

CLIMATE SOLUTION:

Agroecology: Making agriculture fit for purpose in an era of climate change



Penda Mballow from Ngwarr village, The Gambia finds that using agroecological techniques such as composting and diversification have made a huge difference to her crops' resilience to climate change impacts such as drought.

TERESA ANDERSON/ ACTIONAID

Type of action

The world's agriculture and food systems are vulnerable to climate change. Agriculture is also a major contributor of global greenhouse gas emissions, and a source of food and livelihood for the majority of people in many parts of Asia, Africa and Latin America. Climate change interventions in agriculture must therefore take into account multiple considerations.

Groups and organizations involved

ActionAid is an international federation working for social justice and development, working with local communities to promote agroecological approaches to agriculture.

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AGROECOLOGY IS AN IMPORTANT NATURE-BASED SOLUTION to the challenge of feeding the world in an era of climate change. By working with nature, increasing biodiversity and avoiding harmful agrochemicals that impact the environment and human health, agroecology improves resilience to climate change and reduces the GHG emissions released in the process of producing agrochemicals and growing food. Techniques include: using compost, manure and mulching instead of chemical fertilisers; diversifying seed and crop varieties; and using botanical herbs for treating pests and storing seeds.

Agroecology supports farmers and food systems to adapt to climate change in several ways. ActionAid works with farmers to shift from using synthetic nitrogen fertilisers, to adopting techniques such as adding compost, manure and mulching to soils. Synthetic nitrogen fertilisers kill the soil microorganisms that enrich soil fertility and structure, such as mycorrhizae fungi. In contrast, agroecological techniques add organic matter to improve natural soil fertility, structure and water carrying capacity of soils.

In hotter and drier conditions caused by climate change, agroecological soils are much slower to dry out, retaining water so crops can grow for many weeks longer than crops grown in

soils treated with agrochemicals, and significantly extending growing seasons and yields. As agroecological soils absorb more water than chemically-treated soils, they are also more likely to hold crops in place instead of being eroded and swept away in heavy rains or floods.

Agroecology encourages diverse seeds and crops adapted to different conditions, helping farmers spread risks and reduce losses. This contrasts with farms where just one or two varieties of crop are grown, risking high losses if particular weather conditions are not met.

By avoiding the use of synthetic nitrogen fertilisers, agroecology reduces agricultural GHGs and is necessary for mitigation. The creation of fertilisers burns fossil fuels, causing high CO₂ emissions. Applying fertilisers to soils kills off the mycorrhizae and biota that provide nutrients and soil structure, converting soil organic matter to CO₂. Excess nitrogen fertiliser application also releases the potent GHG nitrous oxide (N₂O). Agroecology therefore reduces agricultural emissions.

Adding organic matter from compost, manure and mulching builds soil carbon and must be incentivised. However the risk of reversals and the challenges of monitoring, reporting and verification (MRV) mean soil carbon sequestration cannot be accurately measured and should not be included in quantitative targets.

Impacts of this action (Agroecology) on...

Climate resilience

Agroecological approaches help farmers reduce risk and reliance on external inputs. It increases ecosystem resilience by providing great diversity of microhabitats in soils, at the soil surface, in crops, and in tree canopies. Diverse agricultural systems at plot and landscape level are more resilient to natural disasters than monocultures.

Reduced carbon emissions

There are production system emission reductions associated with limiting fertiliser use and reversing soil degradation and loss. One conservative estimate of emission reductions is 0.6Gt/year CO₂e¹ with agroecological nutrient management techniques. But this figure is just a fraction of the total GHG reduction and mitigation potential that could result throughout food value chains from shifting to agroecology.

¹ CLARA 2018 "Missing Pathways to 1.5°C: the role of the land sector in ambitious climate action" https://static1.squarespace.com/static/5b22a4b170e802e32273e68c/t/5bef947f4fa51adec11bfa69/1542427787745/MissingPathwaysCLARAreport_2018r2.pdf

Positive social and economic impacts

Smallholder farmers experience improved food and livelihood security. Farmers use agroecology to become less dependent on expensive inputs such as fertilisers, pesticides and purchased seeds, to reduce costs, and retain more income. Agroecology works for women farmers, because it does not require deep pockets or access to credit, and it encourages crop diversity suited for their family needs.

Just transition

Agroecology provides an attractive alternative to farmers squeezed by a highly competitive and concentrated agribusiness system.

Achieving SDGs

1, 2, 3, 5, 6, 8, 10, 12, 13 and 15.



◀ Lalmaiya Mundel (left) and Narmaiya Bisenke (right) have used agroecological practices to make their agriculture much more resilient to climate change.

This action is transformational because...

It ensures long-term stability of climate and food systems by using nature and biodiversity instead of harmful agrochemicals, and by valuing farmers as knowledge holders instead of customers.

This action could be scaled up through...

The reallocation of fertilizer subsidies. Ghana for example spends 40% of its agricultural budget on fertiliser subsidies. What's needed instead is funding for agroecology training and gender-responsive extension services.

ActionAid supports work on agroecology in Bangladesh, Cambodia, India, Myanmar, Nepal, Palestine, Thailand, Vietnam, Burundi, DRC, Ethiopia, The Gambia, Ghana, Kenya, Liberia, Malawi, Mozambique, Nigeria, Rwanda, Senegal, Sierra Leone, Somaliland, Tanzania, Uganda, Zambia, Zimbabwe, Brazil, Guatemala and Haiti. Agroecology can be scaled up within these countries, and to many more countries around the world, as it is relevant and adaptable for every country context. Experience across all of these countries shows clear evidence of the resilience benefits to farmers. Although there may be knowledge gaps about the exact scale of emission reductions achievable through agroecology, it is also clear that this is the best way forward for agriculture in an era of climate change.

The CLARA network includes climate justice advocates, faith groups, conservation groups, land-rights campaigners, agroecologists, and representative of peoples movements around the globe. Our commitment to social justice brought us into the climate debate and informs our approaches to climate solutions. For more information about CLARA, visit climatelandambitionrightsalliance.org.

CLARA
Climate Land Ambition and Rights Alliance

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