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What is the evidence on smallholder agriculture interventions in Africa?

A majority of people living in poverty in rural Africa are smallholder farmers. Though the Green Revolution has improved livelihoods in Asia and Latin America, innovative farming practices have not been implemented as widely in Africa. Supporting smallholder agriculture through training, innovation and new technology has the potential to improve households' incomes and food security, and boost rural economies.

A recent 3ie-funded systematic review led by a team of researchers based at the University of Johannesburg, assessed the effects of two types of interventions on the livelihoods of smallholder farmers in Africa:

- **Training interventions** to facilitate transfer of knowledge or skills to smallholder farmers (for example, farmer field schools).
- **Innovations and new technology interventions** to introduce agricultural practices such as conservation agriculture, agricultural inputs like new fertilisers or bio-fortified vegetable varieties, and technologies, such as new machinery (e.g. tractors).

Main findings

Training interventions

The review was unable to find that training interventions had an effect on farmers' income levels, measured as the monetary value

of their total harvest. However, there was indicative evidence that participative farmer field school programmes were more effective in improving farmers' income levels than those using top-down delivery methods.

Innovations and new technology interventions

The review finds that agricultural input innovations introducing new or improved agricultural products, notably orange sweet potatoes in Kenya, Mozambique, South Africa and Uganda produced an improvement in farmers' food security levels, as measured by nutritional indicators. The review also found that interventions promoting input innovations led to an improvement in farmers' income levels. Given the limited evidence, the review is unable to ascertain the impact of agricultural practice and technical input innovations on farmers' economic outcomes or food security.

What is a systematic review?

3ie-funded systematic reviews use rigorous and transparent methods to identify, appraise and synthesise all of the relevant studies to address a specific review question. Review authors search for published and unpublished studies and use a theory-based approach to say what evidence is generalisable and what is more context-specific. The result is an unbiased assessment of what works, for whom and why.

About the systematic review:

This brief is based on *The Effects of Training, Innovation and New Technology on African Smallholder Farmers' Economic Outcomes and Food Security: A Systematic Review*, by Ruth Stewart, Laurenz Langer, Natalie Rebelo Da Silva, Evans Muchiri, Hazel Zaranyika, Yvonne Erasmus, Nicola Randall, Shannon Rafferty, Marcel Korth, Nolizwe Madinga, and Thea de Wet. It synthesises evidence from 19 impact evaluations that study the effect of training, innovations and new technology interventions on income, assets and food security. All of these studies evaluated interventions in sub-Saharan Africa, the large majority of which were in east and southern Africa.

Implications

Policy

The authors concluded that, though the evidence base was quite thin, bottom-up training and innovation interventions hold potential to support smallholder farmers in Africa. This finding affirms the validity of the current approach of maintaining an increased focus on smallholder farming as a central aspect of the rural development process. Overall, investment in smallholder farming interventions appears to be a promising approach to reducing rural poverty.

Programming

The review finds some evidence that agricultural input innovations using bio-fortification as a programme mechanism hold promise for improving the food security of smallholder

households. Introducing higher yield and more drought-resistant crop varieties might further increase household incomes of farmers. Training programmes do not seem to improve farmers' incomes, though bottom-up participatory methods, such as farmer field schools, show more promise than traditional agricultural extension. Of the reviewed interventions, orange sweet potatoes presented the largest potential for improved outcomes.

Research

The authors issue a strong call for more rigorous experimental and quasi-experimental studies when evaluating the effects of smallholder farming interventions in Africa. The review highlighted the need for more theory-based impact evaluations of smallholder farming interventions to further explore and substantiate the review findings.



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