World Vegetable Center

GREENER GREENS BRIEF

# Agroecological approaches improve vegetable production in Kenya

**Research from Murang'a County has shown how the introduction of more sustainable agroecological practices has had positive impacts on crop productivity and profitability. This brief summarizes results, and proposes recommendations based on this evidence.**

Agroecological vegetable farming is considered to be an effective approach to reduce land degradation, carbon emissions and agrochemical use, while improving soil organic matter, sustainability and resilience. However, supporting evidence is often lacking. The Greener Greens project aimed to enhance the income, food security and resilience of smallholder farmers with agroecological practices. It complemented the Veggies 4 Planet & People initiative that fosters vegetable business development, creates employment opportunities, and promotes human and environmental health through regenerative agriculture practices.

A wide range of different agroecological practices were introduced to smallholder farmers, with data collected from 137 farmers who participated in the trials where they grew amaranth, African nightshade, kale and pumpkin leaves. Successes were showcased in demonstration days, and market linkages were encouraged through 'vegetable business networks.'

## Impacts

### Production and consumption

Of the four target crops, kale had the highest average yield (8.8 t/ha), followed by amaranth (3.6 t/ha), African nightshade (1.3 t/ha), and pumpkin leaves (0.8 t/ha), results confirmed that average yields in agroecological plots were higher than conventional plots for all crops. For example, yields were a third higher for kale (10 t/ha compared to 7.4 t/ha). Also, marketable yields from agroecological plots were 22% higher than from conventional plots, with postharvest losses of agroecological produce slightly lower. Interestingly, due to the better perceived taste of agroecological produced crops and that they had not been chemically treated, producer households consumed more of the vegetables from their agroecological plots than from their conventional plots (38% compared to 21%).

### Profitability

Over the three years of the project, more farmers became engaged in vegetable sales, indicating growing recognition of vegetables as a viable commercial venture. Results showed that amaranth and kale were both profitable. Amaranth in agroecological plots had a positive gross margin of KES 21,150 (US$164) per hectare, with a negative gross margin of KES -6,450 (US$-50)/ha in conventional plots. For kale, the story was similar, with gross margins of KES 121,640 (US$900)//ha compared to KES -4,510 (US$-35)/ha. Higher profitability under agroecological approaches can be attributed to cost savings on inputs and more efficient production practices. African nightshade and pumpkin leaves were not profitable in either system, due to lower yields and limited market demand in the area.

### Adoption

Of the 137 participating farmers, over half (55%) adopted at least one of the promoted practices, and more than a quarter (27%) adopted at least five.

The most popular were those that reduced crop pests, with more than 90% of farmers using plant extracts, sticky traps or companion or repellant crops, as a result of the training. So it would be expected that pesticide applications also decreased as a result. Also, over the course of the project, most farmers expanded the area under agroecological farming and adopted more of the practices. Demand for organic inputs such as compost, manure, natural soil amendments and botanical pesticides also increased notably in the project area, indicating reduced reliance on conventional fertilizers. Furthermore, thanks to the project interventions, more service providers were attracted, facilitating knowledge exchange.

## Conclusions and recommendations

The Greener Greens project has advanced the adoption of agroecological approaches in vegetable production in Murang'a County, contributing to improved agricultural productivity, sustainability, food security, and environmental health. Moving forward, expanded collaboration, research, and sharing of best practices will allow the scaling of the project's positive impacts across agricultural landscapes in the County and beyond.

The Murang'a County government acknowledged the benefits of such approaches in a bold move in March 2023, when it launched a ground-breaking Agroecology Development Act, and Agroecology Development Policy 2022-2032 - the first of their kind in Kenya. The results from this research and the clear enthusiasm of farmers can help to feed into the implementation of this act and policy, with the following recommendations proposed to the County government and the local Ministry of Agriculture offices.

1. Invest in training for smallholder farmers on agroecological approaches and agribusiness skills.
2. Strengthen market linkages and develop markets for agroecological or organic vegetables.
3. Encourage farmers to grow more vegetables for sale, diversify production and increase incomes.
4. Invest in water harvesting and storage infrastructure, as water scarcity severely limits profitable production.
5. Increase the availability and affordability of quality biological products, such as the biopesticide Trianum.
6. Build platforms for government agencies, civil society organizations, and research institutions to share knowledge and innovation in farming practice and expand market opportunities.

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