

Handwritten blue scribbles and numbers, including '34' and '10'.

contribution to net change in Urban area
87 - 2007, (B) - 2007 - 2017 and (C)

Urban Area
Water Body
0.00 -40.00 -80.00 -120.00 -160.00 -200.00 -240.00



ZeeMarz



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Influence of Land Use Dynamics on Watershed Sustainability in Suleja, Niger State Nigeria

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Introduction

Nigeria environment today is being confronted with myriads of ecological problems, which have resulted in serious degradation of many watersheds. These environmental problems are occurring at increasing and alarming rates and are being accelerated by man's activities such as urbanization, increased agricultural activities, deforestation, bush burning, civil construction works, and over-grazing and poor water resource management among others (Iroye 2015).

Suleja Local Government Area (LGA), due to its close proximity to the Federal Capital city of Nigeria (Abuja) is inhabited by an increasing majority of average earners from the Federal Capital City. However, reports abound that the study area has been impacted by Land use change. (Buba, *et al* 2016) submitted that increased infrastructural development and forest destruction due to continued population increase have resulted in an increased watershed degradation in the study area. The flooding of the study area 2017, which claimed many lives and properties and rendered many homeless (Vanguard, 2017) and the rise in gully erosion and steep slopes (Munir, 2011) in the study area, are clear illustration that the study area is being impacted by change in land use, and its watershed is degrading.

Although, various authors, (Buba *et al.*, 2016; Ilya, 2015) assessed and performed land use classification, and investigated urbanization rate across land use pattern. Evaluative methodology that could measure the changing livelihood profiles of the watershed

community quantitatively is needed. Therefore this study is aimed at investigating the impacts of land use change on watershed dynamics in the study area with the objectives of examining the land use pattern and the effects of the land use practice in the study area.

Methodology

Satellite imagery of the study area for the years 1999 and 2009 and 2018 were downloaded and processed to get the land use of the area by classifying the image into the different land use classes of built-up, farm land, bare ground water bodies and forest land. The analysis were done using the Arc GIS 10.3. Survey data from local people and key informants living in the Suleja LGA were collected through questionnaire to better understand and interpret the Land Use Land Cover (LULC) scenarios that emerged from image analysis.

Results and Discussion

The land use classes for 1990, 2008 and 2018 are presented in figures 1, 2 and 3. Significant difference was found in Land use between 1999, 2008 and 2018. The percentage changes in Forest land, Built-up Land, Bare Soil, Water Bodies and Farm Land can be 4

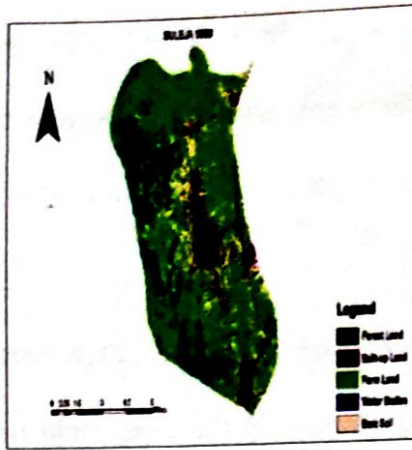


Fig 1. 1999 landuse classes

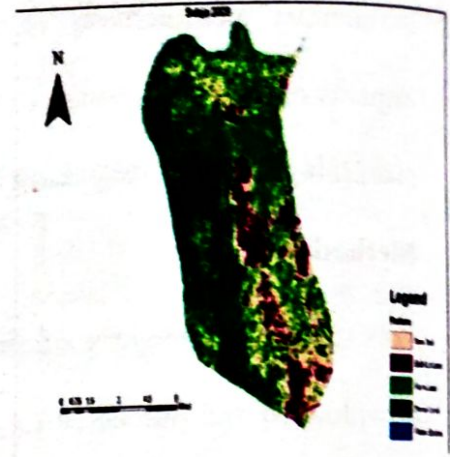


fig 2.2008 landuse class

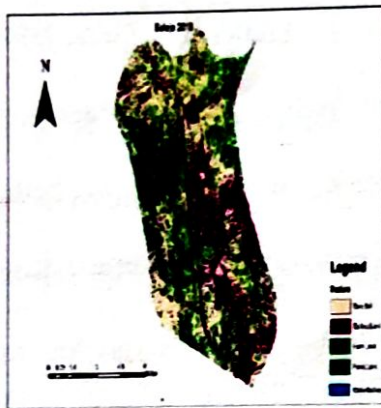


Fig 3. 2018 landuse class

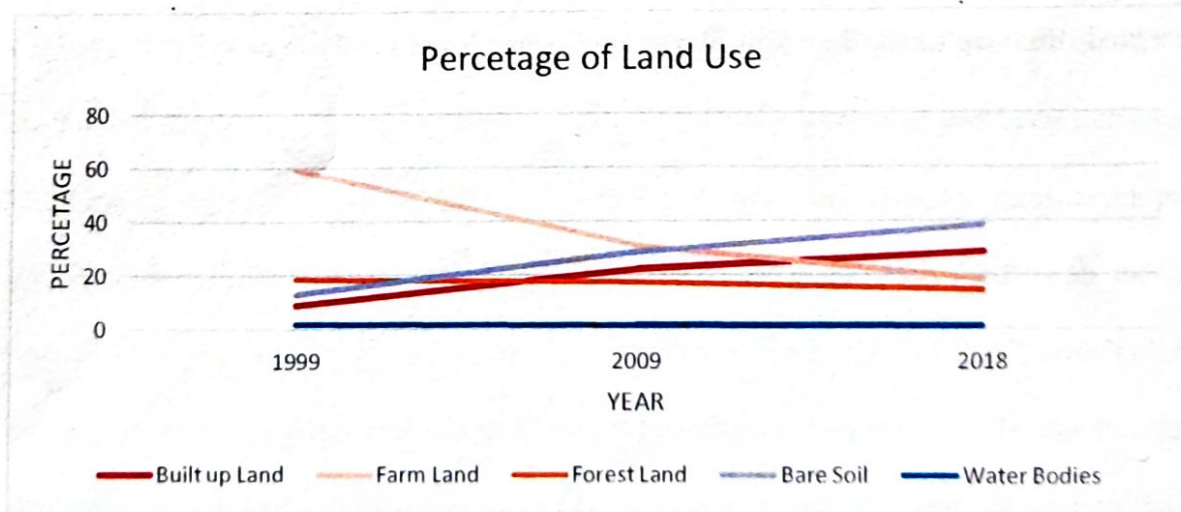


Figure 4. Percentage Landuse classes 1999 to 2018

According to percentage land used in figure 4, built-up covers an area of 8% in 1999 and accelerated to 24% in 2018. Bare soil account for 16% and 39% in 1999 and 2018 respectively while farmland on the other hand covered about 60% in 1999 and depreciated to

19 % in 2018 implying that most of the farmland have been converted to either built-up or bare soil which has contributed to the effect to the watershed sustainability.

Conclusion and Recommendations

The study was able to look at the dynamics of watershed in Suleja. These changes in land use have had negative impacts on the environmental sustainability of watershed. The study provides valuable data to better our understanding of the effects of past land use trends which can empirically predict the future environmental effects on watershed in Nigeria. The need to plant trees and grasses to reduce run-off and encourage percolation of rainfall water was recommended

Suggestion for Further Research

Further research should focus on how the elevation of the area affects the sustainability of the watersheds

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