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Spatial variability of soils on national and hillslope scale in Uganda

Uganda's soil degradation problems have emerged as a major concern and are threatening the food security of many farmers. In order to tailor site-specific corrective land management, this study investigates the spatial variability of key soil-quality parameters on a national and hillslope scale and assesses the soil redistribution rates on hillslopes in Uganda. Soil and environmental data were collected from 107 villages and 2 hillslopes in Uganda. On a national scale, a GIS-based stratification produced 18 spatial development domains that serve as a pre-classification of soils in Uganda. Within these domains, a zonation algorithm can further delineate hillslopes into landscape elements based on soil variability. This can be done by farmers. The Caesium-137 modeling approach is a suitable technique to estimate soil erosion and sedimentation rates and processes on the hillslopes. These GIS-based maps and hillslope delineation tools can help policy makers and farmers in tailoring appropriate land use systems to their fields and landscapes.