



## Appraisal of Causes, Consequences and Remedies of Human Induced Deforestation in Osun State Nigeria

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### ABSTRACT

This research work studied the appraisal of the causes, consequences and remedies of human induced deforestation on the sustenance of national economy in Osun state. The questionnaire method was used to generate data from foresters and residents of the forest environments. A total of 75 questionnaires were administered, the data generated were presented in tables and analyzed using t-test to determine the causes, effects and ways to reduce human induced deforestation in Osun state. The study showed that the forest has socio-economic and environmental benefits. The economic benefits include source of income, diversified products, employment gain, as well as provision of improved infrastructural base. The environmental benefit includes improved supply of marketing services as well as positive spin off for non-market services. The findings of the study reveals that the causes of human induced deforestation includes, mining of natural resources, overpopulation and poverty, urbanization and industrialization, fire outbreak, among others. Human induced deforestation leads to production of immature woods, economic losses, reduction in timber products, losses of forest cover, among others. Therefore the study recommended the possible ways to reduce deforestation which includes participation in forest management, strengthening of policies, increment in the rate of afforestation, recruitment of adequate forester manpower, among others. However, the rate of deforestation has being the major problems that affects impacts of wood technology on the sustenance of national economy of Osun state. Therefore, illegal or falling of forest trees should be prevented. Also, indiscriminate bush burning should be avoided. In addition, indigenous trees should be well conserved.

Keywords: *Appraisal, Consequences, Deforestation, Environment, Human, Induced.*

### 1 INTRODUCTION

The forest is a good source of food, income, ecological resources, social and cultural features, as well as physical facilities like power and building materials. Other functions of the forest are prevention of erosion, as well as the provision of essential habitat for wildlife to survive. Hence, the necessity to conserve the forest and the biodiversity is essential. In addition to conserving biological and cultural diversity, it is now widely recognized that many protected areas also have important social and economic functions. These include protecting watersheds, soil and coastlines, providing natural products for use on a sustainable basis, and supporting tourism and recreation (Thomas, 2003).

Studies in China have also confirmed that medical herb production is a big business and that the suppliers have chosen to invest in forest protection and reforestation in order to guarantee future supplies (Festus, 2012). In spite of the multi-various usefulness of the forest resources, rapid population growth and changes in land uses have put the forest resources under pressure. For instance, Poore (2013) opined that majority of logging operations in tropical countries are considered unsuitable and damaging. The widespread failure of forest governance characterized by illegal logging, associated illegal trade, and corruption directly undermines sustainable economic growth, equitable development, and environmental conservation. It puts at risk poor and

forest-dependent populations, which rely on timber and non-timber forest products, undermine responsible forest enterprises by distorting timber and reducing profitability and results in a loss of government revenue that could be invested in sustainable forest management or general economic development (World Bank, 2006).

The major determinants of deforestation are the available natural resources in an area, how the resources are being used, traditional beliefs and myths, conflicts in the use of resources, population pressure, vis-a-vis the problem of pollution (soils, air or water). According to Meyer (1991), societies have profoundly altered their environments in the pursuit of wealth and powers have been punished by environmental catastrophes (natural and man-induced). It was further opined that world forest area has been reduced by some 20 percent and a large area of land had also been converted from its original vegetation cover to cropping. Some of the major causes of deforestation are increase in the demand for housing and infrastructural facilities, crop and timber export, poor agricultural practices, cutting of fuel wood for urban areas, head loading (cutting of fuel wood for sale), forest fires, logging, and overharvesting. Other causes are overgrazing, road construction, dam construction, as well as careless exploitation of forest resources (Rosenzweig & Parry, 1994).

Deforestation is responsible for damage to habitat, biodiversity loss and aridity, extinction of rare species of plants and animals, climate change, environmental



destruction and the subsequent damage to the sensitive living balance of the ecosystem. Also, empirical studies have confirmed that if we cannot look after the forest they will soon disappear (Brockington, 2007).

The threat to timber resources is being combated in most countries by vigorous afforestation. In addition, many have adopted stringent forestry laws, as in Norway and Sweden, to prevent waste, and elsewhere, experiments are taking place to find alternative materials for making paper. (Whynne-Hammond, 1979).

Other strategies of combating deforestation are the use of alternative sources of energy other than fuel and charcoal, sustainable agricultural practices rather than slash and burn method of farming, land management, avoidance of indiscriminate bush burning, as well as promulgation and enforcement of environmental laws and forest policies. Likewise, mitigating deforestation entails forest conservation, protection of endangered species, as well as the promotion of ecotourism.

Forest resources can provide long-term national economic benefits. For example, at least 145 countries of the world are currently involved in wood production (Laguna, Deltoro, Pérez-Botella, Pérez-Rovira, Serra, Olivares & Fabregat, 2004). Sufficient evidence is available that the whole world is facing an environmental crisis on account of heavy deforestation. Deforestation is the conversion of forest to an alternative permanent non-forested land use such as agriculture, grazing or urban development (Van Kooten and Bulte, 2000). Deforestation is primarily a concern for the developing countries of the tropics as it is shrinking areas of the tropical forests causing loss of biodiversity and enhancing the greenhouse effect. (Myers, 1991). Thirty per cent of the earth's land area or about 3.9 billion hectares is covered by forests. It was estimated that the original forest cover was approximately 6 billion hectares (Bryant, Nielsen & Tanglely, 1997).

Rowe, Sharma and Browder (1992) estimated that 15 per cent of the world's forest was converted to other land uses between 1850 and 1980. Deforestation occurred at the rate of 9.2 million hectares per annum from 1980-1990, 16 million hectares per annum from 1990-2000 and decreased to 13 million hectares per annum from 2000-2010. The net change in forest area during the last decade was estimated at 5.2 million hectares per year, the loss area equivalent to the size of Costa Rica or 140 km<sup>2</sup> of forest per day, was however lesser than that reported during 1990-2000 which was 8.3 million hectares per year equivalent to a loss of 0.20 per cent of the remaining forest area each year. The current annual net loss is 37 per cent lower than that in the 1990s and equals a loss of 0.13 per cent of the remaining forest area each year during this period. By contrast some smaller countries have very high losses per year and they are in risk of virtually losing all their forests within the next decade if current rates of deforestation are maintained. Indeed some thirty one (31) countries do not even make the list because they have

already removed most of their forests and even the remaining parts are seriously fragmented and degraded.

The scarcity and continuous increase in the cost of wood in Osun state has being a major factor which is prompting the woodworkers to produce lower quality furnitures and other wood products. Some wood objects produced nowadays are prone to easy decay and easily attacked by fungus due to less quality and unavailability of matured trees in the forest as a result of the deforestation caused by the peoples in the environment. The deforestation also affects the environment by causing degradation. These as being the major concern of the researchers and subsequently making the necessity for this study imperative, if the causes, consequences and remedies of human induced deforestation in Osun state must be checked for effective national development.

### 1.1 PURPOSE OF THE STUDY

The purpose of this study is to assess the appraisal of the causes, consequences and remedies of human induced deforestation in Osun state of Nigeria. Specifically the study is meant to determine the:

1. Causes of human induced deforestation in Osun state
2. Consequences of deforestation on the forest in Osun state
3. Possible remedies to curtail deforestation in Osun state.

### 1.2 RESEARCH QUESTION

The following research questions were developed to guide the study:

1. What are the causes of deforestation in Osun state?
2. What are the consequences of deforestation in Osun state?
3. What are the strategies to reduce deforestation in Osun state?

### 1.3 HYPOTHESIS

The following hypotheses were formulated and tested at 0.05 level of significance.

HO<sub>1</sub>: There is no significant difference in the mean responses of the foresters and residents in Osun state on the causes of human induced deforestation in Osun state.

HO<sub>2</sub>: There is no significant difference in the mean response of foresters and residents on the consequences of human induced deforestation in Osun state.

HO<sub>3</sub>: There is no significant difference in the mean response of foresters and residents on the strategies for reducing deforestation in Osun state

## 2 METHODOLOGY

### 2.1 RESEARCH DESIGN

The descriptive survey research design was adopted for the study. This method was deemed appropriate as it involved the collection of extensive and cross-sectional data for the purpose of describing and interpreting an existing situation under study. In support of this Obasi (1999) stated that a research design is a plan or blueprint which specifies how data relating to a given problem should be collected and analyzed.

### 2.2 AREA OF STUDY

The study covered three (3) forest reserves in Osun state which include Ago-Owu forest (estimated terrain elevation above sea level is 204 metres, estimated land area of 20.22km<sup>2</sup>, latitude 7°7'59.99", longitude 4°13'0.01"), Oba hill forest reserve (estimated terrain elevation above sea level is 234 metres, estimated land area of 22.66km<sup>2</sup>, latitude 7°45'0", longitude 4°7'0.01") and Ikeji-Ipetu forest (estimated terrain elevation above sea level is 329metres, estimated land area of 18.67km<sup>2</sup>, latitude 7°24'0", longitude 4°55'59.99").

### 2.3 INSTRUMENT FOR DATA COLLECTION

The instrument used in collecting data for this study was a structured questionnaire. The questionnaire was divided into two parts 1 and 2, while part 2 was further divided into three Sections A, B and C

**PART 1:** This section deals with the personal data of the respondent and directions on how the questionnaire is to be answered.

**PART 2 Section A:** This section contains fourteen (14) items which dealt with the major causes of deforestation.

**Section B:** This section contains ten (10) items which deals with the effects of deforestation on the forests in Osun state.

**Section C:** This section contains nine (9) items which deals with the strategies for reducing deforestation in Osun state.

The instrument was face-validated by three lecturers in the research area. Using Cronbach Alpha formular, the reliability of the instrument was found to be 0.73. A total of 33-item questionnaire was distributed to the 75 respondents. The questionnaire was administered to the respondents by the researcher and the research assistant. Only 72 questionnaires representing 96% return-rate were collect.

The population for this study includes the foresters and the residents of the selected forest reserve areas in Osun state, consisting of thirty (30) foresters and forty five (45) residents of the selected forest reserve areas in Osun state, giving the total of seventy-five (75) respondents. The choice of 75 respondents was randomly selected from the entire population of 375 which comprises of foresters and the residents.

For the analysis of the data collected, a four (4) point decision rating scale was used with the following response scale.

Strongly Agree	(SA)	=	3.50-4.00
Agree	(A)	=	2.50-3.49
Disagree	(D)	=	1.50-2.49
Strongly Disagree	(SA)	=	1.00-1.49

Mean ( $\bar{x}$ ) and standard deviation were used for the analysis of the research questions while t-test was used to test the hypothesis at 0.05 level of significance.

To determine acceptance, a mean score of 2.5 was selected as decision point between agree and disagree. In other words, any response with a mean of 2.5 and above was considered as agreed while any mean below 2.5 is considered as disagreed.

## 3 RESULTS AND DISCUSSION

### 3.1 RESEARCH QUESTION 1

What are the causes of deforestation in Osun state Nigeria?

TABLE 1: MEAN RESPONSES OF THE RESPONDENTS ON THE CAUSES OF DEFORESTATION IN OSUN STATE NIGERIA.

S/N	Items	$\bar{x}_1$	$\bar{x}_2$	$\bar{x}_1$	Rmk
1.	Expansion of farm land	2.95	2.42	2.68	A
2.	Logging for fuel wood	3.26	3.16	3.21	A
3.	Fire outbreak	3.00	3.01	2.96	A
4.	Mining of natural resources	3.61	3.39	3.50	SA
5.	Urbanization and industrialization	2.90	2.35	2.62	A
6.	Wars and role of military	3.50	3.05	3.28	A
7.	Exploitation by industrialized countries	2.96	2.74	2.85	A
8.	Overpopulation and poverty	2.61	2.52	2.56	A
9.	Transmigration	2.35	2.26	2.31	D
10.	Poor land management	2.40	2.50	2.45	D
11.	Misuses and abuse of forest resources	2.50	2.54	2.52	A
12.	Lack of monitoring and enforcements of rules and regulations	3.20	3.22	3.21	A
13.	Little participation of community in policy formulation	3.00	3.22	3.11	A
14.	Lack of re-investment in forest development	3.00	2.53	2.54	A

Key:  $\bar{x}_1$  = mean responses of woodworker respondents,  $\bar{x}_2$  = mean responses of resident respondents,  $\bar{x}_1$  = Average mean responses of  $\bar{x}_1$  and  $\bar{x}_2$ , A = Agreed, SA = Strongly Agreed, D = Disagreed and SD = Strongly Disagreed

The analysis in table 1 revealed that the respondents agreed with all listed items as the causes of deforestation except items 9 (2.31) and 10 (2.45) which indicate the disagreement by the respondents. For instance, item 12 (3.21) shows that lack of monitoring and enforcement of rules and regulations governing the use of forest is a factor that causes deforestation. This implies that rules and regulations governing forest services are not being effectively monitored and enforced. Other causes of deforestation as revealed by the study are activities of logging for fuel wood, expansion of farm land, mining of natural resources, exploitation by industrialized countries, Misuses and abuse of forest resources.

### 3.2 RESEARCH QUESTION 2

What are the consequences of deforestation in Osun state?

TABLE 2: MEAN RESPONSES OF THE RESPONDENTS ON CONSEQUENCES OF DEFORESTATION OSUN STATE.

S/N	Items	$\bar{x}_1$	$\bar{x}_2$	$\bar{x}_i$	Rmk
1.	Reduction in timber products	2.57	2.50	2.54	A
2.	It leads to economic losses	2.50	2.54	2.52	A
3.	It leads to low incomes of revenue.	2.55	2.50	2.53	A
4.	It loses forest cover	3.35	2.56	2.95	A
5.	It leads to reduction of livelihood	2.65	2.49	2.57	A
6.	It leads to production of immature woods	2.45	2.55	2.50	A
7.	It leads to scarcity of woods in the markets	3.80	3.04	3.42	A
8.	It affect water shield	2.50	2.61	2.56	A
9.	It leads to climate change	2.53	2.57	2.55	A
10.	It leads to losses of soil resources and flooding	2.54	2.50	2.52	A

Key:  $\bar{x}_1$  = mean responses of woodworker respondents,  $\bar{x}_2$  = mean responses of resident respondents,  $\bar{x}_i$  = Average mean responses of  $\bar{x}_1$  and  $\bar{x}_2$ , A = Agreed, SA = Strongly Agreed, D = Disagreed and SD = Strongly Disagreed

The analysis in table 2 revealed that the respondents agreed that all the items as highlighted in the table are effects of deforestation. As discovered in the table, deforestation leads to reduction of timber, loses of forest cover, lose of soil resources and uncontrollable flooding which to a large extent augment the destruction of life and properties. According to the result, the respondents rejoinder that deforestation does affect climate change often does it lead to the reduction of livelihood in communities that depends on forest. This implies that the respondents agreed with all of the items. The average mean response of respondents ranges from 2.52 - 3.42.

### 3.3 RESEARCH QUESTION 3

What are the strategies for reducing human induced deforestation in Osun state Nigeria?

TABLE 3: MEAN RESPONSES OF THE RESPONDENTS ON STRATEGIES FOR REDUCING HUMAN INDUCED DEFORESTATION IN OSUN STATE.

S/N	Items	$\bar{x}_1$	$\bar{x}_2$	$\bar{x}_i$	Rmk
1.	Participatory forest management and rights	3.15	2.99	3.07	A
2.	Strengthen government and non-government institutes and policies	3.15	2.99	3.07	A
3.	Increase areas of forest plantation	4.00	3.78	3.79	A
4.	Encouraging plant substitutes	3.25	3.54	3.40	A
5.	Promote sustainable management	2.50	2.41	2.45	D
6.	Government to create awareness for importance of forest	2.55	2.53	2.54	A
7.	Increase the conservation land area and permanently reserved it for timber production	3.15	2.36	2.75	A
8.	Provision of adequate forester manpower	2.85	2.53	2.69	A
9.	Reducing emissions from deforestation and forest degradation	2.99	2.28	2.64	A

Key:  $\bar{x}_1$  = mean responses of woodworker respondents,  $\bar{x}_2$  = mean responses of resident respondents,  $\bar{x}_i$  = Average mean responses of  $\bar{x}_1$  and  $\bar{x}_2$ , A = Agreed, SA = Strongly Agreed, D = Disagreed and SD = Strongly Disagreed

The analysis in table 3 revealed that respondents disagreed with item 5, in other words, the response of respondents on item 5 shows that promoting sustainable management is not a strategy for reducing human induced deforestation. As denoted in the table, all other items are agreed to be strategies for reducing deforestation. The items among which are provision of adequate forester manpower, participatory forest management and rights and encouraging plant substitute.

### 3.4 DISCUSSION OF FINDINGS

The findings from the 14-itemed research question one revealed that expansion of farm land, logging for fuel wood, fire outbreak, mining of natural resources, urbanization and industrialization, misuses and abuse of forest resources, lack of monitoring and enforcements of rules and regulations among others are the major causes of deforestation. While on the other hand, the finding is in disagreement with items 9 and 10. This implies that transmigration and poor land management are not considered to be part of the causes of deforestation.

This finding is in line with the findings of Geist & Lambin (2002) who highlighted that, the extension of overland transport infrastructure, followed by commercial wood extraction, permanent cultivation, and cattle ranching, are the leading proximate causes of deforestation. As the result indicated that deforestation is due to population growth and agricultural expansion, aggravated over the long term by wood harvesting for fuel and export.

The finding is also in line with the findings of Poore (2013) that forest clearance for agricultural purpose is a major cause of deforestation. It was further stressed that this problem accounts for close to 20% of the annual emissions of green house gases. Other causes of deforestation are unbridled bush burning, increase in exploitation of forest resources without corresponding regeneration, crop and timber export, logging, over-harvesting and removal of immature trees, as well as overgrazing.

The study corroborates the findings of Uzonu and Bala (2016) that among the several reasons for cutting down trees are to ensure maximum crop yield from their farming activities, to obtain available wood fuel and poles for rural electrification, to make produce from the forest such as furniture making, electric poles, herbs for treating ailments, timber for construction, carving of mortar and pestle and for the construction of temporary houses.

The findings of research question two revealed that deforestation have effect on climate change, and so does it lead to reduction of livelihood. It was also revealed that, deforestation is responsible for reduction in timber products, it increase economic losses, generation of low incomes of revenue, lose of forest cover, scarcity of woods in the markets among others.



This finding is supported by the finding of Sukumar, (2003) which highlighted that the effect of deforestation includes increasing incidents of human-animal conflicts, loss of valuable agricultural land, reduction in underground water, and forcing out of animals species from their natural habitats. It was elaborated further that persistent deforestation gives way to flooding, erosion, and pollutes air, water and soil.

The findings of Coe, Latrubesse, Ferreira and Amsler (2011), also corroborates this findings, that deforestation leads to changes in the hydrological, geomorphological, and biochemical states of streams, increase in poverty, alteration of atmospheric conditions, loss of biodiversity, scarcity of natural resources, increase in erosion and sediment fluxes from the land surface.

Findings of the research question three on the strategies for reducing human induced deforestation also shows the respondent is of the opinion that promoting sustainable management is more or less not a way to reduce deforestation. However, it was discovered that participatory of forest management and rights, increasing areas of forest plantation, encouraging plant substitutes, creation of awareness on the importance of forest, increasing the conservation land area and permanently reserved it for timber production, providing adequate forester manpower and others, are the productive strategies to be considered if activities on human induced deforestation must be reduced.

This findings in supported by the findings of Chakravarty, Ghosh, Suresh, Dey and Shukla (2012) that, some of the strategies to reduce deforestation are reduction in population growth and increase in per capita incomes, reduction in emissions from deforestation and forest degradation, increase in the area and standard of management of protected areas, increase in the area of forest permanently reserved for timber production, increase in the perceived and actual value of forests, promote sustainable management, encouraging plant substitutes, increase in the area of forest plantation, strengthening the government and non-government institutions, policies improvement and increase in investment on research, education and extension, among others.

Also in support of this finding, is the finding of Murphy (2013) which explained that some specific strategies to limit deforestation involves strengthening the elaboration of a policy and actions for a rural development with zero deforestation, Strengthening analysis and impact of policies, strengthening forest management and regulation, harmonizing law on declaration of forest reserves and redefining territorial land use, design and implementation of instruments that contribute to reducing deforestation, achieve progress in the land registration system and possibly design the rural environmental registry on farm monitoring systems.

#### 4 RESULTS AND DISCUSSION

This study assesses the appraisal of the causes, consequences and remedies of human induced deforestation in Osun state of Nigeria. Three research questions were postulated to guide the study. The study provided major findings on causes, consequences and possible remedies to curtail human induced deforestation in Osun state.

Based on the findings of the study, it was concluded that the causes of human induced deforestation includes, expansion of farm land, logging for fuel wood, mining of natural resources, fire outbreak, Urbanization and industrialization, overpopulation and poverty, among others.

It was also discovered that human induced deforestation leads to losses of soil resources and flooding, production of immature woods, scarcity of woods in the markets, losses of forest cover, economic losses, reduction in timber products, and so on.

Promoting sustainable management is not a strategy for reducing human induced deforestation. Therefore, the possible remedies to curtail deforestation are; participation in forest management and rights, strengthening of government and non-government institutions and policies, Increasing the areas of forest plantation, encouraging plant substitutes, provision of adequate forester manpower, among others.

It was also recommended that continued rapid afforestation programme should be coupled with increased private sector participation. Sustainable forest should involve collaborative management of forestry resources. Also, afforestation programmes should consider draught resistant plants, as well as intercropping of trees with legumes.

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