



**Practical
ACTION**

Agricultural

ADAPTATION TO CLIMATE CHANGE

SUMMARY

Poor and rural communities in developing countries are among the worst affected by climate change. Most people living in rural areas depend on agriculture for their food security and livelihoods. The Sustainable Development Goals (SDGs) emphasize the importance of family farming to eliminate hunger and poverty (SDG2). The most effective, sustainable, and resilient way to get people out of poverty and hunger is to develop thriving rural economies that are based on agricultural practices which are in harmony with nature, make effective use of the available natural resources, and are able to adapt to the changing climate.

RECOMMENDATIONS

- **Governments, donors, and the private sector should work more closely with communities** – listening to them and supporting their capacity to experiment, plan, and act so they lead their own adaptation, thereby delivering climate action where it is needed.
- **Support and investment should be focused on improving agricultural knowledge systems and building the ability of smallholder farmers and communities to use that knowledge – to experiment, plan, and implement farming practices that enable them to adapt to the changing climate** – this is **building adaptive capacity**. Our work and that of others has shown that farmers and communities are constantly experimenting and adapting, and have excellent insight into what works and what more they can do.
- **Countries (and communities) need to maintain or restore natural capital in order to adapt at scale**. Most community-based adaptation works with nature – it fits the concept of Nature-based Solutions to climate change. It is locally led development, as advocated by the Global Commission on Adaptation and the Principles for Locally Led Adaptation.

practicalaction.org

enquiries@practicalaction.org

There are straightforward reasons for **increasing international and national support for and investment in community-based adaptation** in low- and middle-income countries. Community-based adaptation:

- builds on the assets communities already have;
- increases the ability of people affected by climate change to innovate and adapt over the medium to long term, i.e. it builds resilience within communities;
- is more effective than externally conceived and implemented adaptation;
- delivers adaptation where it is needed, for those who need it.

By ‘investment’ we include plans and programmes of governments, the international community, and private sector actors.

Community-based adaptation includes **Nature-based Solutions** such as agroforestry, agronomic practices that

look after soils, the production and use of biodiverse seed by smallholder farmers, rainwater harvesting, and the management of surface and ground water.

Effective community-based adaptation will also help solve the lack of finance for adaptation (the ‘adaptation finance



gap’) because success at the community level will catalyse more investment and system change. Practical Action has been involved in many successful initiatives and advocates for more community-based adaptation and a change in planning and investment priorities.

AGRICULTURAL ADAPTATION STARTS NOW

Failures in agriculture occur when farming depletes biodiversity and soil fertility.

In order for agriculture to ‘work’ for smallholder farmers and rural communities, they and their farming systems need to adapt to the changing climate. The crops, livestock, fisheries, and ecosystems on which they depend need to be able to withstand the increasing variability in weather – higher temperatures, less predictable seasons, more intense rainfall, storms, and droughts. The increasing uncertainty and breadth of the challenges to come mean that farmers, households, communities, and the businesses they work with need to have the capacity to experiment and change. Adaptation is not about making a single change – a fix. It can’t be prescribed by external experts. It is not about the next 2–3 seasons. It is about the capacity, confidence, and innovation needed to constantly experiment and adapt.

Farmers and communities have been adapting their farming for centuries as their needs and as society have changed. Through their innovation, farming has evolved. Farmers’ needs and opportunities have been driven by many things, including population

growth, the spread of ideas and technologies, and rising expectations. For the large part, success in agriculture and rural communities has been achieved when their farming works with nature and the ecosystems in which they are located. For example, pastoralists set aside certain areas of rangeland for use in periods of drought, or crop rotation is used to prevent the build-up of disease, or fallow periods or cover crops are used to rejuvenate the soil. Failures in agriculture occur when farming depletes biodiversity and soil fertility. Examples of this include the Dust Bowl in midwestern America when the role of organic matter in the soil was not understood, or the loss of trees from the landscapes of sub-Saharan Africa which is changing the local climate.

Now farmers are facing an urgent and unerring need to adapt to human-induced climate change. To do this they must be able to experiment, learn, and adapt their farming practices. This is best achieved by building their knowledge, confidence, and resources to innovate; this is adaptive capacity.

EXAMPLES WITH POTENTIAL FOR CHANGE AT SCALE

Diversifying coffee farming systems in Peru and Bolivia

Coffee is an important cash crop for certain rural populations and whole countries. It has enabled many farmers to migrate and thrive, from poverty in low-potential areas of the *altiplano* (high plateau) to more productive areas in the tropical zone. But many coffee farms have been decimated by overproduction, disease, and climate change – the land becomes exhausted, some coffee plants die leaving gaps in the coffee farm, and areas become moribund/neglected. In response farmers would develop new areas in higher, often forested, areas, retaining a few forest trees to provide the light overhead shade that helps coffee establish and thrive. Through collaborative innovation many coffee farming communities have explored other ways of rehabilitating their moribund farms – gap filling, planting fast-growing trees for overhead shade (to create a more favourable microclimate – cooling the farm), pruning to quickly restore a closed and accessible canopy, and using mulch, compost, and home-made foliar fertilizers to ensure the plants have the nutrients they need to be productive. Such innovation to rehabilitate neglected farms and diversify the farming systems and economy (e.g. silviculture, food crops, honey, tourism), in a way that also improves and protects the ecosystems on which the farms depend for their existence, is an example of community-based adaptation to climate change.

Managing land and water in Darfur, Sudan

There are many rainwater harvesting, cultivation, or water pumping technologies that can help rural communities adapt to the changing climate, whether it brings more frequent or severe droughts, intense



rain (when it comes), or higher temperatures. However, the real challenge is to work as a population (the wider community) in using these practices to manage the land and water throughout the watershed and landscape. This means collaboration and local institutions (organizations and rules) to manage land and water use, for example farming in the more fertile and water-rich lowland (the *wadis*), access to water points for livestock as well as people and farmers, and corridors or routes for the movement of pastoralists and their herds. This ‘orgware’ – the way land and water use is managed in society – is vital to successful adaptation, and is the reason we should invest in community-based adaptation.

Constructing ‘biodykes’ in Nepal to protect from floods

Biodykes are a nature-based adaptation technology with many other benefits in addition to their main purpose of reducing flood risk (disaster risk reduction). Biodykes are cost effective because they use local materials and nature (fast-growing and deep-rooted plants) to create living embankments that can also be a source of natural products and that improve the ecosystem of the area. The embankments become permanent, protecting the land behind them from flooding, while at the same time building biomass and diversity in the landscape from which communities generate their food and livelihood. Sometimes the biodykes are restoring a flood-damaged or degraded ecosystem,

which is especially important for flood-prone or flood-affected communities.

Farmers managing seed systems in Zimbabwe

Ensuring farmers have access to a wide range of crops and varieties, as well as the skills needed to select, propagate, store, and use seed, enables them to use agricultural biodiversity to experiment and adapt their farming to the changing climate. Farmer-managed seed systems deliver plant biodiversity, and the knowledge and skills for maintaining it, where it is needed. For those engaged in producing and selling seed, it provides an additional source of income.

Experimenting in climate field schools in Nepal

Climate change is making farming in rural, hilly Nepal even harder. The key to adaptation is to produce food and generate income at the same time as improving the soil, maintaining plant cover across the landscape, and increasing the ability of the land to hold and retain moisture without erosion. In climate field schools, farmers experiment with climate-resilient varieties and different farming practices to see how they cope with the changing climate. They get access to climate information and agro-advisory services, and use that information to make decisions. Farmers are helped to do simple cost-benefit analyses, access digital market information, and look at trends, all of which enable them to plan for market-oriented production.

CONCLUSION

Our work and that of others has shown that farmers and communities are constantly experimenting and adapting, and have excellent insight into what works and what more they can do.



Adaptation is not about making a single change.

The most important thing to do when supporting a rural community to adapt is to help them understand the risks and impacts of climate change, then innovate (modify their activities and plans) using **the natural resources and social systems** they already have. Solutions can include the use of climate science, data, and new technologies, but should not ignore local knowledge, social structures, and the innovation of people themselves.

Specific policy priorities to support adaptation are:

1. Investing in learning from community-based adaptation.

This includes horizontal learning within and between communities, and vertical linkages to build consensus between communities and other development actors to bridge the policy–practice gap.

2. Focusing on women and other marginalized groups in agriculture and national climate policies and plans, to take account of the gender implications of adaptation and ensure that women play a central role in learning and planning.
3. Paying attention to local and indigenous knowledge, which can improve the uptake and sustainability of adaptation technologies.
4. Similarly, focusing on the viability of community-based adaptation so that it is sustainable, is supported by private sector actors, and goes to scale. This includes action by government to create incentives (an enabling environment) for investment.
5. Promoting analysis of risk and planning that anticipates uncertainty caused by climate change – it is better to prepare for risk than cope with it after the event.

Supporting adaptation that is planned and led by communities themselves will strengthen local agriculture, food systems, and economies, and will make rural populations and countries resilient for generations to come.



About Practical Action




We are an international development organization putting ingenious ideas to work so people in poverty can change their world. Our vision is for a world that works better for everyone.

We help people find solutions to some of the world's toughest problems, including challenges made worse by catastrophic climate change and persistent gender inequality.

We believe in the power of small to change the big picture. And that together we can take practical action to build futures free from poverty.

Big change starts small.

Practical Action
25 Albert Street, Rugby,
CV21 2SD, UK
+44 (0)1926 634400
Registered Charity No 247257

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