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# Socio-Economic and Environmental Effects of Deforestation in Emohua LGA, Rivers State, Nigeria

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**Abstract:** The study examined the socio-economic and environmental effects of deforestation in Emohua LGA Rivers State, Nigeria. However, 150 copies of questionnaire were administered to residents of the LGAs to elicit information about the residents' perception of rate, causes and effects of deforestation in the study area. Descriptive statistics using frequencies and percentages were employed for the data analysis. Findings showed that males were 63.3% and respondents with age bracket between 18 and 25 years were the highest (37.3%). Majority (43.3%) were single while more than 80% were formally educated and more than 60% were gainfully employed. Results showed that factors affecting deforestation included increase in consumption rate of wood (73.3%), indiscriminate seasonal felling of trees (84%), burning of bushes (74%), inadequate execution of environmental laws and regulations (76.7%) and overdependence on forest resources as energy (80.7%). The rate of deforestation was high as claimed by majority (42%), moderate (35.3%) and low (22.7%). The effect of deforestation included scarcity of raw materials (51.3%), and means of livelihood are affected (35.3%) and air quality and prevention of soil fertility (13.3%). The study concluded that there was reduction in the forest coverage. Thus, it is recommended among others that environmental laws should be adequately promulgated and implemented to reduce the level of deforestation.

**Keywords:** Deforestation, Socio-economic, Environmental, Emohua, Landsat

## Introduction

Forests and agriculture are integral a part of the farming systems where farmers depend upon them for their livelihood (Acharya and Dangi, 2009). The importance of forests as providers of livelihoods and poverty has received growing attention over the past few decades. Forest resources are the major means of livelihood for the rural populace as majority depends on it for livestock farming, inputs for agriculture and supply for timber and non-timber forest products (Belcher et al.,2015). The forest is often perceived as a stock resource, a free good, with the land as something freely available for conversion to other uses without recognition of the consequences on its role of provision of environmental services. Hence many forest ecosystems have been degraded into less diverse and stable ones (Aruofor, 1999).

Deforestation is defined as a direct, human-induced conversion of forested land to non-forested land (UNFCC 2011). Forest degradation occurs when the ecosystem functions of the forest are degraded but where the area remains forested rather cleared FAO (2010). Deforestation is a conventional environmental challenge substantially affecting the resilience and distribution of forests across different boundaries. It is simply defined as the loss of tree cover usually as a result of forests being cleared for agriculture and other land uses (Gorte, and Sheikh, 2010). In Nigeria, forests provide goods such as timber and other non-timber products (e.g. bamboo, chew stick, game)

which help most communities to meet the requirements for rural economy (Ayanwuyi et al., 2007).

Meanwhile, the forests of Nigeria contribute substantially to the national gross domestic product (GDP) and sustenance of the livelihood of the people. This may be the reason why the trend of deforestation across the country seems to be very high. According to CBN (2006), forestry contributions to Nigeria's GDP vary from time to time. The deforestation and degradation of Nigeria forest resources is indisputable. According to (FMEV, 2006), between 1980 and 1990, the annual rate of deforestation averaged 3.5% and the forest area declined from 14.9 million ha.to 10.1 million ha which translates to the loss of 350,000 to 400,000 ha of forest land per annum for the country.

The study carried by Forestry Management and Coordinating Unit (FORMECU/EMP, 1998) on vegetation and land use changes in Nigeria showed that undisturbed forest decreased from 2.9% of total land area of Nigeria in 1976/78 to 1.3% in 1993/95 – (decrease of 1,383,700 hectares); also, the disturbed forest increased from 1.6% of total area of Nigeria in 1976/78 to 2.1% in 1993/95 – (an increase of 441,700) hectares. (FORMECU/EMP 1998) also revealed that the Riparian forest decreased from 0.8% to 0.6% - a decrease of 214,800 hectares within the same period (FAO 2015). Global Forest Assessment reported that Nigeria's forests and woodlands, which currently cover about 9.6 million hectares, have been dwindling rapidly over the past decades.

Many factors due to human activity are considered as possible responsible of the observed changes: among these water and air contamination (mostly greenhouse effect) and deforestation are the mostly cited. While the extent of human contribution to the greenhouse effect and temperature changes is still a matter of discussion, the deforestation is an undeniable fact. Indeed before the development of human civilisations, our planet was covered by 60 million square kilometres of forest (Waring and Running, 2007). As a result of deforestation, less than 40 million square kilometres currently remain (The State of the World's Forest, 2018). It stated that the country's current deforestation rate is estimated at 3.7% and one of the highest in the world. It stated that between 1990 and 2015, Nigeria lost about 35% of its remaining forest resources and over 50% of another wooded land. This is an alarming trend that suggests that the assertion that the remaining forest area of the country would disappear in the next three decades might become a reality if steps and necessary initiatives are not taken to check this. However, much of the human induced deforestation and forest degradation is, in varying degrees, economically wasteful and environmentally negative, as well as socially undesirable as just a few individuals benefit as reported by (FAO 2015). In sub-Saharan Africa, forest goods and services are extremely important for rural livelihoods, providing food, medicine, shelter, fuel and cash income (Kaimowitz, 2003). It is estimated that more than 15 million people in sub-Saharan Africa earn their cash income from forest-related enterprises such as fuelwood and charcoal sales, small-scale saw-milling, commercial hunting and handicraft. In addition, between 200,000 and 300,000 people are directly employed in the commercial timber industry (Oksanen and Mersmann, 2003). For some countries, the forestry sector is an important foreign exchange earner. For example, between 1993 and 2002, the value of net exports of various wood-based products from countries in sub-Saharan Africa amounted to more than US$2 billion (FAO, 2003). However, the national statistics on the contribution of forest products to the countries' economies are extremely poor (Mabugu and Chitiga, 2002; FAO, 2004; Vincent, 1998) and only in a few countries are there comprehensive government programs of

environmental accounting where forestry contributions to the national accounts are captured, e.g. South Africa (FAO, 2004; World Bank, 2006). Meanwhile, forestry sector contributes significantly to Nigerian economy, though most of its resources are yet to be tapped. Forests provide products such as fuel wood, chewing sticks, timber, poles, rattans, fruits, seeds, pulp wood, leaves, mushroom and wildlife. They as well provide such services as environmental protection such as soil protection against erosion and strong winds, protection of watershed and enhancement of nutrient cycling for maintaining soil fertility.

Forests also provide habitats for many plant and animal species. On a global scale, forests are the basis for sustainable and predictable global progress and development (FAO, 2001). World over, forest is now being increasingly acknowledged for its importance and its resources in the improvement of human welfare (FAO, 1983). Natural and man-made forests have economic, social and environmental benefits and they play important roles in the economic development of any society (Okonkwo, *et al*, 2002). According to FAO (1994), forest industry in developing countries contributes about 2.7% of the GDP and so is even more economically important to these countries than it is to the industrialized countries. Hence the increase in demand for forest products, leading to increasing pressure on available forest resources which eventually results in degeneration, deforestation, desertification and subsequent general environmental degradation.

There is enough evidence that many places in Nigeria more specifically Emohua LGA is facing an environmental crisis on account of heavy deforestation. For several years, there has been remorseless destruction which must be put under control to avoid some bad consequences associated with deforestation. Nobody knows exactly how much of its tropical forest have already been destroyed and continue to be razed each year. Data is often imprecise and subject to differing interpretations. Population growth and expansion which are the major causes of deforestation usually results to decrease in per capita income thus savings and rate of capital formation remain low, reduction in per capita income, rise in general price level leading to sharp rise in cost of living. No improvement in agricultural and industrial technology, shortage of essential commodities, low standard of living, mass unemployment etc. The process usually induces adverse effects on the social condition of weaker sectors of society and leads to the progressive impoverishment of ecosystems (Uyanga, 2012). There are several studies on deforestation but limited ones have been cited in Emohua LGA. Those even cited did not consider the combination of socio-economic and environmental issues in their investigations. Against this backdrop, the present study examined the socio-economic and environmental effects of deforestation in Emohua LGA, Rivers State, Nigeria.

**Materials and Methods**

The study was carried out in Emohua Local Government Area. Emohua is one of the four local governments subsumed into the Ikwerre ethnic nationality. Emohua Local Government Area (EMOLGA) is one of the 23 Local Government Areas in River State, with its headquarters in Emohua. Emohua is the local government headquarter of Emohua Local Government Area (LGA) of Rivers State, Nigeria. It has an area of 831km$^2$ (321 sq mi) and a population of 201,901 as at the 2006 census. Its coordinates are 4$^0$53’ 0’’ N and 6$^0$52’0’’E (Figure 1).

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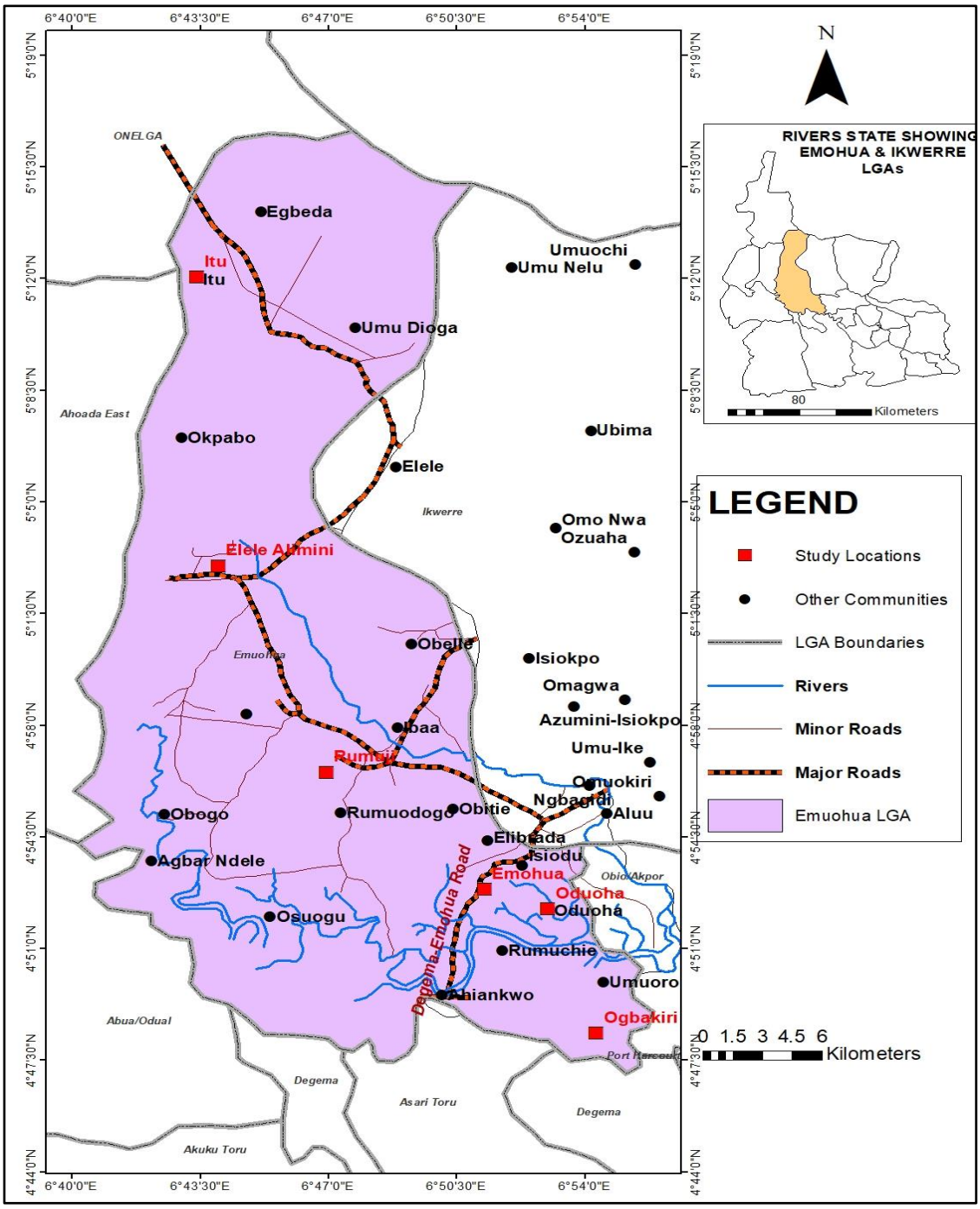

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Figure 1. Emohua LGA showing Selected Communities

The climatic condition is the humid tropical climate (Osuiwu and Ologunorisa, 1999). Emohua according to Efe and Weli (2015) is located within the humid tropics. In most months of the year, there is significant rainfall in Emohua. The area experiences a short dry season which is not very significant. The average annual temperature in Emohua is 26.5 °C. The geology of Emohua LGA is of fluvial sediments. Emohua topographically is very unique and it is located within the coastal plains which by its structure are of the sedimentary rocks of the Agbada, Akata and Benin formation of the Niger Delta. Its height falls within 10m-25m above sea level (Oyegun, 1999). Emohua belongs to the Coastal Sand ridges zone of Rivers state. The area is drained by two major rivers, the New Calabar River and the Sombreiro River which extends towards the southern flank of Ndele community and Abua/Odua local Government area, where there exists a confluence. The drainage network pattern in the area does not fit into the conventional dendritic or trellised pattern of drainage. The area experiences poor drainage, this is because of its low-lying state and the abundance of surface water accompanied by excessive rainfall of about 2476mm. The soils in Emohua are made up of sandy-barns, humus, alluvium and the outer belt of salt water swamps, clay and mud. The soils are in rich in phosphorus because of the nutrients from the parent materials. Emohua area has the same weather condition like Port Harcourt as a region. The type of research design used in this work is descriptive research designs. Descriptive is a type of study that describes the current status of the problem of a study and also seeks among other things, to find out the opinion held, the conditions or relationships that exist in the society.

In this study, members of the towns and villages are the population members that made up Emohua Local Government Area. The sample populations were chosen using simple probability sampling techniques.

This method is used because it gives each population member a known and equal chance of being selected as sample members. Personal interviews were conducted on questionnaires; this is aimed at generating basis information for the study. Six communities were sampled for the study, and they included Emohua, Elele Alimini, Rumuji, Itu, Oduoha, and Ogbakiri. The study made use of 150 copies of questionnaire shared equally among the six selected study locations using convenience sampling technique. Descriptive statistics was used to describe the responses from the questionnaire were also reported using frequency and percentages. All the statistical analyses for the study were computed using Statistical Package for Social Scientists (SPSS) Version 24.0 and Microsoft Excel 2010 Version.

## Results and Discussions

### Socio-Economic Characteristics of Respondents

The socio-economic characteristics of respondents in the study area are presented in Table 1. From the analysis, there were more males (63.3%) than females (36.7%). There were more singles (43.3%) while married were 22.7%; divorced (19.3%), and widow (14.7%). All respondents were above age 18, but mostly youths and few elders. The educational level of the respondent spread through primary tot tertiary, while their occupation ranges self-employed, private employed, civil servants, and other, possibly unemployed.

**Table 1: Socio-economic Characteristics of Respondents**

| **Gender** | **Frequency** | **Percentage (%)** |
|---|---|---|
| Male | 95 | 63.3 |
| Female | 55 | 36.7 |
| **Total** | **150** | **100** |
| **Age** | **Frequency** | **Percentage (%)** |
| 18 – 25 | 56 | 37.3 |
| 25 – 35 | 19 | 12.7 |
| 35 – 45 | 32 | 15.3 |
| 45 – 55 | 25 | 16.7 |
| 55 and Above | 27 | 18.0 |
| **Total** | **150** | **100** |
| **Marital Status** | **Frequency** | **Percentage (%)** |
| Single | 65 | 43.3 |
| Married | 34 | 22.7 |
| Divorced | 29 | 19.3 |
| Widow | 22 | 14.7 |
| **Total** | **150** | **100** |
| **Educational Level** | **Frequency** | **Percentage (%)** |
| Primary | 47 | 31.3 |
| Secondary | 53 | 35.3 |
| Tertiary | 24 | 16.0 |
| Others | 26 | 17.3 |
| **Total** | **150** | **100** |
| **Occupation** | **Frequency** | **Percentage (%)** |
| Self employed | 46 | 30.7 |
| Private employed | 30 | 20.0 |
| Civil Servant | 39 | 26.0 |
| Others | 25 | 23.3 |
| **Total** | **150** | **100** |

**Factors Influencing Deforestation Emohua LGA of Rivers State**

From Table 2, 73.3% of the respondents indicated that they make use of wood as fuel for domestic and business activities, 18% indicated they do not make use of wood as fuel for domestic and business activities while 10.7% indicated that they make use of wood as fuel for domestic and business activities sometimes. This shows the level of dependence on wood as source of energy was still strong in the study area. In terms of the times that people have been using wood as fuel, the analysis reveals that 48% of the respondents indicated that have been making use of

wood as energy for more than ten years, while 35.3% and 16.7% indicated five – ten years and less than five years of use of wood as energy respectively. It also shows that out of the hundred and fifty respondents, 90% of the respondents indicated that they depended on wood as source of energy from one – four weeks, while 10% indicated that they depend on wood as source of energy for less than a week. The analysis on indiscriminate on indiscriminate and seasonal felling of trees, 84% of the respondents indicated that trees are cut down seasonally in their area, while 16% indicated that trees are not cut down seasonally in their area. However, more respondents that reside far from the forest area in the LGA indicated that trees are not being felled seasonally. However, this is as a result of the various activities of those who reside in the interior area of the LGA which seem to have little or no access to any other means of generating energy domestic and mini business activities aside from wood from forest.

Furthermore, the analysis of burning of bushes revealed that 74% of the respondents agree to the fact that bush is being burnt in their area from time to time most especially when new buildings and road are to be built, and this is done without considering the forest reserve in the area. Moreover, 26% of the respondents indicated that there are little or no trace of activities of bush burning in their area following the fact that such areas have not been too developed infrastructurally. Moreover, 1.3% reported that bush are burnt weekly in their area, 17.3% indicated monthly, while 81.3% stated that bush burning is carried out irregularly in their area. This response revealed that more of the forest landuses would have been degraded through the burning activities.

In an attempt of determining the factor concerning the inadequate execution of environmental laws and regulations whereby majority of the respondents (76.7%) agreed that with this assertion and 23.3% did not agree with it. This analysis indicated that adequate execution or implementation of environmental laws supposed to have prevented the rate at which forest is being opened. In terms of over dependence on forest resources, the analysis shows that 80.7% of respondents agreed on this while 19.3% disagreed. It is also revealed that 64.7% of respondents agreed that farming and agricultural activities caused deforestation while 35.3% disagreed. Concerning the indiscriminate and unplanned building and construction activities, 94% agreed on this while 6% disagreed. This shows that government should try to regulate building and constructions activities.

Table 2: Factors contributing to deforestation in Emohua LGA

| **Increase in Consumption Rate of Wood** | **Frequency** | **Percentage (%)** |
|---|---|---|
| Yes | 107 | 73.3 |
| No | 27 | 18.0 |
| Sometimes | 16 | 10.7 |
| Total | 150 | 100 |
| **Duration that fuelwood has been used** | **Frequency** | **Percentage (%)** |
| Less than five years | 25 | 16,7 |
| 5 – 10 years | 53 | 35.3 |
| More than ten years | 72 | 48.0 |

| | | |
|---|---|---|
| Total | 150 | 100 |
| **Frequency of making use of wood as fuel** | **Frequency** | **Percentage (%)** |
| Less than one week | 15 | 10.0 |
| One – four weeks | 135 | 90 |
| Total | 150 | 100 |
| **Indiscriminate Seasonal Felling of Trees** | **Frequency** | **Percentage (%)** |
| Yes | 126 | 84.0 |
| No | 24 | 16.0 |
| Total | 150 | 100 |
| **Burning of Bushes** | **Frequency** | **Percentage (%)** |
| Yes | 111 | 74.0 |
| No | 39 | 26.0 |
| Total | 150 | 100 |
| **Frequency of bush burning activities** | **Frequency** | Percentage (%) |
| Daily | 0 | 0.0 |
| Weekly | 2 | 1.3 |
| Monthly | 26 | 17.3 |
| Irregular | 122 | 81.3 |
| Total | 150 | 100 |
| **Inadequate execution of environmental laws and regulations** | **Frequency** | **Percentage (%)** |
| Yes | 115 | 76.7 |
| No | 35 | 23.3 |
| Total | 150 | 100 |
| **Overdependence on forest resources as energy** | **Frequency** | **Percentage (%)** |
| Yes | 121 | 80.7 |
| No | 29 | 19.3 |
| Total | 150 | 100.0 |
| **Farming/Agricultural activities** | **Frequency** | **Percentage (%)** |
| Yes | 97 | 64.7 |
| No | 53 | 35.3 |
| Total | 150 | 100.0 |
| **Indiscriminate and unplanned building and construction activities** | **Frequency** | **Percentage (%)** |
| Yes | 141 | 94.0 |

| | | |
|---|---|---|
| No | 9 | 6.0 |
| Total | 150 | 94.0 |

**Perception towards the Rate and Effects of Deforestation in the Study Area**

Table 3 presents number of persons in percentage that were affected by deforestation in the study area and it is shown that 84.7% of respondents agreed that they were affected by deforestation in the study area, while 15.3% of respondents disagreed respectively.

Table 3: General Respondents' perceptions towards deforestation

| Perception towards deforestation | Frequency | Percentage (%) |
|---|---|---|
| Yes | 127 | 84.7 |
| No | 23 | 15.3 |
| Total | 150 | 100 |

**Rate of Deforestation**

In an attempt to understand the qualitative rate of deforestation through respondents, the analysis revealed that 42% of respondent indicated high rate of deforestation in their area, 35.3% of respondents attest that the rate of deforestation in their area was moderate while others were of the opinion that the rate of deforestation in their area is low.

Table 4: Description of the rate of deforestation in their area

| Rate | Frequency | Percentage (%) |
|---|---|---|
| High | 63 | 42.0 |
| Moderate | 53 | 35.3 |
| Low | 34 | 22.7 |
| Total | 150 | 100 |

**Effects of Deforestation on Livelihood**

In Table 5 which presents the environmental effects of deforestation on the livelihood of residents in the study area, 13.3% have indicated that is drastic scarcity of raw material that were originally made available when the forest have not been degraded materials such as wood for fuel, herbs for medicines etc, 14% indicated that it has affected their means of livelihood as there is little or no animals available for commercial hunting anymore, and 16.7% reported a decline in agricultural productivity in their area as most agricultural products gotten from the forest are no longer available for consumption anymore. Furthermore, 23.3% agreed that it has led to the increase of climate change, 20% agreed that there is water and soil resources loss and flooding while 12.7% agreed that it has reduced employment.

**Table 5: Environmental and Socio-economic effects of deforestation on livelihood**

| Effects | Number of respondents | Percentage (%) |
|---|---|---|
| Scarcity of raw materials | 20 | 13.3 |
| Affects means of livelihood | 21 | 14.0 |
| Reduced agricultural productivity | 25 | 16.7 |
| Increase in the Climate Change | 35 | 23.3 |
| Water and Soil Resources Loss and Flooding | 30 | 20.0 |
| Reduction in employment | 19 | 12.7 |
| Total | 150 | 100.0 |

**Precautionary Measures to Reduce Deforestation**

Table 6 shows that 52.7% of respondents proposed that government should set up body to regulate and conserve forest resources in the study area. 20.6% proposed that government should come up with a more organized and consistent maintaining the existing forests given by nature in the study area while 26.7% proposed that government should enlightenment and awareness campaign on the consequences and negative effects of deforestation in the study area

Table 6. Measures to reduce the rate of deforestation in Emohua LGA

| Measures | Frequency | Percentage (%) |
|---|---|---|
| Government should set up body to regulate and conserve forest resources | 79 | 52.7 |
| Government should come up with a more organized and consistent method of maintaining the existing forest | 31 | 20.6 |
| Government should create awareness on consequences of deforestation and its negative effects | 40 | 26.7 |
| Total | 150 | 100 |

**Discussion of Findings**

Analysis of data gathered from the field with the use of questionnaires has established the fact that the study area is highly faced with the problem of deforestation. These problems of deforestation are on the high side, and mostly seasonal. It usually a long-term problem and all respondents are directly affected basically in the area of shortage of food and medicinal supply from forest resources, deforestation has also drastically affected the economy of the people in the sense that those who are engaged forest related business such as commercial hunting, saw – milling, bakery etc. Information from respondent also show the poor attitudinal behaviour of people felling trees on daily and weekly basis and also construction building indiscriminately by claiming forest and vegetated areas which server as forest for the people. From findings discovery were made on how the increasing population of study area has led to the rise in demand for food and other resources thereby making resident in the study area exercise pressure on forest resources which has led to increased rate of deforestation in the study area. It is

also discovered that the government sometimes have carried out construction activities such building of council headquarters, schools and major and minor roads that has led to the claiming of some forest that existed in the study area. Furthermore, information from respondent clearly brings to our notice that the government has not set up a body or parastatal to control and regulate deforestation in the study area.

**Conclusion and Recommendations**

It is being concluded that the factors causing deforestation included the increase in consumption rate of wood, frequency of making use of wood as fuel, indiscriminate seasonal felling of trees, burning of bushes, frequency of bush burning activities, inadequate execution of environmental laws and regulations, overdependence on forest resources as energy, farming/agricultural activities and indiscriminate and unplanned building and construction activities. Based on findings of this study, it is recommended that government should set up body to regulate and conserve forest resources, government should come up with a more organized and consistent method of maintaining the existing forest, government should create awareness on consequences of deforestation and its negative effects, the environmental laws of opening a forest should be promulgated with full implementation, bush burning should be under a serious control of an agency; and other means of fuel should be put into considerations to reduce tree for wood fuel.

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