Integrating Interdisciplinary Datasets and Participatory Methods for Accelerating the Adoption of Resilient Farming Systems in East Africa

Leigh Winowiecki*, Peter Laderach², Jennifer Twyman³, Tor Vagen⁴, Kelvin Mashisia, and Anja Gassner⁴

¹International Center for Tropical Agriculture (CIAT) – P O BOX 823 Nairobi, Kenya
²International Center for Tropical Agriculture (CIAT) – Nicaragua
³International Center for Tropical Agriculture ((CIAT)) – Colombia
⁴World Agroforestry Centre (ICRAF) – Kenya

Abstract

Smallholder farming systems in East Africa exist as part of a complex matrix of climates, land uses, land cover types, governance structures and social-economic realities. In order to understand and better address the constraints facing smallholder farmers for developing more adaptive and resilient farming systems, an interdisciplinary, multi-level approach is needed. Identifying locally appropriate strategies requires the co-production of knowledge, innovative modeling approaches, and a combination of participatory and collaborative research methods, including the combination of quantitative and qualitative datasets. We illustrate the integration of key land and ecosystem health metrics with socio-economic indicators, across diverse landscapes in East Africa. For example the land degradation surveillance framework (LDSF) was conducted at four-100 km² sites in Uganda, Kenya and Tanzania, and Ethiopia to assess baseline soil and land health status. These data were combined with socio-economic surveys conducted by the CGIAR Research Program on Climate Change, Agriculture, and Food Security to identify commonly used farming practices, household and village baseline information, and key factors determining the likelihood that farmers will adopt new practices. This analysis revealed constraint envelopes for each of the communities, and highlighted key barriers to overcome. For example, farmers with higher soil and land health indices were more willing to make agronomic changes than those with higher land degradation status. Further trade-off analysis revealed the environmental and economic gains and losses under different farming and land management scenarios. By conducting interdisciplinary analysis and action research, rural prosperity and food security can be improved through the efficient management of natural resources, which supports of livelihoods that are resilient to the effects of climate change. This paper will focus on the application of interdisciplinary research for the development and adoption of resilient and adaptive smallholder farming systems.

Keywords: smallholder farmers, East Africa

*Speaker
†Corresponding author: t.vagen@cgiar.org

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