

## Characteristics, Classification and Management of soils of Kampe – Omi River Basin, Kogi-State

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### ABSTRACT

Six soil profiles were dug in selected area in the basin of river Kampe in Yagba West Local Government Area of Kogi State to determine the characteristics and potentials of the soils of the basin for intensive agriculture. The delineation of mapping units was based on the map of a reconnaissance soil survey of the basin carried out by Progress Engineering Ltd in 1980.

Six mapping units were selected based on the topography; three each from wetland (lower slope) and upland (Upper slope) soils. Most of the pedons had horizons with greater than 75% sand, 10% clay and less than 5% silt. The soils had textures ranging between sand and sandy loam. Soil reactions were generally very strongly acidic to neutral (pH 4.70 - 7.20 in H<sub>2</sub>O). The organic carbon contents of the soils were moderate in the surface but very low in the subsurface horizons. The exchange sites of the soils were dominated by calcium and magnesium with values ranging from 3.00 - 10.2 cmol kg<sup>-1</sup> and 0.40 - 4.00 cmolkg respectively. The available phosphorus was very low at the surface (0.54 - 0.88 mg kg<sup>-1</sup>) and much lower at the sub surface (0.42 - 0.5 mg kg<sup>-1</sup>). Pedon P1 was classified as Plinthic Kandiustalf, P2 as Typic Plinthaqualf, P3 as Aquic Kandiustalf, P4 as Rhodic Kadiustalf, P5 as Arenic Kandiuaqualf and P6 Aeric Endoaquept. The levels of available Fe, Cu, Mn and Zn were not deficient. There was significant (P<0.02) correlation between the soil organic carbon content and the soil content of Zn and Cu. Equally, Zn and Cu were significantly (p<0.001) and positively correlated (r=0.748). The relationship between the pH, Fe and Mn were significant (P<0.05) and negative. The soil pH, organic carbon contents, Fe and Zn were nearly uniformly distributed. The coefficient of variation of the distribution of soil pH and organic carbon were less than 10% in all the cases and as low as 3% in some cases. However, the highest variability in the distribution of the measured properties occurred at 15 cm - 30 cm depth and more stable at 0 cm - 15 cm depths. It is recommended that the level of organic carbon, Fe Cu and Zn in these soils should be maintained by sustained external incorporation of organic materials, proper crop residue management and

development of cropping systems that ensure a higher residual return of organic material into the soil in addition to application of inorganic fertilizers.