstanding need further awareness in conservation practices that they are not completely helpless. The agricultural extension workers need to reach out to the farmers to demonstrate to them how to use various conservatory agricultural techniques and to encourage them to apply them.

The influence of policy and legislative frameworks in the forest sector is very important. Legislation should prevent illegal logging. The violation of forest management and operational rules should be subjected to graded sanctions based on the seriousness and context of the offence. Ostrom (1996) affirmed that anybody who violates operational rules must face sanctions adapted to the nature of the offence.

Logging activities affect the environment but careful and operational practices; can minimize disturbances to the forest. To achieve a sustainable logging, there should be continuously improved felling techniques, improved overalls forest management, innovate harvesting methods, and downstream processing coupled with commitment from timber producing countries.

The following methods can also be adopted:

- Forest monitoring through the use of satellite and remote sensing techniques. Ayobami and Ekundayo (2006) indicated the forest regeneration after logging and review of inventories can be monitored through remote sensing.
- Reduction in the annual rate of logging
- Selective logging should be practices

Other forms of conservative measure include the involvement of youths in conservation for the preservation of African forest (Ayogu et al. 2015). Afforestation programmes should be implemented in order to slow down the alarming rate of deforestation and resource degradation in the country. Getting improved seeds and inputs such as fertilizers across to farmers so as to stop or reduce the rate of slash and burn practices and other practices that are harmful to the forests. There should also be financial support for successful implementation of agro forestry programme.

Finally, premium should be placed on ecotourism in Africa since it serves a dual purpose of conserving the forests as well as its wildlife found therein. This will invariably brings development to the source region and also increase the revenue generated as a result of constant patronage.

## 8. CONCLUSION

Tropical rainforest is disappearing at an alarming rate. Indeed, the forest is shrinking faster than we ever thought and considering the rate at which trees are chopped down without regeneration efforts, all the forests will disappear in a short distant time, hence the need for reforestation. The environmental implication of losing the forest resources such as its potential influence on surface albedo, reduction of timber and firewood therefore calls for rapid action in order to conserve the forest. For every single tree cut, three trees should be planted in its replacement. There is an intricate and inseparable web between the environment and poverty. The overwhelming majority of Africa's citizens inadvertently destroy the environment in an attempt to survive. Reducing poverty can therefore play a pivotal role in environmental protection.

## RECOMMENDATION

It should be noted that tropical timber can be harvested without doing permanent damage to the diversity of life. It is therefore recommended that Governments in Africa should implement effective policies to change unsustainable production and consumption patterns. Trade agreements should not undermine such policies. Social, cultural and ecological values of forest should be fully integrated in the management of forests resources. Strict application of laws for the protection of forests in all African countries should be encouraged. The implementation and enforcement of integrated holistic policies to change logging consumption and production pattern should be enforced. Preservation of biodiversity by establishing more forest reserves, national

parks and game reserves will be a good approach to help in preserving the natural plant communities from total disappearance. Efforts should be made to have more conserved areas in the country and this can be done by identifying an area for conservations and then getting in touch with the local people who possibly are the owner of such area since wildlife-based tourism centres are usually established mostly in the rural areas. To boost ecotourism in Nigeria, there should be adequate publicity in order to encourage the influx of tourists from both home and abroad, development of standard infrastructures like lodging, good roads, water and others. Adequate security should be put in place. Since it is the culture of the people to hunt game, effort should be made to integrate small holder of game farming (glasscutter, giant rat, rabbit, guinea fowl and snail) into agricultural systems to reduce poaching activities within the reserves. There should be adequate publicity of various ecotourism centres through the mass media such as the radio, television, flyers, dailies and other avenues of getting information across to people. There is the need to re-orientate our value system to include the habit and culture of recreation and appreciation of nature. This will encourage domestic tourism among Nigerians and Africa as a whole. Taking all these into consideration will bring about a sustainable forest management and economic development not only in Nigeria but in all African nations.

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