

Toward Climate-Resilient and Livelihood-Enhancing Coffee Farming in Kenya: The Role of ISFM in Regenerative Agriculture – A Review

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Introduction

Coffee farming in Kenya is increasingly threatened by soil degradation, declining yields, and greater climate variability. Regenerative agriculture (RA) presents a promising pathway to build climate-resilient and sustainable coffee systems. Integrated Soil Fertility Management (ISFM) is central to RA, offering resource-efficient, site-specific strategies to restore soil health and enhance productivity in smallholder coffee landscapes. RA moves beyond input substitution—it promotes biological regeneration of agroecosystems and long-term sustainability.

ISFM INTEGRATION INTO NATIONAL COFFEE FRAMEWORKS



Figure 1: Integration of ISFM in National Coffee production

Integration of ISFM and Regenerative Agriculture in Coffee Systems

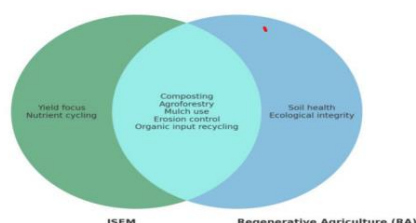


Figure 2: Conceptual interface between ISFM and RA in coffee farms



Figure 3: Integrating livestock in farming coffee systems

Materials/Methods

This review synthesizes global and regional literature on ISFM and regenerative agricultural practices, with a focus on their relevance to Kenyan coffee systems. Case studies from Latin America, West Africa, and East Africa are highlighted to extract lessons and scalable practices.

Results/Discussion

Evidence from the reviewed studies indicates that ISFM practices improve soil structure, nutrient cycling, biodiversity, and water retention—key indicators of ecosystem resilience one of the key principles RA. In Colombia, farmers converted coffee pulp and pruning residues into compost, closing nutrient loops. Outcomes included increased soil organic matter, reduced input costs, and better yields. Agroforestry provided shade, moderated microclimates, and improved soil health. In Ghana, farmers integrated shade and fruit trees with coffee/cocoa to restore soils and diversify incomes. In EA, farmers adopted blended fertilizers, composting, agroforestry saplings, and mulching. Soils showed higher organic matter and nutrient retention, leading to improved yields. In the Kenyan context, the integration of agroforestry and organic matter recycling showed strong potential for scaling. However, adoption remains constrained by gaps in technical knowledge, limited institutional support, and variable farmer capacity.

Conclusion/Perspectives

For Kenya to realize a regenerative and climate-resilient coffee sector, ISFM provides the critical foundation. It offers science-backed, locally adaptable practices that enhance soil fertility while enabling the transition to regenerative agriculture. Aligning ISFM with RA in coffee systems is not just agronomically sound—it is essential for sustainable growth and global market competitiveness.

Reference:

Koutouleas, A.; Waswa, B.S.; Ocimati, W.; Notenbaert, A.M.O.; Rahn, E.T. (2023) *Regenerative agriculture in coffee farming systems: A handbook for practitioners in Kenya*. 80 p.