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fair use of resources”

Land Fragmentation and Agroforestry: Shifting Practices and Perceptions of Trees on Small Farms

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Abstract

In the central highlands of Kenya, decreasing farm size due to land fragmentation upon inheritance has the potential to threaten livelihoods and food security. Farmers are forced to prioritise food, fodder, cash crops, and trees to make the best use of limited space. The objective of this study was to investigate whether and how decreasing land size shapes agroforestry practices, as well as the effects of having trees on farms.

In order to gain a holistic perspective on agroforestry practices and their impacts in the Othaya area, in Nyeri South District, a combination of social and natural science methods were used. These included field interviews, questionnaires, and focus group discussion, which were triangulated with analyses of soil, microclimate, and species richness.

Our findings show an increase in tree density as farm sizes decrease. For instance, farms of <0.5 ha have mean density of 187 trees ha⁻¹, while those >1 ha have mean density of 51 trees ha⁻¹. At the same time, 78 % of farmers report self sufficiency in fuelwood and timber, showing the subsistence value of trees. Farmers strongly prefer exotics also for timber and fruit for income. Species richness analysis revealed that fast growing exotic trees far outnumber indigenous. The cultural valuation of indigenous trees is simultaneously diminishing, potentially suppressed by economically-driven preferences. In addition, there is limited understanding of the potential ecological benefits of trees in farming systems. Multipurpose species, such as leguminous fodder trees, are underutilised, which may represent a missed opportunity for increased livelihood and farm system diversification.

The gap in farmer knowledge, as well as a lack of support for best practices, are key barriers to agroforestry in the Othaya area. With better understanding of trees' effects on crops, livestock, climate, soil, and water, it could be expected that systems would be more productive and resilient, in effect contributing to self sufficiency, increasing livelihood opportunities, and helping to mitigate the effect of land fragmentation.

Keywords: Agroforestry, barriers, crop-livestock systems, East Africa, Kenya, land fragmentation, land subdivision, multidisciplinary, multipurpose trees, smallholders