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Diversity of Soil Fertility Management Practices in the Sudanian Zone of Benin (Western Africa)

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Abstract

The sudanian agrarian landscape of Benin highlighted various practices of soil fertility management. The present study raises some traditional practices such as agro forestry, fallow, animal parking, hiding of crop waste products, revenues of grazinglands post-harvests, farming associations and rotations, which were largely used by 67 % of smallholdings.

Specifically, the agro-forestry parkland system in the sudanian agricultural territories showed five variant practices: **(i)** Woody parks with *Parkia biglobosa*, *Vittellaria paradoxa*, *Adansonia digitata* and *Ceiba pentadra*; **(ii)** Fields pioneers on forest territories; **(iii)** Agricultural plots planted with fruit-lofts of *Anacardium occidentale* and *Mangifera indica*; **(iv)** Shifting cultivation using *Eucalyptus camaldulensis*, *Acacia auriculiformis* and *Leucaena leucocephala*; **(v)** Planted fallow with *Tectona grandis* and *Gmelina arborea*. This traditional system is more largely used, as well as the planted fallows of fruit-lofts, collective fallows grazed under contracts, the fixed parking of sedentary herds that offer some sites which may undergo beneficial for the corn monoculture. The crop waste products and waste domestic are largely exploited by using balks. The revenues of grazing ground post-harvest, higher at leguminous plants control the flows of post-harvests residues, and develop the mechanism of guarantees of grazinglands. The cereal-leguminous plants account for 63 % of farming associations, and are noticed where the organic manure is slightly used. The essential farming successions are the Cotton/Cereals well marked of back-effects of mineral manures and the cereals/leguminous/cereals which produce a nitrogen profit.

The improved practices such as improved parks, composting, improving plants cropping (i.e. *Vigna ungiuculata*, *Glycine max*, *Mucuna pruriens*, *Cajanus cajan*, *Aschynomene histrix* and *Moringa oleifera*) were woefully adopted. The biological cotton slightly scaled with an annual rate of implementation of 8 % and average output of 600 kg ha^{-1}; reducing investments, risks in animal and human health and enhancing agro forestry practice. The improved technical route was ruled with a relative implementation i.e. 25 % of farmers using thinning while 52 % used flat ploughing, 71 % mineral manure rightly amounted and 55 % using organic manure. Sudanian farming systems in northern Benin associate intensive technical routes for certain crops such as cotton which is much more extensive and food for subsistence farming essentially sorghum, groundnut.

Keywords: Benin, diversity, fertility, management, practice, soil, sudanian

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