

The impact of land-cover change on soil properties in northern Ghana

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KEYWORDS

dryland • land-cover change • nutrient replenishment • soil fertility

ABSTRACT

Effects of changes in land-cover on soil quality parameters in an area in northern Ghana were studied. Land-cover changes were derived from maps of the study area for 1984, 1992 and 1999. There were no significant differences between properties of soils under natural vegetation and soils put under cultivation from 1992, but permanently cultivated soils (1984-1999) showed significantly lower physical and chemical soil properties. Soils recently opened up since 1992 for cultivation in the last seven years (i.e. 1992-1999) were found to manifest significantly higher contents of organic C, N, Ca, Mg and ECEC than those under permanent cultivation, suggesting that continuous cropping is responsible for deterioration in soil quality. Minimum organic C contents necessary to meet critical levels of selected soil quality parameters were estimated. The organic C content of recently cultivated soils would need to be increased by about 7 t ha⁻¹ to replenish soil nutrient capital. This calls for a strategy to synchronize organic matter management with inorganic fertilizer application. Further research is also needed to develop farming systems that conserve organic matter and also improve the quality of organic matter in the study area. Copyright © 2004 John Wiley & Sons, Ltd.

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