

**IMPACTS OF FUEL WOOD HARVESTING IN MUTUM-BIYU OF GASSOL LOCAL GOVERNMENT AREA, TARABA STATE, NIGERIA**

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**ABSTRACT**

The study was conducted between the months of August – October 2017 in Kwata village of Mutum- Biyu in Gassol Local Government, Taraba state, Nigeria to assess the impacts of fuel wood harvesting in the area. The study was a Descriptive one using both qualitative and quantitative methods. A total of 133 respondents comprising of 133 local community members and 10 staff of the department of Forestry and Wildlife of Gassol Local Government Area selected by Purposive, Snowball and Systematic sampling techniques participated in the study. Researcher made closed ended questionnaire as well as Structured Interview Guide were the instrument used for data collection. Data collected was analysed using Descriptive Statistics. Results of the study showed that demographically, the local community was mainly dominated by married male youth of ages between 31-40 years having only primary and secondary education. Livestock and crop farming were found to be the dominant occupation among the local people. Impacts of fuel wood harvesting mainly manifest in the area in the form of loss of soil fertility, loss of biodiversity, increased soil erosion, and windstorm among others. As a result of the heavy dependence on the soil resources for livelihood engaging in various deforestation acts such as continuous felling down of trees for different purposes, over grazing, bush burning and others, the impacts are most likely to escalate. Based on these findings, it was therefore recommended that felling down of trees in the area should be well regulated, more job opportunities should be made available to the local communities in order to dissuade them from deforestation acts, strict laws should be established and enforced, nursery belts be established in the area where the local people can easily pick seedlings and plant them etc.

**Keywords:** Impacts, fuel wood harvesting, Kwata, Mutum-Bitu, Taraba state.

## **INTRODUCTION**

Fuel wood is one of the most important sources of fuel energy especially in developing countries and it is referred to as material used to generate heat and light energy by combustion. Fuel wood or firewood, consists of any unprocessed woody biomass used to fuel a small fire most often for cooking or warmth. In most developing countries, firewood comes from dead woody material and small trees. Fuel wood harvesting and consumption is a universal phenomenon in Africa and most other developing countries. It remains the major source of domestic fuel as well as the main source of energy for the micro economic enterprises. According to Gwandu (1991), fuel wood energy is a pivot on which the domestic and economic lives of people revolves. Over the years, the demand and consumption of fuel wood has increased with increases in human population. More importantly, fuel wood supplies appear to be diminishing in the face of increasing demand.

The fuel wood issue presents the double sides of a coin. That is to say, wood is an indispensable source of energy; it is source of income for the traders, yet intensive and indiscriminate harvest of fuel wood imposes heavy environmental burden. The emerging situation calls for caution in order to sustain fuel wood energy trade and consumption. As population increases, the indispensable nature of wood energy has resulted in increasing demand, supply, as well as consumption in most countries. Statistics on consumption rate varies from place to place. According to USAID (1992), daily consumption rate in the developing countries is equal to 21 million barrels of oil. In Nigeria alone, fuel wood consumption in the 1980s was estimated at 43 million metric tones per annum, giving a per capital rate of 500kg (Federal Ministry of Science and Technology, 1987). In Africa, Fuel wood and charcoal account for more than 90% of fuel wood consumption (Kio, 1987). The overall result of the expanding wood market and the increasing rate of harvesting and exploitation is the general degradation of the Nigerian forest wealth and heritage a situation that reduces soil fertility, agricultural production and the general quality of life (Jinadu, 1998). At the national level, FEPA (1992) estimated that Nigeria now loses over 350,000km<sup>2</sup> of forest annually to advance desert. The economic impacts of logging led to intensified harvests to the extent that threat to many economic trees such as the Shea butter trees is eminent.

With continues growth of the country's population and indeed that of urban areas, this trend is becoming a threat to the environment, particularly the areas from where these, fuel woods were harvested. The rate of harvest and utilization is higher than its natural regeneration or replenishment (Babanyara *et al.*, 2016). At present, fuel wood constitutes the main source of fuel for cooking by over 76% of the Nigerian population. Population growth has also put a lot of pressure on the forest as the rising farming population seeks for more land for survival and fuel wood as a source of energy for cooking and heating (Babanyara, 2010).

In Nigeria, the total fuel wood consumption in 1985 was recorded 87.587 million cubic metres (Babanyara, 2010). Obuah (2000) stated that, 55 million tones of fuel wood and charcoal were burnt, and it increased to 80 million cubic metres (43.4x10<sup>9</sup>kg) of fuel wood annually for cooking and domestic uses (Sambo, 2005) in industrialized countries, wood based fuels (fuel wood or firewood and charcoal) have long been replaced by more efficient and convenient

sources of fuel. However, in developing regions, less able to afford and access alternative sources of energy, wood has remained a dominant fuel. Huge numbers of subsistence users depend upon it for their domestic energy and a large number of poor people rely on wood fuel trading as a source of income.

In Nigeria, predominantly rural population depends mainly on fuel wood to meet the basic needs for cooking and heating. The growth of urban areas in Nigeria accounts for increase demand on fuel wood. The rural and urban poor populations are increasing and households within these classes depend heavily on fuel wood to provide energy. Majority of these low income earners cannot afford electricity or gas to serve energy needs such as cooking and heating. Recent studies revealed that Nigeria produces about 1 million tones of charcoal annually of which 30% are consumed in the cities. Fuel wood and charcoal account for more than 50% of the natural primary energy consumption. Both household and industrial sector in all ecological zones demands for fuel wood. It has been estimated that about 90% in northern Nigeria depend on fuel wood as their source of domestic energy (Ewah, 2014).

#### **STATEMENT OF THE PROBLEM**

All over the globe, forest degradation especially cutting down of trees for different purposes is on the increase due to the increasing demand for firewood and timber. Burning of woods subsequently leads to release of greenhouse gases which has resulted in temperature rise both during the day and at night, obstructing the balance between oxygen and carbon dioxide. This has resulted in threatening loss of vegetation, all due to over exploitation of wood plant resources for many domestic and industrial purposes.

Nigeria has the highest rate of fuel wood harvesting in the world according to Food and Agricultural Organization of the FAO, (2011). Between 2000 and 2005 the country lost 55.7% of its primary forests, and the rates of forest change increased by 31.2% to 3.12% per annum. The major factors leading to forest degradation in Nigeria is fuel wood harvesting. The usage of fuel wood for cooking and heating is higher in rural areas of the country where more of the population is concentrated. The volume of fuel wood harvesting and its economic and environmental implications are no doubt huge. The major problems are those of pollution and environmental quality reduction. Most villages which constitute the source region such as, Kwata village in Mutun-biyu area, Gassol Local Government, Taraba State, Nigeria have experienced decreases in wood population over the years. Besides, they have also experienced wind storm, soil erosion, leaching, loss of species and biodiversity as well as land use conflicts and desertification.

Numerous impacts of deforestation such as loss of biodiversity, loss of soil fertility, soil erosion, desertification, loss of water sources and so on are being experienced and reported from different parts of Nigeria especially from the north were considerable number of states such as Yobe, Borno, Jigawa and Sokoto states which are prone to severe desertification. However, deforestation in form of fuel wood harvesting is on the increase in almost all these states because

majority of the poor rural populaces are heavily dependent on firewood as the only source of energy and heating.

Despite efforts put in place by governments at all levels with the aim of regulating deforestation and ameliorating its impacts on the people as well as the environment such as tree planting campaign, formulation of strict deforestation laws, people's enlightenment on the impacts of deforestation and so on, cutting down of trees is still on the increase and quite a number of people still depend solely on fuel wood harvesting as their sources of income while many households are still reluctant to revert to other sources of fuel for their domestic energy supplies.

In view of the above, there is the need to assess the impacts of fuel wood harvesting in areas especially those which serve as centers of fuel wood harvesting such as Kwata village of Gassol Local Government Area of Taraba state, Nigeria with the aim of finding lasting solutions to it.

### **MATERIALS AND METHODS**

The study was conducted between the months of August-October, 2017 in Kwata village of Mutum-Biyu in Gassol L.G.A., Taraba state, Nigeria. Descriptive Survey design involving qualitative and quantitative methods were used to gather data on respondents' demographic characteristics as well as impacts of fuel wood harvesting in the area. A total of 200 respondents comprising of 180 local people and 20 officials of the Department of Forestry of the Local Government selected using Purposive and Snowball sampling techniques participated in the study. Systematic Random sampling was later used to select the sample size of 133 respondents comprising of 123 local people and 10 officials of the Department of Forestry and Wildlife of the Local Government. Researcher made closed ended questionnaire and structured Interview Guide were the instruments of data collection used while data collected was analysed in SPSS using descriptive statistics.

### **STUDY AREA**

Gassol is one of the sixteen (16) LGAs of Taraba State, Nigeria and majority of its population are farmers engaged in agricultural activities like crop farming, fishing and hunting, The headquarters is Mutum-biyu town located at 8° 38' 00 "N, 10° 46 "E. It has an area of 5,548km<sup>2</sup> and a population of 244,749 at the 2006 National Census. On the northern part, it borders the Benue River and the Taraba River which flow northwards through the area to its confluence in Benue State. Kwata a village near Mutum-biyu town is situated at longitude 10, 7667 (104° 0.120"E), latitude 8, 6333 (8° 37' 59.988"N) with an altitude of 137m and is mainly dominated by the Wurkum and Fulani tribes. The vegetation is that of woodland type.

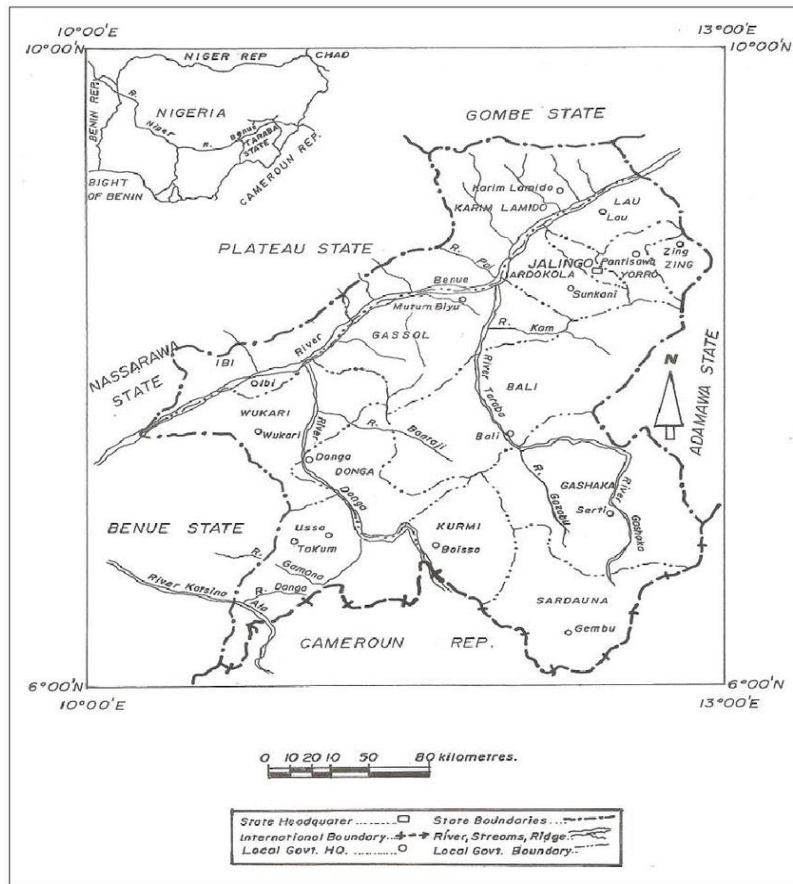


Figure 1: Map showing Gassol L.G.A. in Taraba state.

RESULTS ANALYSIS AND INTERPRETATION

TABLE 1: Showing demographic characteristics of the respondents

DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS.			
V a r i a b l e s	F r e q u e n c y	P e r c e n t a g e	
S	E	X	
M a l e	1	4	92.70%

F e m a l e	9	7 . 3 2 %
<b>A</b>	<b>G</b>	<b>E</b>
1 5 - 2 0	1	7 1 3 . 8 2 %
2 1 - 3 0	3	8 3 0 . 9 0 %
3 1 - 4 0	5	1 4 1 . 4 6 %
4 l a n d a b o v e	1	7 1 3 . 8 2 %
<b>M A R I T A L S T A T U S</b>		
M a r r i e d	8	7 7 0 . 7 3 %
S i n g l e	2	2 1 7 . 8 9 %
S e p a r a t e d	1	0 8 . 1 3 %
W i d o w e r	4	3 . 2 5 %
<b>L E V E L O F E D U C A T I O N</b>		
P r i m a r y	5	7 4 6 . 3 4 %
S e c o n d a r y	4	1 3 3 . 3 3 %
D i p l o m a / N C E	2	4 1 9 . 5 1 %
H N D / B a c h e l o r s	1	0 . 8 1 %
M a s t e r s	0	0
<b>O C C U P A T I O N</b>		
C r o p f a r m i n g	4	4 3 5 . 7 7 %
L i v e s t o c k f a r m i n g	2	2 1 7 . 8 9 %
F i r e w o o d s e l l i n g	2	0 1 6 . 2 6 %
F u e l w o o d h a r v e s t i n g	1	1 8 . 9 4 %
I r r i g a t i o n	9	7 . 3 2 %
H o n e y f a r m i n g	8	6 . 5 0 %
F i s h i n g	9	7 . 3 2 %
<b>H O U S E H O L D S I Z E</b>		
1 - 5	3	8 3 0 . 9 0 %
6 - 1 0	3	0 2 4 . 4 0 %
1 1 - 5 3	3	0 2 4 . 4 0 %
1 6 - 2 0	1	0 8 . 1 3 %
A b o v e 2 1	1	5 1 2 . 2 0 %
<b>N U M B E R O F Y E A R S I N T H E A R E A</b>		
1 - 5	1	0 8 . 1 3 %
6 - 1 0	2	7 2 2 . 0 0 %
1 1 - 5 4	4	1 3 3 . 3 3 %
1 6 - 2 0	3	0 2 4 . 4 0 %
A b o v e 2 1	1	5 1 2 . 2 0 %
<b>S O U R C E O F F U E L B E I N G U S E D</b>		

F u e l w o o d	7	6	6 1 . 7 9 %
C h a r c o a l	2	5	2 0 . 3 3 %
K e r o s e n e	1	8	1 4 . 6 3 %
G a s	4		3 . 2 5 %

The result obtained in the Table above shows that male respondents were the majority 92.7% while female respondents were only 7.32%. Age variation among the respondents indicated that those within the age group of 21-40 years had the highest percentage of 72.39%. Marital status of the respondents was mainly dominated by the married ones 70.73% while the least group was that of the widows with 3.25%. Level of education of the respondents also showed that majority of them did not have big qualifications but only primary and secondary certificates 46.34% and 33.33% respectively while those with Diploma/NCE certificates and HND/first degrees were only 19.51% and 0.81% respectively. With regards to the economic activities mainly engaged by the local communities in the area, it was revealed that majority of them 35.77% engaged in crop farming and livestock farming 17.89%. Other occupations engaged by the respondents were fire wood selling 16.26%, fuel wood harvesting 8.94%, irrigation 7.32%, honey collection 6.50% and fishing 7.32%. Besides, household sizes were also found to be relatively big ranging from 6-15 family members 48.8% though about 12.20% was found to have family members above 21. Unsurprisingly, as it is the case in many African rural areas, majority of the respondents were found to have resided in the area for quite a long time and most probably indigenous of the area. It was discovered that, majority of the respondents 57.73% had resided in the area for between 11-20 years while about 12.20% stayed for more than 21 years. Expectedly, outcome of the study also discovered that majority of the local communities 61.71% use firewood as their only source of energy mostly for cooking and heating. The study was also able to find out that the most commonly used source of fuel or energy in the area was firewood while 20.33%, 14.63% and 3.25% use charcoal, kerosene and gas as their sources of domestic energy requirements.

**IMPACTS OF FUEL WOOD HARVESTING**

**TABLE 2: Showing mean interpretation**

#	Mean	Range	Response	Mode	Interpretation
4	3 . 2 6	- 4 . 0 0	S t r o n g l y	A g r e e	V e r y h i g h
3	2 . 5 1	- 3 . 2 5	A	g r e e	e H i g h

2	1.76 - 2.50	Disagree	Low
1	1.00 - 1.75	Strongly Disagree	Very low

**TABLE 3: Showing responses of local people on impacts of fuel wood harvesting**

Q U E S T I O N S	4	3	2	1	MEAN	STD.
The rate of falling down of trees in the area is on the increase.	42 (34.1)	78 (63.4)	3 (2.40)	0 (0)	3 . 3 2	. 5 1 7
Trees are being used as firewood in this area.	123 (100)	0 (0)	0 (0)	0 (0)	4 . 0 0	. 0 0 0
Many varieties of trees are used for this purpose.	92 (74.8)	31 (25.20)	0 (0)	0 (0)	3 . 7 5	. 4 3 5
Felling down of trees affect soil fertility	40 (32.5)	69 (56.1)	14 (11.4)	0 (0)	3 . 2 1	. 6 3 0
Felling down of trees affects honey collection	37 (30.1)	72 (58.5)	14 (11.4)	0 (0)	3 . 1 9	. 6 1 8
Increased soil erosion is noticed in the area	22 (17.9)	62 (50.4)	27 (22.0)	12 (9.8)	2 . 7 6	. 8 5 9
Cutting down of trees leads to decrease of tree population.	52 (42.3)	60 (48.8)	11 (8.9)	0 (0)	3 . 3 3	. 6 3 5
Windstorm is being experienced in this area	36 (29.3)	69 (56.1)	15 (12.2)	3 (2.4)	3 . 1 5	. 6 8 5
Conflicts among communities do occur as a result of felling down of trees.	22 (17.9)	59 (48.0)	38 (30.9)	4 (3.3)	2 . 8 1	. 7 6 4
Felling down of trees affects grazing of animals.	33 (26.8)	70 (56.9)	12 (9.8)	8 (6.5)	3 . 0 4	. 7 9 3
Increased felling down of trees affects food production.	21 (17.1)	29 (23.6)	60 (48.8)	13 (10.6)	2 . 4 7	. 8 9 9
Drying up of sources of water such as ponds is experienced in this area	10 (8.1)	43 (35.0)	46 (37.4)	24 (19.5)	2 . 3 2	. 8 8 0
In places where trees are cut down, pastures easily dry up	33 (26.8)	70 (56.9)	12 (9.8)	8 (6.5)	2 . 7 0	. 9 0 7
<b>OVERALL AVERAGE</b>	<b>43 (35.0)</b>	<b>55 (44.7)</b>	<b>18 (15.0)</b>	<b>6 (4.87)</b>	<b>2 . 7 7</b>	<b>. 6 6 3</b>

The Table above indicates responses of the respondents (local people) on impacts of felling down of trees in the study. All the respondents (100%) agreed that trees are definitely used as fire woods in the area. Besides, all the respondents (100%) also did agree that various types of



trees are cut down for the purpose of getting fire wood and that the rate of felling down of trees is on the increase (97.5%). With respect to impacts of felling down of trees noticeable in the area, majority of the respondents disagreed that these impacts affect food production and water sources however, considerable number of them agreed that these impacts manifest in the form of affecting soil fertility 88.6%, honey collection 88.6%, soil erosion 68.3% and decrease in tree population 91.1%. Other impacts noticeable are conflicts among people and different communities mostly over land 65.9%, affected grazing of animals 83.7% and drying up of pastures 83.7%.

**TABLE 4: Showing responses of officials on impacts of fuel wood harvesting**

<b>Q U E S T I O N S</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>MEAN</b>	<b>S T D .</b>
Felling down of trees is the major act of deforestation in the area	3 (30)	7 (70)	0 (0)	0 (0)	3 . 3 0	. 4 8 3
Impacts of cutting down of trees in the area are vividly noticeable	2 (20)	5 (50)	3 (30)	0 (0)	2 . 9 0	. 7 3 7
Local people prefer firewood as the main source of domestic energy	10 (100)	0 (0)	0 (0)	0 (0)	4 . 0 0	. 0 0 0
Logging and selling of firewood in the area are on the increase	4 (40)	6 (60)	0 (0)	0 (0)	3 . 4 0	. 5 1 6
Reports of windstorm and soil erosion are related to deforestation in the area	1 (10)	6 (60)	2 (20)	1 (10)	2 . 7 0	. 8 2 3
Loss of biodiversity is experienced in the area as a result of felling down of trees.	3 (30)	6 (60)	1 (10)	0 (0)	3 . 2 0	. 6 2 3
Crop and livestock farming are affected by the impacts of cutting down trees	5 (50)	5 (50)	0 (0)	0 (0)	3 . 5 0	. 5 2 7
Apart from use as firewood, trees are being cut for other purposes in the area.	4 (40)	6 (0)	0 (0)	0 (0)	3 . 4 0	. 5 1 6
Felling down of trees can be a contributing factor towards climate change.	0 (0)	4 (40)	5 (50)	1 (10)	2 . 3 0	. 6 7 5
Issues of conflicts among local people as a result of felling down of trees do occur.	4 (40)	5 (50)	1 (10)	0 (0)	3 . 3 0	. 5 8 7
Increased felling down of trees affects food production.	0 (0)	3 (30)	5 (50)	2 (20)	2 . 1 0	. 7 3 2
Cutting down of trees leads to drying up of sources of water and pasture	2 (20)	6 (60)	2 (20)	0 (0)	3 . 0 0	. 6 6 7
<b>O v e r a l l a v e r a g e</b>	<b>4 (40)</b>	<b>6 (60)</b>	<b>2 (20)</b>	<b>0.4 (4)</b>	<b>3 . 0 9</b>	<b>. 5 7 3</b>

Table 4 above shows responses of the officials of the department of Forestry and Wildlife on the impacts of fuel wood harvesting activities on forest degradation in the area under study. All the respondents (100%) did agree that felling down of trees is the commonest form of forest degradation in the area and the impacts of these acts are vividly noticeable in the area (70%). All the respondents (100%) also agreed that the local people prefer fire wood as the major source of domestic energy and

logging and selling of fire woods are also on the increase. They also agreed that trees were not only cut down for the purpose of getting fire wood but also for other reasons. Although majority of the respondents did not agree with the fact that fuel wood harvesting affects food production or contributes to climate change, they did agree that the impacts were observed in form of loss of biodiversity 90.0%, increased windstorm and soil erosion 70.0%, affected crop and livestock farming, conflicts among people 90.0% and drying up of sources of water 80.0%.

## **DISCUSSIONS**

### **DEMOGRAPHIC CHARACTERISTICS OF THE RESPONDENTS**

According to the findings of this study, bulk of the respondents was male while the female sex was the minority. One of the inclusion criteria of the study was that respondents had to be engaged in economic activities either directly or indirectly related to farming or logging. In the study location men were known to be involved in these activities more than the women. This could be the reason why majority of the respondents happened to be men, because men were mostly involved in activities relating to logging.(Etakhrumen, 2008), men are seen to be the major partakers in the business of logging which ranges from cutting down tree species in the forest, rolling the log down the mountain top, transporting the logs from the forest to collection centers and loading the logs onto trailers. The reason is probably due to the nature of the job which is extremely physical and labor intensive and above all risky. The result agrees with the findings of Manfre and Rubin (2012), who reported that men contribute more to household income than women because their forest activities are income generating whereas women are more involved in subsistence activities. This result also agrees with report of the International Labour Organisation (ILO) (2016) that in the United States, only 6.3% of women worked in male denominated occupations in 2016 and only 3.2% was involved in logging

In terms of age, it was discovered that majority of the respondents were young men of age between 21-40 years while those above 41 years of age were few. Analysis of the age variation showed that young men of ages 31-41 were the majority and the ones mostly involved in logging related activities. This finding agrees with the findings of other similar studies such as that of Abdul Rahman *et al.*, (2008), who revealed that young, strong and able men with secondary or no secondary education are all major actors in the tree felling or timber extraction. Similarly, the work of Aabeyir *et.al.*, (2011) who reported that the major groups involved in commercial fuel wood collection in the communities of Dawadawa and Kunsu respectively falls within the ages of 31-39 years. The high rate of unemployment in the country especially among the majority youth left many young able men with no option but to source means of livelihoods by all means there by engaging in environmentally devastating activities such as deforestation.

Variations in marital status of the respondents showed that, majority of them were married while those who were yet to marry, separated or widowed were few. This finding further confirms the culture of most communities in the North eastern states of Nigeria where young men and women get married at early ages of 25 years and 15 years respectively. This finding corresponds with that of Omolehin *et.al.*, (2007) who reported that married men are more conscious of the need to get better livelihood so that they could meet their family food needs. With regards to their level of education,

majority of the respondents had only primary and secondary education while only few claimed to have obtained post secondary education certificates; this implies that that, majority of the local people end their education after completing primary or secondary schools. This is common in many rural communities in northern Nigeria where majority of kids engage in farming at early age instead of enrolling in schools.

As it is found in many rural communities in Nigeria, analysis of the respondents' occupation indicated that crop and livestock farmers dominated the categories of occupation in the study location followed by fuel wood sellers. Being a famous fuel wood harvesting area in Taraba state, it is not surprising to discover that considerable number of men in Kwata village earn their livings through logging and fire wood selling. Other categories of occupations engaged by men in Kwata village were irrigation, honey collection and fishing. Typical of many families in northern Nigeria, the study found out that household sizes in the study area were relatively big ranging from 6-21 family members. Most often, in rural Africa where majority of the local communities have only farming as their main occupations, large families are desirable and considered to be a blessing. In such communities, it is believed that the bigger a family is, the bigger the farmland it can harvest meaning more food for the families' consumption and for sale. Besides, the big household sizes could be attributed to the fact that, most rural communities in Nigeria lack basic western education as well knowledge of family planning methods. To them, the larger a family is the stronger and self reliant it is.

Majority of the respondents stated that they lived in the area for between 11- 20 years or even more implying that most if not all of the respondents were residents of Kwata village. As a result of the high rate of rural-urban drift found in most developing countries, rural areas are usually inhabited by indigenous people. Unsurprisingly, fuel wood was found to be the most commonly used source of fuel in Kwata village. This could be attributed to the fact that, in most African rural communities, the majority poor communities largely depend on fire wood for domestic energy because it is readily available and cheap coupled with the fact that other sources of fuel such as kerosene and gas are most often not available and expensive. This finding further confirms the findings of Jinadu (1998) who stated that fuel remains the major source of domestic energy in most part of developing world. Encyclopaedia Britannica (2001) reported that in Nigeria for instance, fuel wood is still the main source of domestic fuel even in urban areas and it accounts for more than half of the domestic energy consumption. Similarly, according to Ewah (2014), it has been estimated that about 90% in northern Nigeria depend on fuel wood as their source of domestic energy. Even in many urban areas, as a result of the epileptic power supply in Nigeria, many households depend on charcoal kerosene and gas as their major sources of fuel energy, though few especially the low income earners still use fire woods.

### **IMPACTS OF FUEL WOOD HARVESTING IN THE STUDY LOCATION**

It was discovered by this study that the act of felling down of trees in Kwata village especially for fire wood both for family uses and commercial reasons is on the increase while the impacts associated with it are similarly increasing and diverse. For example, on average, majority of the respondents that

the situation was bad. According to the respondents, the impacts mainly manifest in the form of loss of soil fertility, loss of biodiversity especially tree species, increased soil erosion, frequent windstorm as well as social unrests and conflicts. However, majority of the respondents did not agree that the impacts affect food production or contributed to climate change. In a study conducted by Diaz (2006), it was found that logging cause destruction of natural habitats of wild animals, vegetation species, fruit trees and trees of medicinal importance as well as the disruption of essential microbial ecosystems. This condition leads to lose of biodiversity, degrade the soil and also encourage soil erosion as heavily deforested area due to logging are left bared at the expense of run offs during rainfall. When trees are cut, the forest no longer supports the same wildlife as effectively as it did before and this may place its inhabitants at risk. However, harvesting of firewood for domestic use is considered to have a lower direct impact on the woody plant community than the harvesting of wood for commercial purposes. At present, the effect of firewood harvesting on species or their population's viability is not known because there is a lack of data on their abundance and distribution (Dhillion *et al.*, 2000).

Furthermore, the impacts of felling down of trees as well as other deforestation activities all over the world are far reaching. Many studies have confirmed that. NEST and FAO (2002), concluded that fuel wood consumption in developing countries account for the clearing of 10-15 million hectares of forest annually and that the tropical rain forests which is receding at the rate of 100,000km<sup>2</sup> per annum could disappear in 85 years. According to Jinadu (1998), the overall result of the expanding wood market and the increasing rate of harvesting and exploitation is the general degradation of the Nigerian forests wealth and heritage a situation that reduce soil fertility, agricultural production and general quality of life. Nigeria has the highest rate of fuel wood harvesting in the world according to the Food and Agricultural Organisation of the UN, (FAO). Between 2000 and 2005, the country lost 55.7% of its primary forests, and the rate of forest change increased by 31.2% to 3.12% per annum. The major factors leading to forest degradation in Nigeria is fuel wood harvesting. The usage of fuel wood for cooking and heating is higher in rural areas of the country where more of the population is concentrated.

Furthermore, the impacts of deforestation does not only affect man's immediate environment but goes beyond that and contributes to the problem of climate change which is now a global issue of concern. Although majority of the respondents in this study disagreed with that. According to Putz *et al.*, (2001), unrestrained and uncontrolled logging can have a devastating impact on the environment and contribute immensely to global warming which is currently threatening the world. In Nigeria for instance, the excessive fuel wood harvesting led to massive soil erosion, decreased water quality and Dam siltation Tee *et al.*, (2009). Human-human and Human-wildlife conflicts are other negative consequences of deforestation occurring in many places around the world which led to increasing incident of human-wildlife conflict hitting hard on the success of conservation in a way alienating the people's participation in conservation. Elephant habitats located at northern west Bengal in India is a part of the eastern Himalaya Biodiversity Hotspot characterized by a higher degree of fragmentation. The heavy fragmentation of this habitat has resulted into intense human-elephant conflicts. Besides, sporadic incidence of conflicts among rural communities over decreased land resources as a result of deforestation is common phenomenon in many countries especially sub Saharan Africa. Furthermore,

the impacts of deforestation does not only affect man's immediate environment but goes beyond that and contributes to the problem of climate change which is now a global issue of concern.

## **CONCLUSION**

In conclusion, the finding made by this study that, married male youth of ages between 31-40 years were the group of people mostly incriminated in activities relating to fuel wood harvesting in Kwata village implies that, forest resources especially trees shall suffer serious deforestation in form of fuel wood harvesting so long as these youth earn their livelihoods from commercial logging amidst the growing unemployment rate in many developing countries like Nigeria. Besides, the local communities were also found to be not well educated to be able to secure white collar jobs especially in cities hence, had to cling to logging and other related activities which were the only sources of livelihoods obtainable. This was further confirmed by the finding made that, majority of the local communities use fire wood as the major energy source and fire wood selling was the second dominant economic activity after farming in the area. Thus, if fuel wood harvesting in the area is left uncontrolled and continues to increase, all other economic activities engaged by majority of the local communities such as fishing, honey collection, crop and livestock farming will also be seriously affected by its impacts.

Impacts of felling down of trees in the study area as revealed by this research including loss of soil fertility, increased soil erosion and windstorm, decrease in abundance of tree species as well as drying up of pasture will escalate so long as commercial logging activities continue and eventually, major occupations of the local communities will also be seriously affected. These changes could reduce the ability of the land to support people, often sparking an exodus of rural people of the area to urban areas. According to Jinadu (1998), the overall result of the expanding wood market and the increasing rate of harvesting and exploitation is the general degradation of the Nigerian forests wealth and heritage a situation that reduce soil fertility, agricultural production and general quality of life.

## **RECOMMENDATIONS**

To address the impacts of fuel wood harvesting and logging in the study location and elsewhere, the following recommendation are hereby proffered:

1. Cutting down of trees for fire wood and other purposes especially commercial logging should be greatly regulated by governments all level
2. More job opportunities in rural areas should be created in order to discourage local communities from fuel wood harvesting, selling of fire woods and logging.
3. Strict deforestation laws should be promulgated and where available it should be enforced
4. Alternative sources of fuel such as kerosene and gas should be made readily available and affordable in rural areas and urban areas where fire woods are consumed in large numbers.
5. Nursery plots should be established especially in areas which serve as centres of fuel wood harvesting so that local community people can pick the seedlings at ease and plant them.

6. Governments should enlighten rural people on the impacts of fuel wood harvesting and seriously embark on tree planting campaigns involving absolute participation of the local communities.

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