



CONSTRAINTS TO FOREST MANAGEMENT PRACTICES IN KEBBI STATE, NIGERIA.

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Abstract

One of the major environmental problems associated with the physical environment in Kebbi State is desertification. However, the rural nature of the State suggests that a large population depend on the natural environment for their livelihood. The control of these basic needs from forests has made the strict enforcement of exploitation regulations very difficult. To investigate these problems, mixed approach having both qualitative and quantitative data from questionnaire, in-depth interview (IDI), focused group discussion (FGD) and Normalized Differential Vegetation Index (NDVI). The study used the systematic sampling method to select communities for the in-depth interview (IDI) and focused group discussion (FGD). In the case of selection of people for IDIs and FGD, the study selected participants using purposive sampling method in view of the fact that respondents are strictly stakeholders in forest management. Questionnaire was administered at Ministries, LGCs and Zonal Forestry Offices. Purposive sampling method was also used for the selection of forests for satellite images for 1990, 2005 and 2015 using Normalized Differential Vegetation Index (NDVI). Data was analysed using descriptive statistics. The qualitative data obtained from FGD and IDI were processed by the use of content analyses. However, the study also analysed the FGD and IDI data using quantitative method to compliment the content analysis. Results show that the State is badly deforested hence leading to some recommendations such as ensuring that, all forest resources are taken into account and considered valuable worthy of protection and preservation. Also review all forest policies and management systems already implemented.

Keywords: *Nigeria, Forest, Management Practices, Deforestation, Conservation, Kebbi State.*

Introduction

Forests are complex ecosystems that house a plethora of living things, from the simplest to the most intricate of life forms. However, the sheer complexity and

biodiversity of these forests are both their strength and their own undoing. Forest produce, timber and non-timber products alike, are indiscriminately exploited by man for economic returns. Even environmental and recreational services provided by forests have become important economic sectors in many countries especially in the tropics. International agencies such as the Food and Agriculture Organization (FAO) of the United Nations (UN) and the International Tropical Timber Organization (ITTO) continue to fund development projects. Their objective and hope is that forest resources in developing countries will be effectively and sustainably managed. (Ratnasingam et al. 2013; Faridah and Salleh 2018).

The central concern in the science and practice of forestry has always been the sustainable use of forests and forest resources. Indeed if forest resources are not sustainably managed, they will subsequently be depleted over time causing both environmental, economic and social harm (Sample, 2004; in Monsi 2014).

Egwumah, (2009) stated that, forests make up one of the earth's greatest reservoirs of renewable resources. If properly managed, they can provide essential products indefinitely and at the same time remain a home for wildlife and a vital source of water supplies. Forest management is the process of organizing forest stands/ecosystems so that they produce a continuous stream of whatever resources are desired from that forest timber, wildlife, tourism, recreation, or any conceivable combination of the resources of the forest.

Forest management started in Nigeria as early as 1889 with the opening of the "office of woods and forests" in the then colony and protectorate of Lagos. At the formative stage, due regard was given to standard forest management practices, thus bestowing a high degree of sanctity on the forestry sector. Forest reservation was virtually completed in the high forest areas by 1940. Tropical Shelter wood System was introduced but later abandoned while attempt at artificial regeneration through Taungya system started in 1926. The recent times have however, witnessed an absolute disregard for forest management. Forest reserve is thus not maintained while management plans are either non-existent or abandoned (FAO, EC, 2003). The report further explained that, in the context of National Forest Programmes being the full range of policies, institutions, plans and programmes to manage, utilize, protect and enhance forest resources within a given country, various attempts have been made by successive administrations in Nigeria to ensure the efficient management of her forest resources. These include the setting up of the forest service, the creation of a Federal Department of Forestry in 1970 and the enactment/promulgation of various laws, edicts and decrees by various governments. Furthermore, some programmes and action plans have been developed to achieve sustainable forest development in the

country. Prominent amongst these are Reservation Policy, Establishment of Industrial Plantations, Land Use and Vegetation Survey, Perspective Plan for Forestry Development and the Tropical Forests Action Programme (TFAP).

FAO (2010) reported that, continuing loss of forests and forest degradation in many developing countries, especially in the tropical regions, pose a critical challenge. Rural livelihoods often depend on productive forests that support employment and income, thus reducing poverty. Increasing demand for food, fibre and fuel can trigger substantial unplanned land use changes, including large-scale forest clearance.

One of the major environmental problems associated with the physical environment in Kebbi State is that of desertification. This phenomenon is a serious constraint to development in most parts of the State. In the northern areas of Kebbi State for instance, desertification manifests itself through incidences of wind erosion, dune accumulation and exposure of lateritic ironstone on the landscape. Efforts are being made by the State government towards finding solutions to the problems of desertification. These include; the establishment of shelter belts, woodlots, roadside tree plantations and forest reserves. Desertification and drought which are caused by decrease in rainfall, poor methods of cultivation, excessive utilization of fuel wood and over grazing of the forest lands have combined to deprive the environment of its natural vegetation and thus triggering and accelerating soil erosion and desertification. Grazing is increasing in both extensive and intensive manner and bush burning is persistent in the rural communities in Kebbi State, Nigeria. This is a case for concern which requires an in-depth study of the Forest Management Practices as implemented by Kebbi State Government.

The Ministry of Environment through the Zonal Forestry Offices manages all the forests in terms of protection, conservation and issuance of exploitation permit and determination of product rates. However, the rural nature of Kebbi State suggests that a large population depend on the natural environment for their livelihood, such as construction of houses (thatching, wood and twine), household energy (fuel-wood and charcoal) feed for animals (plants leaves and grasses), medicine (herbs and trees) food items (fruits and vegetables). The control of these basic needs of forest products has made the strict enforcement of exploitation regulations very difficult. The management practices seem to be problematic and at the same time do not consider the sustainability of the forest resources. To further compound the problem, collectors of forest resources from the locality are now engaged in the fuel-wood and herbs trade with Niger Republic where these products are taken to markets.

The State government is responsible for the control in the use of forest resources in both protected (gazetted) and unprotected forests in Kebbi State. Land use in reserves, grazing and cooperative forests is controlled by the State Government, and to some extent the Local Government Authorities. In the case of community forests, community leaders provide for the establishment of farmlands, development of new settlements and establishment of community grazing areas for cattle owners (Fulani and other mixed farmers). However, the practice has led to multiple clashes between farmers and herdsmen especially, where traditional rulers provide grazing land to cattle owners in areas where farmlands have already developed. Both groups depend on the forest for their basic needs. In practice these category of forests are co-managed by State Government, Local Government and communities where these forests are located.

Statement of the Problem

There are three categories of gazetted forests; forest reserves, co-operative forests and grazing reserves managed by the State Government solely. However the fourth and most widely spread category, community forest and woodlots, managed by community leaders and Local Government Authorities are not gazetted, though spread in all communities in the state. It will also be noted that Kebbi State is located in a vegetation zone where forest resources are naturally scarce, deforestation, unavoidable human activities of crop cultivation, grazing and unsustainable collection of forest resources are problems militating against sustainable forest management. However, it will be noted that the lack of a Sustainable Forest Management Practice (SFMP) in addition to the fast depleting vegetation in the State and the non-involvement of stakeholders such as farmer, grazers, women, youths, NGOs, forest resources collectors and users and experts in the management of forests in Kebbi State has created gaps in efforts toward achieving an effective framework for sustainable forest management. The study therefore, seeks to investigate the roles of all stakeholders in order to develop a strategy for effective and sustainable forest management in Kebbi State, Thus, it will consequently provide the bases for a framework that will enhance concerted public participation in forest management.

Methodology

To investigate these problems, mixed design having both quantitative and qualitative data was used. There are 6 forest administration zones in Kebbi State where 3

categories of gazetted (forest, grazing and cooperative) forest reserves, numbering 61 and un-gazetted and unquantified community forests are located. Kebbi State has a total of 117 communities called districts each headed by a District Head. The study concentrated on District Heads, Zonal Forestry Officers, Grazers, Farmers, Women and Youths who are forest resources collectors and users, Ministry of Environment and Solid Minerals, Ministry of Animal Health and Husbandry and 21 Local Government Councils as target population for the study. The study used the systematic sampling method to select communities for the In-Depth Interview (IDI) and Focused Group Discussion (FGD). In the case of selection of people for IDIs and FGD, the study selected participants using purposive sampling method in view of the fact that respondents are strictly stakeholders in forest management. Six Zonal Forestry Officers one each from the Forestry Zones, Director Forestry Ministry of Environment and Solid Minerals, Director Range Management Ministry of Animal Health and Husbandry and Directors of Agriculture and Desk Officers on Forestry from the 21 Local Government Councils in Kebbi State accounted for 50 respondents to the questionnaire. In view of the fact that the data collected is both quantitative and qualitative in nature, data was analysed using descriptive statistics. The qualitative data obtained from FGD and IDI were processed by the use of content analyses. However, the study also analysed the FGD and IDI data using quantitative method to compliment the content analysis. The NDVI is used to simply and quickly identify vegetated areas and their condition for 1990, 2005 and 2015

Purposive sampling method was also used for the selection of forests for satellite images using Normalized Differential Vegetation Index (NDVI). Images from forests are sampled by dividing the State into two (2) regions; Southern and Northern regions. This division is strictly due to the vegetation and climatic differences between the northern and southern part of the State. The Southern region is between Latitude 10⁰ 20'N and 11⁰ 60'N where three forests namely Sakaba/Wasagu, Kasanu and Illo/Kaoje Forest Reserves are sampled. The Northern region is between Latitude 11⁰ 60'N and 13⁰ 15'N where Dandi, Mahono and Lema Forest Reserves are sampled.

Table 1: Selected Forest in Kebbi State for NDVI Images

SN	Name	Size	Region	Images
1	Illo/Kaoje	58,793	Southern	3
2	Kasanu	66,616	Southern	3
3	Sakaba/Wasagu	48,806	Southern	3

4	Dandi	36,791	Northern	3
5	Mahono	14,840	Northern	3
6	Lema	59,984.1	Northern	3
Total				18

Source: Field Survey 2017

Table 1 contains the list of forest reserves distributed in the two regions purposively demarcated. Therefore, three (3) NDVI images were taken for each forest at interval of available data from 1990 to 2017. A total of 18 images were taken for analyses.

Changing Nature of Vegetation in the State

Normalized Differential Vegetation Index (NDVI), Landsat 7 ETM was used to collect data on Band 4R 0.64 - 0.67 wavelength and Band 5NR 0.85 - 0.88 wavelength for whole of the State and 6 other selected forests reserves (Sakaba/Wasagu, Kasanu, Illo/Kaoje, Dandi, Mahono and Lema) in Kebbi State.

Table 2 shows summary of NDVI images results for the three years using the scale (0.70 - 0.40 as dense, 0.40 - 0.30 as moderate, 0.30 - 0.01 as sparse and below 0.01 No Vegetation: None). Figures 1, 2 and 3 shows the dramatic changes in vegetation from 1990 to 2015 across Kebbi State. 1990 has dense vegetation at a value of 0.70 across the State, the values dramatically dropped in 2005 to the best vegetated areas having values less than 0.35. The best value for 2015 as can be seen on figure 3 is 0.30 even though classified as moderate. This change is a clear manifestation of activities leading to massive deforestation. The NDVI images of forest reserves have shown that most of the reserves are cleared of the vegetation. Except for Illo/Kaoje forest reserves all other reserves are given out to farmers on the taungya agroforestry programme implemented by the State since 1994.

Table 2: NDVI Values for Forests in Kebbi State

Sn	Name	NDVI Vegetation Change Range			
		Dense (0.70 - 0.40)	Moderate (0.40 - 0.30)	Sparse (0.30 - 0.01)	None (Below 0.01)
1	1990	0.70- 0.40	0.35 - 0.25	0.20 - 0.01	-0.01 - -0.33
2	2005	-	0.35 - 0.25	0.25 - 0.17	-0.01 - -0.33
3	2015	-	0.30 - 0.25	0.25 - 0.17	-0.01 - -0.33

Source: Field Work 2018

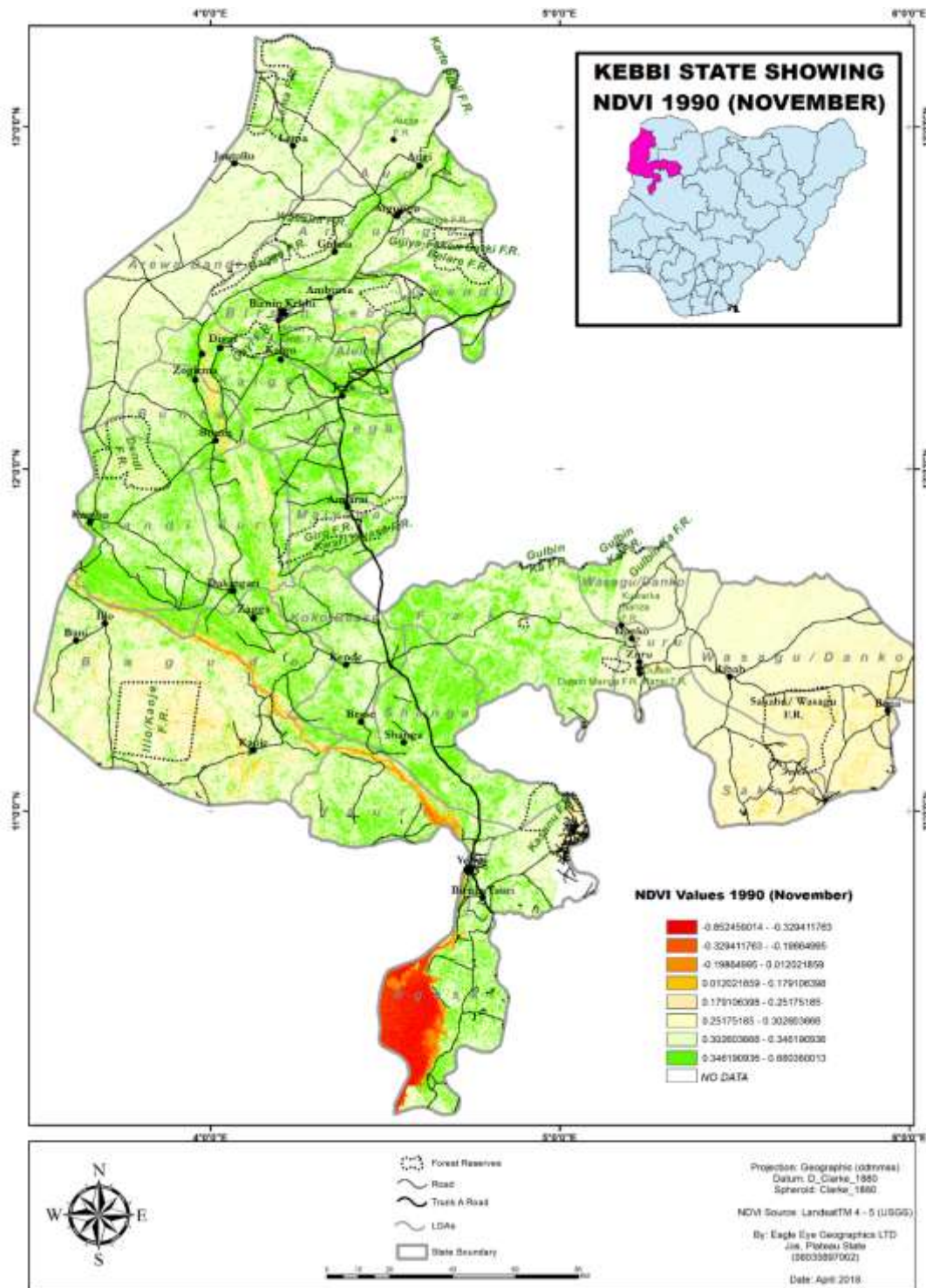


Figure 1 November 1990 NDVI Result for Kebbi State
 Source: Field Work 2018

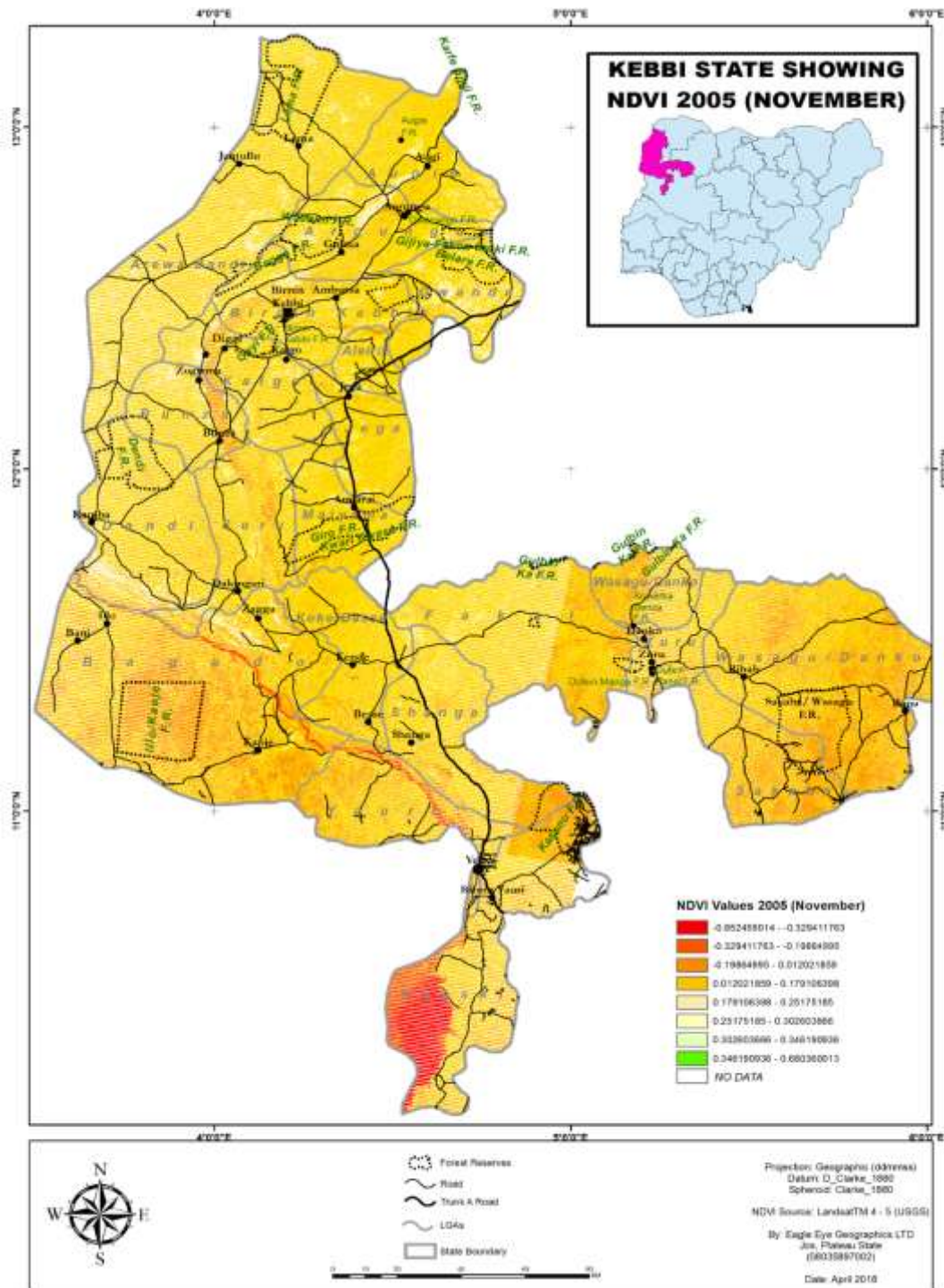


Figure 2: November 2005 NDVI Result for Kebbi State
 Source: Field Work 2018

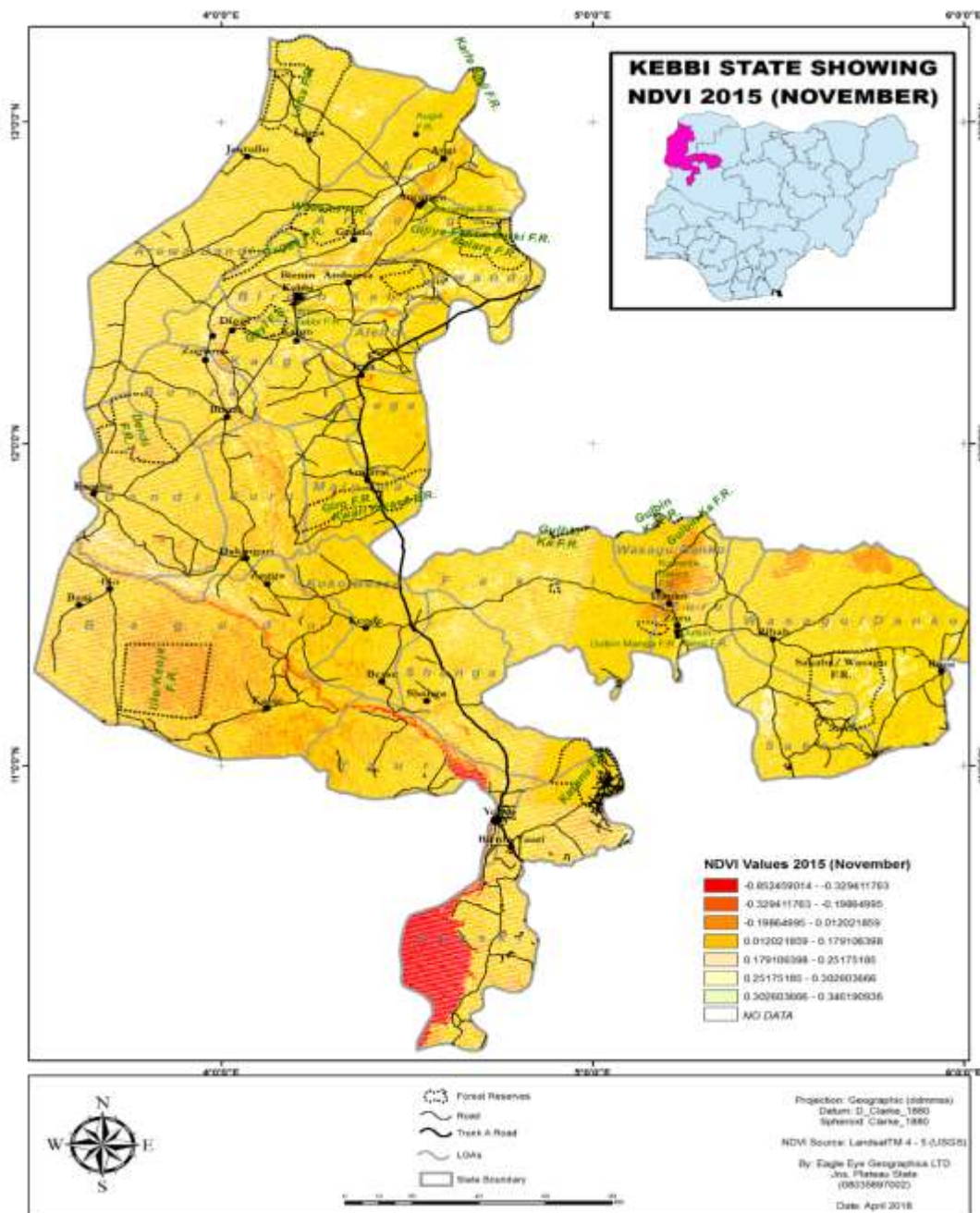


Figure 3: November 2015 NDVI Result for Kebbi State
 Source: Field Work 2018

Deforestation

Kebbi State is terribly deforested due to massive farmland expansion, creation of settlements, commercial fuel wood and charcoal collection, commercial collection of medicinal plants, commercial timber collection and over grazing. This phenomenon is

not unconnected to the rate of population growth in the State which has been steadily increasing. At the 2011 growth rate of 3.15%, the population of Kebbi State in 2017 was 4,724,606 people (population city, 2017). This massive deforestation was further aggravated by the fact that in 1994 Kebbi State Government introduced Taungya agroforestry system where almost all forest reserves were released to farmers for crop cultivation. The State Executive Council in 2003 gave the programme a boost when all civil servants were directed to get involved in agriculture. The Taungya programme was designed to encourage farmers to cultivate crops and plant trees on the farm lands with a view to growing vegetation on the farm.

Felling of trees is a problem with no control as people from far and near are seen cutting down trees to roof their houses and shops. In some areas poachers are not allowed to fetch fuelwood from Government Forest reserve, these activities of poachers are guided by regulations imposed by the district heads and law enforcements agencies. In an IDI, a respondents observed that all hands are put on deck to punish forest offenders. He stated that; the Ministry of Environment and Zonal Forestry Officers do go round to see that such activities; tree felling on restricted grazing areas, illegal farming activities, hunting etc. are put to halt.

Forest manager who are in the government identifies causes and severity of factors responsible for deforestation as shown on figures 4 and 5, as; expansion of farmlands, commercial fuelwood and charcoal collection, commercial collection of timber and commercial collection of medicinal plants with the first two and bush fire ranked as very severe causes.

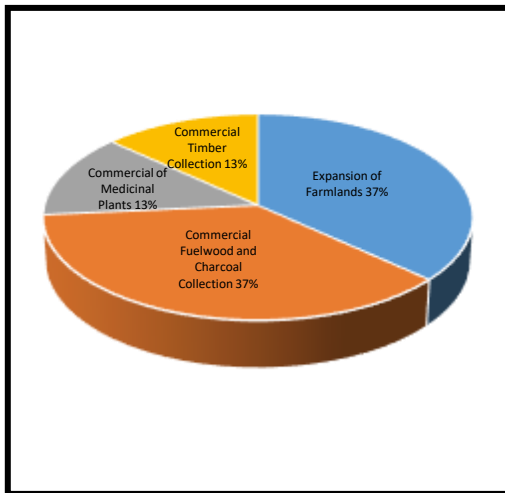


Figure 4: Causes of Deforestation
 Source: Field Work 2018

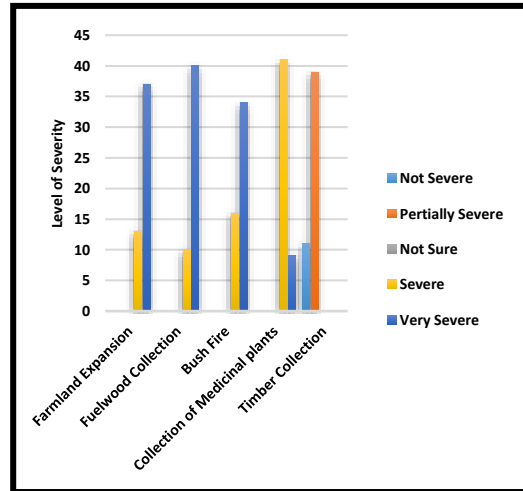


Figure 5: Severity of Causes
 Source: Field Work 2018

In an FGD, participants observed that excessive felling of trees, collection of herbs and damages to shrubs by uncontrolled movement by animals and humans has led to deforestation. A participant in an FGD observed that,

Some roots of *termrendus indica*, back of *parkia clapper Teniana* are used for medicinal purposes. A local medicinal concoction called “*tsime*” is fetched from the roots of some shrubs and trees and these cause deforestation and wanton destruction of forest flora. (Adult, Male, Native 42 Years)

On the excessive/massive felling of trees, the participants were of the view that, increase in population through migration and the need for fuel wood have caused damages to forests.

A participant observed that;

Every Fulani leader has his own territorial settlement with their own human grouping that have come from far and near in search of good pasture...this is because the main occupation of the Fulani is farming and cattle rearing (Adult, Male, 55Years/ Herdsman)

However, another participants in an FGD stated that one of the problems of deforestation is bush burning. Thus,

The most annoying aspect of deforestation is bush burning where most shrubs and grasses are burnt down and thus causes difficulties in grazing and a degradation of forest flora. (Adult, Male, Farmer, 35years)

Problems arising from the Subsisting Forestry Law

The subsisting forestry law of the State is the 1998 Forestry Edict which stipulates costs penalties and compensation rates on forest products. Section 23, Part B of the edict is on “Royalties for Forest Products”.

- a) **Sub-section a)** states that “Sale of timber: Payment for trees within and outside constituted forests reserves on stumpage bases would be as follows”. This is followed by a list of 29 trees costed between N150.00 to N600.00
- b) **Sub-section b)** states that, “Fuelwood; firewood from fuelwood plantations or the cutting of standing trees as thinning from plantations shall be in loads of 1,300m x 1.30m x 2.60m on the payment for the fuelwood collected from forest reserves should be as follows”. Donkey Load N20.00 (\$0.1), Camel Load N50.00 (\$0.14), Pick-Up Load N100.00 (\$0.3), Canter Load N300.00 (\$0.9) Truck Load N500.00 (\$1.4) and Turn- Table Load N1, 000.00 (\$2.9)

- c) **Sub-section c)** states that, “Sales of Poles” 10cm-15cm (N150.00 - N200.00) minimum to a maximum of 55cm – 60cm (N600.00) = \$0,4/ \$0.6 to \$1.7

From the above provisions deforestation by fuelwood and timber merchants became a daily activity when we compare the cost of deforestation and the current value of this products. Currently a pick up load of firewood cost between N16, 000.00 (\$45.7) in southern Kebbi and N25,000.00 (\$71.4) in the northern part. A full grown tree valued between N150.00 to N600.00 will make two pick-up loads of firewood. Comparatively speaking collection of forest products in Kebbi State gives more money than the sale of petroleum products. These has led to the establishment of fuelwood galleries across the States in places such as Kamtu in Fakai LGA, Maburo in Ngaski LGA, Andarai in Maiyama LGA and Birnin Kebbi the State Capital to mention but a few.

When the taungya agroforestry system was implemented, settlement such as Kangon Wasagu, Kanya, Janbirni expanded dramatically as a result of the opening of Sakaba/Wasagu forest reserve for crop cultivation. Migrants from Sokoto and Zamfara States and even neighbouring Niger Republic came and settled in the area. The same scenario was witnessed at Kasanu forest reserved in Ngaski Local Government leading to the growth of settlements such as Birnin Yauri, Kanbuwa, Maburo, Shagiya (Tungan Gwada) and Kimo. As the population of these settlement increase demand for fuelwood and farmlands have outgrown the capacity of the forest reserves thereby affecting community reserves badly. The situation in Illo/Kaoje forest reserve may follow the same line because the Government of Kebbi State resettled Communities from Benin Republic who are of Nigerian origin after the Nigeria-Benin border dispute. Out of the 58, 793 hectares called Illo/Kaoje forest reserve, more than 35, 000 hectares was release to these settled communities and other taungya farmers. With increase in the population of the resettled communities, request for additional land is eminent.

Deforestation via Fuelwood Collection

Fuel wood collection has grown into brisk business. Wood collectors do not only collect wood for local domestic use, fuel wood galleries are spread across the State where wood is collected in thousands of tones for transportation to cities and neighbouring Niger Republic. Plate 3 shows a gallery of fuel wood parked in bundles ready for export to cities and neighbouring Niger Republic. Plate 4 is a picture of Madrin (*Danellia Olieri* or *Albezia Zigia*) popularly known as *Madobiya* in Hausa, a plant going into extinction. This plant is very important to the Fulani which they believe is of high nutritional value to the cattle. In recent years the plant has been used for export particularly to China. This led to massive exploitation of the tree where logs

are sold to exporters. Today this plant has completely vanished in the whole of Northern Kebbi with only a few found in the Southern part and in forests that have very difficult terrains. This plant is predominantly available in the Illo/Kaoje forest reserve of the State



Plate 3: Fuelwood Gallery
Source: Field Work 2018



**Plate 3: Madrin (*Danellia Olieri* or
Albezia Zigia)**
Source: Field Work 2018

Deforestation via Timber Collection

Plates 1 and 2 are pictures of Trees affected as a result of Timber collection which has graduated from the traditional Mahogani (*khaya senegalensis*) to economic trees such as *parkia biglobosa* (locust bean tree) and *vikellariaparadoxam* (sheabutter tree). It is observed that these trees are readily available on farmlands and home shades. They form the group of bigger trees in the forest reserves and are fast being cut down by timber collectors. This is clear indication of the level of deforestation as a result of timber collection for house construction. Most recently farmers cut down these trees on their farmlands to get timber that is used to roof houses especially when male children are about to wed. This is seen as a cost saving measure as the wood is collected from trees on the farm and wood is transported to houses using family members or animal



Plate 1: Parkia Biglobosa (Locust Bean Tree) on a Farm Land

Source: Field Work 2018



Plate 2: Timber Collection using Parkia Biglobosa (Locust Bean Tree) on a Farm Land

Source: Field Work 2018

Timber which cost between N1,200.00 to N1,500.00 per wood; a truck load can be gotten when one locust bean tree is felled at a cost of N350.00/tree. This truck load will take a minimum of 70 pieces which means a total of (70pieces x N1,500.00) N105,000.00 (\$300). This is the major cause of the massive exploitation of these trees leading to the extinction of most of these plants in the forests. Some of these economic trees can only be seen on farm land and home steads as those in the wild have been harvested for timber, fuelwood and charcoal which most recent is the energy source widely used.

Conclusion

Joe (2018) wrote on “The Eastern Forest: From Commerce to Conservation” where he stated that, Prior to European colonization, trees covered a vast portion of the eastern United States, from the pine dominated forests of the southeast to the balsam fir-hemlock-spruce forests of northern Maine. Between Maine and Florida there were also beech birch-maple and oak-hickory forests, and forests adjacent to the Great Lakes that supported pine species that differed from those in the pine forests of the southeast. The visual experience of these forests would have varied widely. For example, the pine forests of the southeast allowed sunlight to filter down to the forest floor, whereas fir-hemlock-spruce forests blocked more light, resulting in a darker interior. Considered as a whole, the forests east of the Mississippi presented at once an unfathomable storehouse of timber and an unanticipated barrier to the European colonizers who hoped to profit from the space and bounty the territory represented.

The forests' worth to these settlers would be a significant factor in their eventual utilization and conservation.

Joe (2018) further observed that, by the early twentieth century, politicians, academics, and business leaders in the East were finally becoming aware of the destructive consequences of unbridled deforestation practiced on this side of the continent since the foundation of St. Augustine, 350 years earlier. It was no accident that this recognition began on the East Coast. It is unlikely that the birth of American forest conservation would have occurred in the West, where early settlement was strictly controlled by the Spanish government and immigration from other European countries and the United States was severely limited. Ample agricultural land was still available in the grasslands in the mid-nineteenth century, and the forests were for the most part in mountainous terrain – relatively inaccessible for most of the population until the twentieth century.

In conclusion, today, much of the land converted for agriculture in New England and elsewhere in the eastern United States during the first centuries of European settlement has reverted to forestland through natural succession. Second-growth forests once more cover hills and valleys earlier cleared for crops and pastureland; the remains of ancient farmhouses lie forgotten deep in northern woods. And yet without these forests' early destruction, the development of American forest conservation would have followed a delayed and different path (Joe 2018).

Recommendation

Eriola (2009) opined that, many efforts at environmental resource management in Nigeria failed because they paid inadequate attention to the various stakeholders involved and their particular interest. In Nigeria today, local people are dependent on forest therefore, a form of Joint Forest Management is to be developed. The local communities, the private sector and government are the stakeholders who should cooperate in sharing the burden as well as the benefit. By stakeholders we mean all those who have a stake in the exploitation and management of the resource, including forest dwellers and local farmers, logging companies, forest and other government departments, national and international policy makers and planners. He further stated that, each stakeholder is expected to have rational but different interest concerning the use and management of forest resources and these differences may be fundamental. Failure to recognize different and potentially conflicting interest of the various groups and what each stands to lose or gain from exploitation or conservation has frequently led to local resistance to policies and development projects, which therefore fail to meet their intended objectives.

In pursuance of sustainable forest management there must be deliberate effort to understanding the dynamics of the socio-economic setting of the people who are directly in contact with the forest estates. The authorities must review their strategies and carry out a holistic inventory of all forests (depleted reserves and community forests) including a taxonomy of the plant across the zones. Driving the vehicle of sustainable forest management policy direction must take account of the following:

1. All forest resources must be taken into account and considered valuable worthy of protection and preservation. This can be done first by taking an inventory of all community forests, mapping the forests and gazetting them.
2. Review all forest policies and management systems already implemented such taungya agroforestry system, afforestation programmes, the sure-p tree planting programme and all other programmes. This will be in form of performance assessment of the programmes for effective planning.
3. Involve all stakeholders in planning, monitoring and developing strategies for effective and sustainable forest management practices. Stakeholders such as policy maker, official forest administrators, industrialist, farmers, grazers, youths and women and other non-governmental organizations should be involved in the process.
4. The laws governing forest should be reviewed to reflect present realities taking into cognisance the role expected of all stakeholders in the management of forests. The laws should provide a process where gains and losses resulting from forest management are shared by all stakeholders.
5. There should be clear demarcation between grazing and farmland to avoid encroachment of these economic activities which most often result in clashes. In so doing grazing land should be located where there are provisions for water resources for the hard.
6. Explore other sources of household energy making them readily available and affordable so as to supplement the pressure on forest resources as the main source of household energy.
7. Mass education and mobilization of the populace towards understanding the practical effects of climate change. This can be done through issues such deterioration in farmland yield, floods, windstorms, desertification, sand filled streams extinction of plants and wildlife etc.

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