Research Paper

Assessment of Deforestation in Damboa Local Government Area of Borno State

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ABSTRACT: *The study assesses deforestation as a factor of land degradation in Damboa community by identifying the extent and trends of the phenomenon as well as the impact it has on the environment. The methods applied the use of primary and secondary source of data collection which included taking physical observation of the environment, administering questionnaires and conducting one on one interviews with the general public in other to gain knowledge of their experiences and ideas about the subject matter and later utilizes remote sensing techniques to analyze the vegetation index of the area. Based on the analytic reviews retrieved from relevant documentation and primary source of data that were achieved from field survey, it was widely deduced that deforestation is a major environmental issue in Damboa with the major cause identified to be the use of trees for domestic purposes at 45% utility followed by crop farming, animal production, medicine and construction. It was seen that the vegetation density is relatively low and is constantly decreasing at a record rate of 50% both periodically and seasonally, this was further proven to be so by a decline in the NDVI value from 0.1 to 0.6. It was also discovered that the residences are non-compliant to relevant programmes on forestation that were initiated for public enlightenment in conserving their natural habitat from environmental degradation. It was concluded that in a progressive era of industrialization and urbanization were the society is more dependent on gas/fuel as a main source of energy, the people of Damboa rural community rely basically on firewood as a direct source of energy for domestic purposes such as cooking, farming, and building etc. This has made the search for alternative sources of power and heat to be necessary but undesirable as it leads to dire environmental consequences such as bio extinction, environmental degradation and a whole lot of others that were mentioned in the study. Certain mitigation measures were highlighted such as restriction techniques, adequate government policies on logging, educating and orientating the public on deforestation and its associated problems.*
KEYWORDS: *Aforestation; Deforestation, Degradation, Extinction, Reforestation, NDVI.*

I.   INTRODUCTION

The earth is home to billions of animal and plant species both known and unknown that rely on her infinite resources in order to flourish. Unfortunately, the earth is delicate but vulnerable and it's prone to distortions in its natural balance which could result in the destruction of natural habitat and loss of many species. The challenge this presents is that it is uneasy to find alternative to the confronting acts of environmental degradation that have been plaguing the earth in the past and in recent years. The act of deforestation is one among several issues that require deep thought and prompt solutions. Khan and Ali, (2017) examines deforestation as the continuous removal of green vegetations, (Trees, Shrubs, and grasses) that exposes the topsoil of the earth. In Nigeria today deforestation is a pressing environmental issue that has a grave effect most especially in the Northern part of the country. It occurs mainly because of increased human encroachment into reserved and forested lands, increased resources extraction and further threats to biodiversity (Ogunwale, 2015; Tariq and Aziz, 2015). There are several reasons why deforestation could occur, the most compelling reasons are; expansion of settlements and urban development, pasture for live stock grazing, charcoal for domestic use (cooking and heat), and logs gotten from trees for commercial purposes (Gebru, 2016).

When trees and other vegetation are removed without sufficient replacement or reforestation, the resulting effects are aridity, desertification, displacement of habitat and loss in biodiversity. It also has adverse effects on the circulation of atmospheric oxygen produced by plants and used by animals (Ogunwale, 2015). Deforested regions, typically incur significant adverse effect to soil erosion which results in land degradation (Tariq and Aziz, 2015) The inattention to the importance of forest and green vegetation, inefficient laws on environmental use and relaxed forest management are some of the factors facilitating deforestation on a higher and larger scale in so many countries of the world (European Commission, 2013). Deforestation is an ongoing trend that is causing extinction, changes to climate conditions, desertification and displacement of the indigenous population. Tree cutting is continuously increasing at a very high rate resulting to so many unfavorable side effects and ineffective attempts to slow or stop it with little results (Okia, 2012).

To understand why deforestation is such a pressing environmental issue, trees and vegetations (Forest) must be given credit for the role they play in the quality of life that we all maintain and enjoy. We benefits immensely from something as minor as species that indulge food to life-giving medicines, the forest amplifies and saves lives. The value of trees and other green vegetation cannot be over emphasized because, the lives of humans and other living species are dependent on them in fact, 25% of medicines come from the forest according to the World Forest Movement (WFM) and this does not still portray the value in its entirety, considering the benefits that have not yet been discovered. Trees improve the quality of the air that we breathe by sieving carbon and other dangerous gasses and particles discharged into the air by agents of pollution (Mfon et al., 2014; Tunde et al., 2016; Khan and Ali, 2017). Trees determine rainfall and replenish the atmosphere cloud forms and provide another way to maintain favorable temperature, they regulate the climate temperature by cooling the environment, they prevent land related hazards like land slide, erosion and keeps the soil fertile and filled with life (Alfred *et al.,* 2017; Chakravarty *et al.,* 2012). Deforestation has a major social repercussion as there are numerous benefits that the forest gives. We enjoy the tree covers and soothing environment when we visit the wild for recreational purposes and sightseeing, the clean air and clean water it provides enables the well being of other animals (Commission, 2008).

Identifying the causes of deforestation is the first step to reducing and managing the impact of this phenomenon. There are numerous causes of deforestation which ranges from urban growth and expansion, uneven distribution of wealth and resources up to the corruption of government institutions (Cuneyt Koyuncu and Rasim Yilmaz, 2008; Schoene *et al.,* 2020). According to the United Nations Frame Work Convention on Climate Change (UNFCC), the direct cause of deforestation is agriculture. Subsistence farming is responsible for 48% of deforestation; commercial agriculture is responsible for 32% of deforestation; logging is responsible for 14% of deforestation and fuel wood removal makes up 5% of deforestation (Meek, 2019). The loss of forest ecosystem could also be traced to economic incentives that make forest conversion appear more profitable than forest conservation (NASA, 2007) but notwithstanding, there are two main factors identified that leads to deforestation, namely; economic and social factors (Inglis, 1996). Dealing with deforestation has come a long way because estimates of trends in deforestation and other environmental related issues have greatly improved as it is seen in recent times that studies of this sort uses modern remote sensing technology and it is consistently evolving to make satellite data collection easy and the data collected more accurate. Furthermore, the quality and accessibility of remaining forest cover have improved immensely and also the use of radar remote sensing can now see below the forest and can also detect below canopy cover (Okia, 2012; FAO, 2007).

The study focuses on the sole aim of assessing the trends of deforestation in Damboa Local Government Area of Borno State, Nigeria. By identifying the major causes of deforestation, the extent of deforestation and assessing the impact it has and has had in the area. The study is vital to the people and the government at large as it intended to; help in alleviating the environmental associated problems of deforestation in the area through making the findings available (particularly) to the Mass Mobilization Unit of the Local Government Authorities, to provide viable information to the Local and the State Government pertaining the usefulness of forest to enable the implementation of forest laws and policies, and to serve as a source of information to other researchers who may wish to undertake a similar study and It will be very vital to government especially the environmental agencies on forest assessment.

II.   MATERIAL AND METHODOLOGY

Study Area

Location and Size: Damboa Local government area is one of the twenty-seven Local Government areas of Borno State. It was created in 1976 during local government reform of the State. The geographical central location is on latitude 11^0 09'11" N and longitude 12^0 45' 35" E. The local government area is bounded to the East and South-East by Askira Uba and Biu Local government areas respectively and in the North-East by Konduga and Gwoza L.G.A. It is bounded to the West by Gujba (in Yobe State) and Kaga L.G.A. (in Borno). Damboa covers an area of about 8,500 square kilometers (Sq Km).

Soil and Vegetation: The soils of Damboa range from sandy to clayey with most of the clayey soil found on the low land and around the river bank. The soil in this area is relatively rich in mineral and organic matters which supports effective growth and development of perennial and annual species of grasses like elephant grass, Gambia grass etc. This covers the ground surface throughout the rainy season. These grasslands are normally Inter-spaced with shrubs of acacia species and big trees such as the mahogany, Shea butter, locust beans, and Baobab and tamarind trees. All these features coupled with the low incidence of tsetse fly have made the study area to be of high potential in terms of cattle production. The production of cattle in the area is mostly handled by the Fulani's, Shuwa-Arab and a few farmers have also engaged in cattle production but on a small scale.

Climate: Like in any other part of Nigeria the area has two main seasons, the rainy and the dry season. The dry season starts from November to April while the rainy season starts from May to October before it ceases. From March to May, the atmospheric air is completely dry and the environment is hot that it becomes almost unbearable both for people and livestock, this mainly due to a long period of the dry season with no rainfall.

People and Occupation: The population of the Damboa local government area was estimated to be 140,710 (2000 projected) with the Marghi speaking people as the majority in the area; Kanuri, Chibok, Hausa, among others. Trading and commerce are not highly developed in the area. However, the people engage in various trading mainly agricultural products such as groundnut, millet, maize etc and cultivation of crops as well.

Socio-Economic Activities: The people of Damboa town are mostly farmers and hunters and produce a very large percentage of the food demand of the state. The farmers produce both food and cash crops. The main cash crops produced in the area is groundnut. Other crops in cultivation include; Bean's Maize, Guinea Corn, Rice, Millet, Barbara nut, and Gum Arabic. The town is also noted for fruit production in commercial quantity, such fruits include; Mango, Guava and Caret. Damboa town is known also for animal husbandry through the rearing of cattle, sheep and goat and in term of mineral resources, the Damboa town is endowed with a large deposit of gypsum, silica and Kaolin.

Infrastructure: Damboa has a concentration of diverse infrastructure ranging from Federal, State and Local Government projects respectively. Some of these infrastructures include; Hospital's, local government secretariat (new and old), the old and new market, 20 housing estates, police station, Civil Defense Corps Secretariat, the information centre of the Federal Ministry of Science and Technology and Federal statistics.
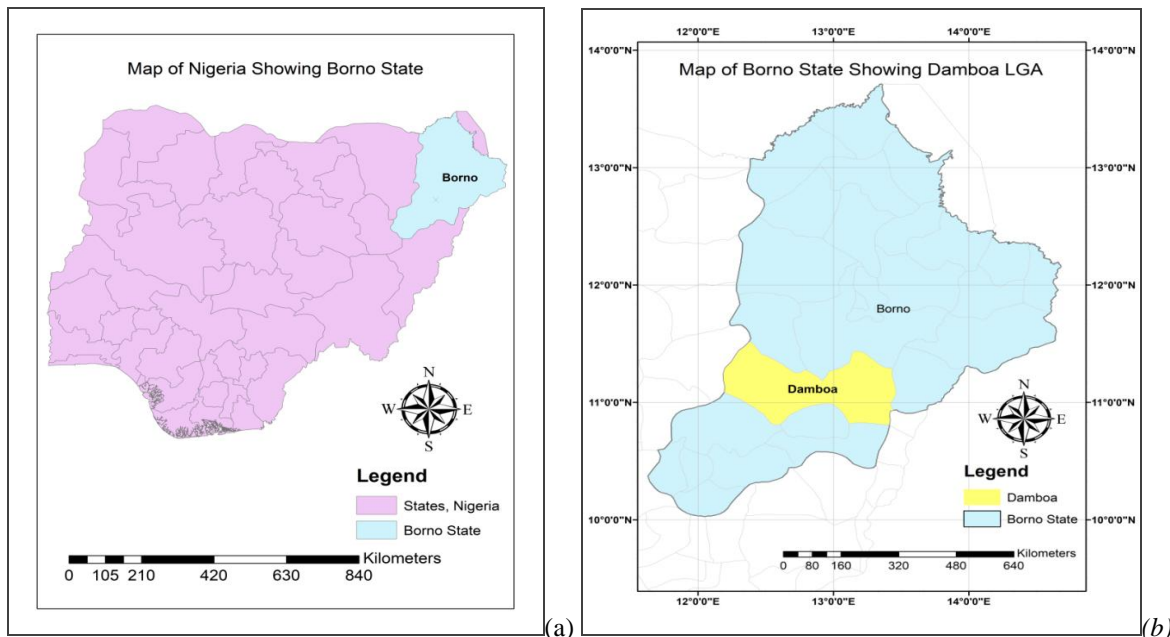

(a) (b)
Figure 1: *Study Area*

III. METHODOLOGY

The research study utilizes simple quantitative and qualitative methods to process primary and secondary data collected in the field. The primary source of data is the first-hand information gathered or obtained through interviews and the administration of questionnaires. To achieve this, questionnaires were handed out randomly to the general public at the local government Secretariat to get a wider perspective of the issue while simultaneously engaging the locals in one on one discussion. The respondent experiences were narrated and combined with the responses from the questionnaire. The focused variables are; the causes, rate and time of deforestation, the tree species mostly affected by acts of deforestation, the resulting consequences, the role of government in forestation, and possible solutions to the problem. The responses from the

questionnaire were arranged in simple grid format and using simple quantitative techniques, it was processed and presented graphically in form of charts and graphs. In addition to the questionnaires and interview, four locations within the study area that are known to have active deforestation activities were visited and using a Global Positioning System (GPS) the locations were identified. Furthermore, these locations were identified on satellite image using geo-gateway; this plotted the trends for each location and extracted information from the images in different timelines. Digital cameras were also used in taking pictures of each location. The pictures were captured five times respectively, as North, East, South, West and Centre. The centre refers to the actual ground location, while the other four cardinal directions refer to the facing direction of the camera. Finally, the secondary data source represents information obtained through documentaries that are mainly from the available text which was used particularly to unearth existing and related view and opinions with regards to the subject which was presented in the introduction section of this stake.

IV.   RESULTS AND DISCUSSION

Data Presentation

As mentioned in the research methodology two methods of data collections (primary and secondary) were employed in gathering the required and relevant data that has been used in assessing this research problem. The method therefore has included documentary, questionnaires, and use of GPS, Digital Camera, remotely sensed data and personal interviews as follows;

Causes of Deforestation: Like in other parts of Northern Nigeria deforestation in Damboa is a result of both natural and human-induced phenomenon, the focus is mainly on the human aided activities. The table below gives the main causes of deforestation and their relative percentage. It indicates that 44% of the respondents believed that domestic uses such as commercial fuel wood are the main causes of deforestation in the area. 20% believe that crop production is to blame because most of the respondents were engaged in intense farming or peasant farmers. About 14% agreed that animal production is the main cause, 13% blamed that the use of tree properties as medicine is the main causes of deforestation 5% believed that construction is the main cause. Therefore the high percentage of the people who believed that domestic uses are the main cause of deforestation is attributed to the fact that the inhabitants in Damboa depend solely on fuel wood as their major source of energy and those agree that construction is the cause because a vast number of trees were destroyed during the construction of roads and some government buildings.

Table 1: Respondents answers to Causes of Deforestation

| Causes	No of Respondents	Percentage %
Domestic uses (firewood/charcoal)	33	44
Crop production (farmland clearing)	15	20
Animal production (Grazing)	11	15
Medicine (Herbs)	10	13
Construction (Buildings)	4	5
Others (not listed above)	2	3
Total	**75**	**100**
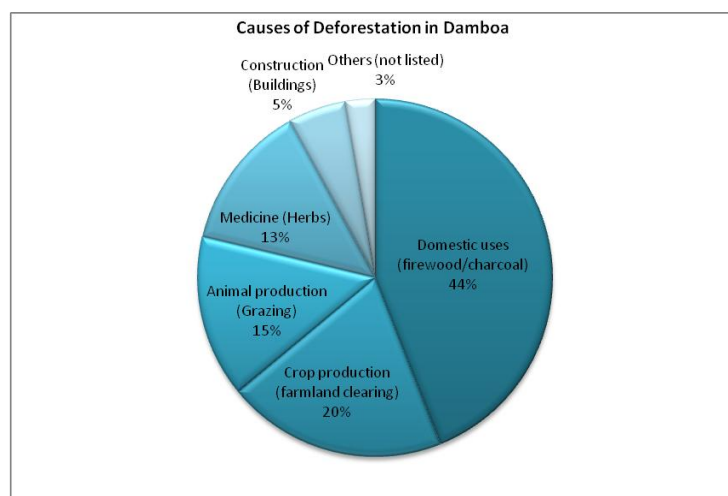
Figure 2: Pie Chart showing the Causes of Deforestation in Damboa

Rate of Deforestation: Although there is no available quantitative figure that shows the rate at which deforestation is taking place in the area, there is a general belief that the density of trees is reducing due to the exploitation through bush burning, fuel wood harvest and land clearance for agriculture. The table below shows that about 73% of the respondents believe that the vegetation density is decreasing because of indiscriminate cutting of trees for various purposes especially fuel wood. While 16% believed that the vegetation density is increasing. This is maybe because of forestation by this part of the population and 11% of the respondents believed that the vegetation is stable.

Table 2: Respondents perspective of vegetation cover in the area

Perception	No of Respondent	Percentage (%)
Increasing	12	16.0
Decreasing	55	73.3
Stable	8	10.7
Total	**75**	**100**
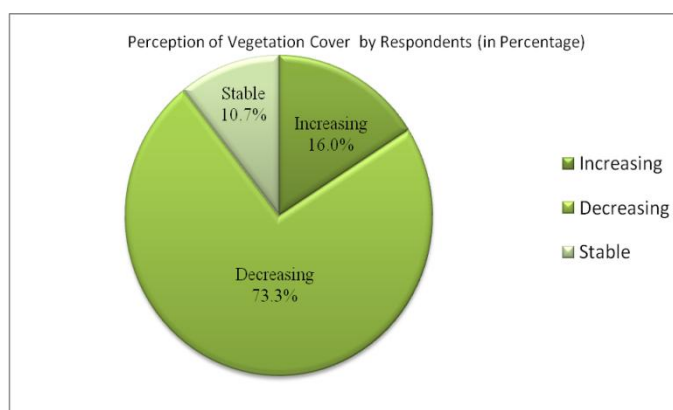
Figure 4: Perception of Vegetation Cover by Respondents

Frequency of Deforestation: Time plays an important role in every aspect of existence. For this reason, certain issues need to be considered in time otherwise when delayed, the problem may get beyond the stage of rectification. The researchers further examined the time on which the people of Damboa LGA plant or cut down trees. So this could help to give useful information on the rate of deforestation in the study area. From the table below we can see that 48% of the respondents cut down more frequently. This means that they cut down trees at any time they wish because they are using this resource as an energy source for cooking. About 32% cut down trees periodically. Here periodically means they cut down trees after a recognized time, this can be two years, two months etc and 20% cut down trees seasonally, that is during farmland preparation for cultivation. This is presented in the table and figure below

Table 3: Frequency of deforestation

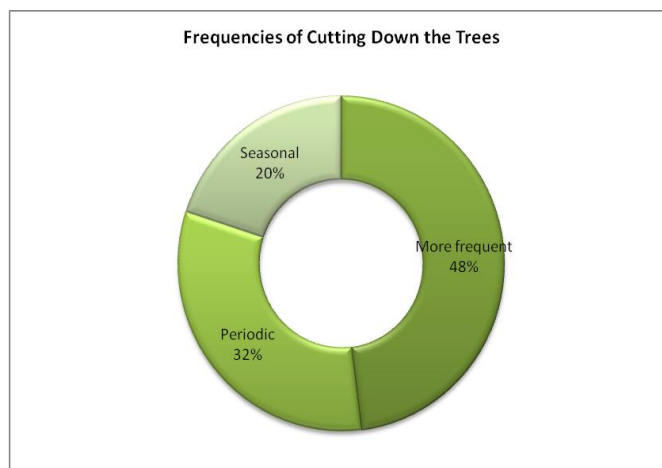| TIME	NO. OF RESPONDENT	PERCENTAGE (%)
More frequent	**36**	48
Periodic	**24**	32
Seasonal	**15**	20
Total	**75**	**100**

Figure 5: Frequency of Cutting down Trees

Tree species mostly affected: In the exploitation of vegetation resources, there are certain qualities in which people take into consideration. Thus consequently leads to the situation in which a few varieties of trees to be most affected as shown in the table below. The number of tree varieties that are mostly affected by deforestation in the study area. The table below indicated that 35% of the respondent believed that Anogeissus lelocapus is the most affected tree in the area. This is because these trees species is very good for fuel-wood and roofing. Azadirachta carries 30% because it is also good for fuel-wood, medicine, roofing, construction etc. 24% of the respondent believes that Piliostigma reticulatum is the most affected tree species. Also, 11% believed that Balanite aegyptiaca, khaya Senegalensis and Acacia Nilotica are the most affected species. The reason behind this is that there are species used in making of some local implements such as hoes, mortar, axes etc.

Table 4: Species that are mostly affected by Deforestation

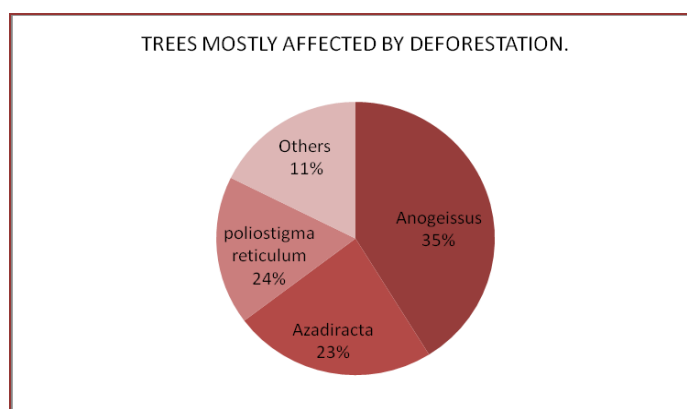| BOTANICAL NAME	NO OF RESPONDENTS	PERCENTAGE (%)
Anogeissus leiocarpus	35	35
Azadirachta	20	30
Poliostigma reticulatum	15	24
Others	15	11
Total	**75**	**100**

Figure 6: Pie-chart showing trees mostly affected by Deforestation
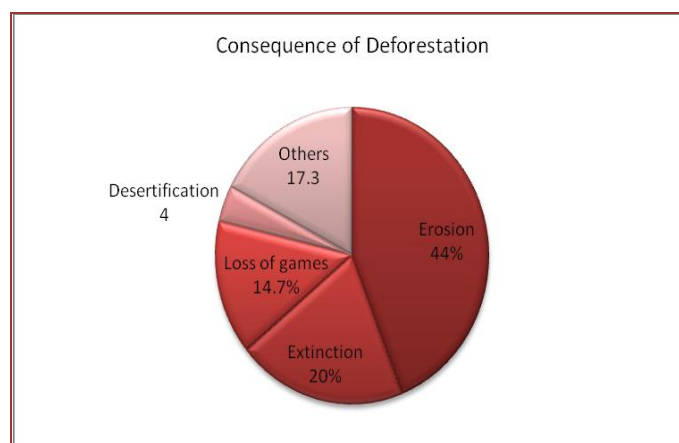
Consequences of Deforestation: Deforestation is one of the prominent factors of environmental degradation as it is very difficult to reverse. Deforestation creates hostile conditions on the majority of the original forest trees, thereby contributing immensely to environmental problems such as desertification, soil erosion, extinction of tree species etc. The table below shows that 44% of the respondents were in the views that deforestation caused erosion, 20% believed deforestation results in the extinction of valuable tree species. 14.7% believed that some wild animals were lost. 4% agreed that desertification is a result of deforestation and 17.3% believed that other consequences such as soil salinity and aridity etc are caused by deforestation. Erosion is the most notable

environmental problems in Damboa; the soil is a finite resource that exists as a thin layer on the surface of the earth which is extremely vulnerable to overuse and mismanagement. Consequently, as a result of deforestation the soil becomes exposed to the influence of wind and water erosion. The result of this is nutrient decline and even though it is contested by Olofin (1991) that the rate of soil formation exceeds that of soil erosion, it should be noted that soil wash, depletion and leaching affects the topsoil, where soil nutrients are concentrated. Thus materials eroded by this process are more fertile than what is left behind. The plant species extinction caused by deforestation in Damboa has been increased and a majority of such species had medicinal properties. It is therefore true that the remarkable consequences of deforestation have been the extinction of valuable tree species, which in some cases has led to the persistence of diseases. There is a good relationship between flora and fauna. This is because vegetation cover provides food and shelter to some animals. So in the absence of plant cover, there is a situation referred to as loss of games. There has been a remarkable loss of wild animal such as hyena and monkeys in the study area.

Table 5: Opinion on the consequences of deforestation

CONSEQUENCES	NO OF RESPONDENTS	PERCENTAGE %
Erosion	33	44
Extinction of tree varieties	15	20
Loss of games	11	14.7
Desertification	3	4
Others	13	17.3
TOTAL	**75**	**100**

Figure 7: Consequences of Deforestation

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Forestation: Forestation here is a combined act of reforestation and aforestation as they both involve tree planting. The table below shows that 56% of the respondents plants trees seasonally. This is attributed to the fact that most of the inhabitants' plant trees during the rainy season because there is no need for nursing the trees planted especially in August. About 27% of the respondents planted trees periodically. This could be the time when the government establishes a forestation programme and about 17% planted trees any time they wished.

Table 6: Frequency of tree planting by respondents

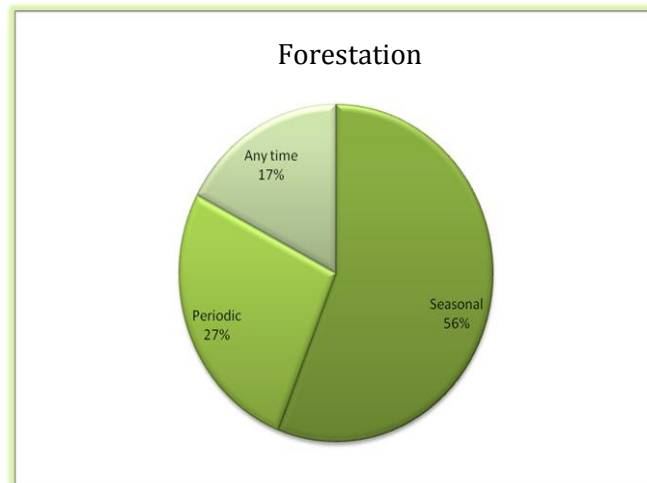| TIME	NO OF RESPONDENTS	PERCENTAGE (%)
Seasonal	42	56
Periodic	20	26.7
Any time	13	17.3
Total	**75**	**100**

Figure 8: Forestation by Individuals in Damboa

The People and aforestation Programme: Cooperation is needed to run any kind of campaign or programme successfully. The study examines the cooperation of the inhabitants of Damboa towards aforestation programmes. The table below presents the findings on the level of cooperation given by the respondent. As presented in the table below, we can see that 62.7% of the respondents were not co-operative in forestation programme. This is because most of them are not well educated and they are not aware of the importance of forest and its destructive effects. It is only 31% that were co-operative with forestation programme.

Table 7: Participation in aforestation Programme

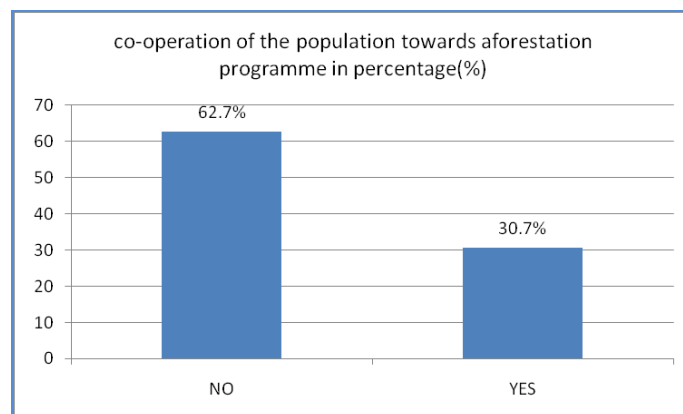| CO-OPERATION	NO OF RESPONDENT	PERCENTAGE %
NO	47	62.7
YES	23	30.7
TOTAL	**75**	**100**

Figure 9: Bar-graph showing the people and aforestation programme

Possible Solution to Deforestation: To safeguard, control and protect the environment from further degradation and to boost its potential through increasing agriculture production, and also to make a more conducive atmosphere for people and their resources. There should be a way out of the destructive effects of deforestation. The table below shows information about the responsible parties for enforcing laws on deforestation in the area. As presented below, 44% of the respondents viewed that the government should be responsible for dealing with the activities of deforestation in the area. This is because it is the government that mostly supply the seedlings of nursed trees used in aforestation programmes, while 24% reasoned that native rulers should be responsible. This is because the native rulers in the area have great say in the affairs of their followers. 16% agreed that inhabitants or individuals should be responsible. This is without co-operation the problem of deforestation will be difficult to deal with 10.6%of the respondents believed that Non-Governmental Organization (NGOs) should

be responsible. This is because the inhabitants are fully aware of NGOs and 5.3% believed that other measures such as planting trees.

Table 8: Bodies responsible to curtail deforestation problem

PEOPLE RESPONSIBLE	NO OF RESPONDENTS	PERCENTAGE %
Government	33	44
Native rulers	18	24
Inhabitants	12	16
NGO's	8	10.6
Others	4	5.3
TOTAL	75	100
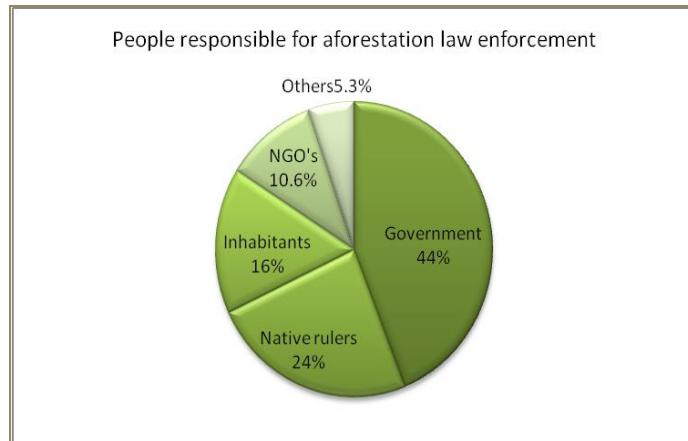
Figure 10: Pie-chart showing people responsible for aforestation law enforcement

V.   ASSESSMENT OF DEFORESTATION TRENDS USING GIS

Assessment of this nature requires a modern way of quantifying and qualifying the trends of deforestation. Research at this level can't assess the trends at the frequent interval, due to the non-availability of images. Therefore the researchers employed the use of remotely sensed data of 2006 to 2007 (a year period) that are available in the University of Maiduguri Geo-database Infrastructure at Centre for Arid Zone Studies, CAZS. SPOT 4 Vegetation Cover for Africa was the remotely sensed images used for the assessment. SPOT 4 Vegetation Cover has a 10-day temporal resolution (that is the number of times for satellite to come back to the same location. For example, in January, it captured the study area 3 times, or in a year, 36 times as presented in figure 13 and 14. Below shows the presentation of vegetation cover as derived by the use of the Geographic Information System (GIS) media in a graph; it depicts vegetation index value at 0.1 to 0.6 ranges which interprets fluctuations in the vegetation cover.
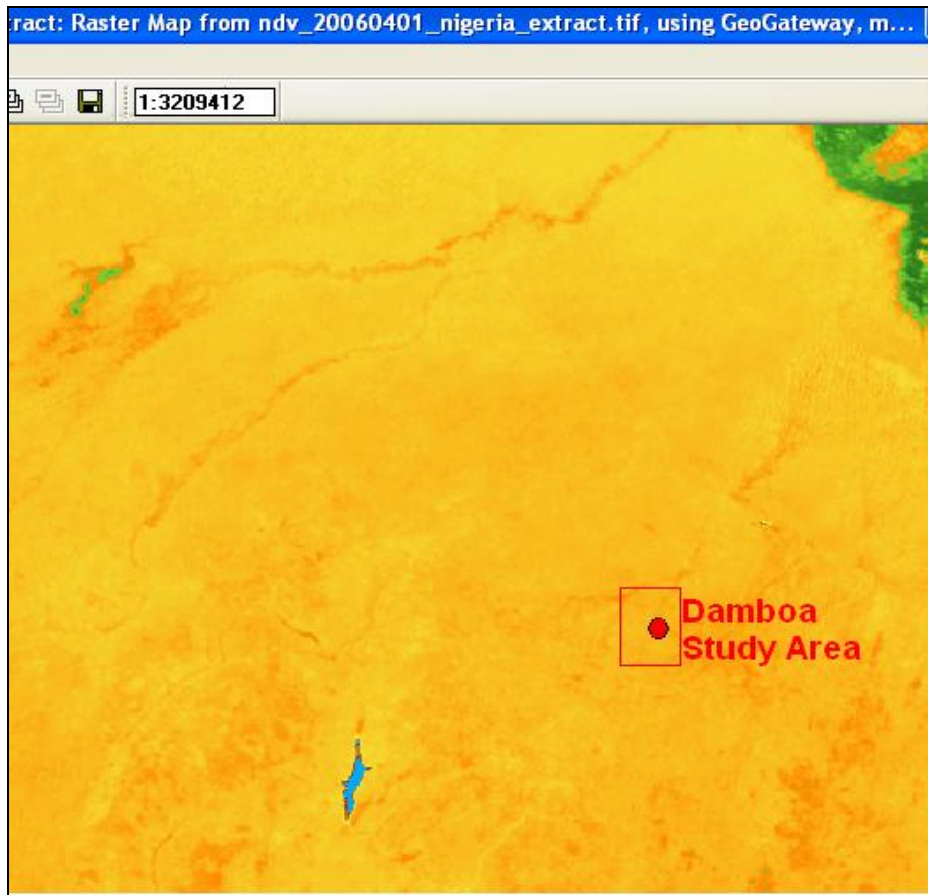
Figure 11: Raster map of the study area

Figure 12: Normalized Difference Vegetation Index (NDVI) Ranges between − 1 to + 1

Table 9: Index Ratio per-month in years 2006 and 2007

| Months	2006	2007
01 Jan	0.28	0.232
11 Jan	0.264	0.208
21 Jan	0.248	0.24
01 Feb	0.224	0.208
11 Feb	0.216	0.192
21 Feb	0.196	0.184
01 Mar	0.2	0.188
11 Mar	0.176	0.176
21 Mar	0.22	0.196
01 Apr	0.212	0.18
11 Apr	0.2	0.208
21 Apr	0.188	0.18
01 May	0.184	0.236
11 May	0.192	0.252
21 May	0.288	0.24
01 Jun	0.308	0.252
11 Jun	0.348	0.264
21 Jun	0.44	0.324
01 Jul	0.448	0.408
11 Jul	0.464	0.464
21 Jul	0.564	0.524
01 Aug	0.652	0.58
11 Aug	0.548	0.632
21 Aug	0.612	0.7
01 Sep	0.592	0.653
11 Sep	0.608	0.652
21 Sep	0.628	0.628
01 Oct	0.608	0.584
11 Oct	0.564	0.564
21Oct	0.536	0.488
01 Nov	0.416	0.428
11 Nov	0.352	0.364
21 Nov	0.344	0.348
01 Dec	0.296	0.308
11 Dec	0.284	0.316
21 Dec	0.276	0.264
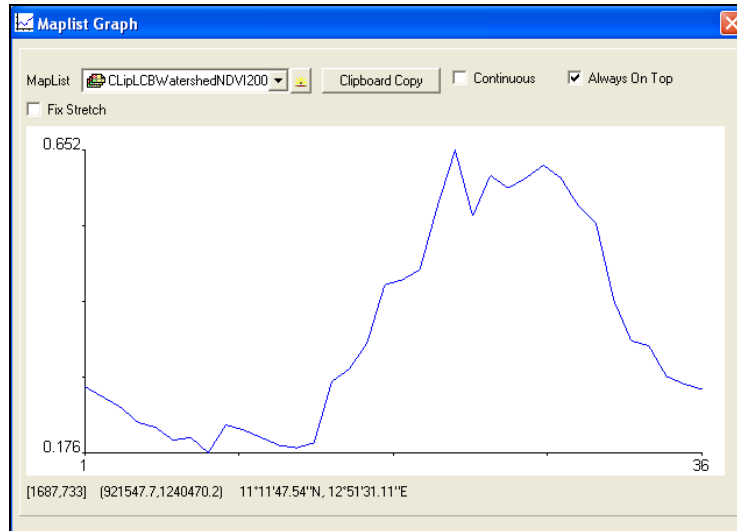
Figure 13: Trends of Deforestation in 2006 as plotted in GIS Software
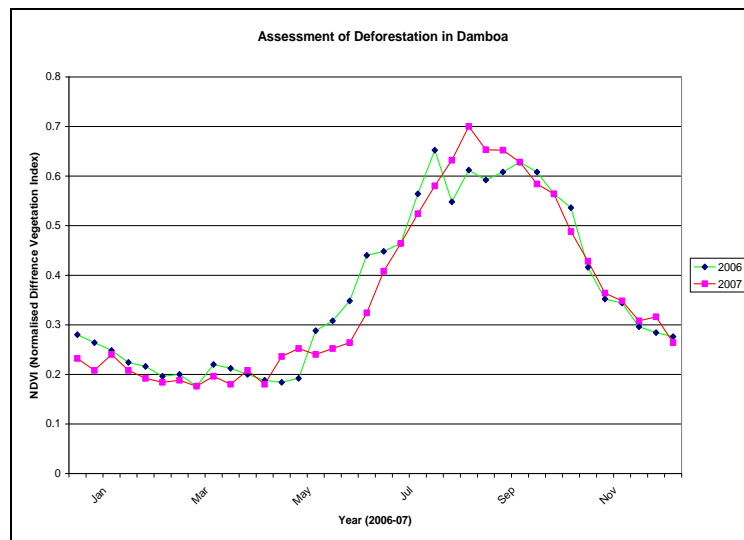

Figure 14: Trends of Deforestation in 2006 as plotted in GIS Software

VI.   DISCUSSION

The forest in Damboa and Borno state at large is being depleted rapidly, this has become very obvious as it can be observed that the land area is becoming arid and gradually turning into a desert area. The results above revealed that most factors that aid deforestation was in play but the notable ones that are seen to be paramount as presented in Fig 3 are; the need for fuel-wood, cattle grazing, settlement expansion and farming. This is because the warmest and the poor (vulnerable group) rely on them for day to day survival. For example, there is an insufficient supply of gas and electricity to the rural community of Damboa and for this reason; people have to turn to trees from the forest for fuel-wood used for cooking and heat as well as to sell them to make money. Tunde et al., (2016) emphasized that the forest depletions are mainly from development activities by the government i.e. land clearing for road construction and viable agriculture. While this can be seen as some causes of deforestation, the pleasure of supply and demand for tree species that produce timber and logging as shown in Fig 6 above could be blamed for fast paste deforestation in the area. This is because statistically there is a negative correlation between the exploitation of forest and conservation in Nigeria (Ogunwale, 2015). This is also very controversial because some individuals generate revenue from it while others are campaigning against such on grounds of deforestation and the negative impact on the environment (Udoagdi Christian Duru, 2014). The study revealed that deforestation still follows an uprising trend as recorded on the line graphs in Figures 15 and 16. The study also revealed notable consequences of deforestation in the study area, such as; loss of game, erosion, extinction and desertification. These consequences are also notable in other parts of the country and the world at large. Beyond the major causes of deforestation, some supplementary ones stack the odds against forest around the globe and have their harmful effect which includes, acid rain and building dams

(FAO, 2007), it, however, does not apply to Damboa as there are no records of acid rains and water dams. This kind of study is necessary to manage environmental resources and combat degradation as they systematically study human influence on the interrelationship of species and their environment as clearly stated by (Khan and Ali, 2017). This applies to this study as it reveals trends of deforestation but most importantly, it reveals several ways of mitigation. For example, the study pointed out that the reduction of environmental degrading practices can slow down deforestation but most importantly, the act of reforestation could reverse the situation.

VII.   CONCLUSION

It is possible to believe that the causes of deforestation problems are closely related to the social, economic, cultural and educational background of the inhabitant's surely people bear the responsibility of deforestation and global ecological crises. But we have the ability and potential to adjust. Thus we will probably turn the situation around, and the destruction of forest will be prevented or reversed. There are a lot of benefit concerning the decrease in deforestation and increase reforestation; trees protect the land from further degradation, biodiversity will be safer and the endangered species will have a better chance of survival. The increasing rate of land degradation in Damboa is a serious source of concern. The nature of deforestation, features, causes, and prevention has been investigated and the details of its analysis have been presented as well. It can be concluded that in other to have a sustainable environment for now and future generations, there is the need to implement some ideological changes; inhabitants will have to live a more sustainable life and be in close harmony with the natural environment. Once the devastating effects of deforestation have passed human beings will enjoy a good existence and will look forward to a bright future. However as long as indiscriminate use of fuel-wood is in play, it is certain that land degradation through erosion, desert encroachment and other ecological problems will continue to exact threat to the environment.

VIII.   RECOMMENDATION

In other to control and protect the environment from further degradation and boost its potential through increasing agricultural production and to make a conducive atmosphere for people and resources, the following recommendations are to be taken.
-    Efforts should be made to sensitize the local community about deforestation, the causes and its effects.
-    Efforts should be made to inform people about the importance of the natural green vegetation in their environment.
-    The community should be enlightened and trained on how to manage their environmental resources, to benefit from what nature has to offer without jeopardizing their environment.
-    Adequate facilities should be provided at every step that is taken to curb the problems of deforestation.
-    Basic amenities and infrastructure should be provided to improve the standard of living in rural communities.
-    Reforestation and aforestation programmes should be encouraged by the government and other stakeholders while actively participating in them.

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