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Impact of Traditional Farming Practices on Nutrient Balances in Smallholder Farming Systems of Nakuru District, Kenya

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Abstract

The smallholder farmers have not been influenced by the “Green Revolution” as they have continued with the practice of non-use of chemical fertilisers, pesticides and genetically modified organisms. These practices are referred to as “Traditional Farming”. Animal compost and recycling of crop residues are the principal soil fertility management strategies in the smallholder farming systems (SHFS). However, few studies have investigated the impact of these practices on soil fertility in the SHFS. The impact of traditional farming practices (TFP) on soil fertility was assessed through quantification of nutrient (N, P and K) balances using farm-NUTMON. The study was conducted in Gilgil, Lare and Molo divisions of Nakuru district, from April 2003 to March 2004. A total of 36 farmers, twelve per study site representative of the socio-economic classes participated in the study. The full farm N, P and K balances were positive for Gilgil (55, 40, 25 kg ha⁻¹ yr⁻¹), negative for N and P in Molo (-86, -4, 4) and N in Lare (-60, 5, 4). The nutrient N, P and K balances in cropping activities were negative with large variations across land use types and study sites. Highly negative N, P and K balances in cropping activities were realised in Lare (-117, -45, -44), followed by Molo (-66, 2, -21) and Gilgil (-42, -1, 0). The pasture and fodder (all sites) and cereals (Lare) land use types had the highest nutrient depletion rates. Crop production is thus unsustainable, under the TFP, with respect to nutrient balances. In view of the central role that manure plays in enhancing soil fertility of the smallholder farms, its proper management and handling is considered critical. Efficient use of organic resources and introduction of other organic farming based technologies (e.g. legumes in short rain season) will tremendously enhance the soil fertility status and subsequently lead to increased crop production. Composting, biomass transfer, improved fallows, agroforestry, and cover crops are such technologies feasible for adoption in the smallholder farms. Further research on the socio-economic impact of these technologies is recommended.

Keywords: Kenya, Nutrient balance, Organic Farming, Traditional farming