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# Impact Assessment of Tree Harvesting Operations for Enhancing Sustainable Management of forest biodiversity in Dekina LGA of Kogi State, Nigeria

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**Abstract:-** Conservation and management of forest ecosystems are currently largely conflicting goals in the Forest biome. However, sustainable forest management systems can offer significant income opportunities for landholders, and thereby actively support the process of ecosystem rehabilitation and protection of the Forest. This research is intended to contribute to enhancing the development of environmentally sound forest management alternatives. Through a case study, the harvesting impact of a conventional harvesting method (CM) was evaluated and compared with an alternative and improved harvesting method (AM). Wheneverforest environment is inappropriately handled, several environmental issues arise. Biodiversity are often directly affected when a forest environment is abused. Globally, several nations with hitherto defined forest belts suffer greatly due to loss of biodiversity today. Three settlements were adopted for this study including Adumu, Etutekpe and Ulaja due to availability of some forest around them. Qualitative or descriptive statistical technique was adopted using tables and percentages for the three communities. Three hundred and eighty (380) structured questionnaires were administered while three hundred and sixty two (362) retrieved. Both primary and secondary sources of data were used to collect data for analysis. In the distribution of questionnaire simple random sampling technique was used. The study reviews that uncontrolled logging affects biodiversity negatively, lack of substitute for trees has increased pressure on the forest, diversion of agricultural loans affects proper forest management. It was recommended that both legal and political framework for forest conservation and management be enhanced and basic education on forestry and wild -life conservation be made compulsory and be adopted into school curricular at all levels.

**Key words: Biodiversity, Tree harvesting, Forest, Sustainable development**.

**Funding Support**

## I. Introduction

There is increasing recognition that substantial tree-based land cover types fall outside of the current institutional and legal framework for forests. In Java, Indonesia, only 23% of the 70% of the land area with trees are classified as forest (Persson, 2003). Also according to Kumar, Singh, Singh and Kumar (2014), globally, 1billion ha which is about 20% of total agriculture area has about 10% tree cover. For instance, In South East Asia 50% of agricultural land has >30% tree cover and in sub Saharan Africa 15% of agricultural land has >30% tree cover (Zomer *et al.,* 2009).

Deforestation is the process of clearing, removal of forest trees where the land is converted to other types of activities for non-forest use, like conversion of forest reserves areas to residential or industrial areas, removing of forest trees as a result of road or rail construction, conversion for agricultural purposes and cutting down of forest trees for domestics and industrial use like fire-woods, timbers, paper production and charcoal production. Charcoal is widely used by high percentage of the population in the country for cooking and other uses, that's what makes it a major threat to forest reserves. About 31% of the world land surface is covered by forest, while in Nigeria it falls gradually from 16.6% in 1996 to 7.7% in 2015. According to Michael Daley (YEAR), associate professor of environmental science at Lasell College in Newton, Massachusetts, the number one major problem caused by deforestation is the impact on the global carbon cycle. Gas molecules that absorb thermal infrared radiation are called greenhouse gases. If greenhouse gases are in large enough quantity, they can force climate change, according to Daley deforestation of trees not only lessens the amount of carbon stored, it also releases carbon dioxide into the air. This is because when trees die, they release the stored carbon.

A high number of people are not aware of all this impact, not that they don't feel it but they are not being informed about it and that's the main reason awareness, environmental law and monitoring is very important so that it will help to regulate the rate of unplanned deforestation, to restore and rehabilitate degraded forest landscape and evaluate the important of carbon sequestration by forest. Deforestation has resulted in habitat damage, biodiversity loss and aridity, as a developing nation a lot of development

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have been taking place in daily basis like roads, rails, houses, dams and oil explorations, most of all this falls into urbanization that contributes to deforestation process due to lack of proper reforestation planning that should had be going on simultaneously with all this developments.

Poverty contributes its own percentage due to lack of some basic amenities that results in people looking for means of survival and lack of proper awareness and enforcement of government policies that will guide people of the risk of deforestation for domestic activities without reforesting. According to the 2010 Global Forest Resource Assessment, deforestation releases nearly a billion tons of carbon into the atmosphere per year, though the numbers are not as high as the ones recorded in the previous decade. This carbon released causes climate change which creates severe weather conditions like droughts, floods and hot weather conditions. According to Food and Agricultural Organization of United Nation as of 2005 Nigeria has highest deforestation rate in the world at 12.2% equivalent of 11,089,000 hectares had been deforested and between (2000 to 2005), 55.7% of our primary forest was been lost and the rate of forest change increased by 31.2% to 3.12% per annum, which is approximately 350,000 to 400,000 hectares per year.

Nigeria lost an average of 409,700 hectares of forest every year which is equal to an annual deforestation rate of 2.38%. According to Mfon *et al* (2014) Nigeria has eight National parks; of the entire eight and damages inflicted to these parks as results of human and natural factors are tremendous and it will keep on increasing everyday if not properly addressed. These human and natural factors like, global warming, insurgency, desert encroachment, over grazing and other agricultural activities. This could also means 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 technique which is a major component of shifting cultivation agricultural system or clear cutting (Odjugo,2010).

Considering the eco-tourism potential of tropical rain forest (TRFs), efforts towards their effective management have in recent times in Nigeria reached an unprecedented proportion. The forest zones e.g. Tropic Rain Forests (TRFs) are of great economic advantage because of their complex ecosystem and distinctive high bio-diversity. This provides and promotes sustainable livelihood, industrial and raw material availability, food security, medicine and healthcare resources (Akinbami, 2012).

As observed by Mfon et al, (2014), the main latitude and longitude of Nigeria is 10$^{o}$N and 8$^{o}$E and most of the forests in Nigeria are located in the southern axis of the country, including the swamp forest, tropical rainforest as well as the wooded savannah. Nigeria has a total land area of 91,077,000 Ha (910,770 km$^2$) with a total forest area of 11,089,000 Ha (110,890km$^2$) representing 12.18% of the forest cover There are about 1417 known species of amphibians, birds, Mammals and reptiles in Nigeria (UNEP – WCMC, 2004). These forests are dominated by trees in a complex ecosystem (Mfon 2010).

Park (2010) equally observed that 60% of all known species of plants (about 15,000 out of 250,000) about 90% of all the world's non – human primates such as monkeys about 40% of all birds of prey and 80% of all insects live in the tropical rain forests of the world. Within these species, about 1.2% is endemic meaning they are found in no other countries than Nigeria while 3.5% are threatened. Nigeria is a habitat to at least 4715 of vascular plants of which 4 are endemic. Also about 3.6% of Nigeria species is protected under IUCN category I.V. Many of these flora and fauna species are threatened, endangered or extinct (Akachukwu 2006).

Nigeria has always depended on the forest for survival, economic development, as well as environmental amelioration, along the animal tracks Mfon (2004). They also use the night to carry out logging especially for Madrid tree (*Pterocarpus erinaceus*) popularly known as the African rosewood since the ones outside the reserved area have been exhausted. Though arrests are being made daily by the forest guards and other officers, these illegal activities seem to be strengthened by the lack of stringent policy and punishment of offenders on the part of the policy makers coupled with poverty, youth employment and the high value-chain of the African rosewood. The activities that result in forest destruction or fragmentation has been linked with the economic decline of the national forest reserve areas and global climate change, hence it must be halted (FAO.2009).

| S/N | Name | State(S) | Head Office | Size |
|---|---|---|---|---|
| 1 | Chad Basin | Borno/Yobe | Maidugari | 2,258 sq.km |
| 2 | Cross River | Cross River | Akampa | 4,000 sq.km |
| 3 | Gashaka-Gumti | Adamawa/Taraba | Serti | 6,731 sq.km |
| 4 | Kamuku | Kaduna | BirninGwari | 1,121 sq.km |
| 5 | Kainji Lake | Kwara/Niger | New Bussa | 5,382 sq.km |
| 6 | Okomu | Edo | Arakhuan-Udo | 202.24 sq.km |
| 7 | Old Oyo | Oyo | Oyo | 2,512 sq.km |
| **Estimated Total Conservation Area** | | | | 22,206.24 sq.km |

**National Parks in Nigeria and their Sizes** (***Source: Mfon et al (2014)***

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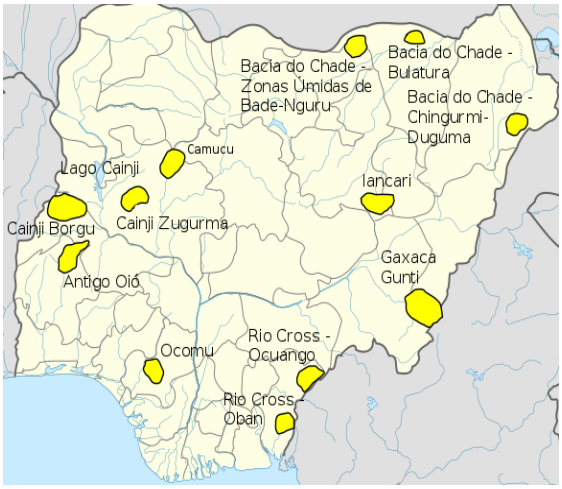


Figure 1: Location of National Parks and Game Reserves, Source: NCF.

**Statement of Research Problem**

Uncontrolled human activities have led to significant modification of the natural biodiversity in the world over the years. Consequentially, land use and land use covers are changed abruptly without adequate consideration for future developments. There is a continuous deterioration from the rich biodiversity. The effects of land use on the environment ranges from minor land cover changes and soil modification to severe desertification, deforestation, erosion, and river encroachment problems. According to FAO (FAO,2002), fragmentation of forest may also be as a result of natural occurrences or human-induced activities, which vary in terms of the extent, severity, quality, origin, and frequency. The natural induced process can be through fire, storm, drought, pest, and disease among others, and the human-induced activities could be unsustainable logging, excessive tree harvesting, shifting cultivation, unsustainable hunting, overgrazing just to mention but few. The International Tropical Timber Organization (ITTO) (ITTO 2002) estimated that eight hundred and fifty (850) million hectares of tropical forest and forest lands could be forest edge through human-induced activities such as logging and agricultural practices. The ecosystem of the park lost its economic value as forest fragmentation keeps on occurring (Dauda, Ebeiyamba and Aluko, 2016). The Government of Nigeria introduced laws and policies that banned the illegal activities in GGNP to protect and to preserve the forests. Trespassers if arrested are prosecuted. In spite of these laws, the forest continues to be under siege.

One of the Challenges of Sustainable Development Goals (SDGs) is deforestation and distortion of eco-biodiversity. Specifically, it is the most serious long term environmental problem due to anthropogenic activities. Man's quest for development activities have resulted in a continuous and serious degradation of the eco-biodiversity, posing a threat to both present and future living. In this regard, Fuwape (2001) studied the relationship between forest resources and economic development in Nigeria. Again, Gwivc (1994) did an intensive study on the wood based industrial sector of Nigeria looking at the economic impacts of logging on the environment. Geomatics (1998) observed the rate of forest resources depletion in Nigeria while Park (2010) studied species loss within the ecosystems in Nigeria due to deforestation. Odjugo (2010) limited his study to the definition of deforestation without making reference to cause and effect of deforestation. Park (2010) also stated that rapid population growth and urbanization is today of great concern to sustainability of the forest biodiversity for the more population increases the greater the impact on the environment. Functional legal institution can enhance environmental health and integrity. However, none of the studies has investigated the impact of tree harvesting operations on sustainable forest bio-diversity in selected communities of Iyale district. It is against this backdrop therefore that this paper sets to assess the impact of tree harvesting operations on sustainable forest biodiversity in the selected settlements of Iyale District Dekina LGA, of Kogi State, Nigeria.

**Aim objective of the study**

The aim of the study is to assessing the impacts of tree harvesting operations on forest biodiversity in Iyale district of Kogi State Nigeria, with a view of identifying the different land use/activities that are responsible. The study specifically tends to achieve this through the following objectives:

1. To determine level of awareness of deforestation.
2. To examine the purpose for which trees are felled.
3. To examine the challenges associated with combating deforestation.

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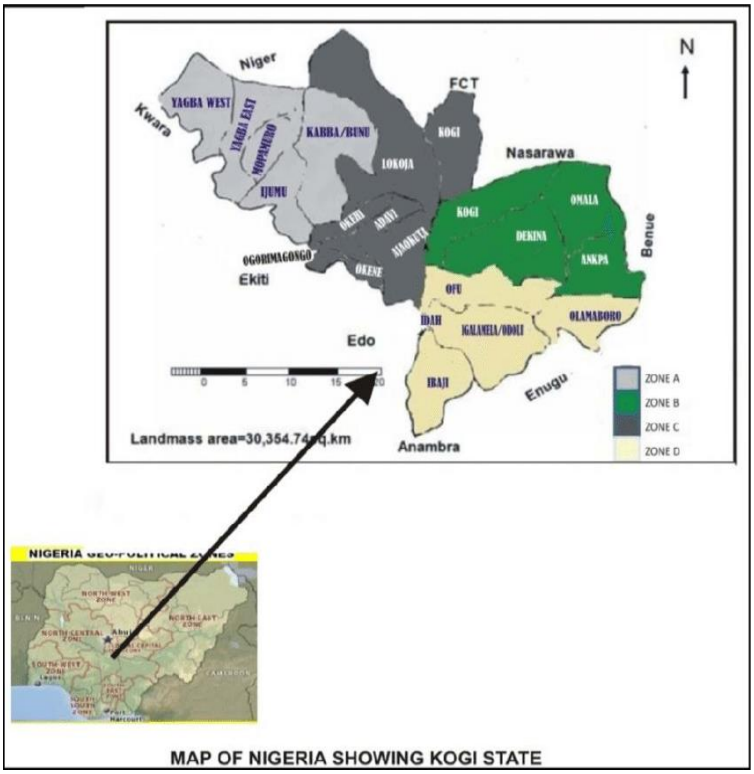
4. To determine agricultural techniques for controlling deforestation.
5. To determine impact of logging on biodiversity.

## II. The Study Area

Iyale District is situated in Dekina LGA of Kogi State, Nigeria. Its geographical coordinates are 7°39′O° North, 7°1′O° East. It is an agrarian society with a cum-linear settlement. Vegetationally, it is of the Guinea Savannah with two defined seasons having high rainfall intensity in the rainy season and a highly dry season with harmattan beginning around December – January.




MAP OF NIGERIA SHOWING KOGI STATE

## III. Materials and Methods

The population of the study were farmers and locals in the study area. A multi-stage sampling procedure was used for sample selection. In the first stage, farmers were purposely selected from each of the districts. Lastly simple random sampling technique was used to select the respondents from each of the districts for the study because the researchers do not have the list of the farmers in each community. In all, 380 respondents were selected for the study. Data were collected using interview schedules at individual level in the study area. The questions were drawn in English language in the major areas based on the objectives of the study. Involvement in tree harvesting was measured using a 4-point rating scale which ranges from: Not Involved (NI) =0, Rarely Involved (RI) =1, Moderately Involved=2 and highly Involved=3. The total involvement score per respondent was further classified into three levels: high, medium and low using mean score plus/minus standard deviation. That is high for scores above mean plus standard deviation; low for scores below mean minus standard deviation; and medium for scores between the two. The respondents' perception was measured by asking the respondents to react to eight perceptional statements. Their reaction were against five-point Likert-type scale of strongly agree (5), agree (4), undecided (3), disagree (2), and strongly disagree (1) for the positive and vice versa for the negative statements. The total perception score per respondent was further classified into three categories: positive, indifferent and negative using mean score plus/minus standard deviation. That is: positive for scores above mean plus standard deviation; negative for scores below mean minus standard deviation; and indifferent for scores between the two. Descriptive statistics such as mean, frequency count, percentages, means and standard deviations, together with inferential statistics such as Pearson Product Moment Correlation were used to analyze the data collected.

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## IV. Results and Discussion

**Table 1:** Gender, Age and Educational distribution of the respondents

| **Gender** | **Frequency** | **Percent** |
|---|---|---|
| Male | 250 | 69.1 |
| Female | 112 | 30.9 |
| Total | 362 | 100 |
| **Age group** | **Frequency** | **Percent** |
| 21-30 | 52 | 14.1 |
| 31-40 | 100 | 33.1 |
| 41-50 | 150 | 41.4 |
| 60+ | 40 | 11.0 |
| **Total** | 362 | 100 |
| **Education** | **Frequency** | **Percent** |
| Primary | 35 | 9.7 |
| Secondary | 112 | 30.5 |
| Tertiary | 15 | 4.2 |
| Non-formal | 200 | 55.2 |
| Total | 362 | 100 |

**Source:** Field Survey 2022

Table 1 above shows that both sexes were involved in the study. 250 of the total respondents representing 69.0% were male while 112 representing 30.9% were female in the study area, the male interview/given questionnaire were higher than the females. The population of the males is higher. The age distribution of respondents is shown in table 1. The age group between 21 and 30 were 52 of the total respondent representing 14.3%. Those between 31-40 were 120 of the total respondents representing 33.1% but those between 41-50 were 150 respondents representing 41.4% but those that are 60+ were 11.0%. It is clear that those between 41-50 formed the bulk of respondents followed by age bracket of 31-40.

Table 1 above also shows the educational qualification of respondents. Those with primary education made 35 of the total respondents representing 9.7%. Those with secondary education are 112 of the total respondents representing 30.5% whereas, tertiary education made 15 of the total respondents representing 4.2%. The non-formal education formed 200 of the total respondents forming 55.2%. It is obvious from table 1 that those that has no formal education formed the bulk of the respondents followed by those with secondary education. A bulk Of the respondents are NOT educated.

**Table 2: Information on Deforestation**

| **S/no** | **Settlement** | **Frequency** | **Percentage** |
|---|---|---|---|
| 1. | Etutekpe | 180 | 49.7 |
| 2. | Ulaja | 160 | 44.2 |
| 3 | Adumu | 22 | 6.1 |
| | Total | 362 | 100 |

**Source:** Field Survey 2022.

Level of information on deforestation in the study area as shown in table 2, Adumu settlement had 22 respondents representing 6.1%, Etutekpe village has 180 respondents on level of education on deforestation representing 49.7% but Ulaja village comprised 160 respondents representing 44.2%. It is also revealed that Etutekpe had the highest number of respondent of level of awareness on deforestation.

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**Table 3: Purpose of Tree Felling**

| S/no | Purpose | Frequency | Percentage |
|---|---|---|---|
| 1. | Building/Construction | 68 | 18.8 |
| 2. | Domestic fuel | 31 | 8.6 |
| 3 | Farming | 103 | 28.4 |
| 4 | Source of income | 160 | 44.2 |
| | Total | 362 | 100 |

**Source:** Field Survey 2022.

Table 3 reveals the purposes for which tree felling and deforestation in the study area. It demonstrated that several people fell trees for building and construction purposes, 68 respondents representing 18.8% opined to the opinion. Those harvesting wood as domestic fuel makes 31 of the total respondents representing 8.6%. Several remove trees to farm, 103 respondents representing 28.4% . 160 respondents representing 44.2% cut down trees for income. It was also revealed that majority of respondents cut down trees and further sell the logs for industrial activities (where is this in Table 3?).

**Table 4: Environmental Impacts of Logging**

| S/no | Impact | Frequency | Percentage |
|---|---|---|---|
| 1. | Loss of Biodiversity | 80 | 22.0 |
| 2. | Soil erosion | 42 | 11.8 |
| 3 | Soil compaction | 30 | 8.3 |
| 4 | Disruption of hydrological cycle | 60 | 16.5 |
| 5 | Desert encroachment | 83 | 22.9 |
| 6 | Depletion of soil/water resources | 67 | 18.5 |
| | **Total** | 362 | 100 |

**Source:** Field Survey 2022.

Table 4 shows that 80 of the total respondents representing 22.0% reported loss of biodiversity. 42 of the total respondents representing 11.8% observed soil erosion. On soil compaction, 30 respondents representing 8.3% responded that logging results in soil compaction (avoid repetition). 60 respondents representing 16.5% opined disruption of hydrological cycle but 83 of the total respondents representing 22.9% observed desert encroachment but 67 of the total respondents representing 18.5% see depletion of soil and water resources as an environmental impact of logging, desert encroachment and loss of biodiversity were the first and the second most observed impact of logging on the environment.

**Table 5: Challenges Associated With Combating Deforestation**

| S/no | Challenge | Frequency | Percentage |
|---|---|---|---|
| 1. | Several opposing demand on trees | 30 | 9.0 |
| 2. | Divergent accounting systems | 50 | 13.9 |
| 3 | Inadequate funding | 65 | 18.5 |
| 4 | Long period of maturity | 53 | 15.2 |
| 5 | Inefficient care for planted seedling | 80 | 20.2 |
| 6 | Lack of substitute for trees | 71 | 19.9 |
| 7 | Diversion f Agric. Loans | 12 | 3.3 |
| | Total | 362 | 100 |

**Source:** Field Survey 2022.

From table 5 above, 30 respondents representing 9.0% observed several opposing demand on trees to be a challenge in combating deforestation. 50 of the total respondents representing 13.9% observed the challenge of diversified accounting system but 65 of the total respondents representing 18.5% saw poor funding as the challenge. 53 of the total respondents representing 15.2% observed long period of maturity of tree as a serious challenge whereas, 80 of the respondents representing 20.2% observed inadequate care to plant seedling but 72 of the total respondents representing 19.9% observed lack of substitute for trees but 12 of the total respondent representing 3.3% saw diversion of agricultural loans to other sectors as the major challenge in all of these challenges, the most prominent is long period of maturity followed closely of maturity followed closely by and lack of substitute for trees and inadequate funding all constituted a great challenge to afforestation progress in the study area.

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**Table 6: Impacts of Deforestation on Biodiversity**

| S/no | Impact | Frequency | Percentage |
|---|---|---|---|
| 1. | Distortion of habitat | 90 | 24.8 |
| 2. | Displacement of faunal community | 75 | 20.7 |
| 3 | Extinction/loss of specie traits | 60 | 16.6 |
| 4 | Harm on biodiversity | 100 | 27.6 |
| 5 | Introduction of invasive species from other habitat. | 87 | 10.3 |
| | Total | 362 | 100 |

**Source:** Field Survey 2022.

Several impacts on forest biodiversity occur whenever logging takes place. Table 6 reveals that 90 of the total respondent representing 24.8% reported distortion of habitat, 75 of the total respondents representing 20.7% observed displacement of faunal community; 60 of the total respondents representing 16.6% observed extinction and loss of specie traits as an impact of logging on forest environment. 100 of the total respondents representing 27.6% reported harm on biodiversity, however, 37 of the total respondents representing 10.2% opined introduction of invasive species from other habitat. From the table above, no doubt there is impact but most prominent of all is harm on biodiversity meaning whenever logging occurs both the floral and faunal communities suffer which could even reduce species population.

**Table 7: Economic Impacts of Logging**

| S/no | Economic impact | Frequency | Percentage |
|---|---|---|---|
| 1. | Cost of reclamation higher than income | 150 | 41.4 |
| 2. | Removes environmental benefit | 50 | 13.8 |
| 3 | Clearing may affect real estate value | 40 | 11.0 |
| 4 | Much debris remain after logging | 100 | 27.7 |
| 5 | Changes aesthetic value of local landscape | 22 | 6.1 |
| | Total | 362 | 100 |

**Source:** Field Survey 2022.

Enormous economic impacts occur whenever deforestation takes place in any community. Table 7 reveals that 150 of the total respondents representing 41.4% believes that cost of reclamation will be high, 50 of the total r respondents representing 13.2% observed that environmental benefits are indirectly removed but 40 of the total respondents representing 11.0% observed that clearing may affect real estate value. However, 100 respondents representing 27.7% observed that much debris remains after logging. Again, 22 of the total respondents representing 6.1% reported changes in aesthetics of the local landscape. The top most of the economic impacts of deforestation is cost of forest reclamation followed by the level of debris that remains after logging.

**Table 8: Agricultural Techniques for Controlling Deforestation**

| S/no | Technique | Frequency | Percentage |
|---|---|---|---|
| 1. | Creation of forest reserves | 50 | 13.8 |
| 2. | Commencement of in-situ conservation | 30 | 8.3 |
| 3 | Legislation | 140 | 38.7 |
| 4 | Rainforest management | 80 | 22.1 |
| 5 | Afforestation programmes | 62 | 12.1 |
| | Total | 362 | 100 |

**Source:** Field Survey 2022.

Table 8 above shows that there are several ways of controlling deforestation in the study area; 50 of the respondents representing 13.8% reported creation of forest reserves. 30 of the total respondents representing 8.3% observed commencement of in-situ conservation but 140 of the total respondents saw legislation as a way out. 80 of the respondents representing 22.1% observed rainforest management strategy for controlling deforestation. However, 62 respondents representing 13.1% responded that afforestation programmes be intensified. In all of the techniques observed, the use of legislation as a tool against deforestation closely followed by efficient rainforest management.

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**Table 9: Result of Estimated Regression**

| Source | SS | df | MS |
|---|---|---|---|
| Modal | 3418.48938 | 5 | 683.697875 |
| Residual | 36.5106249 | 357 | -102270658 |
| Total | 3455 | 362 | 9.5441989 |

| Evnimpact | Coef. | Std Err | t | P > \|t\| | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| Settlement | -.0029602 | .0563752 | -0.05 | 0.958 | -.1138294 | .107909 |
| Purpose | .2092448 | .0401413 | 5.21 | 0.000 | .1303016 | .288188 |
| Challenge | -.0026266 | .0452246 | -0.06 | 0.954 | -.0915666 | .0863135 |
| Econimpact | .5666147 | .0336779 | 16.82 | 0.000 | .5003827 | .6328467 |
| Technique | .2480113 | .0400987 | 6.19 | 0.000 | .1691519 | .3268706 |

Number of obs =362

F (5, 357) = 6685.18

Prob > F = 0.0000

R-squared = 0.9894

Adj R-squared = 0.9893

Root MSE = .3198

*Source: Author's computation*

| Variable | Obs | Mean | Std. Dev | Min | Max |
|---|---|---|---|---|---|
| Gender | 362 | 1.309392 | .4628829 | 1 | 2 |
| Age group | 362 | 2.657459 | 1.03341 | 1 | 5 |
| Eduattain | 362 | 3.049724 | 1.117854 | 1 | 4 |
| Settlement | 362 | 1.563536 | .6070652 | 1 | 3 |
| Purpose | 362 | 2.980663 | 1.132331 | 1 | 4 |
| Challenge | 362 | 4.016575 | 1.677537 | 1 | 7 |
| Evinmpact | 362 | 2.776243 | 1.357115 | 1 | 5 |
| Econimpact | 362 | 2.458564 | 1.414095 | 1 | 5 |
| Technique | 362 | 3.20442 | 1.226297 | 1 | 5 |

Result revealed that the settlement and challenge ( clarify this reporting. As it is does not make sense) is exactly 2% respectively less likely to have effect on environmental degradation, though is not statistically significant at 5% level of significance. This implies that settlement and challenge has an indirect relationship with environmental degradation. Purpose, economic and techniques have respectively 20%, 57%, and 29% more likely to have positive effect on environmental degradation. These variables are statistically significance at 5% level of significance. This suggests that, increase in the level of activities of these variables will have positive impact on the environmental degradation.

**V. Research Findings**

In conclusion therefore the research came up with the following findings:

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i The study area has more males than females. In other words, the number of male respondents to female was high(what is the significance of this study finding??)
ii Logging was for both domestic and commercial purposes. Most of the trees felled were sold outside their place of origin whereas some other wood felled were used for cooking.
iii Deforestation could result in desert encroachment and loss of biodiversity. Expansion of area covered by desert is enhanced by incessant logging. Evapotranspiration is also reduced(????) due to less plant cover.
iv There was inadequate funding for plant seedlings and inefficient funding for afforestation programmes. This resulted is absence of needed seedlings for forest reclamation.
v Logging distorts both floral and faunal habitat and harm the existence of biodiversity. Arbitrary felling of trees has also resulted in the destruction of all levels of dwelling places for both small and bigger organisms.
vi Cost of reclamations seems higher than income expected. Benefit seems not match the damages incurred through logging.
vii No use of workable legislative tools as measure for control of deforestation. No lasting and workable laws to protect the forests.

## VI. Recommendations

This study recommend that in order to address indiscriminate tree harvesting challenges in Nigeria, there is need to adopt the following:- policy and resilience, careful choice of priorities, prudent forest management and getting involved the private sectors, combined with proactive actions and policies. Nigeria leaders, both current and future should prioritize educating the young generations' dangers posed by this unwholesome actions going on in the study area and all the major forest reserves in general. The poor are most vulnerable to environmental hazards and owing to unequal distribution of assets in the country, will also suffer most from the effects generated by deforestation. Increase in temperature, Erosion, Flood, and other forms of degradation effects. Increasing the opportunity for the vulnerable is the only way to sustain overall growth and reduce disparity. Disparity on basic amenities like kerosene, cooking gas and electricity most be reduced drastically so the even if the laws is been enforced, poor people will have alternatives and see reason to keep to the rules and regulations.

In view of the above findings therefore, the research wish to make the following recommendations:-

1. Improvement of legal and political frame works for forest conservation and management. Workable legal and political-will enhances sustainable conservation and forest resources management
2. Provision of basic education on forestry and wild-life conservation. Education is essential to the sustainable development of any sector of man's Endeavour.
3. Primary custodians should be involved in forest management for sustainable conservation practice. When making decisions on forest management, the local people be considered.
4. Employment of qualified field staff for effective forest monitoring. Forest manager should people vast in forestry education.
5. Adopting aggressive afforestation strategy. All time replacement of fell tree should be encouraged at all levels.
6. There should be efficient wood conversion technique and planting of fast growing and improved species' of trees.

## VII. Conclusion

Conclusively, it could be stated that most forest destructions in the study area and Nigeria at large are carried so as to enhance their economic standard of loggers. Both the poor and rich are involved in logging. The impact on biodiversity and the environment is enormous and adequate workable strategies needed to be urgently adopted to forestall extinction of certain organisms and animals.

## Acknowledgments

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## Disclosure of conflict of interest

The authors declare no conflicts of interest.

*Statement of informed consent Informed consent was obtained from all individual participants included in this study.*

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**References**


1. Ackley H. Andean forest fragmentation and the presentativeness of protected natural areas in the eastern Andes, Colombia. Elijah et al.; AJEE, 9(2): 1-17, 2019; Article no.AJEE.48831 13 Biological Conservation. 2001;113:245– 256.
2. Adams M, Sibanda S. Land tenure reform and rural livelihoods. Agriculture and Technology Journal. 1995;1:15-35.
3. Akachukwu, A.C. (2007) Disappearing forest, The Consequences and Challenges of SSustainable Development in Nigeria. In preceeding of 31st Annual Conference of Forestry Association of Nigeria held in Makurdi, Benue State, Nigeria 20th – 25th, Nov. 2006 pp 48 – 61.
4. Akinbami, J.( 2013) An Integrated Strategy for Sustainable Forest-energy –Environment Interraction in Nigeria Journal of Environmental Management 69.2(2013):115-28, Science Direct
5. Dauda DS, Ebeiyamba OE, Aluko OE. Spatio-temporal assessment of Baissa Forest disturbance in Taraba State Nigeria. Accepted in 2016 by Journal of Environment and Earth Science; 2015. ISSN (Paper) 2224-3216 ISSN (Online) 2225-0948.
6. Ebe F.E "Socio-economic factor influencing the use of fuelwood in urban area of Enugu state, Nigeria" Journal of business and management, 2014.
7. FAO. A preliminary survey of the forest animals of Gashaka Gumti National Park, Nigeria. Unpublished Report for WWF-UK and the Conservation Foundation. Contract Reference; 2002.
8. FAO. Report on an expedition to Sardauna Province, North-Eastern State 20th March - 10th April, 1970. Ife University Herbarium Bulletin No. 6; 2009.
9. Ishmeal Ogboru and Rosemary Anga "Environmental degradation and sustainable economic development in Nigeria'' journal of economics 2015.
10. ITTO. Guidelines for the restoration, management and rehabilitation of degraded and secondary tropical forests. ITTO Policy Development Series No. 13. Yokohama, Japan; 2002.
11. UNEP (2004) protested Trees, Plants and Animal Biodiversity – United Nations Environment Programme, World Conservation Monitoring Centre (WCMC) World Database of Protected Areas.
12. Wikipaedia (2008) Deforestation – Wikipaedia. The Free Encyclopadia, http://en.wikipadia.org.wiki/deforestation.
13. Rainforest Mongaby (2008) Nigeria Environment profile. Deforestation Rate and Related Forestry Figures (http://rainforest.Mongaby.com/deforestation/2000/Nigeria.htm.
14. Muhammad Rabi'u Ja'Afar-Furo "Dynamics of poverty, deforestation and beekeeping in Northern Nigeria, concern for policy makers –part II" Journal of physical and Agricultural science. 2016.
15. Mfon (2014) Impacts of Logging of the Forest Diversity in Iwuru, South Eastern Nigeria. A Master of Science in Environmental protection and Resources Management of Geography and Planning Department, University of Calabar, Calabar Nigeria.
16. Mfom (2014) Impacts of Logging on Forest Diversity of Iwuru, South Eastern Nigeria. A Master of Science in Environmental Protection and Resources Management Degree Thesis, Department of Geography and Planning University of Calabar Clabar Nigeria.
17. Ogundele Adeola Tunde Oladipo Micheal O, Adebisi Olusegun Mathew "Deforastation in Nigeria: The need for urgent mitigation measures" Journal for Geography and Environmental Management, 2016.
18. Odjugo, Peter A. (2010) General Overview of Climate Change in Nigeria Journal of Human Ecology 29.147-55 EBSCO
19. Omofonmwan S.I., and Osa-Edoh (2008) The Challenges of Environmental Problems in Nigeria, Journal of Human Eccology, 23.1, 53-57.
20. Park, C.C.(2010) Tropical Rainforests, London, Routledge.
21. Persson, R., (2003): Assistance to forestry. Experiences and potential for improvement. CIFOR, Bogor, 120 pp.
22. Reed RA, Johnson-Barnard J, Baker WL. Spatial characterization and conservation prioritization in tropical evergreen forests of Western Ghats, Tamil Nadu using geoinformatics. Dissertation Published, Bharathidasan University, India; 1996.
23. Zomer, R. J., Trabucco, A., Coe, R., Place, F. 2009. Trees on farm: analysis of global extent and geographical patterns of agroforestry. ICRAF Working Paper-World Agroforestry Centre; 89 pp.