

Deforestation in Nigeria: The Needs for Urgent Mitigating Measures

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Abstract

The problems of an ecologically degrading world has been manifesting in persistent forest depletion, or deforestation. Taking into consideration the fact that this environmental problem has been alarmingly on the increase in Nigeria requires a work of this nature. This paper therefore, examines the trends and status of deforestation as well as how it can be mitigated. The paper establishes the existence of pressures on the forest communities in Nigeria. These pressures are due to urbanization, overpopulation, execution of developmental projects, agricultural expansion, mining, bush burning, logging and fuel wood collection among others. For the nation to retain the forest resources that promote rural welfare, income and employment generation, urban and rural livelihood, poverty alleviation, and sustainable forest management, then attempt should therefore be made to guide against human activities that encourage forest depletion.

Keyword: *Deforestation, sustainable forest management, climate change.*

Introduction

Nigeria is naturally endowed with vast expanse of forest land, the swamp forests in the extreme Southern part of the country, the tropical rainforest in the South- western axis and the wooded savannah in the middle belt. Nigeria ranks among the countries of the world with abundant forest resources. Mfon, *et al* (2014) said forests in Nigeria occupied about 110, 890km² of the country total land mass of about 910,770km² in other words, forests is about 12.18% of vegetation cover of the country. Park (1992), has stated that at least 60 percent of all known species of plant, about 90 percent of all the world's non-human primates such as monkeys, about 40 percent of all the birds of prey and about 80 percent of all the insects live in the tropical rainforests of the world. In other words forest provides us a wide variety of ecosystem services, including provisioning regulating, cultural, and supportive services. These ecosystem services not only deliver the basic material needs for survival, but also underlie other aspects of well being, including health, security good social relations and freedom of choice. In the past, timber production was regarded as the dominant function of forests. However, in recent years this perception has shifted to a more multifunctional and balanced view. Today, it is understood that forest biodiversity underpins a wide ranges of goods and services for human well being.

Ecologically intact forests stores and purify drinking water, they can mitigate natural disasters such as drought and floods, they help store carbon and regulate the climate, they provide food and produce rainfall, and they provide a vast array of goods for medicinal cultural and spiritual purposes (CBD, 2009). Similarly, most Nigerians have always depended on the forest for their survival, economic development, as well as environmental amelioration. The level of community nutrition is sometimes linked to fuel wood availability and cost, others depended directly on forest for their livelihood; among them are a high number of forest and wood worker (Aliyu *et al*, 2014) This is a part from contributing substantially to the National Gross Domestic Product (GDP). In spite of its importance, the natural forest has continued to diminish rapidly in the world especially in Africa continent and particularly in Nigeria.

According to EFC, (2010), the world continues to lose some 15 million hectares of forests every year. Deforestation over the period 1980 to 1990 reached 8.2% of total forest area in Asia, 6.1% in Latin America and 4.8% in African. Most modern deforestation takes place in developing countries, particularly in tropical areas. Deforestation and forest degradation directly threaten as many 400million people including 50million forest indigenous people who depend on forest for subsistence in sub-Sahara Africa (EFC, 2010). Deforestation estimates for some African countries have been given by Lanly (1983). For example, the of forest depletion in Cote divoire and Nigeria is estimated as high as 5 to 6% per year while Ochanda and Epp (1982) stated that in Kenya the indigenous forest now covers only 1.9% of the land area and remote sensing have shown that about 16% of the forest is being lost in each ten year period.

In Nigeria, the scenarios is not different, regional breakdown of deforestation from 1979 to 1995 shows that total forest declined by 48% in the North-central 7% in the North East, 60% in the North West, 53% in the south East, 13% in the South-South and 12% in the South West (FORMECU 1996). In 2000 the forest cover was estimated at 13.5 million hectares compared to 17.5 million hectares in 1990 (FAO, 2001), indicating a forest cover loss of close to 400 thousand ha per annum, or a decline of about 2.6%. Forest/woodlands now stand at only 13% of the total land area (FAO, 2001).

With global outcry on the consequences of continuous unsustainable forest destruction topping major intellectual discourses the needs to examine the current deforestation situation in Nigeria requires a work of this nature.

The Concept of Deforestation

Deforestation results from the removal of trees without sufficient replacement, which leads to reduction in habitat, biodiversity as well as wood and quality of life (Mfon *et al* 2014). Van Kootan and Butte, (2000) said deforestation is the conversion of forest to an alternative permanent non forested land use such as agriculture, grazing or urban development. The use of the term “deforestation” at times is associated with distortion of forestry issues. It is used to denote activities that use the forest, for instance, felling of wood for fuel, commercial logging and activities associated with temporary removal of forest cover such as slash and burn techniques which is a major component of shifting cultivation agricultural systems or clear cutting. It is equally used to describe clearing of forest for grazing or ranching (Mfon *et al* 2014). Also, an activity such as the establishment of industrial plantation may be considered as deforestation by some people while others will view it as afforestation. Accordingly, it is imperative for one to specify what is meant by deforestation in order to reduce all forms of ambiguity. Therefore, many specific terms such as forest decline, forest fragmentation and degradation, loss of forest cover and land use conversions are used (Wikipedia, 2008)

For instance FAO considers a plantation of trees established primarily for timber production to be forest and therefore does not classify natural forest conversion to plantation as deforestation (but still records it as a loss of natural forests). However, FAO does not consider free plantation that provides non-timber products to be forest although they do classify rubber plantations forest (Chakravarty *et al* 2012)

According to Mfon *et al* (2014) there are three major schools of thought associated with the causes of deforestation. The first is the impoverishment school which is of the opinion that, the major cause of deforestation is the increase in the number of poor people; that is small holders are the principal agents of deforestation. The second school is the neoclassical group which believes that, deforestation is caused by open access property rights that is, there are various agents with respect to deforestation. The third school is the political ecology group which believes that, deforestation is caused by capitalist entrepreneur.

World Deforestation Pattern

Extensive tropical deforestation is a relatively modern event that gained momentum in the 20th century and particularly in the last half of the 20th century. The FAO 2001 reports indicate considerable deforestation in the world during 1990-2010 but this was almost entirely confined to tropical regions. (Chakravarty *et al* 2012). Rowe *et al* (1992) estimated that 15 percent of the world's forest was converted to other land uses between 1850 and 1980. Deforestation occurred at the rate of 9.2million hectares per annum from 1980-1990, 16million hectares per annum from 1990-2000 and decreased to 13million hectares per annum from 2000-2010 (Chakravarty *et al* 2012). The net change in forest area during the last decade was estimated at – 5.2million hectares per year or 140km² of forest per day.

South American with about four million hectares per year suffered the largest net loss of forests during the last decade followed by Africa with 3.4million hectares annually and the least Oceania with seven lakh hectares annually. Brazil and Indonesia had the highest lost of forest in the 1990s accounting for almost 40 percent of net forest loss. Brazil was the top deforesting country by area; the forests in Brazil are so extensive that this represents a loss of 0.4 percent per year. The forest area in North and Central America remained stable during the past decade the forest area in Europe continued to expand although of a slower rate of seven lakh hectare per year during the last decade than in the 1990s with nine lakh hectares per year. Asia lost some six lakh hectares annually during 1990s but gained more than 2.2 million hectares per year during the last decade. The five countries with the longest annual net loss of 2000-2010 were Comoros (-9.30%), Togo (-5.1%), Nigeria (-3.7%), Mauritania (-2.7%) and Uganda (-2.6%). The area of other wooded land globally decreased by about 3.1 million hectares per year during 1990 – 2000 and by about 1.9million hectares per year during the last decade. The area of other wooded land also decreased during the past two decades in Africa, Asia and South America (Chakravarty, *et al* 2012).

Deforestation in Nigeria Trends

History has it that as at the beginning of the 1500 A.D, with the exception of cities such as Ibadan, Benin and Calabar, all the Southern part of Nigeria was covered by forests (Akachuku, 2006). However, between the year 1500 and 1960 the rain forest were seriously depleted mainly as a result of demand for wood by the colonial masters (Mfon *et al* 2014). The depletion of the forest within this period reduced the forest into two large blocks with scattered

fragments between 1960 and 1981; continuous degradation of the remaining blocks persisted. Hence, by the early 90's very few considerable patches of the patches of the rain forest were left in some forest reserves and natural parks for protection. Today, the damage to Nigeria, forests invariably has become tremendous.

According to Mfon *et al* (2014) Nigeria has eight National parks (Table 1)

Table 1: National Parks and their Sizes

S/N	Park	Size (km ²)
1.	Gumpti	6,670
2.	Kainji lake	5,341
3.	Cross River	3,720
4.	Old Oyo	2,512
5.	Chad Basin	2,258
6.	Yankari	2,244.1
7.	Kamuku	1,127
8.	Okomu	1,127

Adapted from Mfon *et al* (2014)

The 1,160 constituted forest reserves in Nigeria are said to cover an area of 107, 527. 02km² (FORMECU 1996). This figure represents about 11% of the total land area of the country. These reserves vary in size and are located in 362 local government areas in 36 states of the country. Borgu forest reserve in New Bussa, Niger state is the largest with an area of 3,786.58km² while Lewechi forest reserve in Okigwe in Imo State is the smallest with an area of 0.47km² (Mfon *et al* 2014)

These forest reserves and others have over the years been the major theatre of large scale human activities culminating into serious consequences upon the Nigeria flora and fauna despite decade of collective effort to combat deforestation.

The forest resources in Nigeria are under pressures from urbanization, infrastructure development, residential construction, population growth, nonadic farming and expansion of agricultural crop cultivation. Evidence of these pressures is the growth degradation of both community and National forest. Eboh *et al* (2005) said that about 25% of forest cover was lost from 1991 to 2003 with the remaining forest now standing at about 16 to 17%. FAO (2011) reported that the country loss 55.7% of its total primary forest between 2000 and 2005, and the rate of forest change increased by 31.2% to 3.12% per annum

The spread of deforestation is also noticeable near urban countries. The growth of urban areas bring about appreciable demands for fuel wood, charcoal and sawn wood and this account for much of the observed decline in forest stock (Ogundele, 2012) cooking with fuelwood or charcoal has remained the only alternative to ever increasing cost of fossil fuel in Nigeria (there is persistent increment in the cost of kerosene, cooking gas and electricity tariff). It is therefore predicted that the demand for biomass energy in urban areas would remain strong and continue to account for much of the spread of deforestation. Forests in the country are said to contribute substantially to the natural gross domestic product (GDP) and sustenance of the livelihood of the people. This probably may be the reason why the trend of deforestation across the country is on the increase and the GDP from the forestry sector decline. According to Central Bank of Nigeria (CBN) (2006), the national GDP by forestry sector was high in the early 80's up till 1987. The early 90's till today witnesses a drastic drop in the contributions of forest to the national GDP.

Causative Factors of Deforestation in Nigeria

Distinguishing between the agents of deforestation and its causes is very important in order to understand the major determinants of deforestation (Chakravarty *et al* 2012). The agents of deforestation are those slash and burn farmers, ranchers, loggers, firewood collectors, infrastructure developers and others who are cutting down the forest. Causes of deforestation are the forces that motivate the agents to clear the forests. (Chakravarty *et al* 2012)

Similarly, Pearce and Brown, (1994) identified two main forces that affect deforestation.

- (a) Competition between humans and other species for the remaining ecological niches on land and in coastal regions. This factor is substantially demonstrated by the conversion of forest land to other uses such as agriculture, infrastructure, urban development, industry and others.
- (b) Failure in the working of the economic systems to reflect the true value of the environment. Basically, many of the functions of tropical forest are not marketed and as such are ignored in decision making. Additionally, decisions to convert tropical forests are themselves encouraged by fiscal and other incentives.

This latter factor has been termed indirect cause of deforestation but remained by far the most important. From Nigeria deforestation situation, though the forests contribute substantially to the GDP, but the policies to regulate human interference with the forests so as to safeguard against depletion of this important resources have not been seriously pursued. This thus reflects a government fiscal policies working at cross- purposes with the value of the forest resources. In addition most incentives which the government suppose to provide for the people to serve as alternative to forest resources are not provided, for examples the high cost of fossil fuels has forced people to utilize firewood and charcoal as alternative energy, high rate of unemployment has made people to turn to forest for means of survival and therefore has resulted to serious forest depletion.

Furthermore, defective forest policies of the government greatly encourage deforestation, for instance most laudable policies like afforestation programmes, rainforest management (like enrichment planting, taungya system), creation of forest reserves, in-situ conservation processes among others are underfunded and neglected. The resultant effect of this is further deforestation. Notwithstanding, the above scenarios the following factors have been noted to contribute substantially to deforestation in the country

i. Expansion of Farming Land

About 60% of the clearing of tropical most forests is for agricultural settlement (Myers 1994). Taking into consideration the fact that more than 80% of the Nigeria populace are into farming then one can understand the concern of environmentalists on agricultural induce deforestation in the country. During agriculture the site is prepared through under brushing and felling leading to deforestation the slash and burn activity in tropical forests which is utilized during shifting cultivation has led to the permanent destruction of the rainforest (Nwoboshi 1982). Mostly all reports indicated shifting agriculture as responsible for about one half of tropical deforestation and some put it up to two thirds (Chakravarty *et al* 2012)

ii. Urbanization, Industrialization and Infrastructural Development

Clearing the forest is a prerequisite for expansion of cities and towns for the establishment of infrastructures necessary to support growing population (Sands, 2015), for instance, the 60million hectares of land in Nigeria in 1897 declined to 9.6 million hectares after 100 years this represents a loss of 50 million hectares in 100years (Carty, 1992). The site of Ajaokuta steel plant claimed 18, 390 hectares of Ajaokuta forest reserve in old Kwara State while the Federal capital territory claimed approximately 27, 330 hectares of forest reserves (Carty 1992;

Aderounmu, Akarue, and Ette, 1992). The construction of roads, railways, bridges and airports opens up the land to development and brings increasing numbers of people to the forest frontier. Whether supported or not by the governmental programmes, these settlers have usually colonized the forest by using logging trails of new roads to access the forest for subsistence land (Amor and Pfaff 2008). The negative consequences of these developmental projects apart from deforestation also include destruction of livelihoods of the host communities unfortunately there is no guarantee that significant benefits or compensation will accrue to them.

iii. **Logging and Fuel wood Collection**

Sawn timber is imperative in construction activities for residential, recreational and industrial development. In many cases in Nigeria, trees are felled and sawn without any commensurate effort to replant them, for instance, Ekinta forest reserve (104km²) in Cross river state has been transformed from tropical high forests into grassland as a result of unsustainable logging (Mfon *et al* 2014). Depletion of unreserved forests has also resulted in the concentration of logging activities within protected forest reserved in Nigeria, for instance in 1960 Western Nigerian, the areas outside the forest reserves, amounted to 52% of the total timber volume output, but five years later, this had fallen to just 16% (Areola 1987). In Nigeria as in most third world countries, firewood constitutes the major source of fuel. This is as a result of the rampant, usual and high cost of kerosene and cooking gas leading to a lot of pressure on the forests. It becomes difficult to prevent people from cutting down the forest for firewood when there are no cheap and available alternatives. The country substantial gas reserve is under developed and mismanaged. Hence, it flares constantly causing serious economic and environmental problems

iv. **Bush burning**

Fires are a major tool used in clearing the forest for shifting and permanent and for developing pastures. Fire used responsibly can be available tool in agricultural and forest management but if abused it can be a significant cause of deforestation (Rowe Sharma, and Bowder, 1992). The rainforest of Nigeria is relatively immune to fire than the Savanna in the wet season. However, in the dry season, the rainforest is very much prone to fire, continuous burning of the rain forest leads to derived grassland as most the trees including their seedlings are destroyed. The herdsmen and hunters do set fire to forest in order to have fresh shoots for their animals and in order to drive out wild animals respectively. Taking into consideration the fact that it takes years for forest to reach its climax, therefore, bush burning should be avoided.

v. **Overgrazing**

Overgrazing is more common in drier areas of the tropics where pastures degraded by overgrazing are subject to soil erosion. Stripping trees to provide fodder for grazing animals especially in the dry season can also be a problem. It is a well established fact that over grazing leads to a gradual change in vegetation from derived Savannah to Sudan Savannah as the animals feed on tree seedling especially in the dry season when there is little grass to sustain them (NEST, 1992).

Aliyu, Modibbo, Medugu and Ayo (2014) said that most Fulani nomads in Akwanga area of Nassarawa State practice random grazing where most of the grasses are set on fire so that new ones could grow for their cattle to feed on, making it difficult for other plants to sprout this practice accordingly has led to the extinction of various plants and thereby introducing foreign species that further impoverish the soil.

vi. **Mining**

Nigeria mineral potential is very high. Every day, new mineral resources are being discovered. Mining sector is very intensive and very lucrative (Sands, 2005). It is a lucrative

activity which promotes development booms which may attract population growth with consequent deforestation. The swamp forest of Southern Nigeria were previously protected from destruction or over exploitation due to their relatively inaccessibility as a result of the swampy nature of the environment. However, today, these forests are being destroyed as a result of petroleum exploration, exploitation and spillage (Akachuku, 2006). Mining of several minerals in Nigeria such as bayrite, tin, coal etc has led to the destruction of the forest and scarification of the landscape.

vii. **Tourism**

National parks and sanctuaries without doubt protect the forest, but uncaptioned and improper opening of these areas to the public for tourism is damaging. Unfortunately, the national governments of tropical and sub-tropical countries Nigeria inclusive adopt tourism for easy way of making money sacrificing stringent management strategies. Further many companies and resorts who advertise themselves as eco-tourist establishments are in fact exploiting the forests for profit. Similarly, most staff of the resorts allowed poachers and loggers who depleted the forests for stipends.

viii. **Corruption and political cause**

The Food and Agricultural Organization (FAO) (2015) reports identified forest crime and corruption as one of the main causes of deforestation and warned that immediate attention has to be given to illegal activities and corruption in the world's forests in many countries (Chakravarty *et al* 2014). Illegal forest practices may include the approval of illegal contracts with private enterprises by forestry officers, illegal sale of harvesting permits, under-declaring volumes cut in public forest, under pricing of wood in concessions, harvesting of protected free by commercial corporations, smuggling of forest products across borders and allowing illegal logging, processing forest raw materials without a license. (Chakravarty *et al* 2014). In Nigeria poaching in the forests is corruptly allowed by forest guards.

Other causes of deforestation as identified by Mfon *et al* (2014) include climatic agents (sunlight, water, wind) and biotic agents (microbes, animals and plants)

Consequences of Deforestation in Nigeria

i. **Decreased biodiversity and habitat loss**

Forest especially those in the tropics serve as storehouses of biodiversity and consequently deforestation, fragmentation and degradation destroy the biodiversity as a whole and habitat for migratory species including the endangered ones. Tropical forests support about two thirds of all known species and contain 65% of the worlds 10,000 endangered species (Myers and Mihermeier, 2000). In Nigeria, many trees, shrubs, herbs and assorted animals have been depleted while some are endangered. Mfon *et al* (2014) reported that several plant species have been over exploited especially those with edible seeds, nuts and kernels are now endangered. Most primates such as guenons, mangabeys, drills, chimpanzees and gorillas are now endangered (Akachuku, 2006). In fact, the lowland gorilla which is endemic to the Cross River National Park at Mbe Mountain is seriously endangered through hunting and habitat destruction. Numerous elephants that were found in our ecosystems have disappeared while the number of other mammals such as hippopotamus, manatees and leopards has decreased tremendously. Reptiles such as crocodiles, monitor lizards, alligators, royal python and boar constrictor are very few. Also, several species of amphibians, fruit bats, fishes, snails, birds e.t.c are threatened, endangered or extinct. (Mfon *et al* 2014).

ii. **Climate change**

Forests play significant role in sequestration of carbon dioxide one of the greenhouse gases that cause global warning and global climate change but when forest are depleted lot of process

resulting into global warming resulted. Deforestation disrupts normal weather pattern creating hotter and driver weather thus increasing drought and desertification, crop failures, melting of the polar ice caps, coastal flooding and displacement of major vegetation regimes. In the dry forest zones, land degradation has become an increasingly serious problem resulting in extreme cases of desertification. Degradation is the consequences of extremes in climatic variation and unsustainable land use practices including over cutting of forest cover (Chakravarty *et al* 2014). The baseline scenario in Nigeria shows that at the current deforestation rate of 1.3%, emissions of greenhouse gases are expected to increase from 9.5 MtC/year in 1990 to about 15.5 MtC/year in 2030. (Federal Ministry of Environment, 2010). Though, most of the activities leading to global climate change have been attributed mostly to the developed nations of the world. Evidences of the scourge have been noticed in Nigeria, these are reflected in extreme weather conditions inform of irregular rain, high temperature, and incursion of desert like conditions into the country from the Sahara desert, among others.

iii. **Loss of Water and Soil Resources**

Deforestation also disrupts the global water cycle. Deforested area cannot hold as much water hence, a drier climate is created. The following water resources elements are said to be affected by deforestation; drinking water, fisheries and aquatic habitats, flood/drought control and damage to crops and irrigation systems from erosion and turbidity (Bruijnzeel *et al.*, 2005). Forests serve as natural filter by filtering runoff and at the same time regulate water flow to check flooding. Deforestation on the other hand results into downstream flooding, which may lead to disaster. A number of flooding incidences have been recorded in Nigeria, especially in the Northern, South western and the Eastern parts, these incidences have resulted to loss of properties and life. The long term effect of deforestation on the soil resource can be severe. Clearing the vegetative cover for slash and burn farming exposes the soil to the intensity of the tropical sun and torrential rains. rainfall runs-off soil that have been hardened by exposure much faster than before, the most fertile top layer of soil that can support forest regeneration is therefore greatly reduced and this may persists for so many years since rapidly eroded soil is not replaced within a human generation.

iv. **Economics Losses**

The global tropical forests destroyed each year amounts to a loss in forest capital valued at US \$ 45billion (Hansen, 1997). In Nigeria the value of lost forest cover has been estimated at US\$750 million annually at 1989 prices. (Federal Ministry of Environment, 2010). The remaining forest area in Nigeria will likely disappear by 2020 if the current rate of forest depletion continues unabated. Going with the forests are all potential future revenues and future employment that could be derived from their sustainable management.

v. **Social Consequences**

Deforestation, in other words, is an expression of social injustice (Colchester and Lohmann, 1993). The most immediate social impact of deforestation occurs at the local level with the loss of ecological services provided by the forests. Forests afford humans valuable services such as erosion prevention, flood control, water treatment, fisheries protection and pollination functions that are particularly important to the world's poorest people who rely on natural resources for their everyday survival. (Chakravarty *et al* 2012)

By destroying the forests these services disappeared. Attempt by the government to replace traditional life styles, customs and religious beliefs associated with forest resources with developmental projects are always resisted by the native land owners. This often leads to social and land conflicts especially where government refuse to pay compensation or suggest resettlement. For instance the conflict generated on the proposed site of Ekiti state international airport between the government and the host communities comes to mind.

Mitigating Measures against Deforestation

i. Promotion of Sustainable Forest Management

Sustainable forest management entails that the forest must be ecologically, economically and socially sustained. Ecologically, values of the forest can only be maintained when actions that lead to forest depletion are guided against. In other words silviculture and management should not reduce biodiversity, soil erosion should be controlled, soil fertility should not be lost, water quality on and off site should be maintained and that forest health and vitality should be safeguarded. (Chakravarty *et al* 2012). However, management for environmental services alone is not economically and socially sustainable. The implication of this is that the cost of maintaining sustainable forest management has to be met by the government. For instance, a study carried out by the Federal Ministry of Environment in 2010 suggested that the capital need for afforestation, agro- forestry and establishment of more forest reserves over a forty year plan would be \$3.8 billion, \$2.4 billion ,and \$758.4 million respectively. How to meet this substantial budget remain a mirage especially in a face of dwindling oil revenue and mono economic debacle. This notwithstanding, the federal government National Forest Policy is geared towards ensuring sustainable forest management, promoting participatory process of development, facilitating private sector – forestry development and adopting an integrated approach to forestry development. Government is currently embarking on a number of afforestation programmes. Under the guidance of the African Union Commission, Nigeria is keying into the project on the “Green Wall Initiative” in which a “green wall” of trees (40 million trees annually) will be planted across the dry-land area of Nigeria to not only push back deforestation and secure agriculture and livelihoods across the Sudano-Sahelian zone of the country, but also enhance the carbon sequestration of biological diversity resources in the region for climate change mitigation.

ii. Substitution for Forest Resources

Presently, Nigeria lacks adequate substitution for most forest products, for instance access to affordable cooking energy is beyond the reach of many Nigerians. The high cost and scarcity of kerozene and cooking gas encourage massive consumption of fuel wood and charcoal with their attendant forest depletion. Similarly, there are no alternative for timber and wood consume in paper manufacturing. For all purpose where forest products are been used there is need for substitution, otherwise forest harvesting has to be commensurate with sustainable forest management especially afforestation.

iii. Increase Area for Forest Plantation and Area Permanently Reserve for Timber Production.

Forest plantation can be increase by using most of the vacant or unused as well as waste lands to plant trees. Large expanse of deforested land scatter all over the country especially in the south western Nigeria and the derived savanna of the North-Central part can be used for this purpose. There is no doubt that afforestation programme outside forest area would ease pressure on forests and make wood available for timber, fuel wood and charcoal productions which are the leading agents of deforestation in the country.

iv. The Need for Enforcement of Policies, Legislature Regulatory Measures.

There is no doubt that Nigeria has over the years spelt out a series of policy statements, law and regulatory measures towards ensuring sustainable forest management. However, most of these laudable steps are not properly implemented nor sincerely pursued; hence, the advantages inherent in them are not achieved. Apart from this most of these policies and regulations need modifications and adjustments. Of equal importance is the need for the policies and regulations to take into consideration the customs, norms and right of the people especially forest dwellers and those who depend on the forest, such actions would encourage the people and even institutions to participate effectively in sustainable forest management.

v. Massive Research in Forestry Education and Creation of Awareness

Due to high level of illiteracy in the country, most of the populace lack an in-depth knowledge on the needs for sustainable forest management and mostly the evils of deforestation. Training and education equips the stakeholders on how to prevent or reduce the adverse effects associated with deforestation and forestry activities. (Chakravarty et al 2012). Researches on forestry provide information on the nature of the problems, causative factors and how to ameliorate them. The general findings are then communicated to the general public through mass media, focus group discussion, and town hall meetings among others agents of information dissemination. Similarly, forestry policies makers also need to be educated enormously on the complexity of the interacting ecological, economical, social, cultural and political factors involved in sustainable forest management.

Conclusion

Deforestation in Nigeria has been mainly attributed to the grassroots poor people who means of survival were basically embedded in the forests but on the other hands are been denied access to these resources. Other agents of forest depletion are mainly developmental projects oriented. Persistent deforestation is further compounded by the fact that majority of the Nigerian populace lacked in-depth knowledge of the consequences of deforestation. Ways of reducing deforestation must therefore go hand in hand with improving the welfare and environmental knowledge of the populace otherwise they would fail. General or permanent solutions and strategies would remain elusive since these will vary with region and will change over time. Notwithstanding, all strategies require cooperation and good will. Effectives implementation is essential, including stakeholders participation, development of management plans, monitoring and enforcement of the strategies should be such that on one hand they should recognize the critical roles of governments at the three levels of administration and on the other hand empower the civil society and the private sector to take a pro-active role in reducing deforestation, and should always work in conjunction with government.

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