The Integration of Organic Farm Waste in Degraded Smallholder Banana-Coffee-Farming Systems in the Kagera Region, Tanzania

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Abstract

Smallholder farming account to more than 90 % of the agricultural production in highland perennial-banana-coffee-based farming systems intercropped with beans, maize, cassava, and other annual crops in the Kagera region in NW Tanzania. Densely grown banana-coffee-based farming systems developed over eight centuries and have been severely degraded in less than half a century. For at least one century, traditional composting and mulching techniques have played a crucial role to replenish soil nutrients, combat soil erosion, and soil drying. However, increased biomass production and deforestation of a growing local and refugee hosting population have accelerated soil nutrient depletion and could not be sufficiently replenished through farm waste management. This situation has been worsened through the weakening of farm households after the outbreak of the HIV/AIDS epidemic accompanied by reduced labour, orphanhood, and interrupted knowledge transfer of traditional farm waste practices. Our research shows the current use of organic farm waste in 150 surveyed farm households and how farm waste management is related to biomass production and thus the livelihood. We further present the results of five focus group discussion with 22 lead farmers who have trained 700 households in organic soil fertility, farm waste, and pesticide management fostering sustainable agroforestry. The results compare non-trained with trained farm households. Among the non-trained households, not all households use organic farm waste in composting and mulching. Further, the land size determines biomass up to one hectare. Households either concentrate on crop farming with integrated livestock keeping or livestock keeping and forestry. The majority of the most vulnerable households is female-headed. In comparison, trained households differently succeed in applying the skills they have learnt. The 'wealthiest' group of households use all organic farm waste in strategically applied *in-situ*, ring-hole, pit or drainage composting, whereas those who do not follow the main instructions have a lower biomass production and cannot leave the poverty trap. Soil fertility and biomass production can be significantly improved by training organised by local organisations. However, these organisations need governmental support and funding because they significantly contribute to combat poverty and climate change through soil and organic waste management.

Keywords: Agroforestry, banana-coffee-based farming systems, composting, farm waste management, farmer field training, food availability, gender, Kagera region, Karagwe and Kyerwa district, mulching, smallholder agriculture, Tanzania

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