

DEPLETING FOREST RESOURCES OF NIGERIA AND ITS IMPACT ON CLIMATE

***AIGBE, H. I. AND **OLUKU, S. O**

***Department of Forestry and Wildlife Management,
University of Port Harcourt, Port Harcourt, Nigeria.**

****Mac Adam Publishers, Benin City.**

***Corresponding author's Email: igaigbe@yahoo.com**

ABSTRACT

Nigeria is well endowed with forest resources but the excessive exploitation of these forest resources is a source of concern and threat to the economic, social and environmental importance. The forest, apart from providing a large proportion of the global supply of timber and fuel, also provide a wide range of non – wood products and environmental functions. These products include bush meat, medicine, watershed protection, stabilisation of the hydrological regime and carbon sequestration. Forests regulate global climate and act as a major agents of carbon exchange in atmosphere. The rate of destruction of forest resources has now become a global issue. In Nigeria, natural forests have reduced drastically and its impacts on climate change are increasing. Measures for minimizing deforestation and managing climate change need to be developed urgently. This paper examined the deteriorating forest resources of Nigeria and its impact on climate change.

Key words: Forest Resources, Deforestation, Forest Status, Climate Change

INTRODUCTION

Nigeria is Africa's largest wood producer with an annual harvest estimated in 1998, of more than 100 million cubic meters (Aroufor, 2001). Nigeria used to be a major exporter of timber resources with industrial round wood export in 1964 at 781,200 m³ and a corresponding value of US\$ 36.10 million. This dropped to 26,900m³ in 1976 (Aroufor, 2001). The scenario as experienced in 1976 has not improved and the vegetation had continued to deteriorate. Today, Nigeria is not only a net importer of wood, but the situation of the forest estate and the environment is very precarious. The forest estate which is only about 10 million hectares (10% of total land area of Nigeria) is declining at a rate of 3.5% annually due to encroachments, excisions and outright de-reservations. It is estimated that the Sahara desert is encroaching southwards at a rate of about 1 km per year (Aroufor, 2001). According to Obioha (2009), Nigeria is presently losing about 351,000 square kilometers of its landmass to the desert, which is advancing southward at the rate of 0.6 kilometers annually. The consistent reduction in rainfall leads to a reduction in the natural regeneration rate of land resources, which presents a chain of causal reaction that, makes people to exploit more previously undisturbed lands leading to depletion of the forest cover and increase on the sand dunes deposit. The strong and worrisome increase of 425% in the extent of sand dunes deposits between 1976 and 1995 is a strong pointer to land resource loss due to climate change. (Fasona and Omojola 2005).

The level of deterioration of forest resources is a factor of uncoordinated land use policy and other forms of land-use such as agriculture, grazing, industrialization, urbanization and water management leading to formation of deserts, bare surfaces and general environmental degradation. In the rainforest region, deforestation has risen to an alarming rate that urgent policy instruments are needed to salvage the forests and reduce its environmental

impacts. The government have been factoring into their policies and programme measures for minimizing deforestation. But these efforts by governments and their agencies to protect the forests seem not to make significant impacts. The displacement and depletion of forest resources had resulted in significant climate change. The world today is faced with the threat of climate change. The temperature of the earth is rising so rapidly in recent time such that there is general fear that with the present trend the situation would be very difficult to cope with in the near future if urgent measures are not taken. From 1850, the first time there was consistent measurement of temperature; it has risen by 0.76% and fourteen of the warmest years across the globe since 1850 were recorded between 1995 and 2000 (Ogboi, 2011). The impacts of the rising temperature in these years include the melting ice in the Arctic region and the Alps, unusual rain and snowfall patterns, drought and heat waves, and high intensity of tropical cyclones. All these impact could be attributed to deforestation.

Status of Forest Resources in Nigeria

Formal forestry activities began in Nigeria in 1897, with the creation of a Department of Woods and Forests for the Colony and Protectorate of Lagos, which itself was proclaimed only a year earlier, in 1896 (Lowe 1990). A recent forest resources study carried out by the Federal Department of Forestry (1998), revealed that the forest estate of Nigeria has been very highly depleted. It was estimated that only about 974,674 hectares of the forest reserves is productive while another 2,342,147 hectares of free areas is partially productive. The total growing stock in terms of timber volumes is as shown in Table 1

Table 1: High forest gross timber volumes, excluding bark by forest designation and forest types

Forest Land Designation	Forest Type	Area (ha)	Gross Volume (m ³)
Forest Reserve	Lowland Rainforest	788,053	140,682,489.73
	Freshwater Swamp	186,621	24,397,003.35
	Sub Total	974,674	165,079,493.08
Free Area	Lowland Rainforest	905,930	120,742,244.93
	Freshwater Swamp	1,424,995	187,474,508.28
	Mangrove Forest		
	Sub Total	948,430	212,613.14
		2,342,147	308,429,366.35
Sum Total	Gross Total	3,316,821	473,509,259.43

Source FDF (1998): Forest Resources Study, Nigeria

In view of this dismal trend in the forest resources of the country, the need to manage the forests of Nigeria on a sustained yield basis has never been more felt in recent times. The growth rate of the natural forest is quite low, about 1 to 1.5 m³ of round wood per hectare per annum and this is a serious constraint. Afforestation in the past has not responded with the required vigour as the area under forest plantations of all types by 1998 was only 184,611 hectares with a growing stock of 78,600,160 m³ (Aruofor, 2001).

In Nigeria, natural forest occupied a total land area of 349,278 km² or approximately 35 percent of the country's total land mass of 997,936 km² (Nweze, 2002). But about 60

percent of the country's forests disappeared between 1850 and 1960 (Morakinjo, 1991). In the country, forest area has decreased from 14.9 million hectares in 1980 to 10.1 million hectares in 1990 and to 9.5 million hectares in 1996 (Federal Department of Forestry, 1997). On the average it decreased at the rate of 0.4 million ha per year but the rate of reforestation was put at 0.032 per year (Nweze, 2002). Out of the land mass of 997,936 km², only 10% is under forest reserve (Aruofor, 2001). It is sad to note that the land under forest reserve has been decreasing steadily since 1979. In Ondo State, 107.36km² of forest in Ore has been converted to causal land. In Kano State, 70km² of forest land has been cleared for a Dam project (Tiga Dam) while in Kogi State 183.89km² of forest land in Ajaokuta has been used for the establishment of the steel complex (Egwumah, 2009). Table 2 shows the status of forest cover in Nigeria from 1976 to 1995. Presently forest reserves in the country cover less than 8.7048 km² constituting 8.7 percent of the land area. In Cross River State alone 20 percent of the forest was lost between 1972 and 1992 (Bunn and Out, 1994).

Table 2: Status of Forest Cover in Nigeria between 1976 and 1995

Vegetation	1976 (km ²)	1995 (km ²)	Area of Change	Percentage Change
Undisturbed Forest	29951	12114	-17835	-59.55
Disturbed Forest	14573	18990	4417	30.31
Riparian	7402	5254	-2148	-29.02
Montane	6762	6759	-3	-0.044

Source: FDF (1997)

Deforestation in Tropical Region

Deforestation is the excessive exploitation of forest land. Deforestation is a process whereby a forest land is changed to another use or its cover is removed thus altering the original ecological system of the area (Crump, 1991). The exploitation of forests without accurate statistical data is a related issue of deforestation. The issue of increased deforestation has arisen because of activities of various groups or organizations. They seem to consider the forest as an obstacle in the path of their special interest and development plan. Very little thought is given to examining option on how the resource could be change with minimum environmental impact. In some cases, the loss is greater in economic value than the infrastructure which replaced the forest and costs more to sustain.

A number of factors attributed to deforestation in tropical region. Bisong (1999) identified about thirty three factors responsible for deforestation in the tropical rainforest, including income generation, population growth, cultivation, demand for forest products, and wood collection for domestic fuel, logging and grazing. In the tropical region agriculture is identified as a major activity that causes deforestation. Presently, 14 - 16 million hectares of tropical forests are converted to agricultural use through farming (Ogboi, 2011). Estimate of deforestation caused by agriculture was put at 5.9 hectares in the 1970s, of which 4.5 hectare was converted to permanently cleared land (Myers, 1989). The total hectares of arable land in

Africa are estimated at 220 million hectares. An estimated 117 million hectares of this land are cultivated, leaving only 48 percent in fallow (FAO, 1990). Surprisingly, while cultivated land is increasing, land productivity in the region is declining considerably due to decline in soil fertility.

The activity of Fulani herdsmen by way of grazing is a serious cause of deforestation and desertification. Logging of tree branches by herdsmen to provide fodder reduces total biomass and energy production by tree through photosynthesis. Destruction of forests, bringing into existence exotic species that did not evolve with the natural environment, worsens the condition of tropical rainforests vegetation (Miller *et al* 1990). Rapid urbanization contributes significantly to deforestation in the tropical region. Through construction of houses, public infrastructures, roads and industrial complexes in urban suburbs and rural areas, forests are destroyed (Akanke, 1992). Expansion of urban centres into the surrounding vegetative areas leads to clearing of forests. For example in Nigeria, the state housing project in Enugu led to the destruction of some hectares of forest reserves including the City Zoological Garden. Similarly, the Delta State Housing Project destroyed over 120 hectares of forest area in Jeddo Town near Warri (Ogboi, 2011). In Nigeria, petroleum pricing policy through erratic increases in the price of petroleum products forced people to depend on wood and charcoal as domestic fuel (Jagannathan and Agunbiade, 1990). Deforestation in Nigeria has been estimated at 14000km² between 1979 and 1995, which is 823.5km² per annum for the said period (Egwumah, 2009). It is probably that the current rate of deforestation will be much higher.

Impact of Deforestation on Climate Change

The excessive exploitation of forest resources has cause a serious problem on the environment. When a forest is destroyed, the vegetative cover of the soil is removed and the soil is exposed to environmental forces of wind and surface runoff and the topsoil will experience erosion and reduction of fertility and become less productive (Okonji, 2001). Moreover, deforestation leads to accumulation of global carbon, emitted from burning of fossil fuels, in the atmosphere. The main consequences of this are global warming and climate change.

The intensification of carbon content in the air alters the carbon dioxide and oxygen balance in the atmosphere in favour of carbon dioxide thereby leading to a rise in global warming and sea level. Forests as giant air conditioners regulate the climatic condition of the earth by absorbing carbon contained in the atmosphere and converting it for plant photosynthesis. When carbon from industries and other facilities and activities that would have been absorbed by forest is stored in the atmosphere, on the long run it accelerates the depletion of the ozone layer leading to a rise in global temperature. This is called greenhouse effect. Due to deforestation the global release of carbon into the atmosphere has presently amounted to over 122 billion metric tons at the rate of about 1.6 billion metric tons per year (Mckane, *et al* 1995). The global mean surface temperature for 2002 was expected to be approximately 0.5°C, above the 1961 to 1990 annual mean value. The rise in global average surface temperature since 1990 now exceeds 0.6°C (Egwumah, 2009). It is projected that the mean annual global surface temperature will increase by 1–3.5C by the year 2100 ((IPCC, 1996). The consequences of climate change include formation of cyclonic storms, changing pattern of precipitation and higher intensity of rainfall, prolonged droughts and associated desertification, hurricanes, landslides and wild fires. It is estimated that by the years 2100 the mean sea level will rise by 15 – 95 cm due to melting of ice (IPCC, 1996). Rise in sea levels places low lying areas at very high risk of being submerged by the sea. If measures are not

taken urgently coastal areas and islands across the globe are liable to disappear into the sea. In the last few years due to deforestation some parts of Africa have experienced gradual change from thick forest vegetation to derived Savannah and finally to vegetation characterised by features of desertification (Ogboi, 2011).

Evidence of Climate Change in Nigeria

Increase surface air temperature had been observed in Nigeria. The meteorological data as reported by UNSN (2001) that surface air temperature for Kano, Calabar and Lagos shows increase since 1920. Increase of 0.25 °C for Calabar and an increase of between 0.25°C to 0.5°C for Kano. The greenhouse gas emission is an indication that surface temperature rise in Nigeria has good correlation with greenhouse gas emission which can cause rise in sea level. Rise in sea level can result to coastal erosion, flooding, salt water intrusion, mangrove degradation and other related socio-economic problems. Estimated land loss due to this sea level rise by 0.2m at present is 3,400m² and future prediction, say the next 50 to 100 years stand at 18,400m² for sea level rise of 1m (Egwumah, 2009). There has been evidence of drought, especially in the Northern part of the country, which have reduced agricultural productivity.

CONCLUSION

The issue of global warming and climate change may assume greater dimensions in Nigeria as deforestation continues unabated. Forests regulate global climate and act as major agents of carbon exchange in the atmosphere. The destruction of forests and its associated climate change is the greatest threat facing the planet today. In the tropical rainforest region where forests have drastically reduced strategies for minimizing deforestation, building adaptability capacity and managing climate change must be developed urgently. In this regard, Non-Governmental Organizations (NGOs) and Community Based Organizations (CBOs) may assume more important roles as being the vehicles for mobilizing the rural communities and attracting foreign funds for the conservation and development of forest resources and the environment.

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