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Degradation of Natural Resources or Necessary Intensification of Land Use to Sustain a Growing Number of Users? — The Case of the Zamfara Forest Reserve in Northwest Nigeria

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Abstract

The rural Zamfara Forest Reserve is an important grazing area for the livestock of transhumant pastoralists and the sedentary population living in the four designated farming enclaves and in bordering villages. Both farm sizes and the farmers' livestock holdings are larger than in intensified, densely populated systems where cropland scarcity and the diminution of common rangeland are driving land use intensification. Nevertheless, the farmers in the enclaves have developed a sustainable soil fertility management. But there is increasing human pressure on the communal grazing land, which stems from cropland encroachment, the immigration of landless farmers and intensive grazing, with an average annual stocking rate of 0.73 TLU ha^{-1} on the rangeland. A comparative analysis of vegetation density between 1962 and 1991, it is estimated that 71 % to 85 % of the vegetation and 50 % of the trees had been removed. The present paper examines if the reserve is on the verge of irreversible land degradation like these figures suggest, or if it is sustaining the livelihoods of increasing numbers of farmers and livestock-keepers at low but sustainable levels?

Thus, the change in land use/land cover is being analysed using CORONA images (1965), a Landsat 7 ETM+ (1999) classification and GPS referenced data on vegetation structure. Vegetation structure as ground truthing for the classification and data on the human population and livestock numbers in the enclaves were collected from February to May 2003.

The cropland surface cover increased from 1.2 % (1965) to 8.3 % with agricultural encroachment from outside the reserve accounting for 64 % of cropland areas (1999). The results of the land cover classification contest negative incremental change, as 80 % of the reserve are still covered by tree and shrub savannah. These findings are going to be verified with the field data and compared to other research results to examine if there is evidence of land use intensification in the enclaves. The paper will then describe the development of human and livestock population and discuss the data's feasibility to support or reject the degradation scenario.

Keywords: Land use/Land cover change, Nigeria, resource assessment

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