

# Conflict Induced Migration and its Impact on Land Resources in Plateau State, Nigeria

Elijah A. Akintunde<sup>1,2\*</sup> Ruth A. Jambol<sup>2</sup>

1.Department of Geography, University of Ibadan, Oyo state, Nigeria

2.Department of Geography and Planning, University of Jos, P. O BOX 2084, Plateau State, Nigeria

\* E-mail of the corresponding author: [elyaaaak@gmail.com](mailto:elyaaaak@gmail.com)

## Abstract

The study assessed the Impact of conflict induced migration on the environment in Plateau State, Nigeria, through a combination of both the Geographic Information System and the SPSS to analyze the satellite images and the population data for the internally displaced persons in the area. It related the images of the area for 4 different years in the last decade; the year just before the crises began (2000), the second after two major conflicts (2006), the third after the fourth major conflict (2010) and finally, a projection of the area in the year 2020. From the image analyses and the correlations, a significant positive relationship was discovered to be present between conflict and environmental degradation ( $r= 0.84$ , at  $p<0.05$ ) and the correlation ascertaining the relationship between migration and the depletion of land resources shows that the more the mobility of conflict displaced migrants the less the land resources become in the destination areas, and the less the migration the more the land resources with ( $r= -0.45$ , at  $p<0.05$ ). The Markov Chain analysis and cellular automata analysis forecast showed that by the year 2020, in Jos, Plateau State, Nigeria, there will be increased demand and pressure on land resources; which will show up in forms of declining crop production, biodiversity loss, degradation of land quality and quantity, and competition for land. Little accessible forest cover will remain; the deforestation will lead to a catastrophic increase in soil erosion and loss of productive land through accelerated landslide incidence, and a possible disruption of the normal hydrological cycle. Furthermore, by this time the built up area would have taken over about 80% of the total area while the land resources will only be found in 20% of the total area.

**Keywords:** Conflict, Migration, Resources, Land, Degradation, Plateau State Crises.

## 1. INTRODUCTION

The last decade in the once peaceful state of Plateau, Nigeria has been characterized by sectarian violence and conflicts which have left thousands of people dead and many more injured and displaced. Many sojourners have had to move from conflict areas to new areas of perceived calm. Consequently, this population displacement has impelled the victim population either moving to another area or going to resettle in camps, tents and places of perceived safety. A lot of times, these victims have had to settle in forest reserves like the Fulde pastoralists resettled in a Forest Reserve in Bauchi State in June 2003 (Blench 2003). This resettlement of displaced persons has to a large extent affected the destination environment; especially the land resources of these areas.

Due to the enormity of the variables that make up the environment, one aspect of the environment will be considered in this study; this will be with respect to land resources. For the purpose of this study, land resources will include vegetal cover (trees and forests), agricultural lands, and mountains.

This study will employ satellite imageries to examine the destination of these migrants, such that, the extent which the area has been degraded by settlers and the rate at which this has taken place will be determined. It will require a comparative image analysis of the area before the last decade and the year 2010. This study seeks to identify the unfavorable impact the intra urban migration of people could have on the environment and on land resources in the destinations of migrants. Cassels, (2006) opined that a theoretical discussion on when and how migration, or migrants, may exert negative impacts on the environment can lead to well-planned empirical studies and ultimately how to mitigate negative impacts. Therefore, the impact of migration on the land resources in the destinations of migrants is a very important and timely topic as well.

The impacts of these conflicts as discovered by this study have left indelible prints on the state especially the state capital, Jos. These impacts span much more than the loss of lives and properties; they have significantly led to the depletion of land resources in the destination of displaced migrants.

For the purpose of this study; migration will be considered as induced by violence and crises, this type of migration in light of the classification by Guinness (2008), and the National Geographic society 2005, is referred to as impelled/imposed/reluctant migration, a migration that takes place under perceived threat, either human or physical but with an element of choice which is usually lacking in forced migration. De Souza et al (2003), explained that such war induced migration push agricultural workers off their lands, forests degraded; eventually damaging the local ecosystems and also implying that there will be a requirement for additional land for food income, housing roads and other infrastructure. Harrison and Pearce added that high rates of migration denote a serious environmental crisis in the receiving end (Harrison and Pearce 2000 pp 87).

The movement and resettlements that have been the outcome of the conflicts in Jos have led to the unprecedented erection of residential structures and the emergence of new settlements at the study area. This mobility of persons, establishments of settlements and growth of communities have led to the modification of the immediate environment. Slowly but gradually, deforestation turned thick vegetation into bare fields and residential homes, houses were erected on former farmlands and animals inhabiting these areas were killed while others escaped farther into the yet to be colonized wild for temporary safety.

With the incidence and resurgence of the ethno religious conflicts in the state, more and more people are compelled to move from potentially danger imminent areas to these emerging settlements. This implies that more trees will be cut, more farmlands converted to residential homes, more vegetation depleted, more plant and animal species destroyed and more mountain configurations modified.

More closely, the study area was before the last decade covered with green grass, trees, mountains and a very sparse population. The area was equally cultivated for agriculture, but the turn of events during the last decade has led to the conversion of the area into residential buildings making the vegetation cover today diminutive, a miniature of what it used to be. With the wave of violence and crises globally, this study is thus timely as it can provide an explanation to what impacts conflicts have on the land resources in the environment especially in the destinations of migrants displaced during such crises.

### 1.1 STUDY AREA

Plateau state was created in February 3, 1976. It is located beautifully in the center of the country. It lies between latitude  $8^{\circ}24'$  north and Longitude  $8^{\circ}32'$  and  $10^{\circ}38'$  east. The figures recently published by the Nigeria National Bureau of Statistics indicate that the population of the state based on the 2006 census was 3,178,712 persons, 1,592,033 males and 1,583,579 females. Plateau state has an area of about 26,899 Sq.km and shares common boundaries with Benue, Nassarawa, Kaduna, Taraba, Bauchi and Gombe States. Plateau State has the most striking physical features in Nigeria with the High lands rising from 1,200 meters above sea level at the low lands to a peak of 1,829 meters above sea level.

Jos the study area is the state capital and is made up of Jos north, Jos South and Jos East, and the area to be studied is a strip along these Local Governments precisely the enclosure between the coordinates of  $E8^{\circ}52'44.6''$   $N9^{\circ}56'49''$  and  $E8^{\circ}55'11.7''$   $N9^{\circ}54'37''$  The total population of the area from the 2006 Census is 821,618 persons with Jos North comprising 429,300, Jos East 85,602 and Jos South 306,716 people. The other Local Government Areas of plateau state include: Barkin Ladi, Bassa, Bokkos, Kanam, Kanke, Langtang North, Langtang South, Mangu, Mikang, Pankshin, Quan 'pan, Riyom, Shendam and Wase.

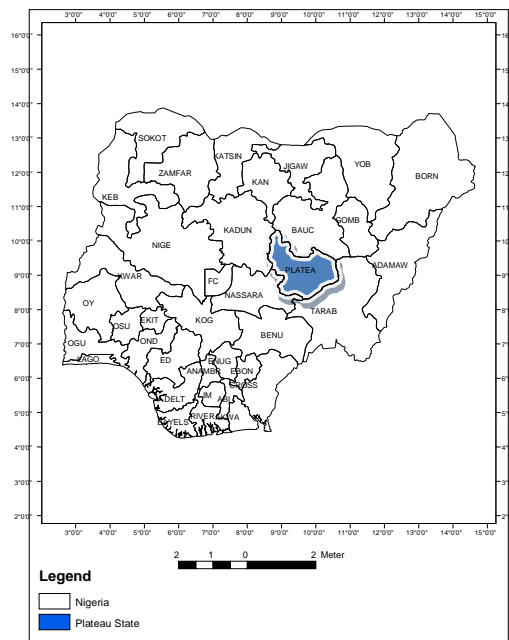


Figure 1. Nigeria showing Plateau State.

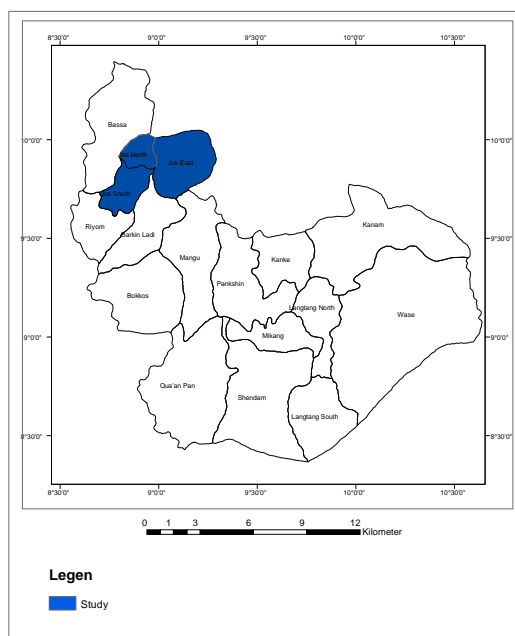


Figure 2. Plateau State Showing Study Area. 1.2 Materials and Methods

The study used primary and secondary sources for the needed data. The primary data included direct measurement of coordinates from the field and reconnaissance survey, Satellite imageries of the area, that depicted the study area before the last decade, the year 2000, 2006 and another for 2010. This was because the major conflicts under consideration occurred between 2001 and 2010. These images were used to identify the status of the area before settlers migrated to the area and what is currently present in the area. The sources of data used include the following:

Geographic Positioning System (GPS) was used for measurement of geographical coordinates and ground truthing of the area. Images from the Google earth were equally used to ascertain selected areas within the sample; the table below summarizes the data source and types.

**Table 1. Data Types and Sources**

S/N	DATA TYPE	DATE OF PRODUCTION	SCALE	SOURCE
1	Landsat Image Landsat Image	12-10-2000 17-11-2006	28.5m <sup>TM</sup> 28.5m <sup>ETM+</sup>	NCRS NCRS
2	Land use/land cover Vegetation map.	2000	1:1,495, 389 (view scale)	Plateau state ministry of Lands/survey
3	Google Earth Image	2000, 2006 and 2010	1m	Internet
4	Crises displacement and settlement data	-	-	Center for Peace and Conflict Resolution in Jos
5	Displacement reports and data	-	-	Nigeria Human Rights Watch
6	Settlement and displacement data	-	-	Displacement Monitoring Center, Norway

**Geo-referencing Properties of the Images**

The geo-referencing properties of 2000, 2006 and 2010 were resampled to the same geo-referencing properties.

Referencing system: UTM-31

Reference units: m

Unit distance: 1

Minimum X: 1150070.296

Maximum X: 1145591.302

Minimum Y: 1101261.377

Maximum Y: 1105638.767

Min Value: 1  
 Max Value: 5

### 1.2.1 SOFTWARE USED

Basically, the softwares used for this project include a combination of the following;

- i. **ERDAS IMAGINE 9.1** – This was used for displaying, processing and enhancement of the image. This was also used for the development of land use land cover classes (Supervised Classification).
- ii. **ArcGIS 9.3** – This was used to vectorize the Jos region from the whole Plateau State admin and local government maps. Clipping the study area from the composite landsat images was also done in ArcGIS environment. Area calculations for the various Land use classes was carried out in ArcGIS environment, it was likewise used to compliment the display of the data.
- iii. **IDRISI ANDES** – Change detection analysis and Projection of the study area were executed using this software.
- iv. **MICROSOFT WORD 2010** – was used basically for the presentation of the research.
- v. **SPSS 17** – This statistical package was used to perform statistical analyses and test the postulated hypotheses.
- vi. **Microsoft Excel** - This was used in computing figures, produce tables and plot charts.

Table 2. Classification Scheme, a Modification of FORMECU 1995

LAND USE/LAND COVER TYPES	DESCRIPTION
<b>Settlement / Bare Surface</b>	Areas that have been populated with permanent residents or covered with Scanty grass and exposed rocks, and bare lands.
<b>Shrub land / Farmland Complex</b>	An area of land covered mainly with shrubby plants and crops
<b>Forest / Vegetation</b>	An area of land covered with mature trees and other plants growing close together.
<b>Water Body</b>	Areas covered with water such as dams and rivers.

### 1.2.2 Sampling Procedure and Technique

The choice of the sample comes as a result of the peculiarity of this study, such that the site is one of the sites that was once characterized by numerous land resources but has over time due to the series of crises been modified by resettlements of the displaced persons and migrants from crises prone areas. The choice also comes from the fact that the study area is located in Jos the state capital where the crises have predominated in the last 10 years.

Similarly, Episodes of mass killing and destruction have occurred in Jos in 2001, 2002, 2008 and 2010 (Higazi, 2011). It is therefore upon this basis that a systematic sampling has been carried out using 3 images. The selection of the images was done such that the first image of the area showed how the study area was before the crises began in the last decade i.e. year 2000, the second is the 2006 image, which was chosen in view of the two major conflicts that have occurred within this time frame from the year 2000. The final image is that of the year 2010, also chosen against the background of the 2 major conflicts that characterized the time frame from the year 2006 to 2010.

### 1.3 RESULTS AND FINDINGS

Recent studies that reflect the global rate of land resource degradation show that something has to be done to salvage the rapid loss of land resources. Much more assertively and as proven empirically from recent studies as well as this; over twenty-four per cent of the land area has been degrading over the last 25 years, directly affecting the livelihoods of 1.5 billion people Bai et al (2008). Land degradation is not an immediate impact that can easily be measured within a short period, as explained by Bai et al (2008).

**Table 3. Land Use and Resource Distribution (2000, 2006, 2010)**

Land Cover Types	Study area 2000 (m <sup>2</sup> )	Area (%)	Study area 2006 (m <sup>2</sup> )	Area (%)	Study area 2010 (m <sup>2</sup> )	Area (%)
Farm land	6673408	35.430	3985072	21.157	3073280	16.316
Built Up Area	10559696	56.062	13998320	74.318	15077104	80.046
Open Space	148960	0.791	144256	0.766	97216	0.516
Water Body	36064	0.191	0	0.000	0	0.000
Thick Vegetation	1417472	7.525	707952	3.759	588000	3.122
<b>Total</b>	<b>18835600</b>	<b>100</b>	<b>18835600</b>	<b>100</b>	<b>18835600</b>	<b>100</b>

$$\text{(Trend) Percentage change} = \frac{\text{Observed change}}{\text{Sum of change}} * 100$$

The table above shows the numerical extent of change that has taken place in the area from the 2000. It is observed that between the year 2000 and 2006, farmlands reduced by 14%, and by another 4% between 2006 and 2010. The implication of this is that after a few years, there will be little or no lands to cultivate anymore within the study area. Consequently, agricultural food production will be affected and that will equally reflect in the output as well as cost of living in this area.

Significant reduction can also be seen in the amount of water body in this area. To begin with, in the entire area being considered, the water body present is relatively small (36,064 m<sup>2</sup>), which explains why by the year 2006, no trace of this water parches can be seen. The emerging structures and the dire human need for water has gradually but completely obliterated the amount of water in this area. What this also portrays is the reduction in the irrigation farming practiced along streams in some part of the study area.

The shrink in the vegetal cover of the area is equally significant, about half of the vegetation in the area was lost between 2000 and 2006; 1417472 m<sup>2</sup> in 2000 and 707952 m<sup>2</sup> in 2006. Deforestation was massive within this period and there was an encroachment of farming activities into this area. This is also reflected in the image such that by 2010, evidence of terrace farming could be seen as large portions of the mountains were cultivated.

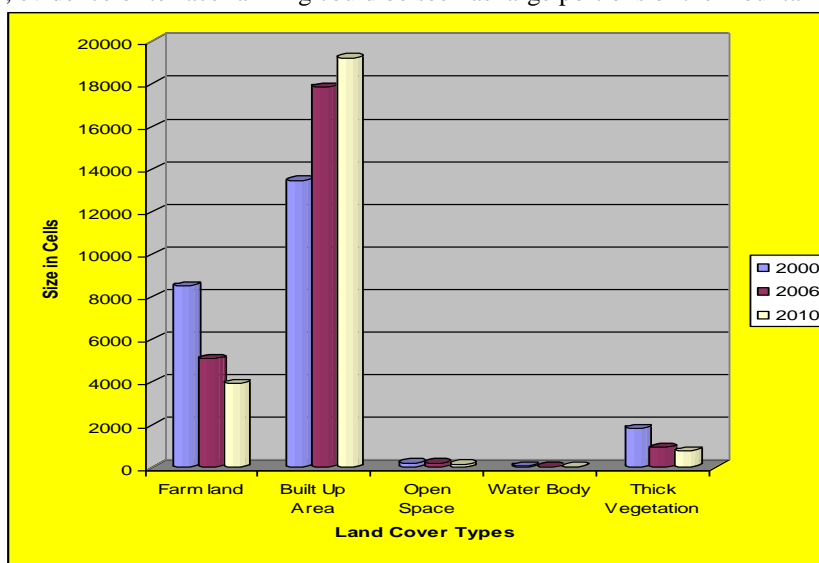


Figure 3. Land Use and Resource Distribution (2000, 2006, 2010)

The graph above shows the decline and increase in the amount of resources and use of the land in Jos. The rate of decline and increase between 2000 and 2006 is relatively higher than that of 2006 and 2010. The reason being that the time frame and the number of conflicts between the periods being considered are not the same. Also depicted is the replacement of all the land resources by the built up area at a very rapid rate.

The 2000 satellite image below shows that in the year 2000, precisely the preceding year before the crisis in the last decade (2001 – 2010), the study area within Jos had a large expanse of numerous land resources, ranging from the thick vegetation, to the green grassy fields, the beautiful mountains and some parches of water bodies. Though the water body in this region is relatively small, only constituting 36, 064 m<sup>2</sup>. The thick vegetation especially in the Tagir Zangam, Lamingo and Shere Hills areas provided habitation for animals like monkeys, snakes, alligators, rabbits, birds and many other species of animals. In the past, these animals

occasionally wonder into the township and back, but nothing of that sought is visible again.

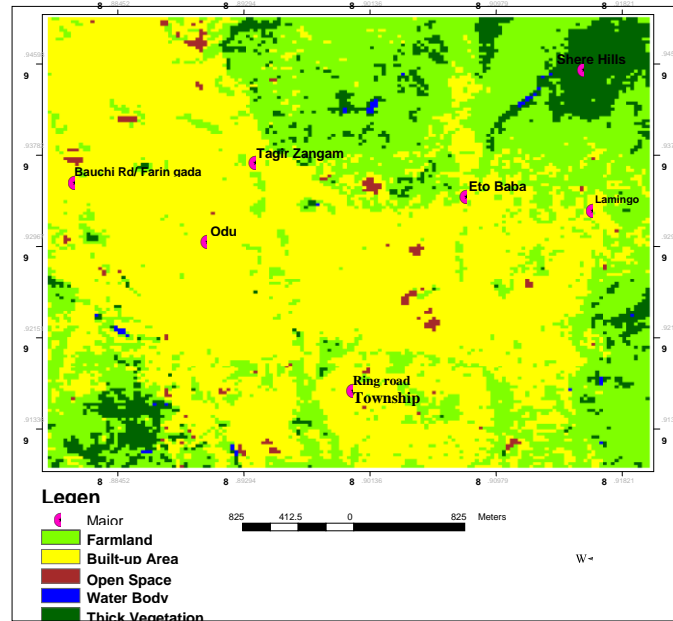


Figure 4. Land Use and Resource Distribution of Jos (2000)

The thick forest provided trees for fuel wood for many of the women who resided around these areas, while few hunters are often seen returning with their fortunes of kills from their traps and hunting escapades. The mountains had their original configurations and served as habitat for many living organisms. Occasionally tourists visit the site for tourism. From the image above, along the Lamingo, Tagir, Eto Baba areas, a lot of farming activities took place; these areas are made up of vast arable land resource used for cultivation and many of the dwellers were primarily farmers. However a shadow of this is the reflection at the wake of the other side of two conflicts.

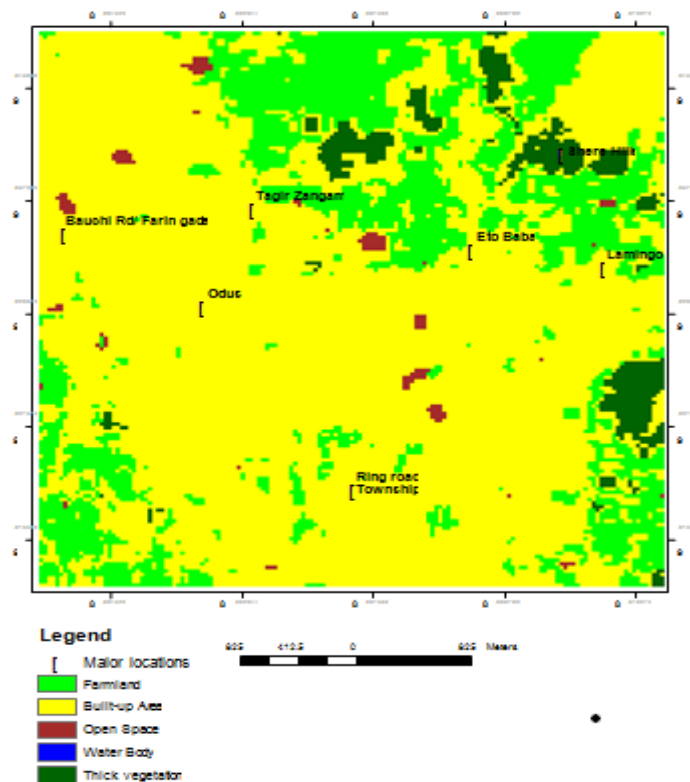
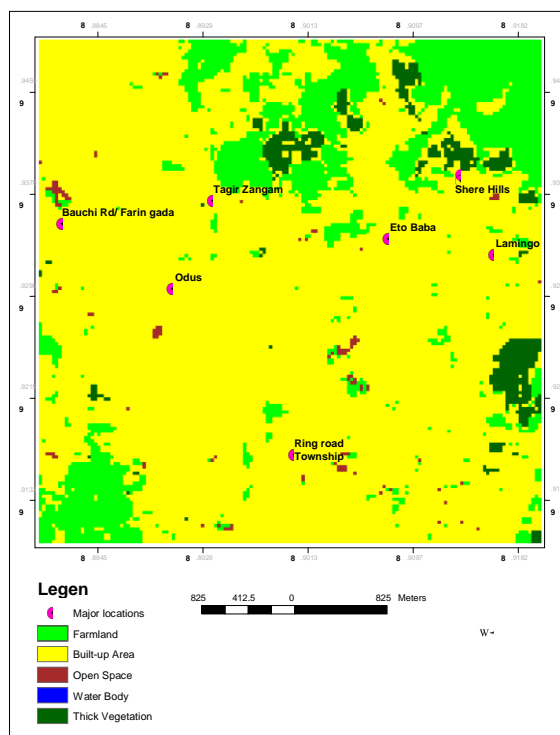


Figure 5. Land Use and Resource Distribution of Jos (2006)



**Figure 6. Land Use and Resource Distribution of Jos (2010)**

The table below gives a breakdown of the number of conflicts experienced in the last 10 years and the number of impelled migrants as recorded by the Human Rights watch, Norwegian Refugee Council and the international center for internally displaced persons.

**Table 4. Major conflicts and Impelled migrants in Jos from 2000 to 2010**

Years of major conflict incidence in Jos Plateau State	Number of Impelled migrants in Jos
2001	60000
2002	3000
2008	25000
2010	18000

**Source: Human Rights watch, Norwegian Refugee Council and the International Center for Internally Displaced Persons.**

Between 2001 and 2010, a total of 5 major conflicts have occurred in Jos and a total of 106,000 persons have had to move from their initial place of residence to new areas within Jos.

By 2006, 2 conflicts have occurred as explained in the literature review, one at 2001 and another in 2004, with a mild one in 2002. Satellite images analyzed shortly after the 2001 conflicts did not show marked differences in the extent of land resources; this owes to the fact that many victims of the conflicts thought the 2001 conflict was the first and the last of its kind hence they could return back to where they were displaced from. Sadly however, the conflicts kept resurging and so victims had to look for other alternative places for their safety.

These areas under this study were considered to be relatively peaceful and largely dominated by a single religious group, for this reason it provided refuge for those who were displaced both on the short and long term. Like the image above shows, people began settling and erecting their structures in these places.

What this portended for the area was that by the end of 2006, as the image shows in areas around Shere hills and areas above Odus, Lamingo, Mazah, lots of the farmlands were converted to homes and residents of individuals, while the thick vegetations were replaced by agricultural lands, the trees in these areas were massively exploited, making the once upon a time vegetated area to become shrubby and exposed; with large expanse being used for agriculture.

The effect of this on the biodiversity no doubt is very significant as species of different organisms were rapidly lost while others sought refuge farther into the wild. Many streams and flowing rivers got dried up due to

interception by unplanned erected structures and because of the demand on water by the ever increasing population in the area.

**Table 5 Rate of Change and Degradation in Jos (2001 – 2010)**

<b>Land Cover Types</b>	<b>Rate of Degradation between 2000 and 2006 (Year 2006 – Year 2000/6) m<sup>2</sup></b>	<b>Rate of Degradation between 2006 and 2010 (Year 2010 – Year 2006/4) m<sup>2</sup></b>
Farm land	2,872,837	2,077,012
Built Up Area	12,238,371	11,577,524
Open Space	119,429.3	61,152
Water Body	30,001	3,233
Thick Vegetation	471,706.7	411,012

The rate of degradation in the study area as shown in the table above shows that the built up area ranks highest with a land area of about 12,238,371 m<sup>2</sup> within the 6 years from the year 2001 and 2006 and by 2010 another 11,577,524 m<sup>2</sup>. This is followed by farmlands, thick vegetation and the open space. It should be noted however that the land area is constant and so any change in one use of the land or the available resource is an encroachment on the other.

The 2010 image shows the effect the 5 major conflicts in Jos plateau state has had on the land resources in this area. By 2010 many victims of previous conflicts have chosen to seek permanent residence in the area, subsequently, large mountains were blasted along the Lamingo, Shere hills and Tagir Zangam areas; all in a bid to accommodate the influx of people. Houses replaced farmlands and thick vegetation and it is evident at this time as shown in table 4.3 above, that the rate of depletion of land resources was high. The images also show that in many of the marked areas, with every crisis comes an influx of a large number of population. It was gathered on the field that prior to 2001 when the first crisis was experienced, the area opposite Odus, along the University of Jos Senior staff quarters, was characterized by a thick vegetal cover with few patches of farmlands. 10 years afterwards, this same area has metamorphosed into a residential area and a semi urban area. Many of the residents there are students and family units who had to relocate from the conflict zones due to the violence meted on them during the crises. This area has since seen development now with so many investors raising structures to be rented out, families are settling and resettling there and services are fast emerging to meet the growing human population need in the area.

Another significant result evident from the image was the fact that the water body in the area was conspicuously absent by 2010, this first of all was because the entire area under this study has a relatively low area of water body, about 0.19% of the entire area. This amount is largely composed of streams and rivers which are equally subject to drying off during the dry seasons. Furthermore, the groundtruthing reflected that water is usually a scarce commodity within that area, especially in the dry seasons, which perhaps explains why many resort to underground water sources, principally wells.

By 2020; the built up area would have taken over about 80% of the total area while the land resources will only be found in 20% of the total area. The test that there is a significant relationship between migration and the depletion of land resources gives a coefficient of correlation (-0.458) at a 95% probability level and a P of 0.042, shows that there is a relationship between migration and degradation of Land resources. This relationship is however an inverse one; when there are more migrants, the rate of degradation is high; implying a reduction in the available land resources, while the lower the number of migrants, the more the amount of land resources available. This further agrees with the Short Term Outlook Theory reviewed earlier, that migrants often have expansionist attitudes that fail to consider long-term effects of resource extraction and land-uses. This invariably suggests that when people are displaced during conflicts and they move to other areas, they are more concerned with their survival, in a bid to survive, they explore and exploit more land resources and this is coupled with the fact that their family sizes will be on the increase with time portraying more need of land resources.



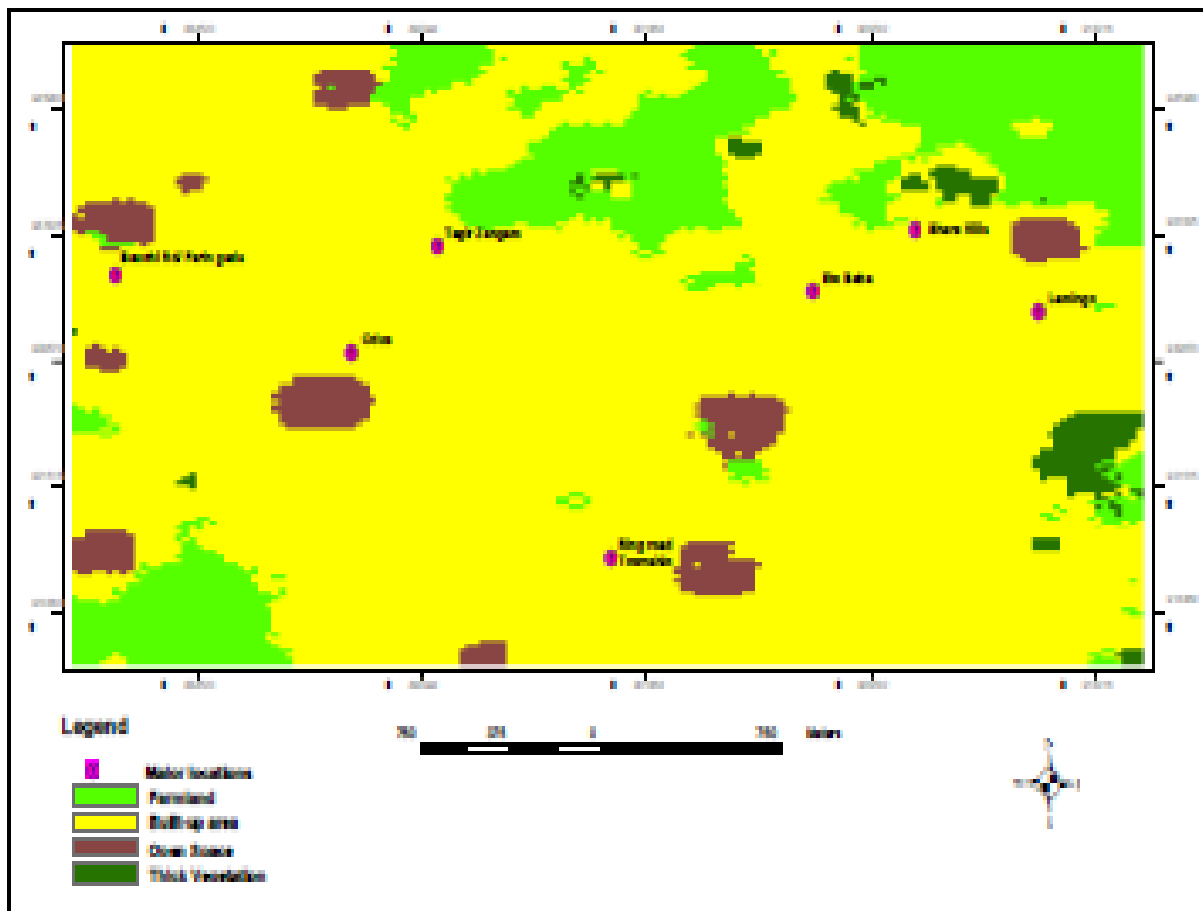


Figure 7. Projection of Land Use and Resource Distribution of Jos (2020) using the Markov Chain analysis

The image above reflects how the study area will look like in the year 2020. From the image it is obvious that little or no land resources with respect to arable lands, tree resources, vegetation and mountains will be present save for the far extremes which once had thick vegetation but will then be replaced by farm lands. This trend has its implication as reviewed in the literature. This forecast shows that by the year 2020, in the study area, there will be increased demand and pressure on land resources; this will show up in forms of declining crop production, biodiversity loss, degradation of land quality and quantity, and competition for land. No accessible forest cover will remain, the deforestation, which includes the cutting of agricultural terraces on steeper and more marginal mountain slopes, will lead to a catastrophic increase in soil erosion and loss of productive land through accelerated landslide incidence, and a disruption of the normal hydrological cycle.

Table 6. Correlation between the rate of degradation and the displacement of persons

		Rate of Degradation between 2000 and 2010	Number of displaced person in Jos
Rate of Degradation between 2000 and 2010	Pearson Correlation	1	-.458
	Sig. (1-tailed)		.042
	N	5	4
Number of impelled migrants in Jos	Pearson Correlation	-.458	1
	Sig. (1-tailed)	.042	
	N	4	4

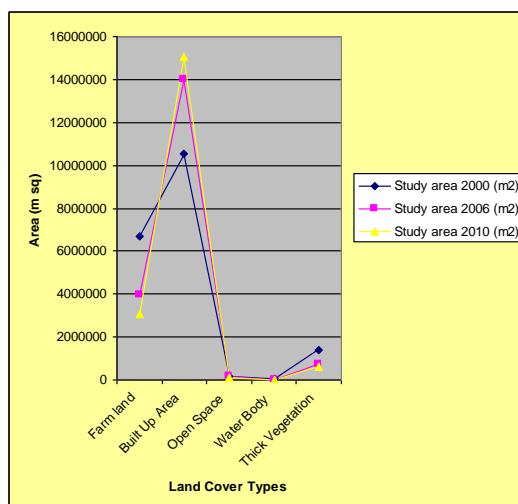


Figure 8. Land Use and Resource Distribution of Jos (2000 - 2010)

The chart above reflects the various attributes being considered and how each of these has changed in the last 10 years. A decrease can clearly be observed in the amount of farmlands, Open space, water body and vegetation. While an increase is seen in the expanse of the built up area, the increase is such that it can only expand into the other land resources, the relationship can be said to be an inverse relationship, an increase in built up areas leads to a decrease in the other land resources.

There is also a relationship between the incidence of conflicts and the rate of land resource depletion. The correlation below shows that there is a significantly high relationship between incidence of conflicts and the rate of land resource degradation. The coefficient of correlation is 0.998 with a significant value of 0.002. This illustrates that as the number of conflicts increase, there is a greater risk of land resource degradation such that increase in conflicts lead to increase in the number of forced migrants consequently; this increases the rate of land resource depletion. Furthermore, what this result suggests is that if more conflicts occur in the future, the risk of losing more land resources is imminent

Table 7. Correlation between the rate of degradation and the rate of degradation

Control Variables			Rate of Degradation between 2000 and 2006	Rate of Degradation between 2006 and 2010
incidence of conflicts in Jos	Rate of Degradation between 2000 and 2006	Correlation	1.000	.998
		Significance (2-tailed)	.002	.002
		df	0	2
	Rate of Degradation between 2006 and 2010	Correlation	.998	1.000
		Significance (2-tailed)	.002	.002
		df	2	0

Table 8. Transition Probability Table

	Farm land	Built Up Area	Open Space	Water Body	Thick Vegetation
Farm land	0.2411	0.6912	0.002	0	0.0657
Built Up Area	0.1188	0.8302	0.0461	0	0.0049
Open Space	0.145	0.7521	0.1029	0	0
Water Body	0.1739	0.5	0	0	0.3261
Thick Veg.	0.7053	0.2017	0	0	0.0931

The transition probability matrix records the probability that each land cover category will change to another category. This matrix is produced by the multiplication of each column in the transition probability matrix by the number of cells of corresponding land use in the later image. The Markov Chain analysis helps in

its derivation. These numbers show the probabilities that a land cell will be in the different categories at a sufficient distant point in time, this is presented in the table above.

The rows represent the older land cover categories and the column represents the newer categories. Although this matrix can be used as a direct input for specification of the prior probabilities in maximum likelihood classification of the remotely sensed imagery, for this study however it is used in predicting land use / land cover of the study area in 2020. The table above shows the Transitional Probability table derived from the land use land cover map of 2000 and 2010. Row categories represent the land resources and land use classes in 2010 whilst column categories represent 2020 classes. As seen from the table, farmlands have a 0.2411 probability of remaining farmland and a 0.6912 probability of changing into a built up area in 2020. This therefore shows an undesirable change (reduction), with a probability of change which is much higher than stability, implying that there is a higher possibility of farmlands converting into built up areas. An intriguing reflection on the probability table is the fact that water bodies could metamorphous into thick vegetation with a probability of 0.3261 in the study area by the year 2020. In the same vane, by that same 2020, all the open spaces would have been obliterated.

#### 1.4 THEORETICAL IMPLICATIONS OF FINDINGS

Seizing a base from the theories earlier reviewed, what these findings portend is a contextual conformity to the theories adopted for this research. To start with, the Catastrophe theory, models the situation of Jos before the series of conflicts in Jos. Where there was peaceful existence between over 50 different tribal groups for so many years, before the residents reached the hostility stage stated in this theory, where values and interests began to differ. Usually when this stage is reached, an actor has an aggression toward other actors. Within an actor, each individual record their hostilities toward other individuals and actors, the actors in this case are the various interest groups and religious groups who could not resolve their differences through peaceful dialogues but had to resort to violent means. After conflicts broke out in the state, there was a safety and security need for the residents, especially those where the conflicts are most dominant. During this period, what preoccupies the minds of the victims is their safety and security needs. It is at this point that the Maslow's hierarchy of needs comes to play and we are interested in the second stage of the hierarchy where victims sought for their safety needs. This theory transits then into the Ravenstein's Push and Pull Model. At this stage victims of the conflicts in Jos, were confronted with the choice to move and where to move to in order for their safety to be ensured. The conflicts became the push factors while the perceived place of safety i.e the destination became the pull factor. Some of the characteristics of these forced migrants in Jos, conformed to a number of the assumptions of the Ravenstein model. These include the fact that

- Most of the migrants travelled only a short distance.
- The migration occurred in steps, this is because people first sought safety in security camps, before moving to reside with family and friends and finally settling within the perceived safe areas.
- Each migration flow produced a movement in the opposite direction ("counter flow").
- Most migrants are adults.

The other two theories are the Short Term outlook theory and the Resource depletion model. In conformity to the Short Term Outlook Theory and the Resource Depletion model, in a bid to survive and be comfortable, residents of Jos who were displaced during the conflicts having moved and resettled at the peri-urban areas of Jos, they explored and exploited all the available resources within their immediate environment. Over time, these resources got exhausted and there was a need to expand outward into areas that have not been exploited. Eventually, this led to a progressive increase of human population who have come to resettle in that region as well as an increase in the extent to which these resources are depleted within that area.

#### 1.5 CONCLUSION

At this point it is imperative to know that long and sustained human settlement in the absence of resource management systems has led to an acute depletion of natural resources, particularly arable land and forests. If the reality that Ethiopia faced a few decades ago is to be avoided in Jos, and indeed, conflict torn regions, more proactive actions need to be taken by individuals at all levels of the government at ensuring the preservation of the rapidly dwindling resources slipping off our finger tips. For the Horn of the Africa region, its inhabitants endured a series of famines, at least 4 major ones since the 1970s and these are closely linked to the depletion of land resources.

The reason for all these emphases is so that prompt actions can be taken in Plateau state and other conflict torn societies so as to avoid their plunging into an unpalatable predicament of declining size of landholdings, decrease in; arable lands, food grains, livestock feed, habitats of organism, biodiversity loss, deforestation and the ultimate hazard of climate change and global warming among other numerous hazards.

A school teacher once said, “The single act of cutting down trees is an automatic reduction in a life.” By implication, the act of degrading land resources irrespective of how little or insignificant it may seem has a negative impact on the interaction in the cosmos, the effect which may not be immediate is more often than not gradual and critical; hence, a need for more informed action and multi-stakeholder cooperation; to preserve and hand down to posterity a good amount if not all, the many resources that were once handed down to this generation.

## REFERENCES

- Bai, Z. G. Dent, D. Olsson, L. L. & Schaepman, M. E. (2008) Review Article Proxy global assessment of land degradation. The Authors, Journal compilation (2008) British Society of Soil Science, Soil Use and Management. Vol 24, 223–234.
- Blench, R. Dendo, M. (2003). Migration 'The City Is Our Farm' Nigeria: Drivers Of Change Component Three – Output 30, Prepared For DFID, Nigeria 8, Guest Road Cambridge CB1 2AL United Kingdom. [Http://Www.Rogerblench.Info/RBOP.Htm](http://www.Rogerblench.Info/RBOP.Htm). 8 - 12.
- Cassels, S. (2006). Livelihoods, and the Environment, Panel Contribution to the PERN Cyber seminar on Rural Household Micro-Demographics, Center for Studies in Demography and Ecology, University of Washington. 1 – 3.
- De Souza, R.M. Williams, J.S. and Meyerson, F.A.B. (2003). Critical Links: Population, Health, and the Environment, population bulletin Vol 58, No 3, a publication of the population reference bureau. 8 – 12.
- Guinness, P. and Nagle, G. (2008). Advanced Geography Concepts and Cases, Revised edition. Hodder Education part of Hachette Livre UK. 31 – 36
- Harrison, P. and Pearce, F. (2000). America Association for the advancement of science AAA Atlas of & Environment, University of California Press. Ltd, London England. 43 -47.
- Higazi A. (2011). The Jos Crisis: A Recurrent Nigerian Tragedy, Discussion Paper No. 2, January 2011: 1 – 35.