



Tropentag, September 11-13, 2024, hybrid conference

“Exploring opportunities ...
for managing natural resources and a better life for all”

Farmers’ innovation–decision processes and adoption dynamics surrounding push-pull technology in western Kenya

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Abstract

Smallholder farmers in sub-Saharan Africa (SSA) face increasing challenges, from pests and climate change to degraded soils, among other issues. In response to these challenges, international agricultural research for development (R4D) investment is often focused on developing and scaling up techniques and technologies that bolster resilience. However, such approaches are often technocentric and follow linear assumptions of innovation diffusion and adoption, which overlook the complex realities that influence smallholder farmers’ dynamic decisions and engagement with novel techniques. This study used qualitative ethnographic methods to explore the experiences, knowledge construction, motivations, and decision-making of farmers in western Kenya regarding the extensively researched push-pull technology (PPT). Findings reveal that motives for practising PPT evolve as farmers respond to emerging realities. Furthermore, farmers modify and adapt PPT components to meet diverse motivations in changing contexts rather than simply adopting the practice as taught or shown. Contextual factors such as health, land tenure, access to information and inputs, cost/benefit trade-offs, interactions and social dynamics interact in complex ways. These complex dynamics question the prevailing notions of innovation success based on aggregate adoption indicators. Ultimately, sustaining African food systems requires moving beyond technocratic approaches to nurturing context-specific, farmer-centric innovation pathways that recognise smallholders’ ingenuity in navigating heterogeneous realities. Innovation unfolds as a dynamic process requiring inclusive participation, flexibility for local adaptation, and long-term collaboration with farmers as partners in finding solutions. This study provides more holistic approaches to agricultural research and development in Africa, placing farmers’ various contexts and active participation at the core of innovation processes.

Keywords: Agricultural innovation, biocontrol, push-pull technology