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"Development on the margin"

Lost Potential: Impact of Land Use Change on Land Productivity in Western Kenya

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Abstract

Land degradation is recognised as a major threat to the ecosystem functioning both in the areas classified as high and low agricultural potential. Western Kenya is considered a bread basket area of the country. However, the capacity of the region to produce food while at the same time ensuring environmental integrity is seriously threatened. A study was conducted in Malava Division of North Kakamega District to assess the effect of land use change on the productivity of land. The study site is in the transition zone between a natural tropical forest and agricultural land. To facilitate representative sampling and mapping of the entire landscape, the Land Degradation Surveillance Framework (LSDF) developed by African Soil Information System (AfSIS) was applied. A "Blocks", 10×10 km in size was demarcated and divided into 16 clusters. The sampling plots were then randomised around each cluster centre point, resulting in a spatially stratified, randomised sampling design. In addition to the above sampling points, the study identified 15 'undisturbed' reference sites to be sampled and used as baseline for land use change assessments. From each sampling point, representative soil samples were collected and bulked for analysis. The surveys revealed that production of the main cereal maize was low, averaging less than 1 t ha^{-1}. Majority of farmers were shifting towards cash crop (sugarcane) production. The main drivers of land use change in the region are agriculture and soil erosion, followed by tree cutting, fuelwood collection and grazing. Preliminary results show that over 60 % of the land was experiencing some form of soil erosion. There was a strong correlation between tree cutting, grazing and fuel wood collection on soil erosion. Laboratory analysis showed that most soils in the region were highly acidic (pH$<$ 5.5) and deficient in most major and micro-nutrients. As a result of the low production on these acid soils, there was more pressure to convert the natural forest to agricultural land. Holistic strategies are needed to address the drivers of land degradation in the region mainly declining soil fertility, soil acidity, increased soil erosion, deforestation and fuelwood scarcity.

Keywords: Land degradation, land use change, soil acidity, soil fertility

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