



Agroecology Case Studies – Q&A

1. What is agroecology?

Agroecology is the application of ecological science, i.e. the science of the relationships between living organisms and their environment, to agriculture and agroecosystems. It encompasses a wide variety of agricultural techniques and practices, which are consistent with key principles of environment preservation, social fairness, and economic viability. Agroecology combines parameters of sound ecological management, such as minimizing the use of toxics by using on-farm renewable resources and prioritizing local solutions to manage pests and diseases, with an approach that upholds and secures farmers' livelihoods.

2. What new perspectives does the work of the Oakland Institute bring to the existing literature on agroecology?

Farmers and researchers have done tremendous work to explore the principles, techniques, and philosophy behind agroecology. The case studies, gathered from real life agroecology projects and the study of their impacts, back up the theory with evidence-based benefits of these systems.. This work counters the arguments of donors such as the World Bank, the United States, the United Kingdom, and the Bill and Melinda Gates Foundation, who advocate for a new Green Revolution to increase yields and feed a growing population. Their approach promotes the heavy use of chemical fertilizers, pesticides, and hybrid or genetically engineered seeds, which jeopardizes biodiversity, the environment, and farmers' livelihoods and health. Our set of 33 case studies shows with facts and figures that agroecology can deliver better outcomes than conventional agriculture in terms of yields, pest management, sustained soil fertility, increased biodiversity, improved incomes for farmers, and more. The practices and projects detailed in the case studies involve over 2 million farming families across Africa, which demonstrates that agroecology is working at scale and not just in research plots or micro-projects. Fact-based evidence presented in the case studies should compel donors and policy makers to shift their approach towards agricultural development.

3. What was your methodology to prepare the case studies?

Over the last three years, researchers at the Oakland Institute worked with dozens of researchers and partner organizations. The case studies synthesize findings gathered through project surveys and evaluations, desk research, participant observation, and focus groups. The studies cover a wide variety of geographical zones, highlighting different challenges and local agroecological solutions.

4. Is agroecology suited for all environments?

Agroecology is not a one-size-fits-all set of practices. Rather, its techniques have to be adapted to specific needs and ecosystems. Farmers who practice agroecology are local innovators. They experiment to find the best solutions in relation to water availability, soil characteristics, landscapes, cultures, food habits, and biodiversity. Our studies show that a specific set of practices, for instance water management techniques developed on a single farm in Zimbabwe, can be disseminated in varied environments provided that farmers take into account their own growing conditions. In the Zimbabwe case, water management systems were adapted throughout the country in places with higher rainfall conditions, steeper slopes, and other landscape characteristics than the farm where these schemes were originally developed.

5. *Can agroecology help combat climate change?*

Agriculture has played a significant role in climate change. The Intergovernmental Panel on Climate Change found that agriculture, forestry and other land use is responsible for nearly a quarter of the greenhouse gas (GHG) emissions. Emissions from these sectors have almost doubled over the past 50 years, and could increase by an additional 30 percent by 2050. The use of synthetic fertilizers is the fastest growing source of agriculture GHG emissions, having increased 37 percent since 2001.

In this context, agroecology can help fight against climate changes on various fronts. First, agroecology reduces GHG emissions by cutting down the use of fossil-fuel based synthetic fertilizers and pesticides that are prominent in conventional agriculture and pollute the atmosphere, soils, and water sources. Second, agroecology often includes planting and using trees, which provide fodder, food, medicine, firewood and fertilize the soils while at the same time sequestering carbon. Lastly, agroecology makes farmers more resilient to climate change by developing techniques that prevent soil erosion, sustainably augment soil moisture and fertility, and enhance biodiversity. In the event of a climate shock, such as prolonged drought or intense rains, conventional farmers often lose more of their harvest, while farms practicing agroecology adapt better with diversified crops and improved water management systems.

6. *What are the main agroecology techniques described in the case studies and how are they different from conventional agriculture?*

A wide variety of techniques are described in the case studies, including plant diversification; intercropping; the application of mulch, manure, or compost for soil fertility; natural techniques to manage pests and diseases; water management techniques; agroforestry; erosion prevention techniques, and much more. These practices embrace the complexity of local ecosystems, while conventional agriculture often offers simplified solutions that are ill-adapted to farmers needs. In conventional agriculture, the use of chemical fertilizers and pesticides result in environmental pollution and increased farmer debt. Some of the projects have also reintroduced the practice of producing, saving and trading local seeds, which helps farmers build on their own stocks instead of relying on expensive imported commercial seeds. The differences with conventional agriculture are therefore very significant from an environmental standpoint—agroecology does not pollute and preserves biodiversity—as well as from a socio-economic perspective—agroecology enhances farmers independence and resilience, unlike conventional agriculture, which makes farmers reliant on external producers of agricultural inputs.

7. *Won't farmers' yields shrink if they stop using chemical fertilizers and pesticides?*

Our case studies show the opposite. Farmers often experience better yields with organic fertilizers and natural pest management methods. For example, in Ethiopia's Tigray region, an approach based on local inputs and improved biological diversity led to a doubling of the grain yield between 2003 and 2006, while fertilizer use decreased by 40 percent. In East Africa, over 96,000 farmers have adopted a push-pull system that fights the parasitic *Striga* weed and the invasion of stem borers in maize fields without any chemical insecticides or herbicides. Push-pull farmers have experienced much better yields and recovery from weed and stem borer infestations than conventional farmers. Sometimes, agroecology techniques may be more labor intensive than conventional techniques but producers easily recover labor costs by saving the money they used to spend on expensive agricultural inputs. In addition, agroecology helps farmers sustain their yields from season to season, while long-term use of chemical fertilizers gradually depletes the soil's nutrients.

8. *Some say that agroecology techniques are only suited for subsistence agriculture and not for commercial agriculture, is that true?*

Most African farmers who experiment with agroecological practices actively trade their goods at the local, national or even international level. The argument that agroecology is only appropriate for subsistence farmers while conventional agriculture supports producers' integration with the market is simply false. The large majority of our 33 case studies demonstrate increased incomes from the sale of agricultural goods. In many projects, the adoption of agroecological practices actually helped farmers expand their business. For instance, farmers have been able to access niche markets and increase their sales by shifting to organic practices for the production of cotton, cocoa, fruits, and other crops. Several cases show how agroecology has also empowered farmers to find solutions to sell more and

get higher returns from their production. In Rwanda for instance, farmer cooperatives have developed to trade farmers' goods, which has enabled them to pool resources for transportation costs and access markets.

9. What is the impact of agroecology on farmers' lives?

The impacts are immense. The case studies document and quantify the improvement on food security, nutrition, and incomes; the increase in resources such as fertile land, fodder, firewood, and water; and the reduction of expenses of external inputs such as chemical fertilizers and pesticides. The cases highlight situations where farmers have gone from chronically suffering from hunger in pre-harvest months to being able to provide three meals a day for their families throughout the year. Many studies report how farmers' increased revenues have allowed them to pay for their children's education. For women, agroecology projects have been key to becoming more involved in production decisions, providing a more diverse and nutrient-rich meals for their families, and spending less time fetching wood, fodder, or water than was necessary before converting to agroecology practices. Overall, the projects examined show a myriad of positive impacts on education, nutrition, empowerment, gender equality, management of the commons, and much more.

10. Why is agroecology better suited than conventional agriculture to sustain agricultural development?

Whereas the world is facing immense challenges with climate change, increasing pressures on land and natural resources, food insecurity, and food-related health issues (undernutrition, diabetes etc.), it is critical to rethink current modes of agricultural production and restore practices that work in harmony with natural ecosystems. Conventional agriculture has created disasters like the South Asian Green Revolution, where the widespread adoption of chemical inputs proved devastating for water quality and human health while trapping millions of farmers in debt. Agroecology provides low cost solutions that protect the environment and farmers' health. Additionally, it provides jobs, improved livelihoods, and creates resilience against climate shocks. In contrast, conventional agriculture offers a system where only large, input intensive monocultures can survive, which does not address the issues of unemployment and food insecurity encountered in many developing countries.

Agroecology upholds the right of people to access healthy and culturally appropriate food. It supports and empowers the farmers who feed their communities. This is what "agricultural development" should be about rather than the pursuit of industrialized and globalized food systems.