



Tropentag, September 16-18, 2026, hybrid conference

“Towards multi-functional agro-ecosystems
promoting climate resilient futures”

Unlocking regenerative farming for climate-resilient crop production in Kenya: Evidence from African indigenous vegetables

WINFRED MUGWIMI

Jomo Kenyatta University of Agriculture and Technology, Kenya

Abstract

Climate change poses significant threats to agricultural systems in Kenya, with rising temperatures, erratic rainfall, and increased frequency of droughts undermining smallholder productivity and food security. African Indigenous Vegetables (AIVs) – including crops such as amaranth, spider plant, African nightshade, and cowpea – are increasingly recognised as climate-resilient crops due to their drought tolerance, short growth cycles, and adaptability to marginal environments. While regenerative agriculture offers potential solutions, adoption among vegetable-growing smallholders remains low. The study assessed awareness, knowledge levels, adoption rates, and perceived effectiveness of 15 regenerative technologies, including integrated pest management, mulching, minimum tillage, agroforestry, crop rotation, cover cropping, composting, vermicomposting, bio-slurry, and micro-irrigation. The study employed a mixed-methods design, combining household surveys (n=240), focus group discussions, and key informant interviews across major AIV-producing regions in Kenya. Findings show that, while awareness of regenerative practices is high (organic manure: 94%; crop rotation: 94%; mulching: 84%; composting: 77%), adoption of these technologies remains limited. Only 34 % of farmers use micro-irrigation, 28 % conduct soil testing, and just 25 % practice vermicomposting. The gap between awareness and adoption widens for practices requiring capital investment or technical training. Farmers practicing crop rotation (96 % adoption) and organic manure application (93 % adoption) report improved soil moisture retention and reduced crop failure during dry spells. Key constraints to adoption include: perceived high upfront costs (micro-irrigation, composting infrastructure); labour intensity (mulching, minimum tillage conflicts with competing farm activities); lack of premium prices for regeneratively grown produce; limited technical extension support (government extension focuses on maize, coffee, tea – not vegetables); and soil fertility decline that pushes farmers toward quick-fix synthetic inputs. Regenerative farming holds significant promise for climate adaptation among smallholder vegetable farmers in Kenya, but current adoption is constrained by knowledge gaps, productivity trade-offs, and lack of market incentives. Bridging the awareness-adoption divide requires moving beyond training to address capital constraints, labour demands, and the absence of premium pricing. Without these complementary interventions, farmers will rationally prioritise conventional systems that deliver higher short-term returns, leaving climate adaptation potential unrealised.

Keywords: African indigenous vegetables, climate resilience, Kenya, regenerative farming, smallholder farmers

Contact Address: Winfred Mugwimi, Jomo Kenyatta University of Agriculture and Technology, 29137-00100 Nairobi Kenya, 00100 Nairobi, Kenya, e-mail: winkinjo@gmail.com