RATE, CAUSES AND IMPACT OF DEFORESTATION IN BORGU LOCAL GOVERNMENT AREA OF NIGER STATE, NIGERIA

HALIDU, S.K.,[1] *AKANDE, O.A.,[2] WAHAB, M.K.A.,[3] OMOLE, E.B.,[1] ALAYE, S.A.[1] AND OSAGUONA, P.O.[1]

[1]Federal College of Wildlife Management, Forestry Research Institute of Nigeria, P.M.B 268, New-Bussa, Nigeria
[2]Department of Zoology, Ahmadu Bello University, Zaria, Nigeria
[3]Department of Fisheries and Wildlife Management, Osun State University, Nigeria
*Corresponding author: akandehmd@gmail.com

Abstract

This study assessed the rate, causes and impacts of deforestation on socio-economic development of selected communities in Borgu local government of Niger state, Nigeria. Data were collected using structured questionnaire from one hundred respondents in five communities in Borgu local government area. Data collected were analyzed using descriptive statistics. The findings show that female respondents recorded the highest percentage (55%) and age group 41-50 had the highest percentage (40%). The major occupation of the respondents was farming with 30%. The source of fuel of majority of the household was firewood (64%). The level of Knowledge about of deforestation revealed that 60% of the respondents have engaged in deforestation. The rate and extent of deforestation revealed that deforestation witnessed in a slow rate recorded the highest. The causes of deforestation in the study area shows that construction of building and farming were the major causes of deforestation. The socio-economic benefits that directly influence the exploitation of forest resources in this community shows that source of income recorded the highest (60%). The negative effects of deforestation in shows that global warming is the highest (40%). The study recommends that alternative source of income should be provided to the communities.

Key Words: *Deforestation, Rate, Causes, Impacts, Forest*

Introduction

Over the years, sustainable management of forest resources has been of primary concern due to its potential impact on biological diversity and importance in maintaining global ecological functions (Areola, 1997). In spite of its importance, the natural tropical high forest has continued to diminish rapidly in the African continent, thus dwindling sustainable forest management. Nigeria could face the possibility of timber and fuel wood scarcity towards the end of the 21st century (Areola, 1997). It has been predicted that within the next fifty years, unless adequate measures are

taken, most humid tropical forestland area in Africa could be transformed into unproductive land and the deterioration of the savannah into desert will be accelerated (Kio, 1990; Hunter *et al.*, 2005; Medugu, 2010). In many areas, due to increasing population, existing wood resources are over exploited. It is claimed that there are now places in the Sahel region where fuel wood has become so expensive that it absorbs about half the monthly budget of some poor families in urban areas (Medugu, 2010). Some families could only afford one meal per day as a result of high cost of fuel wood and other alternative sources of energy for cooking (Bowling, 2000; Mizra, 2003).

With extensive deforestation, villagers are compelled to walk long distance to fetch fuel wood and eventually tempted to substitute dried animal dung and crop residues for fuel wood. This tends to have serious consequences for local agricultural production and productivity because; the rural communities also rely on this substituted resource for improving soil fertility. Apart from the deterioration in the quality of life associated with forest degradation, there are other more insidious effects that endanger the future of humans on this planet (Areola, 1997). Nearly 500 million people around the world depend on forest for their livelihood; among them are a high number of forest and wood workers (Bowling, 2000). Therefore, sustainable forestry management must include safe, stable jobs with adequate wages and working conditions (Krausmann and Mushtaq, 2008).

In Nigeria, environmental problems that are termed degradation collectively, such as desert encroachment, erosion, flooding and drought have a strong link with deforestation. In some state in Nigeria for instance, escalated soil erosion, flooding, increase in aridity, all of which have strong relationship with deforestation, have affected a significant proportion of the state. Human activities, climate change coupled with rural poverty have led to increased deforestation in the rural areas of Nigeria. Given the low productivity of the soil in the tropics to which Nigeria belongs, the poor state of the farmers and subsistence nature of agriculture in Nigeria, green environment may be difficult to sustain (Ojo *et al.,* 2018). There is the need to better understand the constraint and challenges of deforestation especially in the study areas. This research work seeks to assess the extent of the rate, causes and impacts of deforestation on socioeconomic development of the study area and how the stakeholders will adopt environmentally friendly management options for forest resources.

Methodology
Study Location
Borgu Local Government Area is located in Niger state, Nigeria. It is located on latitude 9° 53′ N and longitude 4° 31′ E, covering a land mass of about 16, 200 km^2 (Figure 1) It has a population of about one hundred and two thousand three hundred and seventy (102, 370) people as revealed by 1996 census.
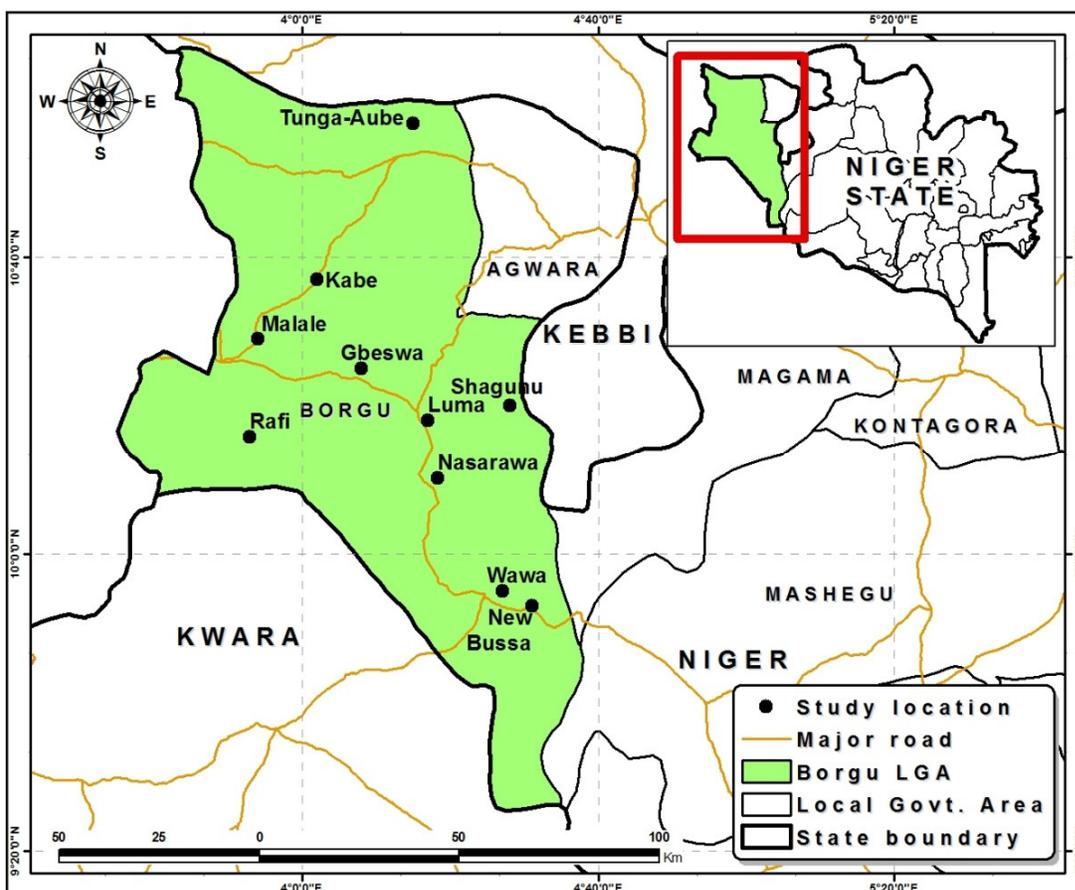
Fig. 1: Map of Borgu Local Government Area of Niger state

Method of Data Collection

A structured questionnaire was used to collect data from one hundred and twenty respondents in the study area. The questionnaire was developed with the objective of obtaining meaningful information and views from rural household members living within the study area.

Sampling Techniques

Five communities were purposively selected in Borgu Local Government Area of Niger State (New-bussa, Luma, Malale, Shagunu and Leshigbe). A reconnaissance survey was conducted prior to the research study in order to acclimatize with the study area and familiarize with the people. Accidental sampling was used in selecting the number of respondents in each village.

Data Analysis

Data collected were analyzed using descriptive statistics in the form of frequency tables and percentages using Microsoft excel.

Result and Discussion

Table 1 shows the socio-demographic factors of the respondents in the study area, in which female recorded the highest percentage (55.0%) and male had 45.0%. It was also revealed that age group 41-50 had the highest (40.0%) and 20-30 is the least (4.0%). The table also revealed that Islam is the highest (69.0%) religion. The educational qualification shows that respondents with primary school certificate were the highest (55.0%), while tertiary education were the least (3.0%).

Majority of the respondents were married (63.0%). The household size of 5-8 members was the highest with 51%. The occupation of most respondents was farming (30.0%). The major occupation of the respondents revealed that farming was the highest with 30.0%, follows by hunting with 15.0% and civil servants was the least with 6.0%. Majority of the respondents (49.0%) had stayed in the communities for a period of 16 years and above.

Table 1: Demographic Factors of the Respondents

| Variable/group	Frequency	Percentage (%)
Sex		
Male	45	45.0
Female	55	55.0
Age group		
20-30	4	4.0
31-40	12	12.0
41-50	40	40.0
51-60	35	35.0
60 above	9	9.0
Religious		
Muslim	69	69.0
Christian	31	31.0
Educational qualification		
No formal education	37	37.0
Primary school	55	55.0
Secondary school	10	10.0
Tertiary	3	3.0
Marital statues		
Married	63	63.0
Unmarried	37	37.0
House size		
1-4	35	35.0
5-8	51	51.0
8 above	14	14.0
Major Occupation		
Unemployed	10	10.0
Farming	30	30.0
Hunting	15	15.0
Fishing	10	10.0
Civil servant	6	6.0
Artisanal	5	5.0
NTFP	10	10.0
Student	14	14.0
How long have you stayed in this community?		
1-5	10	10.0
6-10	26	26.0
11-16	25	25.0
16 above	49	49.0
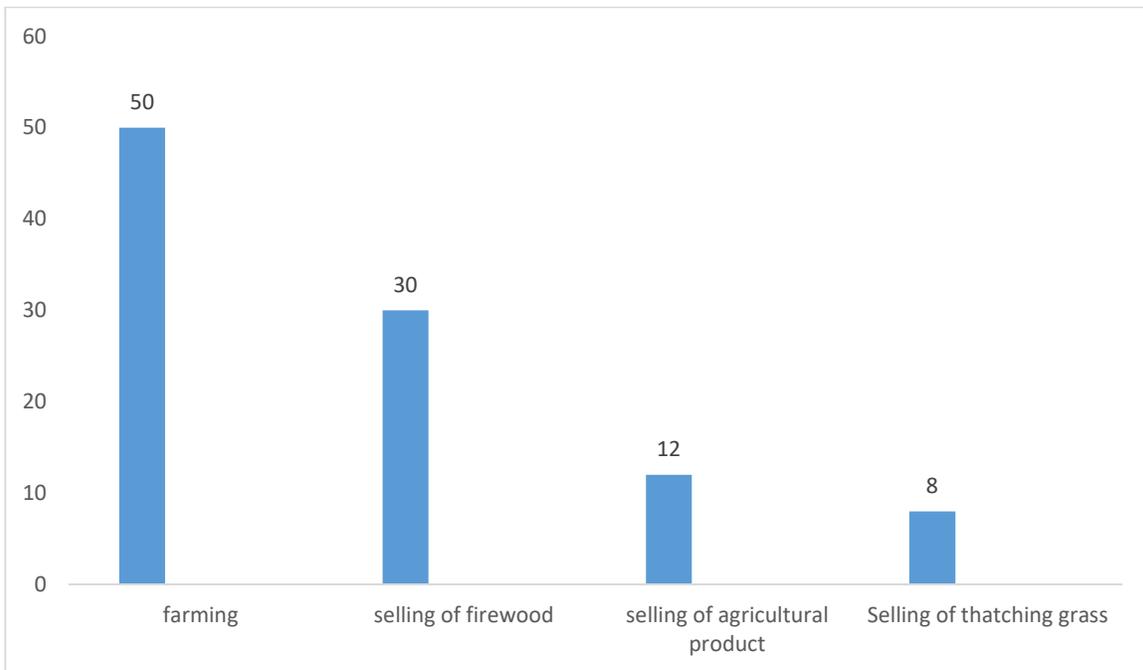
Fig. 2: Sources of Income of the Respondents

Figure 2 shows others sources of income of the respondents; it shows that farming recorded the highest with 50.0%, follows by selling of firewood with 30.0% and selling of thatching grass is the least with 8.0%
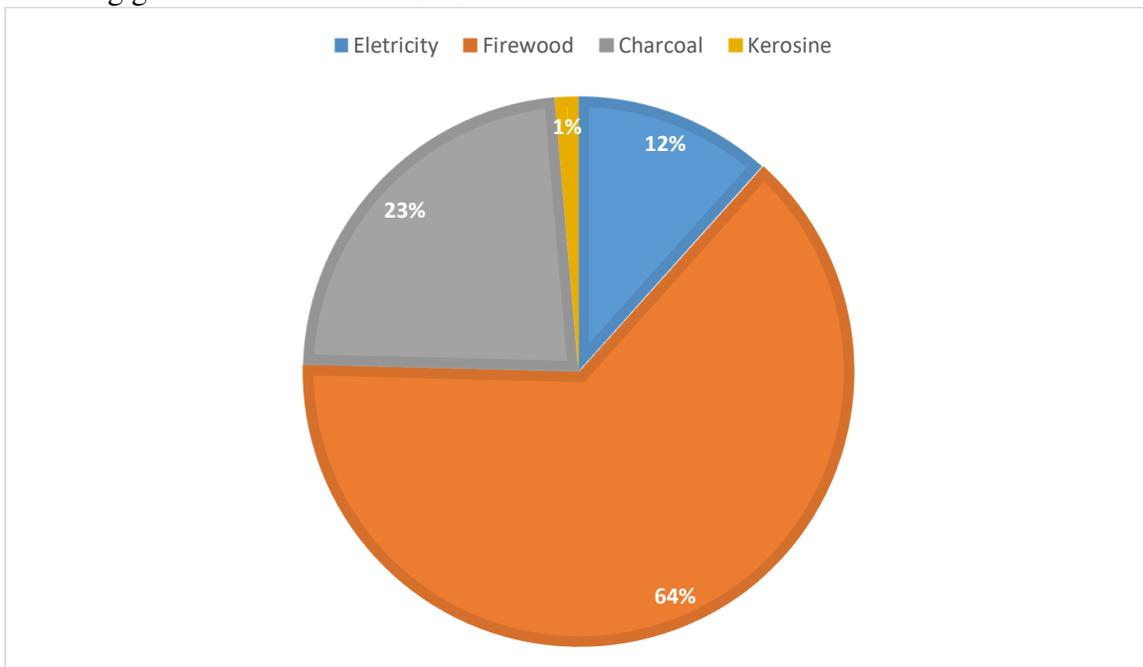

Fig. 3: Source of fuel in the study area

The source of fuel in the study area is shown in Figure 3, it was revealed that majority of the household make use of firewood (64%), followed by charcoal (23%) and the least was kerosene with 1%.
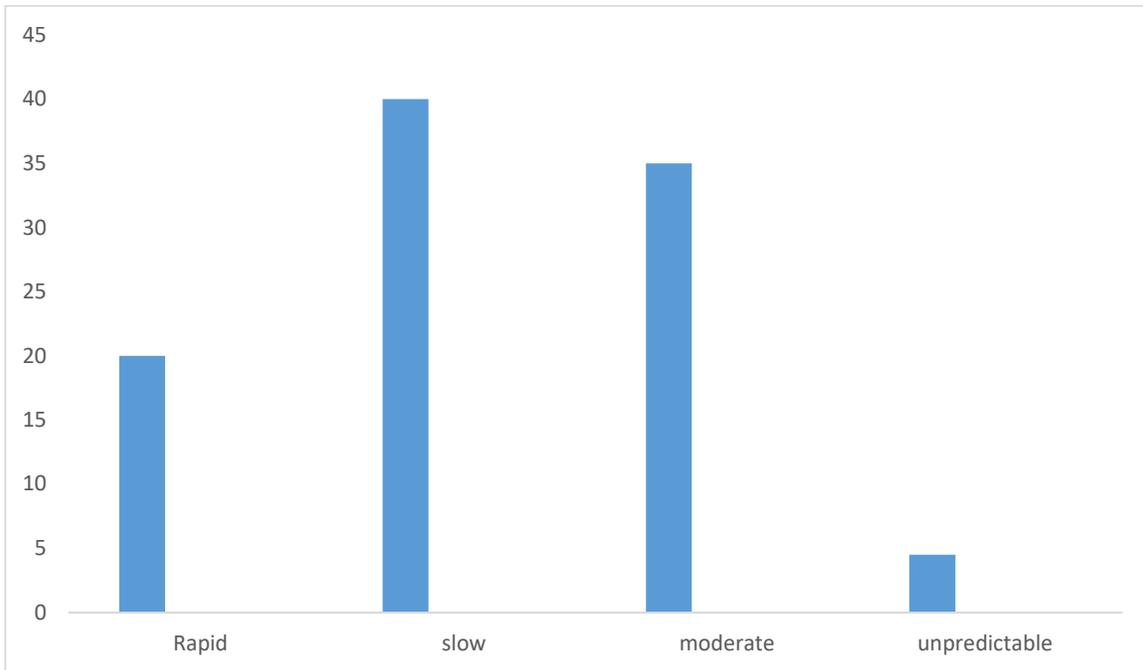

Fig. 4: Rate and Extent of Deforestation in the Study Area

The rate and extent of deforestation is revealed in figure 4, in which deforestation is slow in the study area recorded the highest percentage of 40.0%, follows by moderate with 35.0% and unpredictable was the least with 5.0%.

The causes of deforestation, products extracted from the forest and socio-economic benefits of deforestation in the study area is revealed in table 2, it showed building recorded the highest (30.0%). This was followed by farming and charcoal production with 20.0% each. Logging and urbanization had the lowest representation of 10.0% each. The least causes of deforestation in the study area was hunting. The type of forest products normally extracted from the forest was timber forest products (95%). Some of the timbers were taken to sawmill and converted to planks of varying sizes. Others were mainly used for charcoal production. Non-Timber Forest Products (NTFPs) were the least (5%) type of product obtained from the forest. They include; fruits, seeds, leave, etc. The socio-economic benefits that directly influence the exploitation of forest resources in this community shows that source of income recorded the highest (60%), while source of livelihood and employment recorded 20% respectively.

Table 2: Causes and impacts of deforestation

Causes of deforestation	Frequency	Percentage
Farming	20	20.0
Hunting	4	4.0
Logging	10	10.0
Building	30	30.0
Charcoal	20	20.0
Grazing	6	6.0
Urbanization	10	10.0
Products extracted from the forests		
Timber Forest Products (TFPs)	95	95.0
Non-Timber Forest Products (NTFPs)	5	5.0
Socio-economic benefits influencing exploitation of forest resources		
Source of livelihoods	20	20.0
source of income	60	60.0
source of employment	20	20.0
Contribution of exploited forest resources to households' livelihood outcomes		
Household energy	20	20.0
Foodstuffs	25	25.0
Materials for shelter	29	29.0
Local craft materials	26	26.0
Total	100	100.0
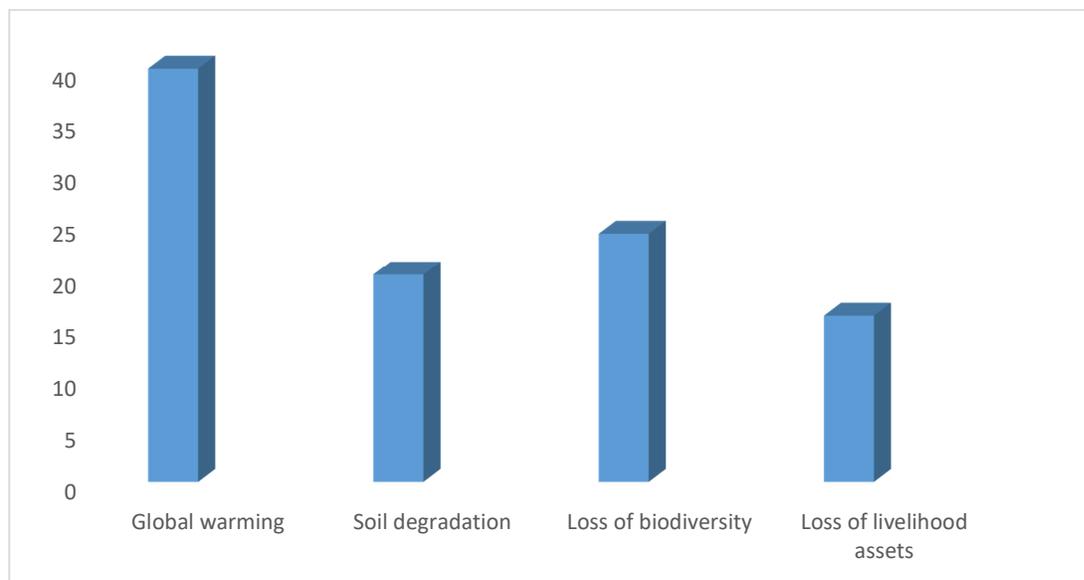
Fig. 5: Negative effects of deforestation on the communities

The negative effects of deforestation in figure 5 shows that; it causes global warming (40%) and loss of biodiversity (24%), soil degradation (20%) and loss of livelihood assets (16%).

Discussion

The findings revealed that majority of the respondents are females. There is no special explanation for this variation in the sex of the respondents but it can be linked with the choice of sampling technique which offered every person whether male or female, the equal chance of being selected. Also majority of the respondents are Muslim and this may be attribute to the fact that the study is carried out in the northern part of Nigeria which is dominated by Islam. The educational qualification shows that respondents with primary school certificate were the highest (55%) while tertiary education were the least (3%). This contradicts a similar work done by Buochuama *et al.* (2018) who observed that a greater proportion (42.5%) of respondents had tertiary education. The major occupation of the respondents are Farming, especially during the raining season is practiced by many household in the study area. Ojo *et al.* (2018) observed that trading and farming were the major occupation of respondents in a related study. Myers (1994) reported that about 60 per cent of the clearing of tropical moist forests is for agricultural settlement with logging and other reasons like roads, urbanization and Fuelwood accounting for the rest.

The causes of deforestation in the study area showed that farming is the major causes of deforestation. This is in accordance with various studies (Bisong, 2010; Geist and Lambin 2002; Oduntan, *et al.*, 2012) that confirmed agriculture as the major driver of deforestation. Agricultural expansion has been determined as the key driver of deforestation in the tropics, particularly commercial actors such as those involved in mechanized agriculture play a significant role in the expansion of agriculture into the forest. For instance, the study by Geist and Lambin (2002), identified agriculture as the cause of 73% of all deforestation tropical Africa. As the trees are felled, they are not replanted. Also, farming and charcoal production are among the prominent activities that result to deforestation. Before farming is carried out in the study area, burning of the existing vegetation occurs, this has resulted to the loss of valuable tree species. Trees are seen as obstacles in farm lands and are thus fell for space to accommodate arable crops. Trees are also felled and used for charcoal production without replacing them. Indeed, forest has the capacity to provide financial gains to communities. However, forest resources are over-exploited and poorly managed. Exploitation of forest resources (TFPs and NTFPs) most importantly contributed to households' livelihood outcomes through provision of materials for shelter (29%), production of local craft materials, provision of foodstuff (25%) and production of household energy. As forests are cleared without replacing them, the amount of carbon which they hold are released to the atmosphere, thus contributing to global warming. As large acres of lands are cleared, biodiversity is loss. Species which were once found in an area might disappear as deforestation occurs. Valuable tree species and wildlife have being loss due deforestation. Deforestation destroys the habitat of wild animals making them to be easy targets for hunters. Deforestation causes the soil to be prone to erosion. Top soils are easily washed from the surface of a bare land.

This makes the land unsuitable for farming. As more trees are cut without replacing them, people who depend on forest resources will invariably suffer economic loss, as their livelihood is threatened (Geist and Lambin 2002).

Conclusion

The study has found that a great number of the respondents are married people that need to cater for the families through the use of forest resources. Majority of the respondents are literates who supposed to understand at least a little about the impact of deforestation in the society. Most of the respondents engage in the trading of forest products and farming; two factors that contribute to deforestation. There are many causes of deforestation in the study area and they include; logging, fuel wood gathering, urbanization, farming and charcoal production. The benefits of deforestation on socio-economic development includes source of income. Fuel and employment. Global warming, soil erosion, extinction of wildlife habitat are some of the impacts of deforestation in the study area.

Recommendations

Based on the findings of this study, it is recommended that:
1. Afforestation and reforestation program should be carried out by the government in the affected area of the study.
2. Sustainable harvesting of forest resources should be encouraged by all relevant authorities.
3. Agroforestry practise should be incorporated into the farming schemes of the community members.
4. Provision of alternative source of fuel for the communities

5. Local communities and other stakeholders at all levels should be sensitized and educated on the values of forests. This will require a comprehensive conservation education and communication strategy.

References

Areola, O. (1997). The Political Reality of Conservation in Nigeria. In: Conservation in Africa People Policies and Practice. *J. Multidisciplinary*, 3(2): 33-48.

Bisong, F.E. (2010). Nigeria Strategic Investment Framework (NSIF) For Sustainable Land Management (SLM): Phase 1, Cross River State (2011 -2020), Draft Report, National Fadama Development Office, Abuja.

Bowling, J. (2000). A worker's view on sustainable forestry Managing forest in the Ecosystem Sustainable forest management. *Forestry Research,* 121-138.

Buochuama, A., Akande, O.A. and Buochuama, M.O. (2018). Devastating Effect of Forest Degradation in Southern Guinea Savanna of Nigeria. *World Scientific News*, 99, pp 84-94.

Geist, H. and Lambin, E. (2002). Proximate causes and underlying driving forces of tropical deforestation, *BioScience*, 52: 143–50.

Hunter, N.M., Horritt, M.S., Bates, P.D., Wilson, M.D. and Werner, M.G.F. (2005). An adaptive time step solution for raster-based storage of cell modeling of floodplain inundation. *Advance Water Resource,* 28: 975-991.

Kio, P.R.O. (1990). Wildlife Inventory by remote Sensing Techniques. Pp 1-7. Wildlife management In Savanna Woodland Edited by Ajayi, S. S. and Co. 273p.

Krausmann, E. and Mushtaq, F. (2008). A qualitative Natech damage scale for the impact of floods on selected industrial facilities. *Natural Hazards,* 46: 179-197.

Medugu, N. (2010). *The Primary Source: Tropical Forests and Our Future*. Norton, New York.

Mizra, D. (2003). *Government policies and Deforestation in Brazil's Amazon region*. World Bank, Washington DC.

Myers, N. (1994). Tropical deforestation: rates and patterns. In: The Causes of Tropical of Tropical Deforestation. The economic and statistical analysis of factors giving rise to the loss of the tropical forest, eds. Brown, K. and Pearce, D. pp 27-40. UCL Press.

Oduntan, O.O., Soaga, J.A., Akinyemi, A.F. and Ojo, S.O. (2012). Human activities, pressure and its threat on forest reserves in Yewa division of Ogun State, Nigeria*. Journal of Environmental Research and Management*, 4(5): 260-267.

Ojo B.S., Alaye, S.A., Buochuama, A. and Martins, A. (2018). Influence of Deforestation in Borgu Local Government Area of Niger State, Nigeria, *World News of Natural Sciences,* 18(2): 62-71.