

# A STUDY ON DEFORESTATION IN NINGI AREA OF BAUCHI STATE, NIGERIA

Jamil Hassan Abdulkareem<sup>1,2</sup> \*Faisal Muhammad<sup>2</sup>, Mohd. Arifuzzaman<sup>2</sup>, ABM Alauddin  
Chowdhury<sup>2</sup>

<sup>1</sup>Department of Environmental Health, New Gate College of Health Technology, Minna Niger  
State, Nigeria

<sup>2</sup>Department of Public Health, Faculty of Allied and Health Sciences, Daffodil International  
University Dhaka-1207, Bangladesh

**\*Correspondence to:**

**Faisal Muhammad**

Department of Public Health  
Faculty of Allied and Health Sciences  
Daffodil International University  
Dhaka-1207, Bangladesh  
Email: fokkanya@yahoo.com

**Abstract:** A study was undertaken to find out the influence of deforestation of the community in Ningi area of Bauchi State, Nigeria. A cross-sectional descriptive survey was carried out among the population of the study site. Simple random sampling techniques was used to drawn sample population. The data sets were collected using semi-structured questionnaire. All the data sets obtained were analysed using SPSS. The mean age of the respondents was  $41.02 \pm SD 22.2$  years. About three-fifths (60%) of the respondents were male and the majority had diploma (31.4%) level of education. Close to three-tenths (28%) were civil servants and about 75.3 percent had 5 and above members in the family and the mean income of the respondents was  $13226.7 \pm 7311.9$  Naira. Among the fuel wood users, the majority stake holders (35.6%) used the fuel wood at least thrice in a day and little below six-tenths (59.3%) of the respondents were getting the fuel wood from commercial fuel wood sellers. Our findings reported that close to two-fifths of the respondents used fuel wood as an energy source for cooking. Socio-demographic factors of the respondents was significantly associated with planning to quit use of fuel wood for cooking purposes.

**Keywords:** Deforestation, Environment, Forest, Nigeria, Wood.

## **Introduction**

Deforestation is the conversion of forest in to an alternative permanent non-forested land use<sup>1</sup>. Deforestation is primarily a concern for the developing countries of the tropics as it is shrinking areas of the tropical forests causing loss of biodiversity and enhancing the greenhouse effect<sup>2-4</sup>. FAO considers a plantation of trees established primarily for timber production to be forest and therefore does not classify natural forest conversion to plantation as deforestation. Forest degradation occurs when the ecosystem functions are degraded but where the area remains forested rather cleared<sup>5</sup>.

Thirty per cent of the earth's land area or about 3.9 billion hectares is covered by forests. It was estimated that the original forest cover was approximately six billion hectares<sup>6</sup>. Deforestation means the removal of trees in the forests<sup>7</sup>. The forests are the "lungs of the planet" and has the capability of renewing two-third of oxygen on earth, grassland, savanna and cultivated land. The forest trees form part of the protective umbrella of the environment. Above all, they takes part in the enhancement of soil fertility, reduction of soil erosion and prevention of desert encroachment.

It is very alarming that the Nigerians are less concerned about the negative impact of deforestation. According to Kulkani (2011), the total area of forests in the world is about 4,700 million hectares (about 32 percent of the total land area). He also stressed that the consequences of deforestation are becoming more and more serious and very devastating. It is observed that the world forests are disappearing at the rate of 15 million hectares each year where most of these loss occur in the humid parts of Africa, Asia and Latin America<sup>8</sup>. Nigeria has the worst deforestation rate in the world which can be attributed to her increasing population with high poverty level<sup>9</sup>. This may be due to poor implementation of law by the policy makers. The

adverse effects of deforestation are alarming and impacts negatively on human health with serious threats to human existence. This study was aimed to find out the influence of deforestation on environmental quality of the community in Ningi area of Bauchi State, Nigeria.

## **Methodology**

A quantitative methods using a cross-sectional descriptive survey was used in this study. The population in the study sites was composed of farmers, environmental expert, and agriculturist, business men, students, housewives, civil servants and others. The ages of the respondents were from 16 and above. Disable person, other people who are not relevant to the study were excluded.

Simple random sampling techniques was employed to drawn sample population for this research work. The data were collected within Ningi L.G.A of Bauchi State, Nigeria, for a period of September to December 2015. The information was collected directly from the respondents by using semi-structured questionnaire by face to face interview techniques. All the responses obtained from the participants were coded numerically and entered into the SPSS (Version 22.00) for analysis. Cross tabulation analysis was done using Pearson Chi-square test which was used to determine the associations between the variables and p-value less than 0.05 was considered to be statistically significant.

## **Results**

### **Socio-demographic factors of the respondents**

Table 1 showed that the majority of the respondents (30.7%) were in the age group 49 and above years, followed by 27-37 (27.4%) and the mean age of the respondents was 41.02  $\pm$ SD 22.2

years. Three-fifths (60%) of the respondents were male and the rest of them were female. According to educational level of the respondents the majority had diploma (31.4%), followed by secondary (22.6%), degree and above (14%). In terms of occupational status close to three-tenths (28%) were civil servants (service holders), followed by business (22%), students (20%) and more than half (56%) were married. Regarding the family size about 75.3 percent had 5 and above members in the family and the mean income of the respondents was 13226.7±7311.9.

**Table 1: Distribution of Socio-demographic factors of the respondents (n=150)**

Variables	Frequency	Percentage (%)
<b>Age group</b>		
16-26	32	21.3
27-37	41	27.4
38-48	31	20.6
49 & above	46	30.7
Mean ±SD	41.02 ±SD 22.2	
<b>Gender</b>		
Male	90	60.0
Female	60	40.0
<b>Educational level</b>		
No formal education	21	14.0
Primary school	16	10.6
Secondary school	34	22.6
Diploma	47	31.4
Degree & above	21	14.0
Others	11	7.4
<b>Occupation</b>		
Civil servant	42	28.0
Business	33	22.0
Student	30	20.0
Farmer	24	16.0
housewife	10	6.6
Others	11	7.4
<b>Marital status</b>		
Unmarried	66	44.0
Married	84	56.0
<b>Family size</b>		
<5	37	24.7
5 & above	113	75.3
<b>Family monthly income (Naira)*</b>		
≤15000	109	72.7
16000-26000	27	18.0

27000 & above	14	9.3
Mean $\pm$ SD	13226.7 $\pm$ 7311.9	
Total	<b>150</b>	<b>100</b>

**\*1.00 BDT=3.00 Naira (2015)**

### **Pattern of Energy Use by the respondents**

Table 2 showed that close to two-fifths (39.3%) of the respondents used fuel wood and the remaining used fossils fuel. Among the fuel wood users the majority (35.6%) used the fuel wood thrice in a day, followed by four times and above (18.6%), once (13.6%) and the rest of them were using it twice in a day (3.2%). Little below six-tenths (59.3%) of the respondents were getting the fuel wood from commercial fuel wood sellers, followed by farmers (22%), get it by themselves (11.9%) and the rest from other suppliers (6.8%).

**Table 2: Pattern of Energy Use by the respondents (n=150)**

<b>Variables</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Energy source of the participants</b>		
Fuel wood	59	39.3
Fossils fuel	91	60.7
<b>Frequency of using fuel wood in a day (n=59)</b>		
Once	8	13.6
Twice	19	3.2
Thrice	21	35.6
Four times and above	11	18.6
<b>Supplier of the fuel wood (n=59)</b>		
Commercial fuel wood seller	35	59.3
Farmers	13	22.0
Get it by yourself	7	11.9
Others	4	6.8

### **Respondents Opinion about Deforestation**

Table 3 showed that most of the respondents (46.7%) mentioned that deforestation can affect our air and the majority (36.7%) stated that deforestation occurs as a result of urbanization, followed by increase in demand for wood (35.3%), increase in food production (19.3%) and the rest stated that it was due to poverty (8.7%). According to respondents' opinion regarding method of overcoming deforestation problem, more than two-fifths (42.7%) mentioned that afforestation

can be the solution to overcome deforestation, about 34.7% stated that stringent action should be taken on illegal deforestation, little above one-tenths (12%) of the respondents mentioned green initiative program to be the solution to overcome deforestation problem and the remaining mentioned that public awareness campaign on effect of deforestation (10.7%) can be the solution based on their opinion.

**Table 3: Respondents Opinion about Deforestation (n=150)**

Variables	Frequency	Percentage
<b>Deforestation can affect our air</b>		
Yes	70	46.7
No	48	32.0
Don't know	32	21.3
<b>How deforestation occur?</b>		
Increase in demand for wood	53	35.3
Urbanization	55	36.7
Increase in food production	29	19.3
Poverty	13	8.7
<b>How to overcome deforestation problem</b>		
Afforestation	64	42.7
Stringent action should be taken on illegal deforestation	52	34.7
Public awareness campaign on effect of deforestation	16	10.7
Green initiative program	18	12.0
<b>Plan to quit use of fuel wood as energy source for cooking</b>		
Yes	47	31.3
No	64	42.7
Don't know	39	26.0

### **Respondents Knowledge about Deforestation**

Table 4 demonstrated that most of the respondents (37.3%) mentioned that logging activities was the cause of deforestation, followed by farming activities (29.3%), lack of proper legislation on forest conservation (26%), poverty (6.7%) and the rest mentioned it was due to other causes. Regarding the effects of deforestation on environmental health close to three-tenths (28.7%) mentioned that it increases the local temperature of the environment, followed by decline in

water cycle (25.3%), loss of diversity (23.3%), abnormal rainfall distribution (14.7%) and the rest have mentioned other effects. Most of the respondents (26%) noted that they received knowledge on deforestation from radio, followed by television (22%). Close to half (49.3%) mentioned that deforestation can result to lack of rainfall and most of the respondents (26%) stated that availability of forest was the factors influencing deforestation, older family member use this type of energy (25.3%), family support (16%), friends use it (14%) and the rest mentioned that low price (9.3%) was the factor that influenced deforestation.

**Table 4: Respondents Knowledge about Deforestation (n=150)**

Variables	Frequency	Percentage
<b>Causes of deforestation</b>		
Lack of proper legislation on forest conservation	39	26.0
Logging activities	56	37.3
Farming activities	44	29.3
Poverty	10	6.7
Others	1	0.7
<b>How deforestation affects environmental health?</b>		
Increase in local temperature of the environment	43	28.7
Loss of biodiversity	35	23.3
Decline in water cycle	38	25.3
Abnormal rainfall distribution	22	14.7
Others	12	8.0
<b>Source of knowledge on deforestation</b>		
Newspaper	29	19.3
Friend	19	12.7
Radio	39	26.0
Television	33	22.0
Others	30	20.0
<b>Deforestation can result to lack rainfall</b>		
Yes	74	49.3
No	46	30.7
Don't know	30	20.0
<b>Factors influencing deforestation</b>		
Availability of forest	39	26.0
Family support	24	16.0
Older family member use this type of energy	38	25.3
Friends use it	21	14.0
Low price	14	9.3
No alternative energy	14	9.3

**Relationship between socio-demographic characteristics and Plan to quit use of fuel wood of the respondents**

Table 5 demonstrated that age of the respondents ( $p=0.046$ ), educational level ( $p=0.000$ ), family size ( $p=0.000$ ) and family income of the respondents ( $p=0.000$ ) was found to be significantly associated with planning to quit use of fuel wood for cooking purposes. However occupation of the respondents ( $p=0.062$ ) was not associated with planning to quit use of fuel wood for domestic purposes.

**Table 5: Relationship between Plan to quit use of fuel wood and socio-demographic characteristics of the respondents (n=150)**

Variables	Planning to quit use of fuel wood			Total	Chi-square	p-value
	Yes	No	Don't know			
<b>Age (years)</b>						
16-26	8	17	7	32	12.840	0.046
27-37	13	11	17	41		
38-48	10	18	3	31		
49 & above	16	18	12	46		
<b>Educational level</b>						
No formal education	1	15	5	21	59.365	0.000
Primary school	1	5	10	16		
Secondary school	4	18	12	34		
Diploma	20	18	9	47		
Degree & above	18	2	1	21		
Others	3	6	2	11		
<b>Occupation</b>						
Civil servant	10	20	12	42	17.603	0.062
Business	10	12	11	33		
Student	13	13	4	30		
Farmer	4	13	7	24		
housewife	2	5	3	10		
Others	8	1	2	11		
<b>Family size</b>						
<5	30	5	2	37	58.589	0.000
5 & above	17	59	37	113		
<b>Family monthly income (Naira)*</b>						
≤15000	17	58	34	109	47.502	0.000



16000-26000	18	5	4	27
27000 & above	12	1	1	14
<b>Total</b>	<b>47</b>	<b>64</b>	<b>39</b>	<b>150</b>

**\*1 BDT=3.00 Naira (2015)**

## **Discussion**

In the present study close to two-fifths (39.3%) of the respondents used fuel wood and the remaining used fossils fuel. Fuel wood gathering was considered to be the main cause of deforestation and forest degradation in El Salvador<sup>10</sup>.

About 46.7% of the respondents mentioned that deforestation can affect our air. Intergovernmental Panel on Climate Change reported that the deforestation mainly in tropical areas, could account for up to one-third of total anthropogenic carbon dioxide emissions<sup>11</sup>. A study reported that deforestation is a contributor to global warming<sup>12</sup>. The majority (36.7%) stated that deforestation occurs as a result of urbanization, followed by increase in demand for wood (35.3%), increase in food production (19.3%) and the rest stated that it was due to poverty (8.7%). Deforestation might be as a result of contemporary causes which include corruption of government institutions, the inequitable distribution of wealth and power, population growth and overpopulation, and urbanization<sup>13-16</sup>.

According to respondents' opinion regarding method of overcoming deforestation problem, more than two-fifths (42.7%) mentioned that afforestation can be the solution to overcome deforestation. In many parts of the world, especially in East Asian countries, reforestation and afforestation are increasing the area of forested lands<sup>17</sup>.

In this study most of the respondents (37.3%) mentioned that logging activities was the cause of deforestation, farming activities (29.3%), lack of proper legislation on forest conservation (26%), poverty (6.7%) and the rest mentioned it was due to other causes. Nations Framework

Convention on Climate Change (UNFCCC) secretariat reported that, subsistence farming is responsible for close to half (48%) of deforestation activities, commercial agriculture is responsible for 32%; logging is responsible for 14%, and fuel wood removals make up 5%<sup>18</sup>. Regarding the effects of deforestation on environmental health close to three-tenths (28.7%) mentioned that it increases the local temperature of the environment, followed by decline in water cycle (25.3%), loss of diversity (23.3%), abnormal rainfall distribution (14.7%) and the rest have mentioned other effects. Deforestation affects wind flows, water vapour flows and absorption of solar energy thus clearly influencing local and global climate<sup>19</sup>.

## **Conclusion**

The present study showed that close to two-fifths of the respondents used fuel wood as an energy source for cooking and most of them were supplied with the fuel wood by commercial fuel wood sellers and the farmers. It reveals that afforestation can be the solution to overcome deforestation. Socio-demographic factors was significantly associated with planning to quit use of fuel wood for cooking purposes. Further research is needed to better quantify the environmental health impacts of deforestation and evaluate the potential alternative energy for cooking apart from fuel wood.

## **References**

1. Van Kooten, G. C. and Bulte, E. H. *The economics of nature: managing biological assets*. Blackwells, 1994.
2. Myers, N. *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. 1994:27-40.
3. Barraclough, S. and Ghimire, K. B. *Agricultural Expansion and Tropical Deforestation*. Earthscan, 1999.
4. Angelsen, A. *Agricultural expansion and deforestation: modeling the impact of population, market forces and property rights*. *Journal of Development Economics* 1999: 58: 185-218.
5. Anonymous. *Global Forest Resources Assessment, 2010-Main Report*. . FAO Forestry 2010: Paper 163. Rome, Italy. 340p.

6. Bryant, D.; Nielsen, D. and Tanglely, L. *The last frontier forests- Ecosystems and Economies on the Edge*. World Resource Institute, Washington DC 1997.
7. Modebelu, M. N). *Women environmental education for poverty alleviation. A Paper presented at Agulu Women Archdeaconry Conference, Agulu, Anambra State on 6th June, 2012.*
8. Kukani, S. *Deforestation, tribal communities and popular movements: Adult education and development. Journal of Institute for International Cooperation of the German Adult Education Association; 2011: (37):19-25*
9. IITA. *Deforestation: Nigeria ranked worst in the World. A publication of International Institute of Tropical Agriculture. 2011. Available from: <http://www.thisdaylive.com/articles/deforestation- Nigeria-ranked-worst-inthe-world/103321>*
10. Repetto, R. *Deforestation in the Tropics. Scientific American April, p. 37 1990.*
11. *IPCC Fourth Assessment Report, Working Group I Report "The Physical Science Basis" Section 7.3.3.1.5. P 527*
12. Fearnside, Philip M.; Laurance, William F. "Tropical Deforestation and Greenhouse-Gas Emissions". *Ecological Applications. 2004; 14 (4): 982. Doi: 10.1890/03-5225.*
13. Burgonio, T.J. "Corruption blamed for deforestation". *Philippine Daily Inquirer. 3, January 2008.*
14. Marcoux, Alain. "Population and deforestation". *SD Dimensions. Sustainable Development Department, Food and Agriculture Organization of the United Nations (FAO) August 2000. Archived from the original on 28 June 2011.*
15. Butler, Rhet A. "Impact of Population and Poverty on Rainforests". *Mongabay.com / A Place Out of Time: Tropical Rainforests and the Perils They Face. Retrieved 13 May 2009.*
16. Ehrhardt-Martinez, Karen. "Demographics, Democracy, Development, Disparity and Deforestation: A Cross-national Assessment of the Social Causes of Deforestation". *Paper presented at the annual meeting of the American Sociological Association, Atlanta Hilton Hotel, Atlanta, GA, 16 August 2003. Retrieved 13 May 2009.*
17. Foley J.A, Defries R, Asner G.P, Barford C, Bonan G, Carpenter S.R et al., "Global Consequences of Land Use" *Science, 2005; 309 (5734): 570-574*
18. UNFCC "Investment and Financial flows to address climate change' UNFCCC, 2007 p.81
19. Chakravarty, Sumit, Ghosh S.K, Suresh C. P, Dey A.N, Shukla Gopel "Causes, Effects and Control Strategies, Global Perspectives on Sustainable Forest Management. Retrieved 23 August 2017