ASSESSMENT OF PANGOLIN STATUS AND HABITAT LOSS IN ONDO STATE, NIGERIA USING REMOTE SENSING AND GIS.

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Introduction

Pangolins have received global attention with the news that the COVID-19 pandemic potentially came from pangolins in a Chinese wet market but

DO YOU KNOW?
Pangolins are the most trafficked animal in the world

There are four indigenous to sub-Saharan Africa; the black-bellied pangolin (Phataginus tetradactyla), white-bellied pangolin (P. tricuspis), giant pangolin (Smutsia gigantea) and Temminck ground pangolin (S. temminckii).
Pangolins habitats are of various types including tropical and flooded forest, thick bush, cleared and cultivated areas, and savannah grassland. They inhabit places where large numbers of ants and termites are found (Helwig, 2007; Odewumi, O.S and Ogunsina, 2018).
In 2019, the white bellied pangolins and the Giant pangolins were accessed by IUCN are currently listed as endangered while the ground pangolin and the black-bellied pangolins are listed as vulnerable (IUCN Red List of Threatened Species, 2019)
This study aims to establish and access the presence and status of Pangolin, access the environmental factors and deforestation in Ondo state.

Data

LandSat Imagery - Surface Reflecrance Data (1986, 2002 & 2016) on Google Earth Engine and Rainfall Data from CHRS Data portal

Software

ArcMap

Google Earth Engine

Methodology

To establish the presence and status of pangolin in the state, the focused group consisting of market bush meat sellers, community leaders, hunters and pepper soup joint owners were interviewed. The method adopted in this study is the post-classification method. Supervised Classification technique was used to separately classify Landsat SR data using Random Forest classifier algorithm for the year 1986, 2002 and 2016. The following environmental factors were assessed - Rainfall, Land Surface Temperature, NDVI and Land Use/Land Cover. Fuzzy Logic Suitability was used in the modelling of the habitat suitability
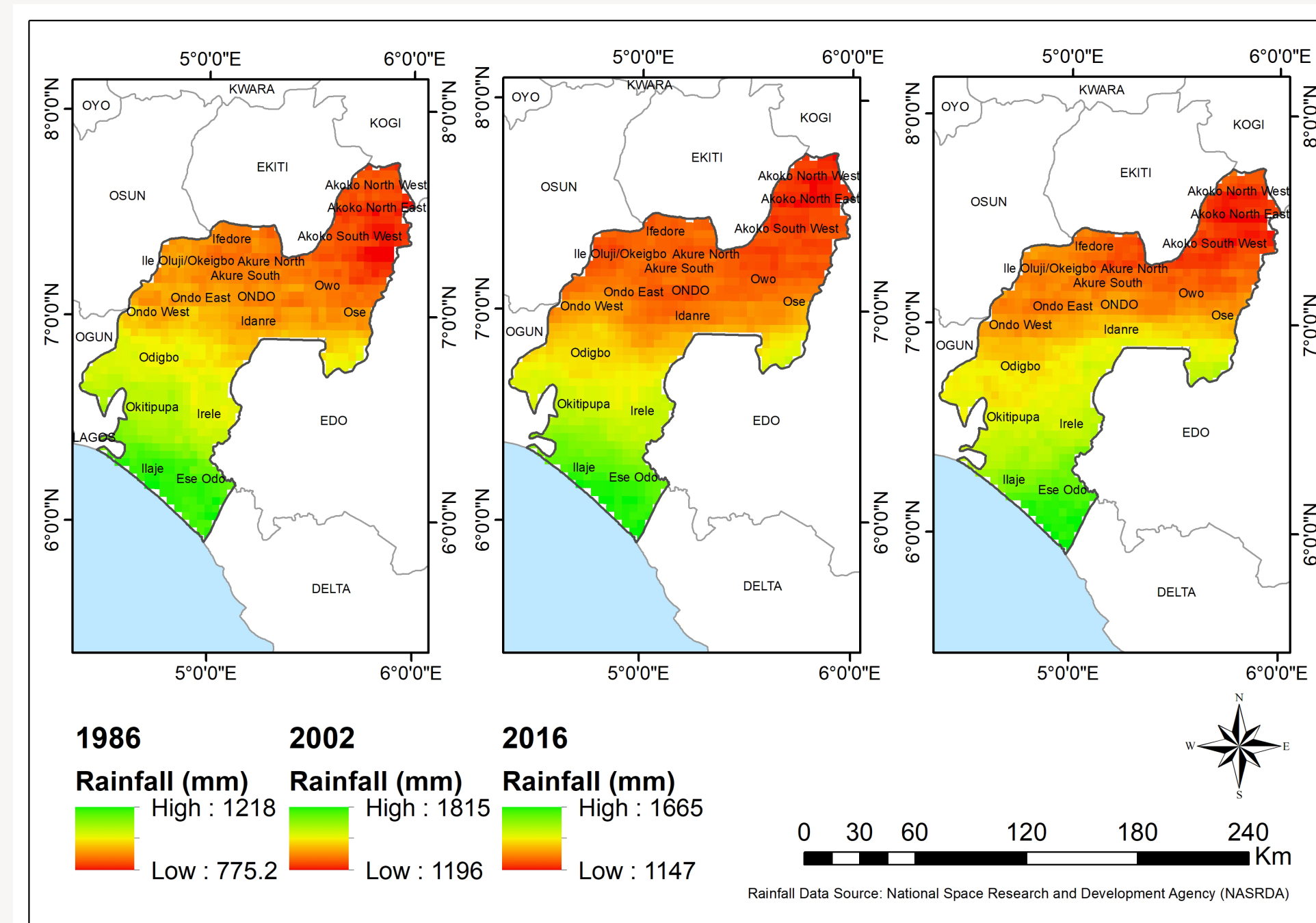
Results and Discussion

Figure 1: Rainfall Map of the Study area

It can be deduced from the interviews that the population of Pangolins are dwindling at an alarming rate. Every of the meat sellers reported steep decline in the amount of Pangolins hunted. .
The environmental factors of the study area was accessess and maps were created for these factors. They are (i) Rainfall, (ii)Land Surface Temperature (iii) NDVI (iv)Land Use /Land Cover
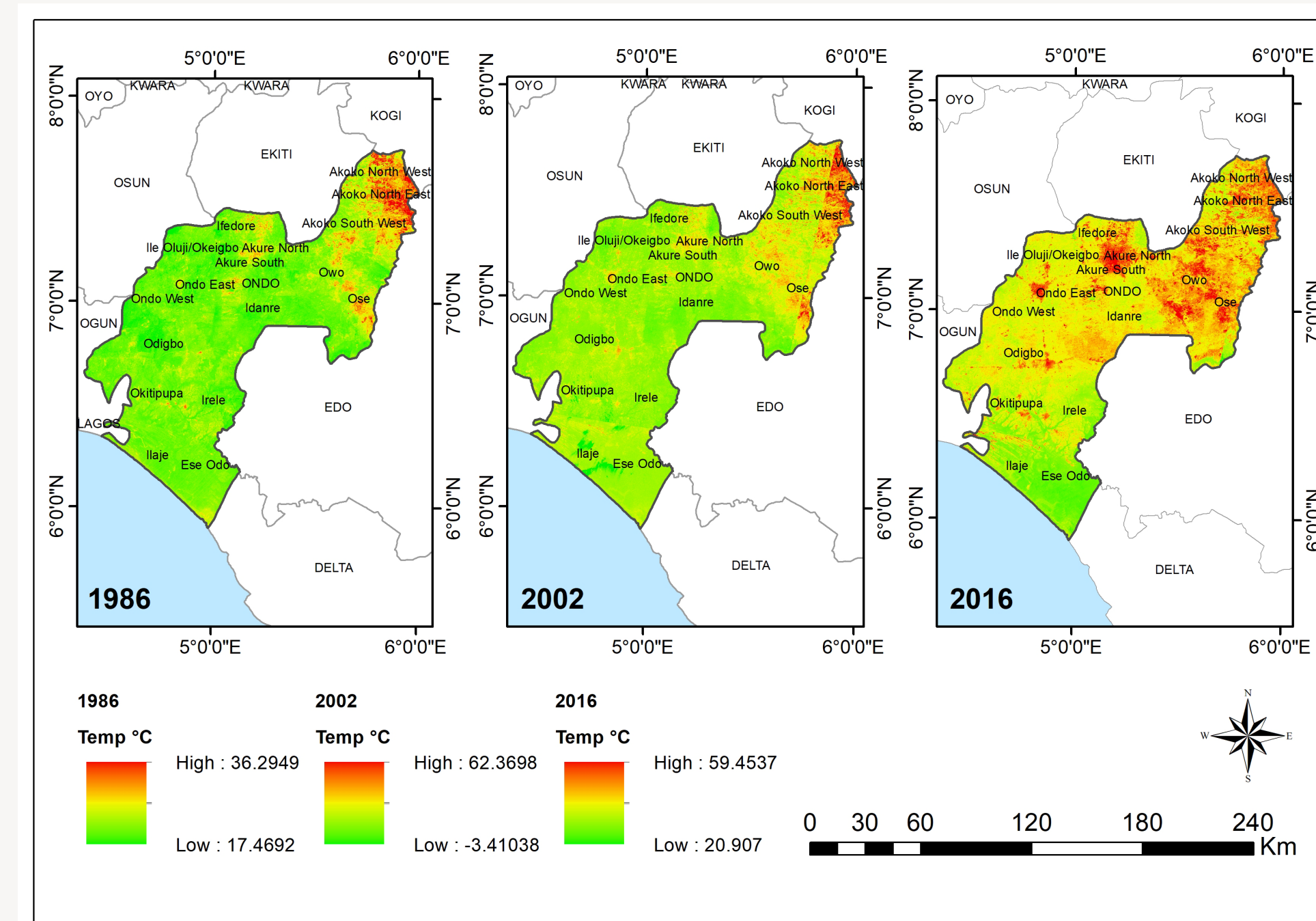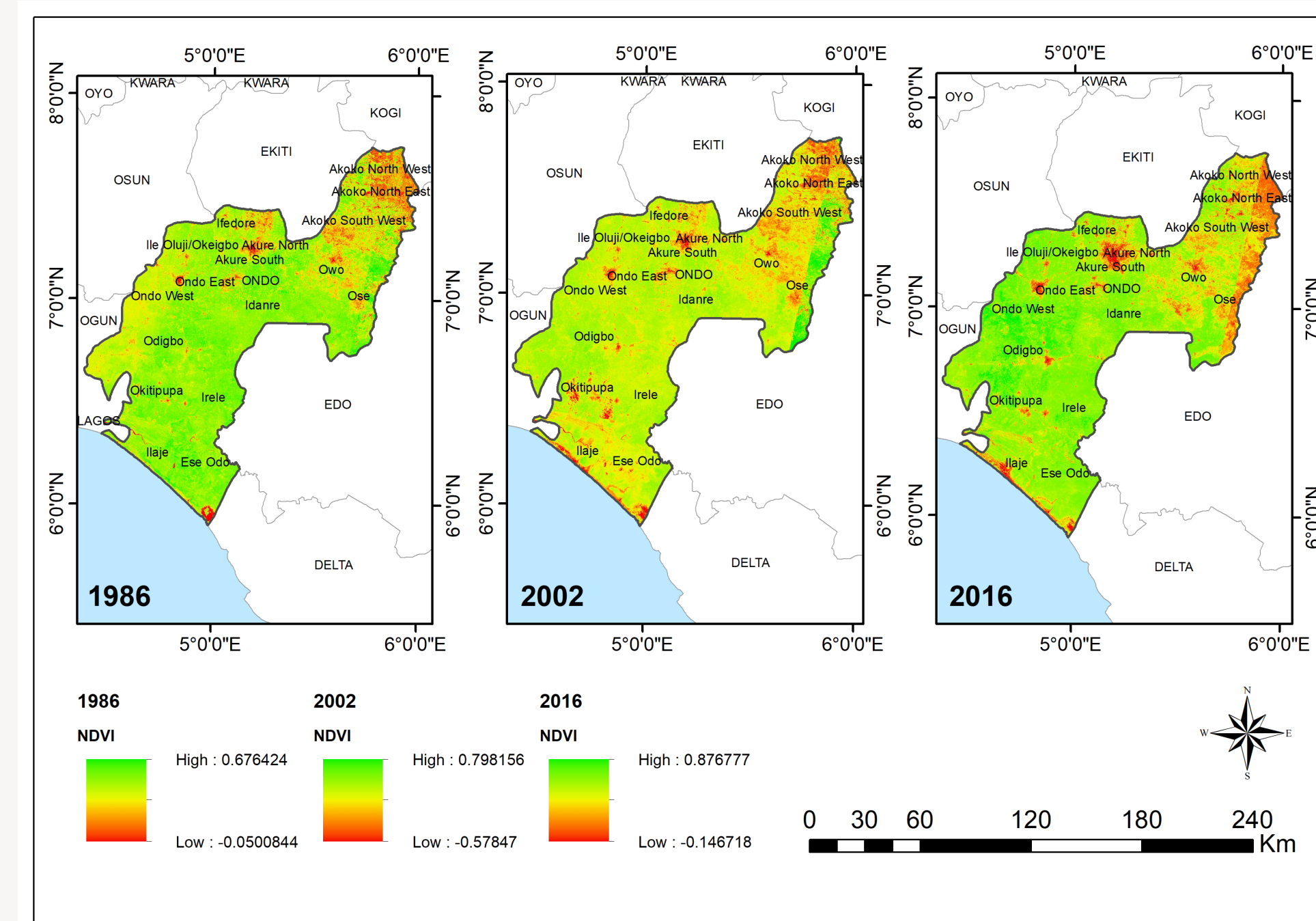

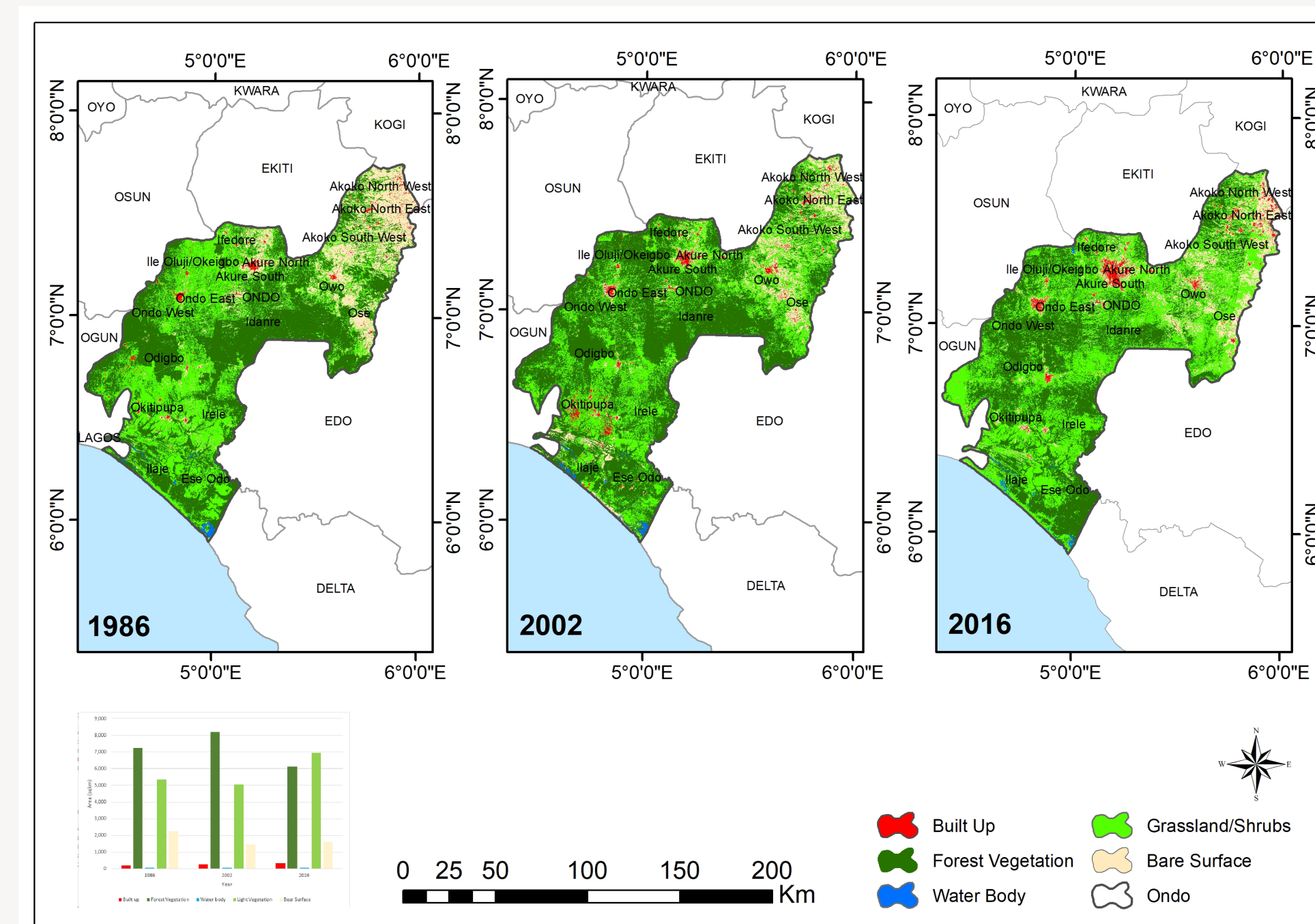Figure 2: LST Map of the Study area

Figure 3: NDVI Map of the Study area

Figure 4: LULC Map of the Study area

Land Use Land Cover Change between 1986-2016

Class Name	1986 Area (Sqkm)	%	2002 Area (sqkm)	%	1986-2002 Change %	2002 Area (sqkm)	%	2016 Area (sqkm)	%	2002-2016 Change %
Built up	184.62	1.23	280.75	1.87	20.66	280.75	1.87	324.76	2.16	7.27
Forest Vegetation	7237.06	48.10	8205.65	54.53	6.27	8205.65	54.53	6130.19	40.74	-14.48
Water body	56.27	0.37	54.15	0.36	-1.92	54.15	0.36	55.28	0.37	1.04
Light Vegetation	5340.97	35.49	5045.46	33.53	-2.85	5045.46	33.53	6936.90	46.10	15.79
Bear Surface	2228.22	14.81	1461.12	9.71	-20.79	1461.12	9.71	1600.00	10.63	4.54

Deforestation

From the analysis, the forest cover about 7237.06 sqkm in 1986, it increased to 8205.65 sqkm an increase of 6.27% in 2002 and decreased to 6130.19 sqkm in 2016. In total, the forest area lost about 1106.87 sqkm of land. The reduction of forest habitat makes hunting for them easier as they sometimes would have to come to the open to feed.
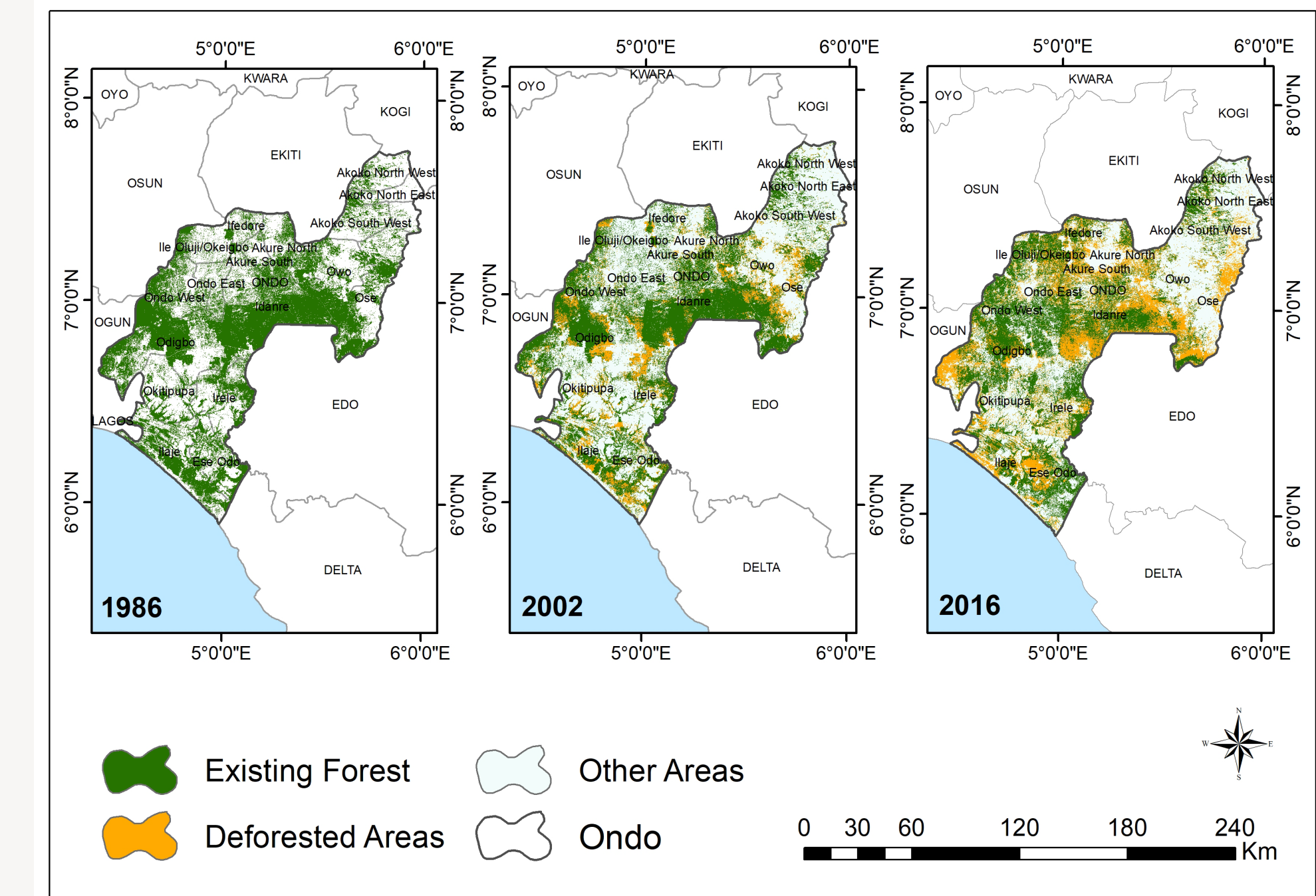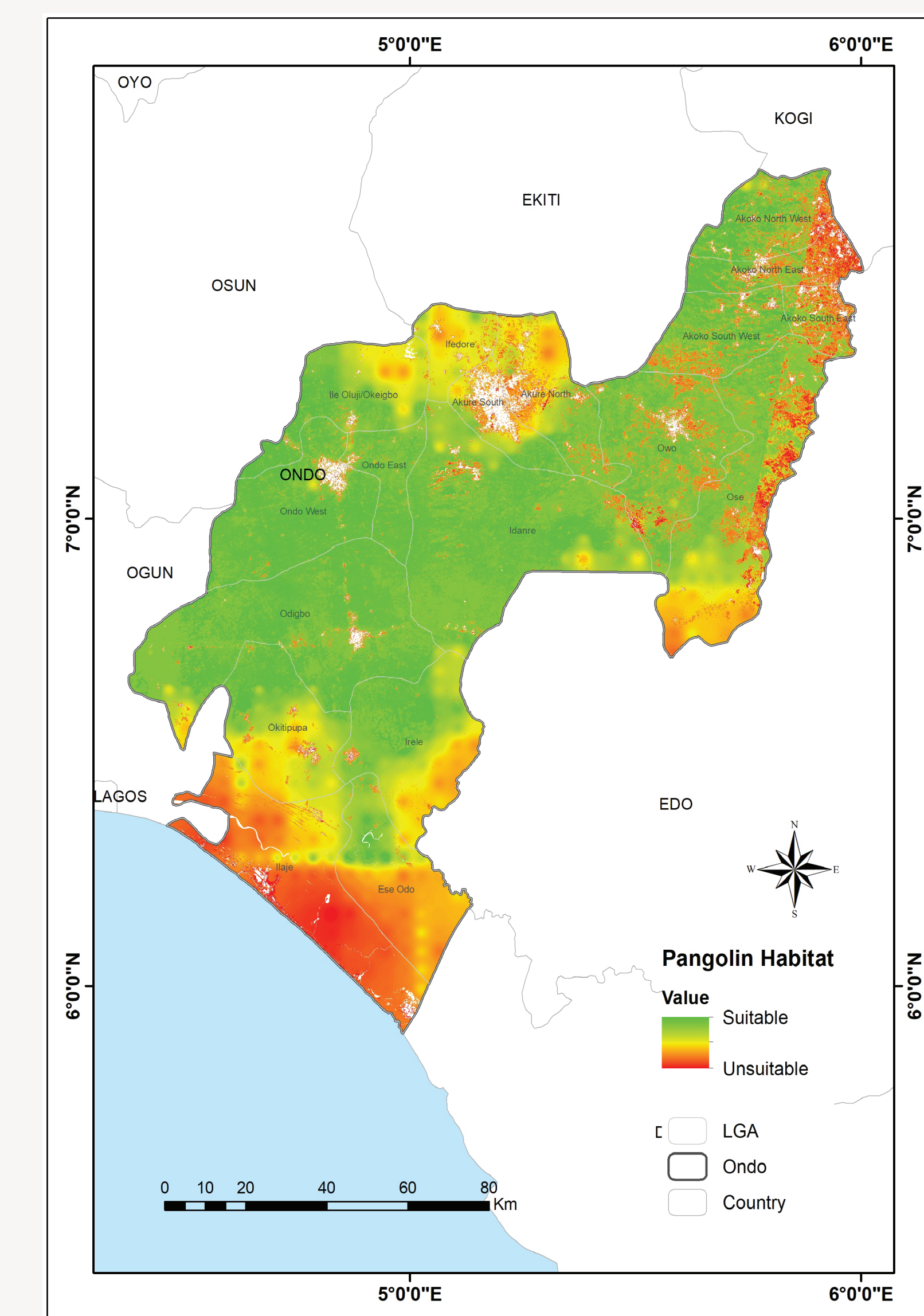

Figure 5: Map showing deforested area

Spatial Distribution of Pangolin Habitat using Environmental Factors

In the modelling of the spatial distribution of pangolin Habitats, the environmental factors considered were based on how they influence the presence of ants and termites. From the analysis the suitability of the area as pangolin habitat vary from the red to green. The red indicate areas where pangolins is less likely to be and the green areas indicate areas where pangolins are likely to live which have favourable conditions.

Figure 6. Map showing modelled pangolin habitat.

Conclusion

The population of pangolin in the state has experience a rapid decline due to exploitation for trade and local consumption. Of the interview participants, 80% get an average of 26 pangolins/month in the 80's, now 60% now get an average of 10 pangolins/year. Areas delineated in green region shows the most suitable areas for pangolin habitat. It shows that the pangolins would be readily present in areas with moderate rainfall (about the range of 1798-2250mm), places with high vegetation cover, moderate temperature and forest cover. The suitability decreases to the red region where pangolins may not be present.
The forest area lost about 1106.87sqkm of land between 1986 & 2016. The forest underwent a 14.48% decrease. The reduction of forested areas implies reduction of pangolin habitat. Agriculture is identified as the major driver of deforestation; majority of forested lands are converted to agricultural lands. Pangolins are secretive and nocturnal animals so the reduction and intrusion of the forest makes them vulnerable to poachers.