

## **IMPACT OF POVERTY ON THE SUSTAINABILITY OF FORESTS IN NIGERIA: IMPLICATION FOR SUSTAINABLE FORESTS AND REDUCTION IN GLOBAL WARMING**

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### **ABSTRACT**

Generally, the sustainability of the Nigerian economy is negative. One of the key resources in Nigeria that is increasing fast in its non-sustainability status is the forest. The forest is important in view of its role in economic development and trapping of CO<sub>2</sub> to slow down the process of global warming. The rapid rate of deforestation has been linked with increases in prices of petroleum products, especially dual purpose kerosene. These increases in prices have equally been linked with the incidence of poverty. This work was carried out in order to outline the factors that pose as threats to sustainability of forest resources in Nigeria. Special emphasis was placed on the role of poverty. A correlation coefficient of 0.771, significant at 5%, shows that poorer geopolitical regions tend to use more wood fuel to meet their domestic requirements. This suggests that poverty is a key factor in the problem of the sustainability of our forest resources in Nigeria. The introduction of unemployment benefits, birth control, increased wages, improved agricultural production and marketing systems, the drastic reduction in the price of dual purpose kerosene, and adequate enlightenment campaign are canvassed as avenue for poverty reduction. The enactment and enforcement of progressive forest laws, a participatory approach, as well as the encouragement of the practice of agro-forestry are also canvassed to sustain the forest resources and reduce Nigeria's meager contribution to climate change.

**Keywords:** Forest resources, Sustainability, Poverty, Global warming

### **INTRODUCTION**

Generally, the sustainability of the Nigerian economy is negative, implying that the country conserves or saves less than the depreciation on its manmade and natural capital (Pearce & Atkinson, 1993). A key sector of both economic and environmental concern is the forestry sector. Forests provide many social, economic, and environmental benefits. In addition to timber and paper products, forests provide wildlife habitat and recreational opportunities, prevent soil erosion and flooding, help provide clean air and water, and contain tremendous biodiversity. Forest litters and soil microbes, together, constitute an important resource that makes forests fertile for arable farming in the tropics (Akachukwu, 2006). Also, the ecotourism value of the forest is a formidable tool for sustainable economic development in Nigeria (Adeyemo & Okosodo, 2005; Akachukwu, 2005). Again, forests are an important defense against the global climate change. Through the process of photosynthesis, forests produce life-giving oxygen and consume huge amounts of carbon dioxide, the atmospheric chemical most responsible for global warming. By decreasing the amount of carbon dioxide in the atmosphere, forests can reduce the effects of global warming (Mastrandrea & Schneider, 2009).

Nigeria is reputed to have the largest mangrove forest in Africa and the third largest in the world. Her forests are concentrated in the southern part of the country. As one moves from the coast landwards the forest types of mangrove swamp forest, fresh water swamp forest, and rain forests are observable. But these resources have continued to be depleted without replenishment.

Akachukwu (2005) has provided the history of the deforestation of forest reserves in Nigeria. He relayed that southern Nigeria, with the exception of the land covered by Benin and Ibadan, were densely covered by rainforest in the year 1500. He relayed further that from 1500 to 1900, the rainforest were significantly reduced. Again, from 1900 to 1960 the remaining rainforests were reduced to two blocks with scattered fragments. These blocks, he further stated, were seriously degraded. Furthermore, he stated that by 1991 only a few considerable patches of the rainforest remained in the forest reserves, which were converted to national parks to enhance their protection.

### **THREATS TO THE SUSTAINABILITY OF FORESTS IN NIGERIA**

Many reasons account for the threat to the sustainability of the Nigerian forests. Bush burning has been identified as an important threat to the sustainability of forests in Africa as a whole. It has been documented that between 2000 and 2005, 300 – 800km<sup>2</sup> of forests were destroyed by fire in Africa (FAO, 2007). In Nigeria, another factor responsible for the depletion of forests is the de-reservation of forest reserves by the government for development purposes, without any care for replenishment or relocation to other areas. Over exploitation occasioned by greed and illegal exploitation, to the extent that it outstrips regeneration, is also another threat to the sustainability of forest resources in the country. According to Akachukwu (2005), petroleum exploration, exploitation, and oil spillage are, together, destroying large areas of swamp forest in Nigeria. Communal clashes have also been identified as another threat to the sustainability of forest in Nigeria. The above human induced problems are occasioned by one or more of the following- poverty, overpopulation, political insensitivity, poor enlightenment, urbanization and industrialization without proper planning, and research. Naturally, the global warming, orchestrated by green house gas emissions, which have led to the desertification of the country from the far north at the rate of 2 km per year, is the another culprit.

The effects of the above threats include depletion of forest resources, exposure of the soil to erosion, reduction of forest flora and fauna, and the “lost crop” effect, which describes the loss of food “crops” found in forests. These crops were once part of our traditional diets, but are now being forgotten, underutilized, or abandoned. Examples include algae, roots, mushrooms, leafy vegetables, tubers, fruit trees, culinary plants, medicinal plants, etc. Akachukwu (2005). Depletion of soil and water resources, destruction of earths webs of life, loss of recreational potentialities, and the reinforcement of climatic problems, like climate change are some other impacts of unsustainable forest use (Wikipedia,2010)

### Nature and status of forest resources in Nigeria

The estimated forest area in Africa is 16% of the global forest area (FAO, 2007). The percentage of the total land area covered by forest is 12.2%, i.e. about 110,890 ha, 36,500 of which covers forest plantations. These have decreased yearly between 1996 and 2000 by a negative factor of 1.5%. According to FAO (2007), the annual change rate for forest in Nigeria, between 1990 and 2000, was about - 2.7%, while between 2000 and 2007, it decreased by 3.3% (Table1). Nigeria has the worst deforestation rate of primary forests from 2000 to 2005 among some selected low income countries (Table 2)

Table 1: Forest Area of Nigeria and Rates of Change.

| Total forest area (1000ha) | % change in land area | Forest plantation (1000ha) | Rate of change (1990-2000) | %    | Rate of change (2000-2005) | %    |
|----------------------------|-----------------------|----------------------------|----------------------------|------|----------------------------|------|
| 11.089                     | 12.2                  | 3.65                       | -410                       | -2.7 | -410                       | -3.3 |

Source: FAO, 2007

Table 2: Deforestation Rate of Primary Forest for Selected Low Income Countries (2000-2005)

| Countries   | %    |
|-------------|------|
| Nigeria     | 55.7 |
| Vietnam     | 54.5 |
| Cambodia    | 29.4 |
| Sri lanka   | 15.2 |
| Malawi      | 14.9 |
| Indonesia   | 12.9 |
| North Korea | 9.3  |
| Nepal       | 9.1  |
| Panama      | 6.7  |
| Guatemala   | 6.4  |

Source: Mongabay, 2005

Table 3: Forest growing stock in Nigeria: Biomass and Carbon

| Growing Stock               |                                 | Biomass         |                      | Qty of carbon in biomass |           |         |
|-----------------------------|---------------------------------|-----------------|----------------------|--------------------------|-----------|---------|
| Per ha (m <sup>3</sup> /ha) | Total (million m <sup>3</sup> ) | Per ha (ton/ha) | Total (million tons) | Per ha (ton/ha)          | Total     | tonnage |
|                             |                                 |                 |                      |                          | (million) |         |
| <b>125.0</b>                | 1386                            | 252.9           | 2.804                | 126                      | 1401.0    |         |

Source: FAO, 2007

Table 4: Production, trade and consumption of round wood and down wood in Nigeria (2004)

| Wood fuel/1000m <sup>3</sup> |            |            |                 | Industrial wood/1000m <sup>3</sup> |            |            |                 | Sawn wood/1000m <sup>3</sup> |            |            |                 |
|------------------------------|------------|------------|-----------------|------------------------------------|------------|------------|-----------------|------------------------------|------------|------------|-----------------|
| Producti<br>on               | Impo<br>rt | Expo<br>rt | consumpti<br>on | Producti<br>on                     | Impo<br>rt | expo<br>rt | Consumpti<br>on | Producti<br>on               | impo<br>rt | Expo<br>rt | Consumpti<br>on |
| <b>60852</b>                 | 0          | 1          | 60851           | 9418                               | 1          | 42         | 9377            | 2000                         | 2          | 22         | 1980            |

Source: FAO, 2007

Table 5: Production, trade and consumption of wood based panel, pulp and paper

| Wood based panels /1000m <sup>3</sup> |            |            |                 | Pulp for paper/1000m <sup>3</sup> |            |            |                 | Paper and paper board/1000m <sup>3</sup> |            |            |                 |
|---------------------------------------|------------|------------|-----------------|-----------------------------------|------------|------------|-----------------|--|------------|------------|-----------------|
| Producti<br>on                        | Impo<br>rt | Expo<br>rt | consumpti<br>on | Producti<br>on                    | impo<br>rt | expo<br>rt | Consumpti<br>on | Producti<br>on                           | impo<br>rt | Expo<br>rt | Consumpti<br>on |
| <b>95</b>                             | 42         | 0          | 137             | 23                                | 17         | 0          | 40              | 19                                       | 297        | 2          | 315             |

Source: FAO, 2007

Wood fuel consumption in the country takes almost all the wood fuel produced in the country, with only a tiny fraction to export (Table 4). Aside from the wood fuel, upon which we depend for domestic consumption, other unprocessed wood products (Table 4) (industrial wood, sawn wood) enjoy relatively high exportation with a positive term of trade. When these products are processed, however, the term of trade for the country is in deficit.

The pathetic state that the Nigerian forest was captured by Stock (2008). According to him, the bulk of Nigeria's forest production is fuel wood, consumed either as wood or as charcoal. In 2006, fuel wood production was 62 million cubic meters (2.2 billion cubic feet), harvested mostly near dense urban areas. By contrast, annual lumber production—mostly hardwoods, such as mahogany, iroko, and obeche—averaged 2 million cubic meters (71 million cubic feet), almost all from the tropical forest zone. Consequently, Nigeria, once a significant exporter of timber, is a net importer. Ongoing, rapid deforestation makes it unlikely that the situation will improve appreciably.

We have seen from Table 1 that the sustainability of the country's forest resources is negative (For example, we are consuming at a greater rate than we are replenishing – if at all there is any form of replenishment). We have also seen those

other factors that threaten the sustainability of forest resources in the country and the negative impact they exert on the economy and the environment.

Many works have been carried out on the threats to sustainability of forests in the country, but none have given any form of emphasis to the role of poverty. This work tries to capture the role of poverty in the loss of forests and forest resources in Nigeria.

### **SUSTAINABILITY OF THE FORESTS AND CLIMATE CHANGE**

The major causes of deforestation include corruption, overpopulation, urbanization, population growth, inequitable distribution of wealth, and poverty (Wikipedia Encyclopedia, 2010). The United Nations Framework Convention on Climate Change has stated that the overwhelming cause of deforestation is agriculture. It stated that subsistence agriculture accounts for 48% of deforestation, while 32% of deforestation results from commercial agriculture. Wood fuel is said to account for 5%.

Ultimately, deforestation has been traced to economic incentives. The developing world, entangled in poverty, engages in more deforestation. Forests conversion, for them, is more profitable than forest conservation. Obviously, the many important functions of the forest have no markets and, hence, an economic value that is readily apparent to the people that rely on the forest for their wellbeing. Developing countries take a radical stance on the issue of sustainability of the forest. They argue that the developed world had relied on deforestation for development at a point and, thus, it will be unfair to be told to conserve the forests. Moreover, they believe that the benefits of forests, such as carbon sinks and biodiversity reserves, go to the developed world and there is no significant compensation for such services (Wikipedia Encyclopedia, 2010). Thus, sustainability of forests does not constitute a priority area, as it should be in the third world countries, on the account of poverty.

According to Wikipedia Encyclopedia (2010), deforestation is a major contribution to global warming and is often listed as one of the major sources of enhanced green house effects. Tropical forests are responsible for 20% of green house gas emissions. According to the intergovernmental panel on climate change, deforestation, mainly in tropical areas, could account for one-third of total anthropogenic CO<sub>2</sub> emissions. Deforestation may also cause the carbon stores in the soil to be released and reduce the capacity of the forest to absorb CO<sub>2</sub>. Thus the negative impact of poverty in third world countries leads to unsustainable forest, which, in turn, contributes to global warming.

### **FUEL CONSUMPTION IN NIGERIA**

Forest biomass has remained the most common source of household energy in Nigeria, meeting 80% of domestic energy requirements. In 1992, alone, forest wood and charcoal products were estimated at 55 million tons, suggesting that much forest woods are been used for domestic purposes. According to Choji (2005), more than half of 9.6 million ha of rain forests in the south of Nigeria have been used to meet the demand for fuel wood in rural and urban neighborhoods.

Compared with the costs of petroleum product, fuel wood is cheaper than any commercial fuel substitute and this has, over the years, increased forest depletion (Choji, 2005), as this appears to decrease their expenditure on fuel to the detriment of the environment and the sustainability of the forest.

As at 2007, the types of fuel used in cooking in Nigeria are segregated as follows: wood (74%), electricity (0.7%), gas (0.7%), kerosene (24%), and coal (1.6%). Between 1996 and 2007, the amount of kerosene consumed in the country decreased steadily (CBN, 2008). Of course this decrease was informed by an increase in the prices of petroleum products (Choji, 2005), especially dual purpose kerosene, which is commonly used for domestic cooking. Increases in the prices of petroleum products have also worsened the poverty situation in the country (CBN, 2006). It is easy to agree with the fact that the amount of woods used would have to increase since it is the only accessible alternative.

### **THE ROLE OF POVERTY ON WOOD FUEL CONSUMPTION**

Information for these works was sourced from the publications of (FAO 2007), Central bank of Nigeria (CBN,2006 and 2008), National Bureau of Statistics (NBS, 2007) and other sources. The tables were used to present findings and a correlation analysis was used to establish the relationship between poverty and the quantity of wood consumption by regions.

In order to analyze the role of poverty in the depletion of forest resources in Nigeria, the average percentage of wood used in 2007 in each of the six geopolitical regions of Nigeria was studied in relation to the poverty level of Nigerians in these respective regions (Table 6).

**Table 6: Poverty Rate and % of Wood as Fuel Source by Geopolitical Regions**

| <b>Region</b>        | <b>Poverty rate</b> | <b>% of wood as fuel source</b> |
|----------------------|---------------------|---------------------------------|
| <b>Northeast</b>     | 72.2                | 95.9                            |
| <b>Northwest</b>     | 71.2                | 95.3                            |
| <b>North central</b> | 67.2                | 86.4                            |
| <b>Southwest</b>     | 43.0                | 54.9                            |
| <b>Southeast</b>     | 26.7                | 78.0                            |
| <b>south south</b>   | 35.1                | 72.7                            |

Source: NBS, 2007

Table 6 shows, clearly, that the poverty rate strongly suggests the use of wood fuel as cooking fuel, except for southeastern Nigeria, whose poverty rate is lower than that of southern Nigeria, but has a higher percentage of cooking fuel as wood fuel. On a general note, a correlation coefficient of 0.771 (significant at 5%) shows that the poorer region tends to use more wood fuel to meet their domestic requirements. This finding suggests that poverty is a key factor in the problem of sustainability of our forest resources. These poorer regions (such as Northern Nigeria) have less woody vegetation compared to the richer regions (such as Southern Nigeria). In fact, forests are almost non-existent in the northern regions of the country, except for a few patches of trees here and there in the northwestern and northeastern parts of the country, and a better-off north central part, which forms the Savannah zone. These northern regions consume more wood fuel than the southern regions, where the

forests are concentrated, on account of their higher poverty rate. A critical implication here is that more pressure is brought to bear on the patchy forests of the northern regions and, as time goes on, the movement of wood fuel in the form of commercially processed charcoal from the southern regions northwards will intensify, bringing much pressure on the largely overexploited forests of the country.

## **CONCLUSION**

The study found that overpopulation, urbanization, population growth, de-reservation, and bush burning as the factors militating against the sustainability of forests in Nigeria and holds poverty as a major culprit standing in this regard. It shows a linkage among poverty, non-sustainability of forests, and climate change - revealing poverty as a major factor of non sustainability of forests in Nigeria and a major reinforcement for global warming.

Poverty continues to remain a pressing topic in discourses bordering on socioeconomic issues in Africa. This social malady is still very much produced in Nigeria (one of the poorest nations, despite the abundance of human and material resources) where poverty alleviating programs have been frustrated by the machineries of official corruption, regional disharmony, and poor political commitment. The continuous entrenchment of poverty has forced people to resort to nature, exploiting it unsustainably, for succor. This is the case with the Nigerian forest resources, where forests have been depleted on the account of poverty, which has not allowed the mass access to more viable alternatives that would have assisted in reducing the pressure on sustaining the forest resources. In other words, poverty, the key culprit in the rapid loss of forest resources in Nigeria as asserted by the study, has not been successfully tamed as this rapid deforestation goes on unchecked leading to its unsustainable status. With this, it is almost certain that the exploitation of forest resources, in a way, that would guarantee its optimum utilities by this generation and the generations coming behind, is being jeopardized. If forest resources must be sustainably managed, then it is imperative to discourage its overexploitation, and this can be successively done by reducing poverty to tolerable maximum.

## **RECOMMENDATIONS**

Several efforts have been made at the sustainability of the forests in Nigeria. These include the arid zone afforestation program, between 1976-1983, which covered Kebbi, Kaduna, Kastina, Jigawa, Borno, and Adamawa states; forestry project 1, which covered Ondo, Ogun, and Anambra states with the aim of planting short fiber trees; Kastina state afforestation program, which was funded by the European Union; and the forestry 2 program and tree planting in Benue, Cross River, and Kastina state in the last political dispensation. Despite these, the non-sustainability of the Nigerian forests continues. Also, efforts aimed at reducing poverty in Nigeria include the establishment of the National Directorate of Employment, the Rural Banking Idea, and the National Poverty Eradication program, among others. Yet the poverty has continued unchecked. It is a fact that any effort aimed at sincerely reduction g poverty will be helpful in leading to sustainable forest resources and reducing Nigeria' meager contribution to climate change. The introduction of unemployment benefits, increased wages, improved agricultural production and marketing systems, the drastic reduction in the price of dual purpose kerosene, and adequate enlightenment campaign are canvassed in this regard.

Also, institutional reforms that will involve great planning efforts towards sustainable forest resources in the country are canvassed. This could be done by way of forestation through vegetative propagation. The genus acacia, which comprise of many species that is important from firewood, folder, and tannin, to pulpwood shelterbelts and soil improvement are good examples of trees that should be considered for this purpose. This is because they are often regarded as quick growing species. The enactment and enforcement of progressive forest laws, a participatory approach, as well as the encouragement of the practice of agro-forestry are also canvassed.

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