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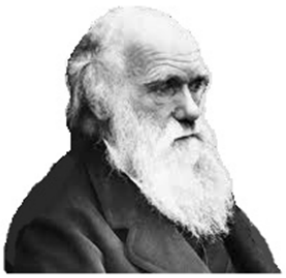

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Influence of Deforestation in Borgu Local Government Area of Niger State, Nigeria

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ABSTRACT

There are ample facts that the whole world is facing an ecological crisis by reason of heavy deforestation. Thus, this study assesses the influence of deforestation on some selected villages in Borgu Local Government Area, Niger State. Data were collected from members of the community using a set of structured questionnaire. This was then analyzed using descriptive statistics (percentages and frequency count). Findings reveal that the major occupation is trading (33.3%), followed by farming (30%). The causes of deforestation in the study area include: fuelwood removal (31.7%), urbanization (25.0), logging (20.0%), subsistence farming (15.8%), population growth and overpopulation (3.3%), commercial farming (2.5%) and inequitable distribution of wealth and power (1.7%). Global warming (31.7%) was the major effect generated by deforestation in the study area, followed by soil erosion (24.2%). Encouragement of better agroforestry practices (30.8%) was seen as the major strategy for reducing deforestation by the respondents. Other best practices include: afforestation (27.5%), public enlightenment (13.3%), enforcement of forest land and policy (12.5%), forest education (8.3%), forest conservation and preservation (7.5%).

Keywords: deforestation, ecological crisis, forest, influence

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1. INTRODUCTION

Tropical forest covers 814 million ha, of which 110 million ha is located in Africa, 168 million ha in Asia and the pacific, and 536 million ha in Latin America. However, only 25 million ha are exploited in a sustainable way and 11 million ha of tropical forests are conserved with an effective political protection (FAO, 2000). It is believed that almost all the tropical forests in Nigeria have suffered from enormous deforestation. Loss of biodiversity of tropical forests is mainly caused by anthropogenic activities. Currently, it is a global problem (Sukumaran and Jeeva, 2008) because the annual rate of global deforestation is about 13 million hectares, most of which occurs in developing world. Forest loss in Africa is particularly troubling, however, two-thirds of the continent's population depends on forest resources for income and food and 90% of Africans use fuel wood and charcoal as sources of energy. Despite this dependence on forest resources and non- timber forest products, deforestation in Africa is estimated at about 3.4 million hectares/year (FAO, 2010; Boyowa, 1993; Aweto, 1990; Chokor, 1989; Conable, 1989; Omuta, 1985; Walker, 1985).

The absence of appropriate forest management and utilization, land tenure policy and lack of compatible forest legislations could result to deforestation. However, Population growth and the associated expansion of agricultural lands is the primary cause of present day deforestation (Gibbs *et al.*, 2010; Foley *et al.*, 2011). Although rates of deforestation have decreased over the last decade, the loss of forested areas is expected to continue during the present century (FAO, 2010). Forested area in the Amazon Basin, where the largest rainforest on Earth is found, could be reduced in approximately 50% by 2050. (FAO, 2010) .While most deforestation occurs in the tropics, non-tropical forests are likely to suffer new deforestation pressures as the climate warms and areas which were previously too cold become suitable for agriculture (McCarthy, 2001; Salihu, 2016; Okwodu, 2016; Yunusa, 2016; Adedeji, 2017; Etuk, 2018).

There are ample facts that the whole world is facing an ecological crisis on account of heavy deforestation. Aiyeloja and Chima (2011) reported that inappropriate forest use and management practices, pollution and climate change as well as undocumented and uncontrolled movement of germ plasms have been identified as additional threats to forest resources. However, this work deals with the causes, effects and strategies of reducing deforestation.

2. MATERIALS AND METHODS

2. 1. Study Location

Borgu Local Government Area is located in Niger state, Nigeria. It is situated on latitude 9°53'N and longitude 4°31'E, covering a land mass of about 16,200 km^2. It has a tropical continental climate characterized by a shorter wet season (May to September) and a longer dry season (October to April) with a temperature of 15 °C to nearly 40 °C (Adeniji *et al.* 2015).

Figure 1 shows the map of Borgu Local Government Area indicating the study area.

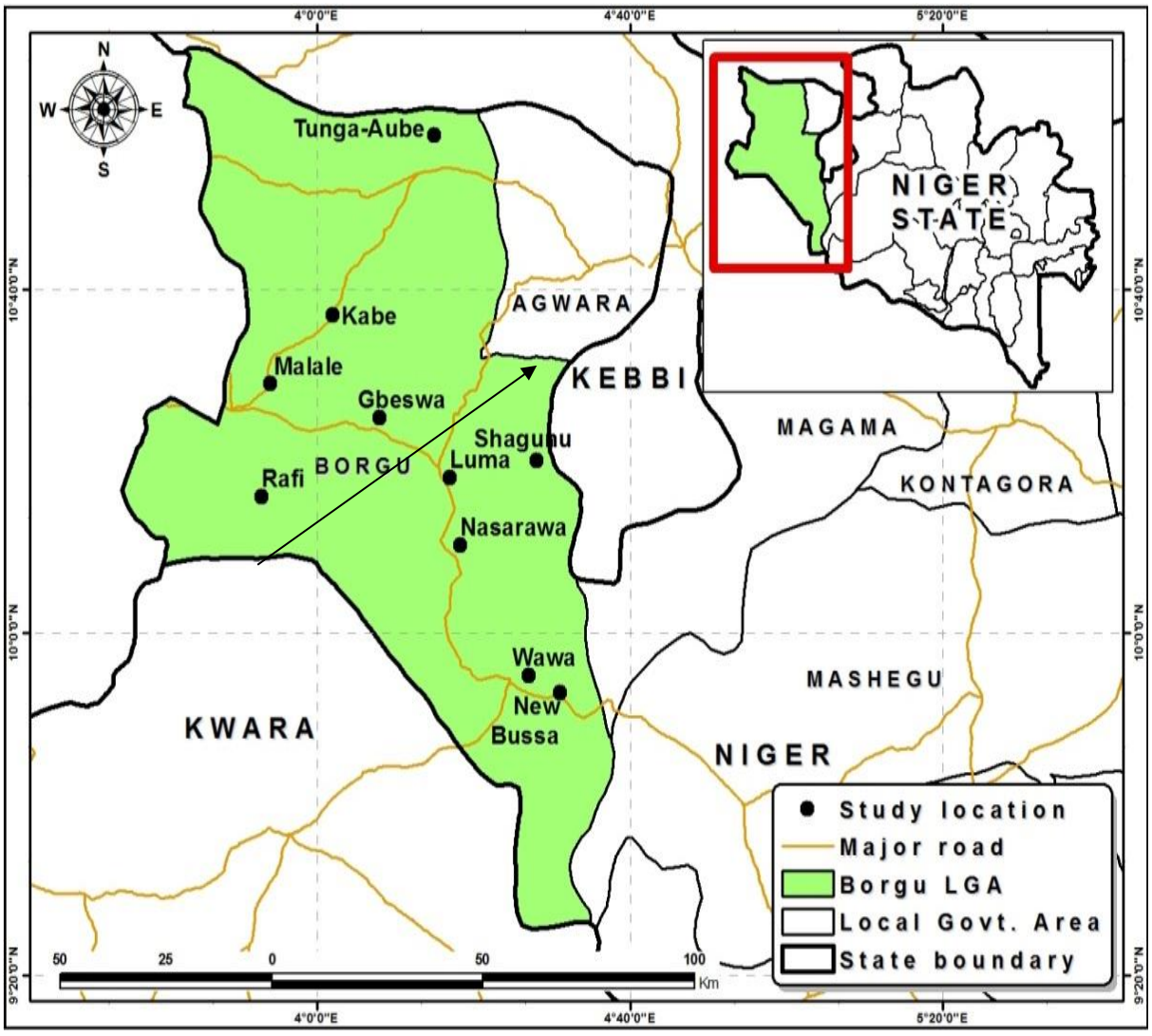

Figure 1. Map showing Borgu Local Government Area of Niger state

2. 2. Method of Data Collection

A well structured questionnaire was used to collect data from one hundred and twenty (120) 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.

2. 3. Sampling Techniques

Five villages in Wawa community (Babarasa, Malale, Garafini, Wooko and Leshigbe) were selected from Borgu Local Government Area of Niger State. Proportional allocation was used in selecting the number of respondents in each village. Data collected were analyzed using descriptive statistics in the form of frequency tables and percentages.

3. RESULTS AND DISCUSSION

3. 1. Personal Characteristics of the Respondents

Table 1 shows the personal characteristics of the respondents. It can be observed that 12.5% of the respondents were between ages 15-20 years, majority of the respondents (36.7%) were between ages 21-25 years, while the least (9.2%) were between ages 36-40 years. 55% of the respondents were single, 44.2% were married, while only 1% were divorced.

The table also revealed that 42.5% of the respondents had tertiary education, 10.8% had secondary education, 26.7% had primarily education, while only 20% had no formal education. The adjusted family size result shows that, the family size of 1-10 persons recorded the highest (67.5%). This is an indication that the family size is within a manageable limit for an African community. Those between 11-20 persons were 17.5%, while those between 21-30 and 31-40 persons had the least (11.7%) respectively.

The major occupation was trading (33.3%). This conforms to the fact that most rural dwellers depend on the sale of charcoal and firewood as a means of livelihood. From the result, it is possible to say that forest resources are one of the main income and livelihood sources to the local community in the area (Culas, 2006). Farming was second (30%). This shows the importance of farming to rural dwellers. Annually, large hectares of forest land are cleared for agricultural purposes in the rural communities. 14.2 % were civil servants, 9.2 % were artisans and students respectively, while only 4.2% were hunters.

Table 1. Personal Characteristics of the Respondents

Variables	Frequency (n = 120)	Percentage (%)
Age Group		
15-20	15	12.5
21-25	44	36.7
26-30	19	15.8
31-35	16	13.3
36-40	11	9.2
≥41	15	12.5
Marital Status		
Single	66	55.0
Married	53	44.2
Divorced	1	0.8

Qualification		
No formal	24	20.0
Primary	32	26.7
Secondary	13	10.8
Tertiary	51	42.5
Adjusted Family Size		
1-10	81	67.5
11-20	21	17.5
21-30	14	11.7
31-40	14	11.7
Occupation		
Farming	36	30.0
Trading	40	33.3
Hunting	5	4.2
Artisan	11	9.2
Civil servant	17	14.2
Student	11	9.2

Source: Field Survey, 2017.

3. 2. Causes of Deforestation in the Study Area

Table 2 reveals the causes of deforestation in the study area. Logging had 20%, while fuelwood removal had the highest (31.7%). This can be due to the fact that most of the household rely on fuel wood as a source of heat energy. This conforms to the finding of Ali et al. (2006) who observed that in northern areas of Pakistan, the forest wood is intensively using for the construction of new and repair of existing houses a s was informed by 73% of the respondents.

Urbanization had 25.0%. The relationship between urban development and deforestation is complex and dynamic (Sands, 2005). The influence of urbanization on forest land area cannot be overemphasized. Forest is usually cleared to make way for road construction and urban settlement. Also, during construction, most trees are felled for use as structural materials without replacing them in the forest. Also, expanding cities and towns require land to establish the infrastructures necessary to support growing population which is done by clearing the forests (Sands, 2005).

Population growth and overpopulation had 3.3%. As population size increases, the pressures on forest land also increases. This agrees with the findings of FAO (2005) who started that poverty and overpopulation are believed to be the main causes of forest loss. More people need more food and space which requires additional land for agriculture and habitation. This in turn results in more clearing of forests.

Subsistence farming had 15.8%. Households close to the forest keep on encroaching upon forest land for the cultivation of crops and rearing of animals for family consumption. This is in line with Gillet *et al.* (2016) who noted that the forest communal territory is subjected to degradation through increased agricultural activities. Commercial farming had 2.5%. Large-scale farming has resulted to the loss of thousands of hectares of forest land. A large expanse of land is usually cleared to give way for monocropping. This has resulted to large scale deforestation in urban societies.

Inequitable distribution of wealth and power had 1.7%. Because wealth is unequally distributed in our society, the less privilege looks for an alternative source of income. The forest is usually seen as the first alternative that comes to mind for exploitation. The rural poor exploit these forest resources indiscriminately to meet their needs.

Table 2. Causes of Deforestation

Factors/ Practices	Frequency(n = 120)	Percentage (%)
Logging	24	20.0
Fuel wood removal	38	31.7
Urbanization	30	25.0
Population growth and over population	4	3.3
Subsistence farming	19	15.8
Commercial farming	3	2.5
Inequitable distribution of wealth and power	2	1.7

Source: Field Survey, 2017.

3. 3. Effects of Deforestation in the Study Area

Table 3 shows the effects of deforestation in the study area. It was revealed that global warming had the highest (31.7%). Deforestation promotes global warming which results from increased atmospheric concentrations of greenhouse gases (GHG) leading to increment of the global mean temperature as the forests are the vital terrestrial sink of carbon. Tropical deforestation is responsible for the emission of roughly two billion tonnes of carbon (as CO_2) to the atmosphere per year (Houghton, 2005). This is in line with the findings of Sumit *et al.* (2012) who noted that one of the most important ramifications of deforestation is its effect on the global atmosphere.

The table also revealed that soil erosion had 24.2%. This agrees with the findings of Habtamu *et al.* (2017) who found out that the most common effects of deforestation are soil erosion, loss of soil fertility, increase in temperature, loss of biodiversity, rainfall variability and water and fuel wood scarcity.

Extinction of wildlife habitat had 12.5%. It is generally accepted that forests especially those in the tropics serve as storehouses of biodiversity and consequently deforestation, fragmentation and degradation destroys the biodiversity as a whole and habitat for migratory species including the endangered ones.

Other environmental hazards had 9.2%. Forest serves a number of protective roles to the environment, when these forests are absent, environmental hazard is bound to occur. When trees are felled without replacement, environmental hazards would likely occur.

Table 3. Effects of Deforestation

Factors	Frequency (n = 120)	Percentage (%)
Global warming	38	31.7
Aridity	27	22.4
Soil Erosion	29	24.2
Extinction of wildlife habitat	15	12.5
Other environmental hazards	11	9.2

Source: Field Survey, 2017.

3. 4. Strategies for Reducing Deforestation in the Study Area

Table 4 shows the strategies for reducing deforestation. It was revealed that afforestation had 27.5%. Increasing the area of forest plantations by using vacant or marginal lands and on land not ideal for agricultural production will be beneficial. Planting trees outside forest areas will reduce pressure on forests for timber, fodder and fuelwood demands.

Public enlightenment had 13.3%. When the communities have knowledge about the adverse effects of deforestation, the level of forest degradation would be reduced. Encouragement of agroforestry practices had 30.8%. This can meet the need of the rural community by providing food, environmental benefits and fuelwood.

Enforcement of forest land and policy had 12.5%. A wide variety of policies are currently in place to protect forests but need to be effectively enforced. New modifications are required for site specific conditions.

Forest education had 8.3%, forest conservation and preservation had 7.5%.Training and education of stakeholder's helps people understand how to prevent and reduce adverse environmental effects associated with deforestation and to take appropriate action when possible.

Table 4. Strategies for Reducing Deforestation

Factors	Frequency (n = 120)	Percentage (%)
Afforestation and reforestation	33	27.5
Public enlightenment	16	13.3
Encourage agroforestry practices	37	30.8
Enforcement of forest law and policy	15	12.5
Forest education	10	8.3
Forest conservation and preservation	9	7.5

Source: Field Survey, 2017.

4. CONCLUSION

The study has revealed that there were many causes of deforestation in the study area and they include; logging, fuel wood gathering, urbanization, overpopulation, farming and inequitable distribution of income. Global warming, soil erosion, extinction of wildlife habitat were some of the effects of deforestation in the study area. Afforestation, agroforestry practices, forest education enforcement of forest law and policy, forest preservation and conservation were ways to mitigate deforestation in the study area.

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