



Building resilience to social-ecological change through farmers' learning practices in semi-arid Makueni County Kenya

Chinwe Ifejika Speranza (1,2), Boniface Kiteme (3), John Kimathi Mbae (3), and Miron Schmude (1)

(1) Department of Geography, University of Bonn, Meckenheimer Allee 166, D 53115 Bonn, Germany (ifejika.speranza@uni-bonn.de), (2) Centre for Development and Environment, University of Bern, Switzerland, (3) Centre for Training and Integrated Research in Arid and Semi-Arid Lands Development (CETRAD), Nanyuki, Kenya

Social-ecological change is resulting in various risks and opportunities to farmers, which they address through complex multi-strategies to sustain their agricultural-based livelihoods and agricultural landscapes. This paper examines how various stakeholders such as research and government organisations, local and international non-governmental organisations, private companies, farmer groups, individual actors and farmers draw on scientific, external and localised knowledge to address the needs of farmers in sustainable land management and food production. What is the structure of collaboration between the various actors and how does this influence the potential for learning, not only for the farmers but also for other stakeholders? How does the supplied knowledge meet farmers' knowledge needs and demands for sustainable land management and food production? To what extent and how is knowledge co-produced among the various stakeholders? What different types of learning can be identified and what are their influences on farmers' sustainable land management practices? How does farmer learning foster the resilience of agricultural landscapes?

Answers to these questions are sought through a case study in the semi-arid areas of Makueni County, Kenya. Particular environmental risks in the study area relate to recurrent droughts and flooding, soil erosion and general land degradation. Opportunities in the study area arise short-term due to more conducive rainfall conditions for crop and vegetation growth, institutional arrangements that foster sustainable land management such as agroforestry programmes and conservation agriculture projects. While farmers observe changes in their environment, they weigh the various risks and opportunities that arise from their social-ecological context and their own capacity to respond leading to the prioritization of certain adaptations relative to others. This can mean that while certain farmers may have knowledge on sustainable land management practices, their capacity to act can be constrained by various factors.

Through learning about new land management technologies and adaptation practices, and adapting these to their local contexts, farmers attempt to balance the risks and opportunities arising from social-ecological change. They share and transfer the acquired knowledge to other farmers. While success has been achieved in adoption of sustainable land management practices by many farmers, adoption by other farmers and practice by all farmers remain constrained by various social-ecological factors. The implications of the research findings for interventions and policies aimed at sustainable land management and improved food production are discussed.