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## Land Use and Cropping Intensity Changes in Western Kenya: Driving Forces and Implications on Resource Base Quality and Rural Welfare

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### Abstract

To meet the rapidly growing food demand and to raise household income, farmers in Kakamega District in Kenya intensify their crop production systems in an unprecedented way. The traditional multiple and mixed cropping systems include field crops (maize and beans), home gardens (indigenous vegetables), fruit and auxiliary tree stands (agroforestry) and the integration of animal husbandry with cultivation of forage species and the application of animal manure. This highly diverse and integrated farming system has been able to sustain yield levels, to minimise risks, and to maintain the resource base quality (soil fertility and biodiversity) at a reasonable level. Nevertheless, it is disappearing and many parts of the district are being displaced by either industrial plantations or subsistence-oriented field gardens. Mono-cropping with maize, sugar cane and tea dominates the agricultural landscape in infra-structurally favoured areas and forest buffer zones. Despite moderate use of external inputs, soil quality indicators suggest occurrence of nutrient depletion and imbalances and a loss of the functional biodiversity. On the other hand, the densely populated rural areas and the peri-urban fringes are increasingly characterised by land fragmentation and the permanent and year-round cultivation of subsistence food crops on land holdings of less than 1 ha. With animal husbandry having been discontinued for lack of land for forage production and crop residues being used for fuel, soil fertility decline and land degradation can be severe. Both production systems appear to threaten the biophysical and socioeconomic sustainability and their emergence patterns need to be understood in order to provide adapted and adoptable alternatives. Analyses of secondary data sources combined with household survey interviews were used to determine the driving forces and the factors influencing the spatial and temporal dynamics of land use and cropping intensity changes and indicators for biodiversity, agricultural productivity, and rural welfare were assessed along biophysical (agro-ecological zone, distance from primary forest) as well as socioeconomic gradients (population density, market access). Surveys and analyses are under way and the results will be discussed.

**Keywords:** Biodiversity, livelihoods, productivity, trends