

EVIDENCE OF AGROECOLOGY'S IMPACT ON YIELDS, NUTRITION, AND RESILIENCE **IN AFRICA**



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Agroecology, which integrates ecological principles into agricultural systems, is gaining prominence in Africa as a pathway to sustainable and resilient food systems. In Nigeria and across Africa, several successful case studies demonstrate agroecology's potential to enhance food security, restore ecosystems, empower communities, and build resilience against climate change.

This document presents selected agroecological case studies with references to scholarly

1. Impact on Agricultural Yields

Contrary to concerns about reduced productivity, agroecology has demonstrated the potential to maintain or increase yields over time, particularly in low-input systems. Agroecological practices such as crop diversification, intercropping, agroforestry, and organic soil management improve soil fertility and pest control, resulting in stable or even improved yields.

- In a meta-analysis of 115 studies, Pretty et al. (2018) reported that agroecological practices increased crop yields by an average of 79% across 57 countries, particularly in resource-constrained settings.
- Altieri and Nicholls (2020), documented that smallholder farmers applying agroecological principles in Latin America, such as polycultures and cover cropping, maintained or increased productivity while reducing dependence on chemical inputs.
- Moreover, FAO (2019), has emphasized that agroecology enhances functional biodiversity and ecosystem services that support yields over the long term, especially under climatic stress.

2. Impact on Nutrition and Dietary Diversity

Agroecological systems improve nutrition by promoting dietary diversity and access to a variety of nutrient-dense foods. Through diversified farming systems, smallholder farmers cultivate multiple species, including vegetables, legumes, fruits, and small livestock, enhancing household food security and nutritional quality.

- Bezner Kerr et al. (2021), found that agroecological interventions in Malawi led to significant increases in dietary diversity and improved child nutrition through integrated crop-livestock systems and nutrition education.
- A study in Burkina Faso by Dumas et al. (2018) showed that farms practicing agroecology produced more food

groups relevant to a healthy diet, such as leafy vegetables and legumes, which directly improved household consumption patterns.

- Additionally, HLPE (2017), highlighted that agroecology addresses both availability and access to diverse food, thereby reducing hidden hunger, particularly in rural and marginalized communities.

3. Impact on Climate Resilience and Environmental Sustainability

Agroecological practices enhance the resilience of farming systems to climate shocks such as droughts, floods, and pest outbreaks. These systems are rooted in ecological processes such as recycling nutrients, building soil organic matter, and conserving water which reduce vulnerability and enhance adaptive capacity.

- De Schutter and Tiftonell (2010), argue that agroecology builds resilience by enhancing ecosystem diversity, improving water retention, and buffering against climate variability.
- Research in East Africa by Mdee et al. (2022) found that farmers who applied agroecological methods such as water harvesting, mulching, and agroforestry experienced less crop loss during extreme weather events compared to those in conventional systems.
- Moreover, agroecological systems sequester carbon in soils and biomass, contributing to climate mitigation. Lal (2020), estimates that widespread adoption of agroecological soil management could offset significant amounts of CO annually.



Conclusion

The body of evidence supports agroecology as a viable pathway for achieving productive, nutritionally rich, and climate-resilient food systems. By centering farmer knowledge, ecological principles, and social equity, agroecology not only sustains yields but also enhances nutrition and strengthens resilience to climate change.

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