ABSTRACT

Organic Nutrient Source Allocation and Use in Smallholder Farming Communities: What Are We Missing?

Blessing Nyamasoka-Magonziwa, Steven J. Vanek, Michael Carolan, John O. Ojiem and Steven J. Fonte

Organic nutrient sources (ONS) are managed as a key resource by smallholder farmers to maintain the productivity of soils. Recycling of ONS by applying them to soils is a globally dominant strategy of ecological nutrient management. Understanding how ONS produced on-farm are allocated and what drives farmer decision making around their use is critical for sustainable nutrient management in smallholder agroecosystems. Using focus group discussions and a survey of 184 farming households, we studied socio-economic, socio-cultural, and environmental drivers of ONS allocation and use at the farm scale in three contrasting agroecological zones of western Kenya. Farm typologies of ONS management were also developed using cluster analysis based on resource endowment and the connectedness of farmers, management norms, and interaction with extension. Our findings suggest that the more resource endowed a farmer is, the more ONS are allocated to the main plot within the farm. We also observed that farmers preferred allocating more resources to plots that were considered more fertile. Land tenure had an important influence, in that main plots not owned by farmers were more likely to retain ONS such as crop residues. Management of residues is dependent on farmer gender, for instance, female farmers tended to burn legume residues in particular, which is notable since these higher quality residues are often considered key to sustainable soil nutrient management. Farm typologies featured different allocation patterns of ONS and were associated with resource endowment and farmer networks, including external ties to extension agents and internal ties to other farmers. Finally, there was a strong overarching influence of agroecological zone that often escapes characterization on the allocation of ONS. As research and development organizations continue to engage with smallholder farmers to reduce the burden of global food insecurity, the insights gained by this research will allow better anticipation of drivers and obstacles to improved nutrient management in these farming landscapes and communities.

Keywords: soil health, cereal-legume-livestock systems, crop residues, manure, socio-cultural, ecological nutrient management