



Scaling resilient intensified agriculture through agroecology in East Africa

Why scaling resilient, intensified agriculture matters in East Africa

Agriculture is the most important economic sector in East Africa. Above 80% of the East African population is involved in agriculture. Between 25 to 40% of the East African Community's GDP is earned in agriculture (East African Community, 2020). However, current yields are not reaching the region's full potential, and unsustainable, current practices threaten to reduce productivity even more and to degrade natural resources. In addition, East Africa is a net importer of food, making it vulnerable to unexpected shocks such as the COVID-19 pandemic. It is urgent, therefore, to intensify agriculture in a sustainable manner to ensure people's livelihood and food security in East Africa (Kilimo Trust, 2014).

In this issue brief, we examine the potential of scaling-up agroecology to intensify and increase resiliency of food and livestock feed systems in East Africa. To summarise the possibilities offered by agroecology, we concentrate on

three central questions. First, what are the contributions of agroecology to resilient and sustainable intensified agriculture? Second, what is the regional potential to scale-up such agricultural production systems? Third, what knowledge gaps limit the potential of scaling resilient, intensified agriculture through agroecology in East Africa? This issue brief is part of a series of briefs created as part of the [scaleWAYS research project](#). These briefs aim to provide a condensed overview of central concepts and research questions that are dealt with in the research project.

What agroecology can contribute to resilient and sustainable intensified agriculture

The basic principles of agroecology focus on designing farming and food systems that benefit both society and nature equally. The overall goal is to improve the well-being of all food system actors. Agroecology thus focuses on the entire food system. It seeks understand context-specific

About ScaleWAYS

The project 'Scaling out resilient water and agricultural systems (scaleWAYS) in East Africa' is being implemented jointly by IIASA, the Lake Victoria Basin Commission (LVBC) and the International Crops Research Institute for Semi-Arid Tropics (ICRISAT). The research for development project analyses scaling options for water and land management practices for resilient and sustainable agricultural intensification in the extended Lake Victoria Basin. Informed by local stakeholder's rice and fodder production systems are chosen for gaining an improved understanding of up-scaling and out-scaling of such sustainable practices through model simulations and integrated analysis of political economy aspects, governance, and social and gender dimensions.

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characteristics of production such as the social, political, and ecological characteristics of the place where food (fiber, and fuel) is produced, processed, traded, and consumed. As such, agroecology also enhances food system resilience and reduce environmental impacts.

The Food and Agriculture Organization of the United Nations (FAO) defines agroecology principles to guide the transition to sustainable food and agricultural systems worldwide (LINK TO FAO). A farm or food systems meets agroecological standards if it complies with the following key principles: (1) the integration of annual and perennial plants enhance diversity and efficiency and further unlocks synergies in the management of soils, ecosystem services, weed and pests; (2) the need for external inputs is reduced through a circular resource flows involving the recycling and diversified use of by-products in the value chain; (3) ecologically conscious farming practices enhance biodiversity and nutritional values of foods; and (4) governments, consumers, financial institutions, and other agents, enable inclusive and fair food production and trade.

Consequently, agroecology is not a “one-size fits” all approach but rather acknowledges socio-ecological complexities and promotes so-called “clumsy solutions”. It does so by advantage of the local characteristics to increase productivity by supporting and sustaining circularity (e.g. water-saving technologies and nutrient recycling). The region-specific climate and soils, the social and food preferences, and political frameworks shape agroecology. Agricultural practices, therefore, will look different in different regions.

Subsequently, agroecology can contribute to increase resilience of local food systems, and to the achievements of several Sustainable Development Goals (SDG). For instance, scaling resilient, intensified agriculture matters in East Africa through agroecology could contribute to the following SDGs:

SDG 1 - No Poverty: By increasing productivity, reducing production losses and waste, and enhancing resilience, agroecology is likely to increase and sustain profitability.

SDG 2 - Zero Hunger: By diversifying production systems and increasing the availability of diverse foods and nutrients, agroecology contributes to the.

SDG 6 - Clean Water and SDG 15 - Life on Land: By reducing the application of external inputs and taking advantage of the synergies of the agricultural ecosystem (for example, by recycling manure).

SDG 5 - Gender Equality and SDG 8 - Decent work and economic growth: By enabling inclusive and fair production, trade, and value chains.

Knowledge gaps to be closed for unlocking the scaling potential of agroecology in East Africa

Despite the availability of technical and practical knowledge for building resilient and sustainable intensified agriculture, we know comparatively little about the conditions and processes that make these practices scalable. Moreover, the role of agroecology in this undertaking has not yet been fully explored. The Scaling out resilient water and agricultural systems project (scaleWAYS), therefore, aims to understand the implications of agroecological transitions on land- and water use in the Lake Victoria Basin and East African Community.

In scaleWAYS, we focus on lowland rice for human consumption and livestock feed production supporting the dairy and meat sector. We use quantitative and qualitative methods to compare the social-ecological effects of agroecology, high-external input, and traditional farming approaches. We identify three significant knowledge gaps related to agroecological transitions in the region:

- Where can agroecology be implemented and expanded to produce lowland rice and livestock feed production?
- What are the potential food security, income, and environmental outcomes of expanding agroecology in these regions – in comparison to high-input and traditional farming approaches?
- What are the political economy barriers and scaling potential of agroecological transitions in these regions?

So far, initial studies within scaleWAYS suggests that the transition to agroecology would be more feasible than the transition to conventional intensified farming practices, given current agricultural practices and structures of the agricultural sector and current strategies not varying wildly from fundamental agroecology principles. Expert interviews within this project produced following key insights:

- agroecology would be suitable for the transition of small- and medium farmers, especially those which participate in structured schemes where knowledge and infrastructure might be shared and managed while commercial farmers would be more challenging to transition into an agroecology system
- small- and medium-sized farmers livelihood would significantly benefit from perennial plants, push and pull practices, and improved wetland management.



- agroecology could decrease soil erosion risks, which is a specific concern in upland rice production.

On a gender perspective experts highlighted the benefit of agroecology for women and the youth through their participation in the value chain and new revenue-earning activities. In the rice sector specifically agroecology would significantly decrease the burden on women whereas in the fodder sector agroecology would increase household-level food security and nutrition especially regarding the lactating livestock. Agroecology driven intensification of rice and fodder production further creates new opportunities for the youth creating employment in the use and maintenance of machinery.

- For transitions to be successful, however, experts in both the fodder and rice sectors state the importance of capacity building through agricultural advisory systems.

References

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Key messages

1. The Lake Victoria basin water and ecosystem influences the regional hydrology and food production in East Africa. Yet deforestation and unsustainable agriculture negatively impact the quality of rivers and freshwater lakes.
2. Agroecology contributes to the design of resilient and intensified food production systems in the Lake Victoria Basin. It does so by leveraging a better understanding of relations within farm and food systems.
3. All three strands of agroecology (science, practice, movement) are needed to contribute to scaling the impact of resilient, water-secure agriculture in the Lake Victoria Basin.
4. Little is known about the conditions and processes required for scaling resilient intensified agriculture in the Lake Victor Basin despite available technical knowledge.
5. The evidence we generate supports national and regional policy processes mentored by the Lake Victoria Basin Commission (LVBC).