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"Management of land use systems for enhanced food security: conflicts, controversies and resolutions"

Participatory Soils Mapping in a Semi-Humid Agricultural Landscape in Tanzania

Jacob Kaingo[1], Siza Tumbo[1], Ludger Herrmann[2], Boniface Mbilinyi[1]

[1] *Sokoine University, Agricultural Engineering and Land Planning, Tanzania*
[2] *University of Hohenheim, Inst. of Soil Science and Land Evaluation, Germany*

Abstract

Smallholder agricultural production systems in Tanzania are faced by increasing degradation of soil resources. Proper management of soils is recognised as a significant pathway to secure food supply levels. Understanding the distribution, potential and constraints of soils within these systems is an important aspect for adaption of innovative soil management options for sustainable food production. Participatory approaches which build on indigenous knowledge of the local farmers have been fronted as the key entry point to ensure the sustainability of innovative technologies. A study was undertaken to establish the indigenous soil knowledge of smallholder farmers in a semi-humid village of Ilakala, Tanzania covering an area of 44 km^2. Focus group discussions were held with seven selected smallholder farmer groups of 7 to 10 people to map the soil resources within the village. Farmers were also asked to identify the indigenous soil types, their major soil constraints, and the key attributes used to distinguish the soil types. A 1:45,000-scale google earth image printed on an A0- paper was used as a visual aid to facilitate the delineations of indigenous soil units. Transects were performed to verify the delineated indigenous soil map units. Representative soil profile pits were established on each indigenous soil map unit. Soil samples were collected from observed horizons in each profile pit for laboratory analysis for scientific correlation of the indigenous soil types. Five indigenous soil types were identified; Kichanga, Tifu-tifu, Mfinyanzi, Wakitope-Mweusi, and Ngunja. The key attributes for distinguishing indigenous soil types were; soil colour, moisture retention, topography, and workability. Poor soil fertility status was established as the key limiting factor for crop production. Tifu-tifu was identified as the most suitable soil type for crop growth and the Kichanga as the least suitable for crop growth. Smallholder farmers are endowed with knowledge of the soil resources within their locality and are aware of suitable management options for increasing their productivity. Therefore, their inclusion in the development process is key to introducing of new innovations to enhance land productivity.

Keywords: Food production, indigenous soil knowledge, smallholder farmers, soil management

Contact Address: Jacob Kaingo, Sokoine University, Agricultural Engineering and Land Planning, Box 3003 Morogoro -Tanzania, 3000 Morogoro, Tanzania, e-mail: jacobkaingo@gmail.com