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Local Residents' Perception on the Causes and Effects of Deforestation in Fufore Local Government Area, Adamawa State, Nigeria

A. M. Ba, M. Galtima, A. L. Tukur, and A. A. Zemba[1]
1Department of Geography, Modibbo Adama University of Technology, Yola, Nigeria
aazemba@gmail.com

Abstract

The aim of this study was to assess the local residents' understanding of the causes of deforestation in Fufore Local Government Area of Adamawa State, Nigeria. Structured questionnaire was used to obtain the views of the populace on the causes and the effects of deforestation. Questionnaires were administered to 602 respondents randomly picked in 3 Districts out of 7 in the Local Government Area. The data collected was analyzed using simple statistics and the results presented using tables. It was discovered that the local residents are aware of the high rate of deforestation in the area. They attributed the high rate of deforestation in the area to fuelwood extraction and over-cultivation. The study revealed that the tree species mostly harvested are Anogeissus leiocarpus, Combretum ghasalense and Daniellia oliveri. This is because of their usage either as fuelwoods or for the production of domestic utensils such as mortar and pistles as well as handles of local farm tools like hoes, cutlasses, sickles, knives etc. The most serious effects of deforestation in the area include erosion, loss of vegetal resources and increase in temperature. Based on these findings, it is recommended that there is need to intensify tree planting campaign. Government should ensure the availability of both Kerosene and Gas and enlighten citizen on the dangers of deforestation. Laws regulating cutting down of trees should be promulgated and enforced, as this would go a long way in curtailing the rate of deforestation in the area.

Keywords: Residents, Perception, Deforestation, fuelwood.

Introduction

Deforestation can be defined as a large-scale removal of forest vegetation prior to its replacement due to other land uses such as agricultural, commercial, industrial or residential etc. (Adeofun and Akinsami, 1997). Though, the term deforestation has been used interchangeably with forest degradation, they are absolutely different. Forest degradation, unlike deforestation implies reduction in forest quality, particularly in terms of its biodiversity due to human activities.

The loss of large areas of tropical forest through deforestation has become a major source of concern to the world communities. According to Adeofun and Akinsami (1997), there are many causes of tropical deforestation and forest degradation. For instance, according to them, between 1850 and 1980, about 60 percent of forests and woodlands in North Africa and the Middle East were destroyed due to the pressure of human activities (Munansinghe and Sharma, 1995). During the same period, tropical Africa lost 20 percent, southern Asia lost 43 percent and Latin America lost 19 percent (Rowe and Sharma, 1999). In spite of several efforts to mitigate the problem, deforestation in the tropics has continued unabated and by some estimates may even be on the increase. However, according to FAO (2005), the estimated annual loss of tropical forests in the late 1990s was put at 16.9 million hectares, compared to 11.3 million hectares in the early 1990s. Recent studies on the causes of deforestation in Nigeria particularly in the northern region, shows that several interrelated factors have contributed to it. Some of the main reasons are land clearance for commercial and subsistence agriculture, over grazing, consumption of wood for fuel, construction of traditional houses etc. (Audu, 2003).

During the long history of subsistence agriculture in Nigeria and especially after the introduction of commercial agriculture, many forests were converted into agricultural land. The seriousness of the problem was noted already during the first half of last century period (Audu, 2003). With the increase in population, land clearing

extended to vulnerable steep areas unsuitable for cultivation. Furthermore, increased demands for fire wood and use of wood for the construction of traditional houses had adversely affected the forests cover (Musa *et al* 2003). Licensed commercial exploitation of timber, fuelwood and charcoal has further aggravated the problem (Akosim, 1999). This is likely to remain as it is, because the main source of domestic energy in the region is still woods.

Howard (1991) reported that the impact of deforestation include loss of biodiversity, damage to wildlife habitat, erosion, degradation of watershed areas, deterioration of the quality of life and reduction of the options for development. The major causes therefore, include agricultural expansion, commercial over-exploitation of timber, fuelwood collection, heavy livestock overgrazing, accelerated urbanization and industrialization.

Thus, the deteriorating nature of the forest resources both in quality and quantity due to human activities highlighted above signifies untold hardship in the future. Therefore, concerned agencies (government and non-governmental organizations) and scientists have to take urgent actions towards minimizing the rate of deforestation and the rate of forest resources depletion particularly in the developing countries. Studies in some parts of Nigeria show that people are aware of the negative implications of deforestations, but could not help it because they don't have alternative.

It is against this background that this study intends to investigate the situation in Fufore Local Government Area, which is composed of typical African rural communities, with little or no access to sources of energy used in urban areas. The study intended to assess peoples' understanding of the causes of deforestation, its impacts and efforts made by the people in minimizing the trend.

Study area

Fufore Local Government Area is located between latitude 8^0 45' N and 9^0 35' N and longitude 12^0 15' E and 13^0 15' E. It has a total landmass of about 3,666 square kilometers (Ba 2010). The Local Government area has two forest Reserves: Gurin Forest Reserve, gazetted on 6th September 1962 with an area of 165.95 square kilometers and Karlahi Forest Reserve with an area of 104.44 square kilometers and gazetted on 2nd December 1965. Fufore Local Government Area has a total population of 207,287, out of which 105,784 are males and 101,503 are females (NPC 2006) with a growth rate of about 3.5%.

The area, like any other areas within Guinea Savannah, experiences distinct dry and wet seasons with temperature and humidity varying with seasons. The wet season is between April and October with average annual rainfall of about 875mm. The dry season, which is usually associated with harmattan, extends between December and March and characterized by dry, dusty and hazy north-east trade winds that blow over the area from Sahara desert and reduces visibility to less than 1000m. Temperatures are relatively high almost all the year round. The temperature of the area ranges from 30^0 to 42^0 C (Adebayo, 1999).

Vegetation of the area is divided into two, thus; the southern guinea savannah zone and the northern guinea savannah zone. The most abundant woody species in the southern guinea savannah zone include *Danielia oliveri, Combretum ghasalense, Anogeissus leiocarpus, Diospyros Ellioti, Ceiba pentandra, Parkia biglibosa, Khaya senegalensis,Vitex doniana and Terminalia laxiflora.* The dominant plant species available in the northern guinea savannah zone include *Africana spp, Vitellaria Paradoxa, Tamarindus indica, and Termanalia laxiflora, Andropogen pseudapricus, Pilostigma thoningii, Hippocratea Africana and Burkea africana.* The common grass species found in the area include *Andropogan gayanus, Pennisetum galucum, Hyprarrhenia subplumoso, Brachiaria distichophylla and Aristida stipoides, Balanites aegyptiaca and Aristida adsensionis.* Natural vegetation in the area has been seriously tempered with through human activities, more especially fuelwood extraction, land cultivation and grazing of animals (Tella and Jatau, 1999). The Major economic activities in the area are farming (rainfed and irrigation) and livestock grazing.

Materials and methods

This study made use of both the primary data and secondary data. The primary data were collected through the use of structured questionnaire on the socio-economic characteristics and personal observations in the field. Secondary data included published and unpublished from library and internets. Questionnaire was administered to people of 35 years and above. This was to capture group of people who have sound knowledge of history of the area by virtue of their age and experience.

Fufore Local Government area has seven districts out of which three districts were considered in this research for the administration of questionnaires, representing 40% of the total districts. The districts considered are Daware, Gurin and Ribadu. The lottery method of simple random sampling was adopted in the selection process, which involved writing the names of the districts on pieces of papers and putting all the papers in a container for selection purposes. The systematic sampling technique was used to select every fifth household in the path of movement in order to administer the questionnaires. A total of 609 questionnaires were given out and 602 were returned. The formula by Israel (2003) was used to draw the sample size of the population for each district as follows:

$$n = \frac{N}{1 + N(e)^2}$$

where:
n = sample size
N = population size and
e = level of precision (7%) i.e. 0.07

Table 1 shows the distribution of population and the percentage used for this study. The data obtained were analyzed using descriptive statistics (means and percentages).

Table 1: Population and percentage of the population used as Sample

S/No	Districts.	Total Population	Sample size for precision (e) of ±7%
1	Daware	27872	203
2	Gurin	42160	199
3	Ribadu	32323	200
	Total	102355	602

Results and discussion

Socio-Economic Characteristics of the Respondents

This section discusses the results on socio-economic characteristics of the respondents in the study area. The main variables discussed include: Sex, age and occupation of the respondents. These characteristics are deemed to play vital roles in determining the general perception of individuals on any issue.

Sex Distribution of the Respondents

Table 2 revealed that 73.6% of the respondents were males and 26.4% were females. It should be noted that questionnaires were administered to household heads, Thus, results indicated that majority of the respondents in the study area are males.

Age Distribution of the Respondents

The results on Table 2 show that 65% of the respondents are above 40 years, while 35% of them are between 35 and 40 years. The findings therefore, indicated that majority of the respondent are old enough to provide good assessment of the condition of the area, over time, in terms of trends of deforestation.

Occupational Status of the Respondents

Table 2 revealed that the greater percentage of the respondents are farmers (31%), followed by civil servants (24.4%) and then commercial wood vendors (12.1%) and fishermen constitute about 9.6% of the respondents. Wood loggers constitute a good percentage because more people go into this business to take advantage of what they called good and quick returns from it. Daware district happens to have greater number of farmers perhaps because it also has large sample size. The high number of farmers in the area is a pointer to high rate of deforestation. This is because farming activities is known to involve clearing of trees. Ribadu district has greater number of Civil servants. This might be because of its status as a District headquarters with relatively high percentage of elites. Generally, farmers constitute high percentage of the respondents (Table 2). This is therefore, an evidence that forest lands could be under threat of deforestation in the study area.

Table 2: Socio-Economic Characteristics of the Respondents

Sex of the Respondents					
Sex	**Daware**	**Gurin**	**Ribadu**	**Total**	**%**
Male	143	148	152	443	73.6
Female	60	51	48	159	26.4
Total	203	199	200	602	100
Age of the Respondents					
Age	**Daware**	**Gurin**	**Ribadu**	**Total**	**%**
35 – 40	70	61	79	210	35
41 and above	133	138	121	392	65
Total	203	199	200	602	100
Occupation of the Respondents					
Occupation	**Daware**	**Gurin**	**Ribadu**	**Total**	**%**
Farmer	74	67	44	185	31
Wood loggers	34	20	19	73	12.1
Civil Servant	52	35	60	147	24.4
Petty trader	8	19	20	47	7.8
Tailor	11	14	13	38	6.3
Fisher men	15	8	35	58	9.6
Mechanic	9	6	5	20	3.3
Others	0	30	4	34	5.6
Total	203	199	200	602	100

Indicators of Deforestation

Source of Domestic Energy

Table 3 revealed that 85% of the respondents are dependent on fuelwood as source of domestic energy, 9.5% on kerosene as source of energy and 3% on gas. This means that majority of the population in the area depend on vegetal resource for their source of energy and this leads to indiscriminate cutting down of trees for fuelwood. This is true because both kerosene and gas are either unaffordable because of their high cost or even unavailable for the people to buy and use.

Change in vegetal cover in the area

Table 3 shows that 99% of the respondents were aware that there has been decrease in the vegetal resources of the area over time. This shows that the impact of farming activities and fuelwood gathering are greatly felt in the area, since almost everyone in the area is said to have noticed the trend and bearing the brunt of its negative consequences.

Increase in Farm Lands in the Study Area

Table 3 has also indicated that about 97% of the respondents agreed that there is an increase in farmlands and farming activities in the area. About nine out of ten people are full-time farmers, due largely to the rural nature of the area. This shows that

majority of the people are into this occupation and it means more and more hectares of lands are under cultivation; hence more vegetation clearances are done annually.

Ratings of Deforestation Process by the Respondents

The results in Table 3 revealed that 58% of the respondents believed that the rate of deforestation is high, 22.7% said that it is moderate, while 11.9% considered the rate of deforestation in the area as being very high. Only 6.2% of the respondents indicated that the rate of deforestation is low. This means that the people are fully aware of what is happening but cannot help the situation. The result confirms an assertion that the rate of deforestation in the area is high due mainly to farming activities and fuelwood extraction (Ba, 2010).

Causes of Deforestation

The respondents' views were also sought on the causes of deforestation in the area. Table 4 shows that 41.1% of the respondents are of the view that fuelwood extraction is the main cause of deforestation in the area. 23% are of the opinion that over-cultivation is the key cause of deforestation.

Over-cultivation is aggravated by increased population growth. 8.4% and 6.9% of the respondents related this to bush-burning and overgrazing respectively while 6.4% of the respondents attributed it to urbanization. From the forgoing therefore, fuelwood extraction and over cultivation constitute the main causes of deforestation in the area.

Table 3: Indicators of Deforestation

Source of Domestic Energy					
Source	**Daware**	**Gurin**	**Ribadu**	**Total**	**%**
Fuelwood	172	186	154	512	85
Kerosene	17	10	30	57	9.5
Cow dung	4	2	2	8	1.3
Gas	8	-	10	18	3.0
Electricity	2	1	4	7	1.2
Total	203	199	200	602	100
Changes in vegetal cover of the Area					
Vegetal cover	**Daware**	**Gurin**	**Ribadu**	**Total**	**%**
Decreasing	200	198	198	596	99
Increasing	3	1	2	6	1.0
Total	203	199	200	602	100
Increase in Farm Lands in the Study Area					
Farm Lands	**Daware**	**Gurin**	**Ribadu**	**Total**	**%**
Increase	195	192	195	582	97.0
Decrease	8	7	5	20	3.0
Total	203	199	200	602	100
Deforestation rating of the Respondents					
Rate of Deforestation	**Daware**	**Gurin**	**Ribadu**	**Total**	**%**
Very High	30	20	22	72	11.9
High	113	126	110	349	58.0
Moderate	50	37	50	137	22.7
Low	10	13	14	37	6.2
Very low	-	3	4	7	1.2
Total	203	199	200	602	100

Table 4: Causes of deforestation in the Area

Causes of Deforestation	Daware	Gurin	Ribadu	Total	%
Over cultivation	43	41	52	136	23
Fuelwood Extraction	76	102	70	248	41.1
Urbanization	14	12	13	39	6.4
Population growth	32	21	33	86	14.2
Bush fire	24	10	17	51	8.4
Over grazing	14	13	15	42	6.9
Total	**203**	**199**	**200**	**602**	**100**

Tree Species that are mostly affected in the Area

Results on Table 5 show that tree species that are mostly harvested in the area is *Anogeissus leiocarpus* (*Marke* in Local language). This is followed by *Combretum ghalenses* (*tarauniya*) and *Daniellia oliveri* (Maje). Others are *Vitellaria paradoxa* (Kiriya), *Khaya senegalensis* (Madaci) and *Butyrospermum paradoxa* (kadanya). *Khaya senegalensis* is harvested for its wood, which is used in making mortar and pistles. *Anogeissus leiocarpus*

and Daniellia oliveri are suitable fuelwoods used in the households. This is why about three-quarter of

the respondents indicated that they are the ones that are mostly harvested in the study area.

Table 5: Tree species mostly harvested in the Study Area

Botanical Name	English name	Fulfulde Name	Hausa Name
Combretum ghasalense	black Combretum	Busde	Taramniya
Anogeissus leiocarpus	Chewing stick tree	Kojole	Marke
Daniellia oliveri	African Balsam	Karallaje	Maje
Khaya senegalensis	Mahogany	Daleje	Madaci
Vitellaria paradoxa	Shea Butter	Kareje	Kadanya
Parkia biglobosa	Locust been tree	Nareje	Dorawa
Prosopis Africana	False Locust	Kohe	Kirya
Azadirachta indica	Neem tree	Gadina	Dogon yaro

Respondents' assessment on the effects of deforestation in the study area.

Table 6 revealed that 44.2% of the respondents believe that the main resultant effect of deforestation is disappearance of vegetation resources while 26.4% indicated that erosion is the main effects. Deforestation exposes land to the direct hit of

rain drops; hence erosion sets in. 18.4% indicated that deforestation leads to increase in temperature and 6% said flooding is the resultant effect. Thus, this finding means that loss of vegetal cover and erosion are the main footprints of deforestation in the study area.

Table 6: Effects of deforestation in the study Area

Effects of deforestation	Daware	Gurin	Ribadu	Total	%
Erosion	93	79	94	266	26.4
Increase in Temperature	38	40	33	111	18.4
Flooding	13	11	12	36	6.0
Decrease in vegetation resource	49	60	50	159	44.2
Decrease in rainfall	10	9	11	30	5.0
TOTAL	**203**	**199**	**200**	**602**	**100**

Suggestions of the Respondents on Combating Deforestation Problem

Table 7 shows that 48**%** of the respondents are of the opinion that indiscriminate cutting down of trees should be stopped while 42% are of the view that every person should plant at least a tree in his or her domain. However, 10**%** suggested that people should resort to use of other means of fuels, like

kerosene and gas. Generally, it was discovered that majority of respondents believed that when indiscriminate cutting down of trees for fuel and other purposes is stopped the problem is almost tackled. The respondents also believed that when kerosene and gas are made available and at relatively cheaper price to all by the Government, deforestation can be reduced to the barest minimum.

Suggestions on ways of tackling deforestation problems in the Area.

Suggestions	Daware	Gurin	Ribadu	Total	%
Plant a trees	75	83	93	251	42
Use of other means of energy e.g. kerosene, gas	26	21	16	63	10.0
Stop cutting down of tress	102	95	91	288	48
TOTAL	**203**	**199**	**200**	**602**	**100**

Conclusion

Based on the findings above, the following conclusions are drawn:

That fuelwood gathering and over-cultivation are the most causal factor of deforestation in Fufore Local Government area of Adamawa state. Other causes are overgrazing, population growth, urbanization and bush burning. The most harvested woody plants in the area include *Anogeissus leiocarpus (Marke), Combretum ghasaleuse (Taramniya)* and *Daniellia oliveri (Maje)* species. This is due to their suitability as either domestic fuelwoods or their usage in making local domestic utensils. The resultant effects of deforestation in the area are erosion, loss of vegetal resources and increase in temperature. However, flooding and decrease in rainfall are also seen as important effects.

Majority of the people in the area are farmers and this implies that more hectres of land are cleared which in turn leads to loss of vegetation. In the same vein, majority of the people (85%) depend on fuelwood for their daily domestic energy. This implies that more trees need to be cut to provide household energy for this teeming population. This, in turn aggravates the problem of deforestation in the area. Serious and proactive sensitization campaigns on the dangers of deforestation need to be embarked upon so as to minimize the rate of deforestation in the area.

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