IMPACT OF DEFORESTATION ON SAPELE COMMUNITY IN DELTA STATE

Dr. K. Okunomo

Abstract

This study was carried out to assess the impact of deforestation on Sapele community, in order to identify the root causes of deforestation, the extent of deforestation and to determine the economic and environmental impact of deforestation on the people and the community. A total of 100 respondents (30 timber contractors, 20 charcoal producers, 20 wood sellers and 30 wood consumers) were selected from the entire population of this community. In order to address the problem and objectives of the study, primary data were collected with structured questionnaire and analyzed using probit model to determine the relationship between the dependent and independent variables. The probit model revealed that deforestation had negative and significant impact on the environment as well as the revenue generated by the government from the community forest and the income of wood sellers, timber contractors, charcoal producers and consumers of fuel wood. It was therefore recommend that the state government should sensitize the community about the layers of deformation and set the machinery in motion to commence massive tree planting campaign.

Key word: Deforestation, Environmental Impact, Sapele Community.

Introduction

Given the dynamic nature of global ecosystem, environmental change driven by man-made and natural causes are inevitable. Men activities had always had an impact on the physical environment. Until recently, the consequences of people's action were limited in space and intensity. However, economic activities and the rate of population growth have increased to the point that the effect of humanity on the environment can no longer be ignored.

The forest is the heart of natural resources. Forests act as wind brakes and prevent sheet and gully erosions by significantly reducing surface run-off (Gupta *et al;* 2000). The forest is also considered to be of high aesthetic value. It provides shelter to wildlife, serves as camouflage during war, is a source of food, medicine and environmental protection. It has greatly been degraded in recent times through the acts of deforestation as a result of illegal felling of trees (Agbogidi and Eshegbeyi, 2008).

One of the most widely debated environmental issues nowadays is the prospect of global climate change. This phenomenon is caused by the emission of key green house gases (GHGs) namely; oxides of carbon, nitrous oxides and methane into the atmosphere through human activities which include burning of fossil fuels, deforestation (mostly by burning) to make land available for agriculture and grazing and burning of wood and charcoal for fuel. The resultant

increased concentration of the green house gases (GHGs) in the atmosphere raised the atmospheric temperature, a situation reported by (FAO, 2007; Asthana and Asthana, 2003).

As more scientific information about global warming accumulates, the issues of climatic charge have become topical in the twenty-first century. What is more, a virtual pandora's Box of major global threats such as hunger, poverty, population growth, soil degradation, deforestation and desertification are inter-twined and all of them contribute to climate change (Beacon and Cargill, 2007). All these menace are caused by the acts of deforestation.

Deforestation could be defined as an uncontrolled and unregulated removal of vegetation. Generally, deforestation is the conversion of forested areas to non-forested land, for uses such as pastures, urban use, logging purposes etc. these can create aridity of land and waste lands. In many countries, deforestation is on-going and is shaping climate and geography; deforestation results from removal of trees without sufficient reforestation and results in decline in habitat and bio diversity of life (Helmut, et al; 2002; Wikipeda 2008).

The emission of dangerous gases into the atmosphere, the loss of soil fertility and consequent food shortage, the loss of wildlife and its habitat, the encroachment of the desert and the loss of the aesthetic value of the forest form the pivotal point of this study. Worthy of note is that deforestation is a problem linked mainly with human activities. The known causes of deforestation as are prevalent in other parts of the world also apply to Delta State. Hence, this research was carried out in a Sapele community of Delta State, Nigeria to critically examine the causes and impacts of deforestation.

As rural areas are growing to assume the states of urban centers, the forest has been greatly tampered with by man's activities through illegal felling of trees for wood and charcoal production, heavy construction work, industrial activities and the pressure of population exploitation. Prior to this time, the extent of deforestation in the rural and urban areas has not been investigated on Delta State. Hence there is the need to compare the degree of deforestation in rural and urban areas. The essence of this is to design an approach that is suitable for forest resources conservation in the rural and urban areas respectively.

Consequent upon the problems mentioned above, which area caused by illegal felling of trees such as sheet and gully erosion, reduction of surface run-off water, wind storm and global warming. There is an urgent need to know the causes of deforestation and its effect in Sapele environment. This paper focused on identifying the causes of deforestation and also ascertaining the extent of degradation and its economic and environmental impact on Sapele community and its environs in Delta State.

Materials and Methods

Description of Study Area

The Study was conducted at "Okpe-urhobo" forest reserve located in Sapele Local Government Area of Delta State. Sapele local government area has

a land mass of 387 square kilometers, and it is located in Delta Central Senatorial district in Delta State. It has a temperature range of 32.2^0C with rainfall range of 1500mm to 1849mm per annual range season and it is between April and October (Asaba Meteorological Station, 2009). Sapele lies between latitude $08^0$14'N and longitude $05^0$45'E of the equator.

The area comprises timber contractors (saw millers), charcoal producers, fuel wood users and sellers.

Sampling Procedure

Simple random sampling technique was used to select about 30 timber contractors, 20 charcoal producers, 30 fuel wood users and 20 fuel wood marketers form Sapele community. Respondents were drawn from four villages in Sapele local government area to ensure a fair representation of the entire Sapele community in which the study was carried out.

Data Collection Techniques

The selected respondents which were the timber contractors (saw millers), charcoal producers, fuel wood marketers and local consumers of fuel wood were interviewed with the use of structured questionnaire, which were presented in English language and in most cases questions were asked in their native tongue as well as colloquial English in order to communicate effectively with the people who are majorly uneducated. The following variables were considered of trees felled felling trees, the number of trees felled per annum and the perceived effect of the felled trees on the environment when compared to previous years (10 – 20 years back). Questions were also asked based on the market structures of fuel wood and charcoal, whether there is any governmental policy on tree felling or local laws from the chiefs that governs that act of tree felling. Questions like if they also derive any satisfaction from the felling of trees in forest estates, and also the perceived effect of bush burning on the environment.

Information retrieved was through primary source. The primary source was structured questionnaires and discussions where necessary.

Method of Data Analysis

Data obtained at the end of the study was subjected to probit regression model.

Probit regression model is a popular specification for a binary response model which employs a probit link function. This model is most often estimated using maximum likelihood procedure, such estimation is called probit regression.

The probit model in the implicit form as IMP = F (X_1 --- X_{11})

Where

IMP	=	Impact Y
X_1	=	Government revenue
X_2	=	Income of wood sellers

X_3	=	Population Density
X_4	=	Damages Done To Residential Houses
X_5	=	Climate change
X_6	=	Scarcity of Cellulose
X_7	=	Depletion in carbon sink
X_8	=	Loss of wildlife habitat
X_9	=	Reduction in oxygen level for human consumption
X_{10}	=	Reduction in building materials
X_{11}	=	Reduction in soil water

Results & Discussion

Socio-economic Characteristics of Respondents

The socio-economic characteristics of respondents considered in this study include Age, gender, Educational status, Household size, years of experience and marital status of the community dwellers that are involved directly or indirectly in the act of deforestation. This is presented in Table 2.

Majority of the respondents are females (58%). This implies that majority of those in the act of deforestation in the study area are female. This was due to the fact that they wanted an improvement in their standard of living and the better quality of education giving to their children.

The study also revealed that 279 (majority of the respondents had secondary education indicating that deforestation was not done out of ignorance but as part of survival strategy. Majority of the respondents are married. They constitute 60%. This implies that married people have more tendencies of influencing or causing deforestation which was probably due to their greater responsibility.

The findings of this study revealed that most of the respondents (53%) has large families; which means that the larger the size of the household the greater the impact on deforestation. Hence, household size is a contributing factor to deforestation in the community.

Almost the whole community is involved in one way or the other in activities that deplete the forest resources due to the fact that majority of them are timber contractors, charcoal producers and fuel wood sellers.

Impact of Deforestation

The probit model showing the impact of deforestation is as presented in Table 3. Deforestation has caused so much impact on the environment of the study area. The variables turned out to be a significant determinant of the impact on the natural ecosystem. The negative signs associated with the variables in the model implies that so much harm has been done to the environment and will continue if deforestation is not discouraged. The result agrees with the findings of FAO (2005).

Examining the individual variables reveal that they had negative relationships with the impact of deforestation. Such variables as Government

revenue, income of wood sellers, population density, Damages done to roofs of residential houses are statistically significant in the model and also agrees with the apriori expectation. However, a positive relationship occurred between climate change and a forested environment. This was the situation in the community when the forest was still intact until recently.

Other variables affected by deforestation are scarcity of cellulose, depletion in carbon sink, loss of wildlife habitat, reduction in oxygen level, reduction in building materials. These variables were not statistically significant. The implication of this is that there is positive relationship between the impact of deforestation and these variables. For instance, the study reveals that the forest was formerly a store of cellulose (raw material) providing raw materials for industries before deforestation wiped out almost everything leaving an insufficient quantity which could not meet the demand of the population. This result agrees with FAO (2001) that forest fosters medicinal conservation. With forest being irreplaceable sources of new drugs (such as taxol) deforestation can destroy them all including the genetic variation of the species irretrievably. Furthermore, the study reveals that oxygen level has been reduced drastically due to the fact that trees that should absorb carbon doxide (C02) has been depleted. This result agrees with the finding of (Phillip et al; 2008) who asserted that trees and other plants remove 60g from the atmosphere during photosynthesis and release it back to atmosphere during normal respond. Reduction in building materials and reduction in soil water were also made possible by deforestation. Watson (2000) and FAO (2000) all confirmed these assertions.

Conclusion

It is obvious from the result of this investigation that deforestation in the study area was caused by poverty, unemployment, illegal logging, subsistence agriculture and fuel wood exploitation which have created a negative impact that is contributing greatly to the recent changes occurring in the climatic condition of the community. These changes include blown-off roofs, lack of cellulose, reduction in building materials and soil water reduction to low yield in agricultural productivity. Further more wood sellers and charcoal producers have experienced a great reduction in their income as a result of the deforestation.

References

Agbogidi, O.M. & Eshegbeyi, O.F (2008) Forestry development for a safe environment in: Onyekwelu, J.C., Adekvule, V.J. and Oke D.O. (eds.) Proceedings of the first National Conference of the forests and forest products society of Nigeria (FFPD) held at Ondo State between 16th and 18th of April, 2008 Pp. 95 – 98.

Asaba Meteorological Report in Meteorological Bulletin (2005) Lagos, Nigeria.

Asthana, D.K. & Asthana, M. (2003): Environment: Problems and Solutions S. Channel and Company Ltd. Publishers. Rain Magar, New Delhi. Pp. 434.

Beamon, C & C.J. Largill (2007): Deforestation and desertification (Internet) Available from: http://www.munfer.org/archive/45th/csdi.htm

FAO (2005): Food and Agriulture Organization of the United Nations, home, Italy Global Forest Resources Assessment. FAO Bulletin 35 p.

FAO (2001): Forestry outlook study for Africa: A regional overview of opportunities and challenges towards 2020 FAO, Rome.

FAO (2000): "Biotechnologies in the forestry sector in developing countries". Biotechnology in food and Agriculture file: A:/FAO. Biotech. In food and Agric Conference 2. Htm (2003) July 7th Rome.

Cupta, R.K. Gabral, B.G Meher-Honiji, V.M. and Puri (2002): Forest ecology and Environment. Forest and Rainfall Vol 3. 21 – 25.

Helmut, J., Geist, K.& E.F. Lambin (2002). Proximate Causes and Underlying driving forces of tropical deforestation. Bio Science 52: (2) 143 – 150.

Philip, M., Fear side .I. & F.L. Williams (2004). Tropical deforestation and green house gas emissions, ecological application Vol. 14. Issue 4 (August) 2004 Pp. 982 – 986.

Watson, R.T. (2000): Land use" Land use change and forestry. Inter governmental panel on climate change, Cambridge University Press, 2000.

Wikkepedia (2008): Wikkipedia Contributions on deforestation (Internet). The tree encyclopedia 2007 feb. 26, 21:01 UTC cited 2007, March 6th) Available from: http:illen wikipedia.org/w.index.Php

. **Table 1: Demographic characteristics of respondents**

Parameters	**Frequency**	**Percentage (%)**
Age		
<25	2	2
25-30	18	18
31-35	9	9
36-40	30	30
41-45	17	17
46-50	15	15
>51	9	9
Total	100	100

Gender		
Male	42	42
Female	58	58
Total	100	100
Educational Background		
No formal education	24	24
Primary education	25	25
Secondary education	27	27
Tertiary education	24	24
Total	100	100
Marital status		
Married	65	65
Single	10	10
Divorced	16	16
Widowed	9	9
Total	100	100
Household size		
>5	10	10
5-8	53	53
9-12	33	33
13-16	4	4
Total	100	100
Occupation		
Timber contractors	30	30
Charcoal producers	20	20
Fuel wood marketers	20	20
Fuel wood consumers	30	30
Total	100	100
Working experience		
<10	7	7
10-15	10	10
16-20	12	12
21-25	15	15
26-30	20	20
31-45	17	17
36-40	10	10
>41	9	9
Total	100	100

Source: Field Survey, 2009

Table 2: Distribution of respondents on the causes and extent of deforestation

Degree	Frequency			Percentage
Causes o Deforestation	**Yes**	**No**	37	**No**
Improper applied logging	88	12	30	12
Bush burning	47	53	17	53
Fuel wood collection	90	10	6	10
Mining (infrastructural expansion)	69	37	35	37
Poverty	70	30	75	30
Population growth and over population	83	17	12	17
Urbanization	94	6	4	6
Agricultural intensification	65	35	5	35
Wildlife	25	75	25	75
Industrialization	88	12	88	12
Reasons for felling trees	96	4	96	4
Frequency of wood exploitation	95	5	95	5
Demand for fuel wood	97	3	97	33
Market price of wood	93	7	93	7
Sources of fuel wood	41	59	41	59
Means of livelihood	88	12	88	12
Population density	46	54	46	54
Implemental of government policies	4	96	4	96
Effect of Deforestation				
Climate change	99	1	99	1
Effects of deforestation on the soil	58	42	58	42
Effect of deforestation on erosion	93	7	93	7
Effect of deforestation on wood specie	75	25	75	25
Effect of deforestation on wood supply	76	24	76	24
Effect of deforestation on forest size	93	7	93	7
Conversion of forest land to grassland	97	3	97	3

Table 3: Probit model showing the impact of deforestation

Variables	**Co-efficient**
Y	-5.677994 (2.284061)
X_1	-1.13066478 (0.266472)
X_2	-0.547200 (0.206642)
X_3	-533152 (0.316682)
X_4	0.626861 (0,304968)
X_5	1.011467 (0,304968)
X_6	-0.350802 (0,315399)
X_7	0.170154 (0.293091)
X_8	0.096374 (0.352747)
X_9	0.96374 (0.286397)
X_{10}	1.276367 (0.293244)
X_{11}	-0.782897 (0.314355)

Source: Field survey, 2009