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AN EXPLORATORY ANALYSIS OF THE IMPACTS OF LANDUSE TRANSITION ON NIGERIA'S NATIONAL ECONOMIC DEVELOPMENT

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Abstract
The previous three decades have seen a dominance of spatial correlates of land use change in the global, national, local and supra-local contexts. In land use change scenarios and government policy formulations, the intricate linkages between anthropogenic land use change drivers and naturally occurring land use change have been critical. In order to examine the changes in 12 different land cover classes in Nigeria between 1995 and 2016, the study employed Landsat images. During the analysis period, the study also used the GDP and the Composite Consumer Price Index (CCPI) and Gross Domestic Product (GDP) as indicators of economic development (1995-2016). The changes in economic development indicators and the change in land cover underwent Pearson's correlation analysis. Results showed that Nigeria lost 733,729 hectares each year between 1995 and 2006 to non-forest-based land cover; between 2006 and 2016, 133,893 hectares of forest-based land cover were lost annually. Between 1995 and 2006, the yearly growth rate of CCPI was 4.9, whereas between 2006 and 2016, it was 12.7. Even though the Pearson's coefficient values were low, they nonetheless demonstrated a connection between Nigeria's economic growth and vegetation reductions. The study concluded that there should be a balance between economic development and the need for conservation. The solutions proffered by UNFCCC to reduce emissions and carbon trade should consider the need for economic growth and the micro-economic development of poor African nations.

Keywords: Land use change, Economic development, Land conversion, Composite Consumer Price Index, Gross Domestic Product

Introduction

Changes in land use /land cover and conversion have grown in importance in discussions about climate change and global warming. In particular, numerous authors have looked at the spatial correlates of land use change at the global, national, local and supra-local levels over the past decades. Researchers were generally concerned with the issues such as land use change causes, population dynamics and land use change, deforestation and economic development, among others. Shi *et a*l. (2018) described how China's land use changed during its unplanned economic expansion between 1990 and 2010. Using Landsat image data, they compared the changes in land use with China's social and economic development. According to their research, social and economic development and human activities are the primary causes of land use change. In Ibadan, Fabiyi (2011a) identified the factors contributing to urban decay, and in the Niger Delta region, Faviyi (2011b) looked at the factors influencing vegetation losses. Walker (1993) discussed the effects of deforestation on economic development in seven countries, including South Africa, while Bilsborow (1992) identified the impact of population and development on deforestation. Allen and Barness (1985) investigated the causes of deforestation in developing nations. Browder (1988) addressed the issue of how deforestation affects national policies. Understanding the climatic effects of land use change and determining the potential policy direction for national governments has been made much more difficult by the complex interactions between anthropogenic-induced and naturally occurring land use change. According to research,

regional and national land-use changes are directly related to a country's social and economic development.

Global carbon emissions and ozone layer depletion are proportionally correlated with the quantum of forest losses or growth in non-forest land use classification. However, expanding land uses other than forests is a sign of economic activity in any nation. Fabiyi (2015) investigated how vegetal resources affected the rural people's social and economic survival in Nigeria's coastal communities. It is evident that when a land conversion occurs, it is a pointer to a dynamic economy or rebounding of a recessed economy.

Various publications on land use change analyses have been made in Nigeria, but few writers have made an effort to look into the nature of the relationship between land consumption, deforestation or land use conversion and the economic well-being of Nigerian citizens. Understanding the relationship between economic developments and the dynamics of the use will be a critical factor in national policy on afforestation, climate change and international carbon transactions.

Resulting from the ongoing this study divides the country's land cover into specific classes of land use which are expected to have different effects on livelihood and human economic participation in Nigeria. The standpoint of the analyses is 1995, shortly before the advent of the current democratic dispensation, and the endpoint is 2016 based on data availability.

The Nexus between land use change and economic development

It is a generally accepted theory that the economic development of low-income countries is a major driver of deforestation and land use conversion, though there are few pieces of evidence to support this theory. Economic growth in developing countries has been identified to increase along with the deforestation rate (Walker 1993), but it is assumed that the effects disappear in wealthier economies based on scientific evidence. The more developed economies don't depend on land conversions for economic development (Allen and Barnes, 1985, Brookfield and Byron, 1990). The developing countries, however, rely on deforestation or land use change for industrialisation and urbanisation, which will translate to greater economic fortunes. Cuaresma *et al.* (2017) used shreds of empirical evidence to examine the relationship between economic development and land use changes but posited that forest statistics used are most negatively affected by accounting and reporting errors.

Satellite image datasets and extracted forest cover for each country were used to provide evidence of relationships between economic development and forest cover across national borders worldwide for 2005. They utilised Kuznets Curve to empirically identify the determinants of forest cover across all countries of the world.

Lambin and Meyfroidt (2011) examined globalisation and land use change. They identified the globalisation effects on land use change, especially the remittance effect from out-migration from rural regions, affects land use through a decrease in the Labour force and consumption needs and inflows of remittances. Landuse integration and specialisation.

Before independence in 1960, Nigeria was largely forest and savannah, while the southern region was basically thick vegetation cover; the north ranged from Guinea Savanna to Sudan savanna. However, as early as the 1980s, there was significant desert incursion into the savannah while deforestation and urbanisation depleted the forest resources in the south. The losh vegetative bluff in the coastal area is being eroded and overtopped by the sea level rise and coastal subsidence. The forest zones are plagued with high deforestation due to logging activities, urbanisation, and arable land conversion. Increasing urbanisation, fuel wood harvest, logging and charcoal production have destroyed close to 80% of forest cover in Nigeria. The only areas where there are natural forests are unreached highlands in the Obudu Mountains in the Cross River state and the areas of Cameroun highlands ridge offshoot into Adamawa and Taraba states of Nigeria.

Some studies have examined land use resources and development, such as Fabiyi (2013), which analysed the land use resources with the level of community poverty in Kwara state, Nigeria. He concluded that the proportion of vegetal resources available to a community has a weak positive relationship with the level of community poverty in the study area. Li *et al.* (2016) examined the physical and social economic driving forces of land use change in the city of Wuhan, China. They obtained regression equations for each land use change and considered the city's climatic, social, and economic changes over time.

In Nigeria, few studies have attempted to estimate the linkages between the economy the land use resources, especially at the national scale. The carbon trade is heavily skewed to these developments as nations embark on afforestation to earn carbon credit. There is a trade-off between a country focusing on earning Carbon credit or heavy industrialisation. Industrialisation and urbanisation are both generative in improving a nation's economy, while afforestation will enhance the nation's access to Carbon Credit earnings. In an attempt to reduce the rate of deforestation in developing countries, carbon credit was introduced to compensate for the slowing down of the rate of industrialisation and the attendant removal of forest cover. Therefore, there is a need to identify any linkages between Nigeria's economic development and the vegetal cover or land use resources over time. The relationship would necessarily be complex and not linear; it is worth exploring to establish if there is any correlation at all.

This paper examined the relationship between the changes in land use/cover over time and the micro-economic development in Nigeria. It attempts to find connections between the land use resources available in the country and the resultant economic growth in the citizen's life over time. Economic development may necessarily result in a change in land use as the nation industrialises and cities grow to conurbations

Deforestation and economic development

There has been some form of concern over deforestation, especially in developing countries. The popular account was that deforestation results in soil degradation, erosion and regional climate change, which eventually reduce productivity. The development process involves landscape changes as land is put to different uses in response to demographic dynamics, technological innovation and shifts in consumer preferences. Walker (1993) examined the spatially conflicting facts that tropical deforestation is necessary for economic development while, at the same time, tropical forest is necessary for maintaining a global life support system. Deforestation leads to erosion and loss of soil productivity, impoverishing local farmers who depend on subsistence agriculture to feed their families. When population pressure persists, farmers are forced to cultivate more lands for crop production, leading to deforestation, leaching and reduction in soil productivity (Blaikie and Brookfield, 1987, Walker, 1993;1991; 1987). In many academic discussions, deforestation has been regarded as a phenomenon in developing countries. However, most developed countries have also experienced a similar rate of deforestation in the past. The assumption is that the rate of land conversion in the advanced economy is relatively stable. This suggests that developing countries are trying to catch up in the development equation. Land conversion is expected to be high in a rapidly growing economy (Shi *et al.,* 2018). Therefore, it is possible to assume that there is a relationship between the level of economic development and stability in the overall pattern of a nation's land use system (Walker 1993). Walker (1993) has postulated that the National land use systems might be viewed as economic development correlates. However, he did not specify whether this is more related to the macro or micro-economic development of the nation.

He examined the forest cover in seven countries, including the United Kingdom, Greece, Italy, France, Norway, Spain, Portugal, Japan and Canada. He posited that all showed a gain in closed forest cover. In the United States, for instance, Walker (1993) submitted that the forest land exceeds the forest and woodland of 1923, and the forest cover in Puerto Rico in 1980 is greater than in 1940. While the developed economies were recording an increase in the closed forest cover, which increases recreation land and conservation, the forest in the developing countries is basically for exploitation, and no conscious efforts are targeted towards afforestation. Most forest plantation projects are for commercial logging purposes, not conservation. The contribution of the forest harvest and vegetal degradation to the economic well-being of African societies is not well understood, as the need to feed the surging urban population in Africa requires more land to be cultivated and, thus, acute reduction in forest cover. The woodlot of the forest is the primary resource which is felled for wood planks, charcoal and fuelwood for domestic energy.

Population growth is another factor that puts pressure on forest resources as the need to provide space for accommodating the urban population and the twin sister industrialisation. Most industries in developing countries are still large space users; thus, more forest is cleared to provide space for industries and urban growth (Boserup, 1965,1981; Hayami and Ruttan, 1987; Walker, 1993). While adopting labour and land-saving agricultural technologies and strong rural-to-urban migration was largely responsible for the reforestation in developed countries, most developing countries cases are quite different.

The Study Area

Nigeria has a population of over 200 million with a land area of 923,000 km^2. The topography of Nigeria consists of plains in the north and south intersected by plateaus and hills, mainly in the country's central and eastern regions. The major river basins in Nigeria include the River Niger and River Benue valleys that characteristically cut through the country from the western flange and the eastern flange emptying the water content into the Atlantic Ocean through the networks of creeks in the Niger Delta. The lake Chad basin and Sokoto-Rima Basing also contain enormous water resources in the arid region of the Northern region. These show that though the country has more than ten states in arid land areas, there are still adequate water resources to maintain a prosperous economy.

The landscape in the northwest is characterised by gently undulating plains, which become waterlogged during the rainy seasons. Other landforms that can be found in northern Nigeria are plains, inselbergs, Volcanoes and ridges

Nigeria has significantly fertile soil to support smallholder farmers and mechanised farming. The soil consists in northern Nigeria is particularly rich for agriculture as it contains a combination of wind-borne deposits and riverine sand, especially where there is a marked dry season and a dense surface layer of laterite develops. The middle belt comprises savanna vegetation and reddish laterite soils that are also fertile for crop production. However, because they receive more rainfall than the northern part of the country, they are subjected to leaching and thus less productive than the north. There is a high magnitude of deforestation in the middle belt through active drivers such as fuel wood harvest, charcoal production, urbanisation and other anthropic activities that further degrade the lands and vegetation.

The level of deforestation taking place in southern Nigeria is comparable with the rate of urbanisation and industrialisation (Fabiyi, 2011b) and large-scale tree crop farming. On the other hand, the deforestation level in the Central region is mainly for fuel and domestic energy use as well as subsistence farming. It would be expected that the level of land use change in southern Nigeria has positive effects on the economy, while the land use change in the middle-belt and central Nigeria leads to further entrenching poverty.

Nigeria's climate is generally tropical with variable rainy and dry seasons with high dichotomous between north and southern Nigeria. The weather is hot and wet most of the year in southern Nigeria.

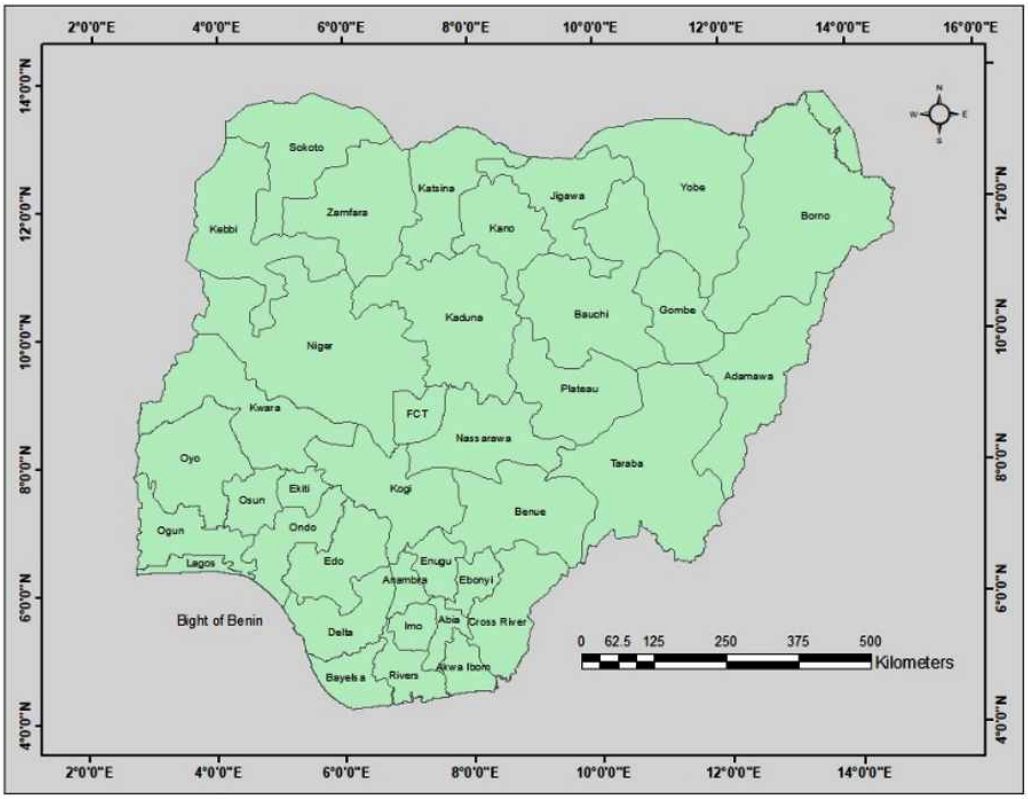

Fig.1: Map of Nigeria

Nigeria has a tropical climate with variable rainy and dry seasons, depending on location. It is hot and wet most of the year in the southeast but dry in the southwest and farther inland. A savanna climate, with marked wet and dry seasons, prevails in the northeast and northwest, while a steppe climate with little precipitation is found in the far north.

İn sum, environmental exploitation and natural resource harvest significantly affect economic opportunities and the potential to prosper in communities. As the population of Nigeria increases, it will put further pressure on the environmental elements, including land use as people go about in pursuit of their daily activities and the desire for a better economy

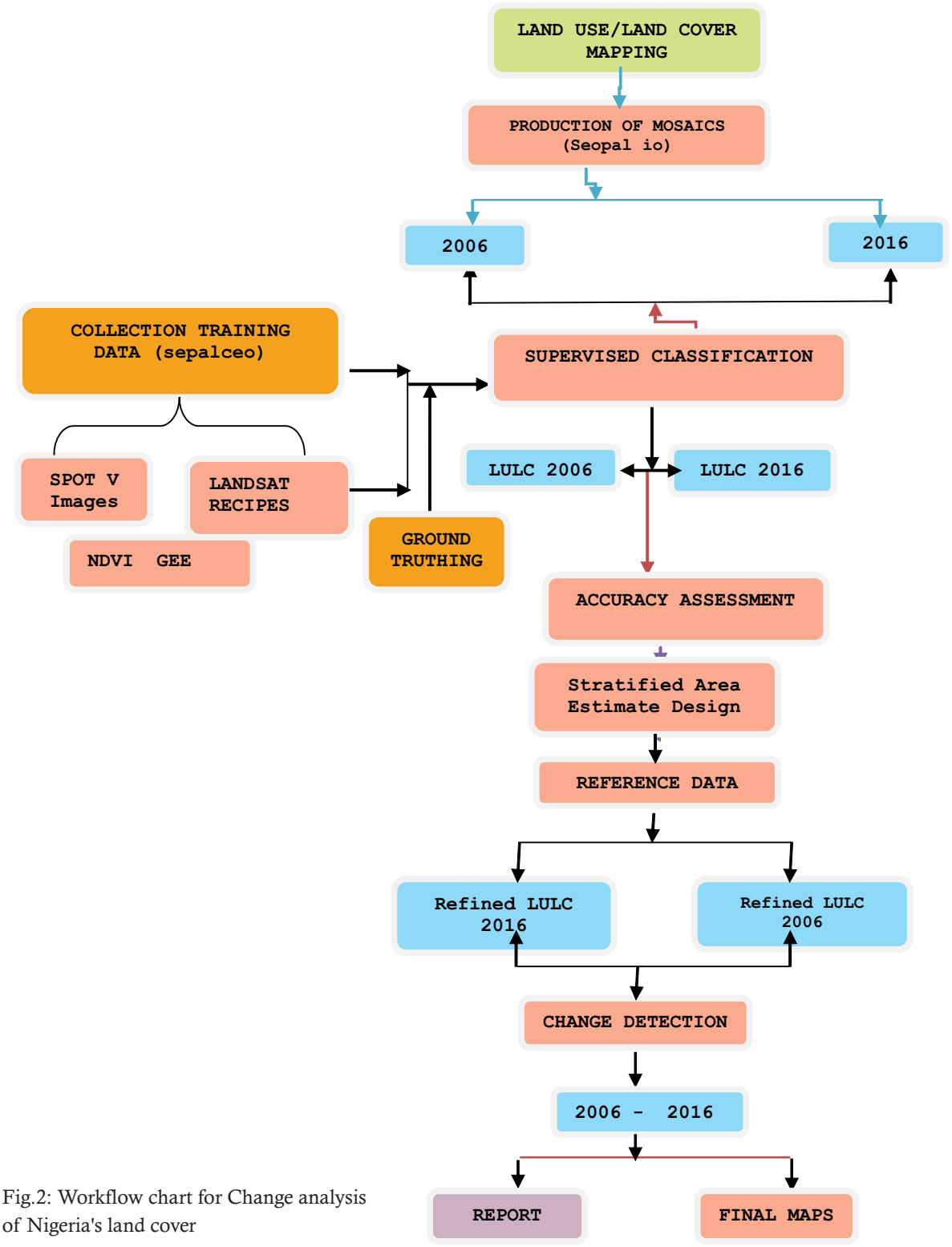

Fig.2: Workflow chart for Change analysis of Nigeria's land cover

Methodology

The paper used Landsat imageries acquired between 1995 and 2016 to analyse the changes in identified 12 land use classes in Nigeria. The analysis epochs of data used were 1995, 2000, 2006, 2010 and 2016. The data were extracted through the data archives in Google Earth Engine (GEE and processed for image classifications. A total of 1,753 training sites were used to classify the entire country into 12 discrete classes. Then change detection analyses were conducted among the datasets. Composite Consumer Price Index (CCPI) and Gross Domestic Products (GDP) data sets were also acquired from the website of the Central Bank of Nigeria. The data sets for the years 1995, 2000, 2005, 2010, and 2016 were extracted and used in a correlation analysis with the change in the forest land cover losses identified in the image analyses.

Archival Data for Landsat were acquired from the USGS and Google Earth engine. Composite Consumer Price Index (CCPI) and Gross Domestic Product (GDP) datasets were obtained from the Central Bank of Nigeria's Annual report. The annual difference in micro-economic scale can be measured by the Composite Consumer Price index and Gross Domestic Product.

Consumer Price Index (CPI) measures the average price change of consumer goods and services. CPI can be computed for single items of a predetermined group of items which are considered household goods and services. These households and services often used in calculating the CPI are food, transportation, health and medicare, clothing, energy, education and recreation.

A review of previous wall-to-wall land use mapping in Nigeria was done, and various land use classes were revised to 12 classes. The 12 revised classes comprised six forest-based and six non-forest land uses. The forest classes include Undisturbed Forest (UF), Disturbed Forest (DF), Mangrove Forest (MF), Freshwater Swamp (FS), and Forest Plantation (FP). The non-forest classes include Arable Land (AL), Grassland (GL), Savannah (SV), Tree Crop Plantation (TP), Settlements (ST), Bare Surfaces (BS) and Water Body (WB). These 12 classes were used to classify the entire country into discrete land cover classes for 2000, 2006, 2010 and 2016. A total of 1,501 training data points were collected from the High-resolution images of the entire country, including SPOT5 and GeoEye. These training data were collected digitally, while a total of 252 sample data points were collected physically on the ground, especially in Taraba, Niger, Nasarawa, Osun, Oyo, Ogun, FCT and Sokoto States.

The consumer price index (CPI) was used to estimate economic well-being, and the data published from 1995 to 2016 were used. **C**orrelation analysis was carried out between Nigeria's changes in land cover between 1995 and 2016 to examine the relationship between the changes in Composite Consumer Price Index and land use change over the same period. The diagrammatic representation of the workflow for land use classification and change detections is shown in Figure 2.

Results and Discussion

Nigerian landuse/landcover transition 1995 to 2016

From 1995 to 2016, Nigeria's land cover saw a significant change. In 2016, there were much fewer untouched forests, down from more than 2 million hectares to a little above 1 million hectares. Additionally, the amount of forested freshwater decreased from 3,126,971 to 2,686473.54 hectares. The settlements changed from 522,417.29 in 1995, to 10,642,392 in 2006 and 8,325,510.48 hectares in 2016.

Land use change analysis showed that undisturbed forest decreased from 23% in 1995 to 12 % in 2006, and only 11% of undisturbed forest remained in 2016, mostly in hilly terrain and other hard-to-reach places. Throughout the period, the mangrove forest remained mostly suitable; it was 12% in 1995, 8% in 2006 and 11% in 2016. This might be due to sea level rise that provides the right environment to thrive for mangroves despite a high rate of deforestation. In 1995, it covered 34% of the land surface; by 2006, it had dropped to 26%, and by 2016, it had slightly risen to 29%. Forest plantation is also reducing at an alarming rate because of high encroachment in government-owned forest plantations. Forest plantation land cover was 0.3% in 1995 but increased to 2% in 2006, and in 2016, only a marginal 0.7% of forest plantation remained in Nigeria. On the other hand, disturbed forests covered a large extent of space in Nigeria in 1995, when about 11% of the entire country had disturbed forests. The total area decreased to about 2.4% in 2006 and 2.3% in 2016

Tree crop plantations, including cocoa, rubber palm cashew and agricultural cash crop trees, showed a marginal increase in the entire country, which showed an improvement in large-scale tree crop farming and an upsurge in small-holder farmers

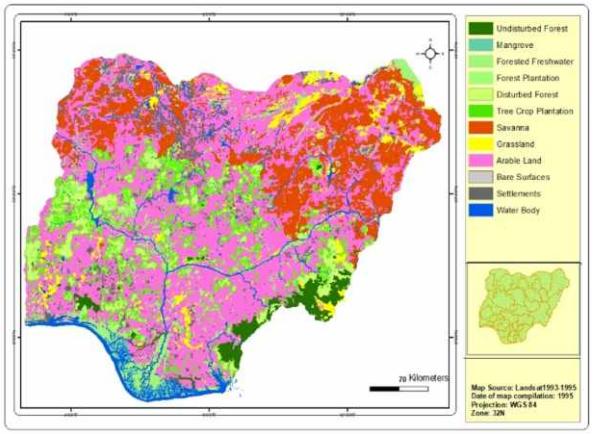

Fig 3A . Land use/Land cover 1995

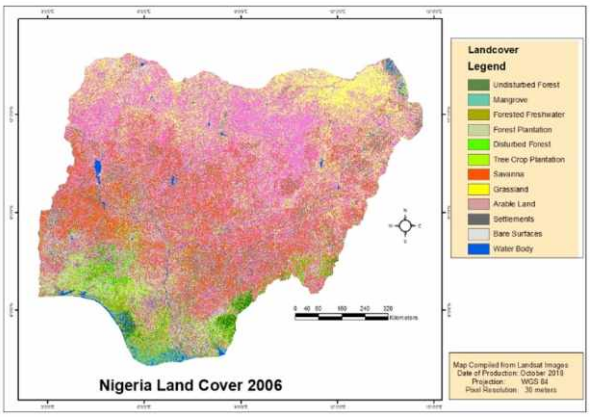

Fig.3B. Landuse/Landcover 2006

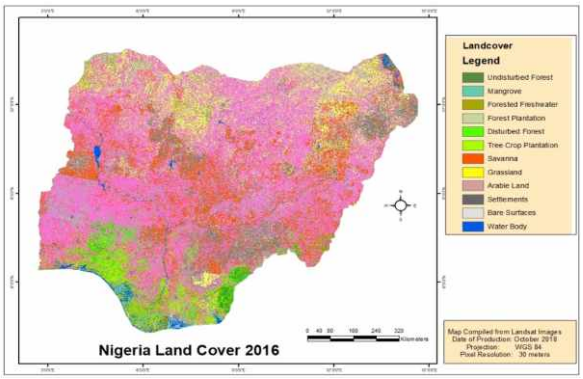

Fig 3C: Landuse/Landcover2016

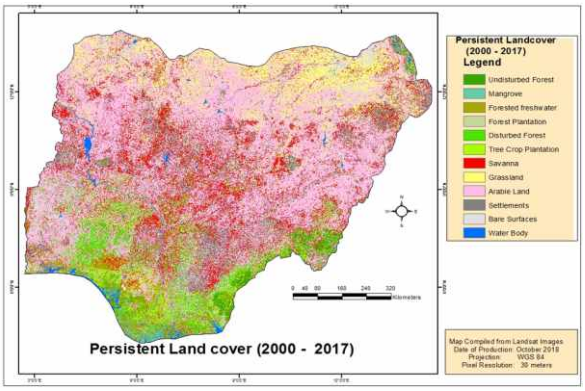

Fig.4: Persistent land cover 2000 -2017

Table. 1. Land Cover Trend Analysis (1995-2016)

Land cover class	Land cover areas in Hectares				
	1995	2000	2006	2010	2016
Undisturbed Forest		1297912.68	1000490.58	872372.6	790244.06
Mangrove	1081571.93	8841505.31	8744156.59	7128980.15	976430.52
Forested Freshwater	3126971.87	1732003.79	1685779.29	1269232.74	1072817.6
Forest Plantation	269294.07	2377858.41	1898765.91	1311878.07	1025006
Disturbed Forest	10258307.08	3567729.15	2012190.99	934311.53	923311.34
Tree Crop Plantation	214482.18	1321992.9	1426601.64	1462665.75	1156675
Savanna	11049488.69	11101559.62	13104930.28	13544058.8	13689311
Grassland	598417.29	13357431.06	13269115.99	13452808.5	14532089
Arable Land	59598675.3	30805055.68	30224264.03	32654252.34	31867101
Settlements	522417.29	14257916.91	15832027.2	16075967.1	17177091
Bare Surfaces	2683627.13	3029112.1	2518086.31	3004535	8522185.1
Water Body	1527378.24	1366822.17	1340490.96	1345837.19	1324637.8
Total Area in Hectares	**93056899.79**	**93056899.78**	**93056899.77**	**93056899.77**	**93056900**

Source: Analyses from Landsat datasets

involved in tree crop farms. For instance, in 1995, about 0.2% of the total land area was devoted to tree crop plantation, but in 2006 it increased to 2.4% and stood at 2.0% in 2016. Savannah's land cover remains relatively constant in the period under consideration. It only fluctuates slightly. Savannah landcover about 11.9% in 1995 and 15.6% in 2006 and 14.2% in 2016. This relatively stable land cover accounts for the areas that have been heavily farmed and maintained savannah nature over the years.

Grassland was merely 0.6% of the total surface area in 1995 but increased to 15% in 2006 and slightly reduced to 12;7% in 2016. This showed a steady increase in grassland and further reinforced evidence of desert encroachment in Northern Nigeria. Arable land, including all cultivated and fallow lands, was about 64% of Nigeria's total surface area as of 1995 but drastically reduced to 34% in 2006 and increased to 42% in 2016. Shifting cultivation and food crop was common in 1995, but there was a marked reduction in arable land.

Table 2: Composite Consumer Price Index Trends in Nigeria

Month	1995	2000	2006	2010	2016
Jan	14.36	29.38	67.44	103.13	181.71
Feb	15.02	29.74	68.53	105.04	185.89
March	15.56	30.06	70.43	104.9	189.94
Apr	16.95	30.66	71.97	105.72	192.99
May	18	31.62	72.02	105.68	198.3
Jun	18.81	32.99	71.88	108.76	201.7
Jul	19.43	32.83	73.31	109.94	204.23
Aug	20.12	33.59	75.67	111.87	206.29
Sep	20.46	34.06	76.12	112.38	207.96
Oct	19.96	34.26	74.22	112.72	209.68
Nov	20.23	33.79	73.69	112.77	211.33
Dec	20.96	33.93	73.13	114.22	213.56
Average	**18.32167**	**32.24**	**72.3675**	**108.9275**	**200.2983**

Source: National Bureau of Statistics (Accessed from Central Bank of Nigeria website April 2020)

The settlements in 1995 were merely 0.6% in 1995 but rose to 11.4% in 2006 and 8.8% in 2016. The reduction in 2016 settlement land cover compared to 2006 has been explained in the previous section of the report. Bare Surfaces, including rock outcrops, eroded surfaces and sandy alluvium, increased significantly between 1995 and 2006 but have remained relatively stable since then. Bare surfaces accounted for 2.9% in 1995, 10.8% in 2006 and 10.5% in 2016.

Water bodies, including natural and manmade lakes, river channels and canals, was 1.6% in 1995 but reduced to 1.2% in 2006, and in 2016 it was 1.4%. This showed a slight reduction in the water body between 1995 and 2006 but increased slightly in 2016. The increase in water bodies between 2006 and 2016 may be a result of artificial lakes built in different parts of the country

Composite Consumer Price Index and Gross Domestic Product as measures of micro economy and economic well-being of the citizen in Nigeria

The Composite Consumer Price Index was used to measure affluence and average economic development over the years. It is traditionally used to measure inflation and determine the cost of living at a given time. Inflation can endanger an economy by making living costs impossible to maintain, particularly if salaries do not keep pace with rising costs. This ultimately decreases the living standards for consumers, which can lower the quality of life. This is especially true when normal inflation leads to hyperinflation, which can financially devastate a nation's economy. Measuring inflation and cost of living using CPI helps governments appropriately address the economy's health. We utilised CCPI value to estimate the level of household development and microeconomic structure of Nigeria. We examined the relationship between change in CCPI and change in land use between 1995 and 2016.

The average CPPI for all items in 1995 was just 18.3 and 32.24 in 2000, 72.36 in 2006, 108.92 in 2010 and 200.29 in 2016. It showed a rapid increase in the CPPU as of 2010, having passed the 100 mark. Each year's average Composite Consumer Price Index represents household economic development. The political development in the country also corresponds with the CCPI values. The values were also compared with the Nominal GDP for each year which changed rapidly from 2006, and it is presented in Table 3 in billion Naira.

Table 3: Nigerian National Nominal Gross Domestic Product for all items

Year	Nominal GDP in Billions Naira
1995	2895.20
2000	6,897.48
2006	28,662.47
2010	54612.26
2016	101489.49
2017	113711.63

Table 4 shows the correlation analysis of the forest losses and the CCPI and the Spearman Correlation analysis conducted to examine the relationship between the forest cover and non-forest cover with the CCPI and the Gross Domestic Product of the country between 1995 and 2017.

Table 4: Correlation Coefficients of Forest loses and CCPI

Spearman Correlation Coefficient	Forest Loss	Rate of Forest Loss	Change in CCPI	CCPI Rate	Change in GDP	GDP rate
Forest loss	**1.0**	0.813	0.245	-0.013	0.356	0.379
Rate of Forest loss	0.813	**1.00**	0.179	-0.01	-0.18	-.013
Change in CCPI	0.245	0.179	**1.0**	0.845	0.043	0.141
CCPI rate	-0.013	-0.01	0.845	**1.0**	-0.301	-0.249
Change in GDP	0.356	-.179	0.043	-0.301	**1.0**	0.99
GDP Rates	0.379	-.125	0.141	-.249	0.992	**1.0**

Table 5: Total Land areas for Forest cover and CCPI, GDP

Correlation Spear man Rank	Total Forest	Total Non-Forest	Annual CCPI	Nominal GDP
Total Forest	**1.0**	-0.086	0.771	0.771
Total Non-Forest	-0.086	**1.0**	-0.029	-0.029
Annual CCPI	0.771	-0.029	**1.0**	1.0
Nominal GDP	0.771	-0.029	1.0	**1.0**

Source: Author's analysis

Table 6: Correlation coefficients of % change in Land cover and CCPI Index

Spearman Rank Correlation of Land cover change and CCPI Index change				
Spearman Rank Correlation	% change in LC 95-06	%Change in LC 06-16	% Change CCPI 95-06	% Change CCPI 06-16
% Change in LC95-06	1.0	0.203	-0.364	-0.678*
%Change in LC06-16	-0.678*	1.0	-0.007	0.091
% Change in CCPI95-06	-0.364	0.091	1.0	-0.007
%Change in CCPI 06-16	0.203	1.0	-0.839**	1.0

*Correlation significant at Two-tailed test

** Correlation Significant at One-tailed test

The Correlation Coefficient for the relationship between the forest loss and the change in CCPI is -0.051 and 0.1 with the CCPI Rate. This is a very weak relationship but negative. It is unclear if there is a direct relationship with the CCPI rate of change. The connection of forest loss with annual GDP change is -0.60, and the rate of change in GDP rate is -0.60. This shows a high negative correlation with the Gross Domestic Product. Therefore, as forest losses continue, the micro economy increases before land conversion becomes a significant driver of economic development.

The average Composite Consumer Price index was 18.32 in 1995, but in 2006, it increased to 72.36 while it increased to 200.29 in 2016. The changes in the CCPI in Nigeria sharply increased, showing a sharp improvement in the health of the microeconomy.

Summary of Findings

The correlation coefficient between the changes in forest-based land cover and the CCPI was 0.245, while the relationship between the forest loss and the CCPI rate was -0.013. Of relative importance was the change in the GDP and the Rates in GDP, respectively, were 0.356 and 0.379. This shows that deforestation is significantly related to the Composite Consumer Price Index and Gross Domestic Product. There is a very weak relationship between the rate of forest loss and the economic well-being indexes.

Another dimension of consideration was the annual CCPI and Nominal GDP on the total forest in the period. The correlation coefficient was 0.77, which shows an evident positive relationship between the

total forest resources available to the country and the economic well-being of the citizen. The percentage change in the Land cover change between 95-2006 and the CCPI change between 1995 and 2006 showed -0.36 and 0.203. Per cent change in CCPI between 2006 and 2016 and change in LC92-2006 was -0.364.

The influence of forest losses on the Composite Consumer price index and Gross domestic product is significant, despite a weak positive relationship. It showed that development that encourages land conversion in Nigeria most likely results in an improvement in the economic well-being of the populace. This confirmed the proposition of walker 1993 that most developing countries rely on land conversion to secure wealth for their citizen. However, Nigeria is expected to exceed the threshold when land conversion has low effects on the economic well-being of the people. The study showed that the effects of forest conversion between 1995 and 2006 were very high, 0.77 coefficient of correlation, but later dates showed a lower correlation coefficient.

For instance, the effect of land use change between 95 and 06 on CCPI in 95-06 -0.364, but in 2006 and 2016, the relationship is -0.007. This showed that the more developed Nigeria becomes, the less the capacity to depend on land conversion for wealth creation. Advanced economies depend on servicing industries and technological advancement to increase the economic well-being of the people rather than a physical improvement in the producing capacities of the citizen.

The weak relationship between forest losses and the economic well-being of the populace indicates some other variables are active in determining the influence of land use conversion on economic well-being. Therefore, future research should focus more on unravelling the complex interactions between land use and the economic development of nations that depend on non-agricultural resources for national income flows.

Many African countries are struggling to implement their budgets without support from the lending nations or international lending organisations. Therefore, they can inject a conscious policy of land conversion to improve the income of the people and thus increase the tax-paying capacities of the populace. The taxes from the people will further increase the national income of the country and, ultimately, the productive capacities of the citizen

Conclusion

The paper argues that land conversion from forest-based land use to cultivated land and tree cropland has a positive relationship with economic growth at the micro and macro level. There is the potential catalytic opportunity of upscaling the economy by stimulating land-use conversion activities. There is a general global focus on zero deforestation, which places a lot of constraints on developing economies. Notably, most sub-Saharan African countries still depend on land conversion to grow their domestic economy and alleviate poverty. Carbon trade with all the incentives for emission reduction payment cannot supplement the potential economic growth generated from land conversion. Africa has always been holding the short end of the stick regarding global trade and economy. Zero deforestation focus in the agricultural sector does not favour African countries, especially those that depend on the land resources-based economy.

Africa should not restrict itself to the pursuit of benefiting from the carbon market at the expense of the domestic and micro-economy. The trade at the moment is not in the realm of suppliers and buyers where the price mechanism fully operates. It is rather an arrangement to surcharge the powerful countries who became wealthy from common global patrimony to pacify weaker countries and prevent them from advancing their local economies. Reducing emissions is a global challenge, and IPCC must find solutions that reduce emissions without limiting the growth of weak nations whose major populations depend on natural resources for development.

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