

Comparative description of land use and characteristics of belowground biodiversity benchmark sites in Kenya

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Abstract

The Kenyan below-ground biodiversity (BGBD) team selected two benchmark sites for the inventory of soil biota which were the Irangi and Ngangao forest sites located in Mount Kenya region of Embu District and the Taita Hills area of Taita Taveta District. These two sites are found in biodiversity hotspots that support rare and endemic plant and animal species. The larger Embu and Taita benchmark areas were demarcated into sampling areas which are referred to as windows 'W' in this study. Site characterization was carried out using the method provided by FAO-UNESCO for characterizing and classifying soils. Further to this, attempts were made to establish land use intensity (LUI) and land productivity (PI) indices that provided land condition indicators. The soils in Taita Taveta benchmark site were classified as Plinthic Lixisols, Plinthic Acrisols, Dystric Cambisols and Chromic Luvisols, while those from Embu ones were Rhodic Nitisols, Humic Nitisols, Humic Acrisols, Haplic Acrisols and Umbric Andosols. The highest level of soil organic carbon recorded was 7.6% in forest soils while the intensely cultivated maize-based and horticultural systems recorded low C levels of 1.6%. Low land use intensity gradients (LUI) were observed in the forests with values less than 2%, while horticulture and maize-based systems recorded more than 30%LUI. The productivity index (PI) followed a similar trend being highest in the natural forest and grassland (40-50%) and lowest in horticultural and maize-based systems (15-20%) It was concluded that the decline in soil quality and productivity was linked to increased land use intensification due to lack of knowledge of the appropriate management practices for sustainable ecosystem functions and services. Key words: Soil characteristics; soil quality; productivity index; land use intensity index.