

# **Guinea Savanna Structure and Land-use in Northwestern Nigeria.**

Ero, Isaac Izogie

Ph.D. Botany

Department of Botany

Obafemi Awolowo University, Ile Ife, Nigeria

1985.

## **Abstract:**

The Guinea savanna of northwestern Nigeria was characterised using parameters of climate, soil and vegetation. The scale of variability of the attributes measured in the four localities - Yelwa, Mokwa, Borgu and Jebba - was assessed and found in the case of soil and vegetation to be significant on at least a hectare to hectare scale. Density of all species, the most abundant species, size class distribution, and pattern of woody elements were estimated.

Principal component analysis was employed to explore the correlation and variability of soil attributes (sand, silt, clay, organic carbon) and vegetation characteristics between plots and localities. Broad homogeneity in edaphic features was shown, while marked differences existed between plots in each location. The vegetation was heterogeneous in respect of most physiognomic/structural attributes, although considerable homogeneity was observed at Jebba and some at Mokwa. The relative physiognomic/structural heterogeneity was shown to parallel that of soil attributes and in some cases to be directly related to specific soil attributes.

The stability and resilience of the sample plots were assessed. The Markovian prediction model gave varying values of weighted relative change showing that successional or maturity class differences are not mainly dependent upon differences in species composition. High diversity indices are related to stability if log-normal species distribution indicated stability, but if geometric species distribution indicates stability then stability is associated with low diversity.

It is concluded that land-use and vegetation mapping must be done on a local scale permitting the application of management to delineated land units. The attributes concerning stability (functional/compositional stability) vary in relation to specific land use and should be accordingly assessed. Recommendations are made for such assessment together with listings of parameters most practical for land-use planning in the Guinea savanna.

**Keywords:** Land-use/ vegetation/ land-use planning

**Supervisor:** W. W. Sanford

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