

# Climate-resilient agricultural development

## Scaling up note



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## Climate-smart scaling up processes

Smallholder farmers are in the front line of climate change impacts. The ecosystems on which they rely are increasingly degraded and their access to suitable agricultural land and to forest resources is declining. Many smallholder farmers produce on marginal rainfed land that is affected by increased water scarcity and erosion, while declines in fish and marine resources threaten other essential sources of income and nutrition. The primary interface between climate change and agricultural development is through agricultural production, but climate hazards also have impacts on the storage, processing and market access of produce.

Even before climate change adaptation became a major topic of international debate, IFAD was supporting investment programmes for smallholder farmers in drought- and flood-prone areas, promoting adaptive technologies such as agroforestry and water harvesting. Preliminary analysis shows that at least a third of IFAD's investments from regular sources are used for activities that are directly relevant to climate change adaptation, such as natural resource management, expansion of irrigation schemes, pasture management and erosion control.

IFAD is strengthening its capacity to respond to threats to global and national environmental commons and rural livelihoods by applying diverse resources and instruments. To create an incentive for mainstreaming climate issues into country operations, IFAD established the Adaptation for Smallholder Agriculture Programme (ASAP) in 2012. ASAP is a financing window that receives climate finance from earmarked sources and blends it with core IFAD resources to make bilateral climate finance work for smallholder farmers and help them manage climate risks. Its objectives include increasing the climate resilience of at least 8 million smallholder farmers and the area of land managed under climate-resilient practices by at least 1 million hectares by 2020. (IFAD, 2012a)

Climate mainstreaming is already changing the ways in which IFAD operates. For example, better analysis of climate risks and vulnerabilities is influencing the location and design of IFAD's investments; integrating adaptation innovations such as weather information systems or risk insurance is adding value to more traditional approaches; and scaling up of sustainable agricultural techniques is being accelerated. Climate mainstreaming is also reflected in the attention to climate risks in all new country strategic opportunities programmes (COSOPs) and associated projects.

## What is to be scaled up?

### **Sustainable agricultural technologies that promote climate change adaptation**

Over recent decades, IFAD has promoted a wide range of approaches that maximize the use of natural processes and ecosystems, reduce excessive use of external inorganic inputs, enhance the diversity of production while tailoring production intensity to the capacity of the landscape, and use a mix of traditional and new technologies. These approaches are knowledge-intensive and heterogeneous. They are described as “**multiple-benefit**” approaches because they typically build climate resilience alongside other benefits, contributing to poverty reduction, enhancement of biodiversity, increased agricultural productivity and lowering of greenhouse gas emissions from the agriculture sector. They are often implemented as packages at the farm level. There are many examples: minimum or zero tillage coupled with crop rotation and the application of manure, compost and mulching; intercropping of nitrogen-fixing plants with staple crops; and fallow management to improve soil structure and fertility, while building organic matter and water-holding capacity. Agroforestry is another integrated system that combines trees with agricultural crops and/or livestock. The trees can themselves be a source of income, depending on the species, while also improving soil quality through nitrogen fixation (“fertilizer trees”), capturing nutrients from deep in the soil and making them available through leaf litter, and creating a more favourable microclimate. These approaches are all examples of sustainable agricultural intensification or sustainable land management. (IFAD, 2012b)

### **Ecosystem-based adaptation at the landscape level**

At the landscape level, IFAD has been investing in initiatives to manage competing land uses and maintain intact ecosystems that serve as buffers against extreme weather events. Examples include projects focusing on rangeland management, watershed management or coastal afforestation.

### **New technologies to strengthen climate risk management in agricultural investment projects**

Complementary to investments in well-known technologies for agricultural intensification and landscape management, IFAD has recently started to integrate new technologies for climate risk management into its portfolio, such as early warning systems, provision of reliable weather information, scenario-based land-use planning and index-based weather risk insurance.

## Scaling up pathways

IFAD can use its main areas of intervention – **policy engagement, project financing, and knowledge generation and sharing** – to scale up climate-resilient interventions.

## Policy engagement

There are many examples of policies that negatively affect the sustainable management of natural resources, such as land-use policies that allow people to farm in sensitive areas or that deny access to more suitable areas. A lack of clear access and tenure rights to land removes incentives to make the usually long-run investments that maintain land in ways that make it resilient to climate change. Often, there is also a gap between technology and policy: the technologies are there but not the policies that give smallholder farmers the tools to use the technologies.

Addressing policy failures by supporting the rule of law, appropriate environmental policies and the use of subsidies can accelerate scaling up of the multiple-benefit approaches mentioned in the previous section. At the national and international levels, incorporating climate issues into policies for poverty reduction, agriculture and food is highly feasible, given the huge concerns among communities and electorates. Through its programmes and projects, IFAD contributes to this process of integration mainly by providing evidence on sustainable management and climate adaptation. IFAD's contribution is not only in generating new information from its years of experience but also in engaging with stakeholders responsible for policy and implementation, including the stakeholders on the ground, e.g. farmers and local institutions.

Any approach to revising/changing policy can provide a mechanism for transformation – be it creating platforms for dialogue among different ministerial and non-ministerial actors, such as in the IFAD/Global Environment Facility (GEF) Participatory Control of Desertification and Poverty Reduction in the Arid and Semi-Arid High Plateau Ecosystems of Eastern Morocco project,<sup>1</sup> or integrating climate vulnerability assessment into programme interventions, such as in the Rural Growth Programme in Yemen.<sup>2</sup>

Many countries are starting to engage with the National Adaptation Programme (NAP) process of the United Nations Framework Convention on Climate Change (UNFCCC), aiming to integrate climate change adaptation measures into medium- and long-term national planning processes. This means identifying entry points for adaptation planning in agriculture and taking action to strengthen country systems to improve management of the risks and opportunities of climate change. The NAP process represents a potential scaling-up mechanism for IFAD. By making climate finance available to agricultural investment programmes, IFAD can reorient these programmes to make them climate-resilient and better aligned with national priorities in climate change adaptation. By linking organizations (agriculture departments, associations of smallholder farmers, local cooperatives, women's groups and the private sector) that are usually not well connected to climate change-related planning and decision-making processes, such as NAPs, IFAD can ensure that the adaptation needs of smallholder farmers are reflected at the policy level.

## Project financing

The scaling up of climate-resilient development through COSOPs and projects occurs in three main ways.

### **Better analysis of climate risks and vulnerabilities, focusing on long-term development scenarios**

Project designs have to consider the ongoing changes in patterns of risk, and coping strategies cannot be based on historic experience and traditional knowledge alone. Losses and damage to livelihood systems are increasing and becoming more unpredictable. Greater attention to the assessment and management of climate risks and shocks needs to be integrated into all new COSOP and project designs. This means taking all climate-related threats into account, from rapid-onset events such as floods, storms, wave surges, rainfall-induced landslides and hailstorms to slow-onset events such as droughts and heat waves, and including persistent occurrence of lower-intensity damaging events such as soil erosion, degradation of coastal

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<sup>1</sup> The project set up a tripartite partnership agreement involving the Ministry of Agriculture, the Ministry of Interior and the High Commission for Water and Forests and the Fight against Desertification to coordinate rangeland management actions through the creation of advisory committees at the local, provincial, interprovincial and national levels, in which local communities and pastoral cooperatives were also represented.

<sup>2</sup> Informed by a vulnerability assessment based on geographic information systems (GISs), a US\$127.4 million investment programme has been formulated to increase the economic and climate resilience of 176,000 rural households. The programme supports community action plans in 550 village units in devising investment priorities for water harvesting, drinking-water management, land conservation, road rehabilitation and the adoption of renewable energy. The findings of the vulnerability assessment have been widely disseminated and will be used by all government agencies and partners in the country, serving as a platform for planning the design of development initiatives.

ecosystems and salinization of soils and groundwater. As stressed in the *10-Point Plan for Climate Mainstreaming* for IFAD10 (IFAD’s tenth replenishment) (IFAD, 2014a), this process will be facilitated by modifying Environmental and Social Review Notes to include climate risks more explicitly and by making fee income from the ASAP trust fund available to cover the additional costs of climate vulnerability analysis.

### Integration of innovative adaptation actions into agricultural investment projects

Adaptation to new and emerging risks requires access to innovative knowledge and technology, including when smallholders are already increasingly integrated into markets. A key pathway is providing timely access to relevant climate information, which improves the quality of autonomous adaptation decisions and reduces losses and damage from climate hazards. Different types and scales of climate information can be used for different purposes, from adjusting seasonal crop calendars to changing livelihood strategies. Examples include strengthening the network of weather stations to provide more reliable weather information for smallholder farmers; putting in place early warning systems to reduce losses and damage from climate hazards such as flash floods; and establishing a salinity monitoring system to track the effects of sea-level rise on rice production. It is extremely important to select not only the right type of information but also the right dissemination mechanism (rural radio, information and communication technology, mobile phones, etc.), as relatively minor support from a project can lead to adaptation actions at the national scale. Equally important is ensuring that adaptation actions are incorporated into community planning and management processes and are effectively monitored.

### Access to sustainable agricultural techniques and technologies

Both new and existing technologies play vital roles in climate risk management. There is need to support promising technologies that are new to the market and require promotion and piloting; smallholder farmers need training in how and when to use these technologies, and incentives for adopting them; and governments need support in formulating policies for providing incentives either directly or through markets. IFAD’s track record in community-based natural resource management provides many platforms for scaling up technologies that are relevant to climate change adaptation. The many technologies ready to be scaled up include improved seed and crop varieties that can tolerate or are resistant to drought, heat, salt, insects or pests. New technology is important but farmers already possess valuable knowledge and seed varieties, and local and traditional knowledge of crop management and ecosystem services can support adaptation to climate change by marginal rural and indigenous communities.

**Box 1: Examples of adaptation responses to increased risks from climate change in IFAD’s ASAP-supported project designs**

Country	Risk	Response
Bangladesh	Inland flash floods	A flash flood early warning system
Bolivia (Plurinational State of)	Increased droughts	Inventories of indigenous techniques for managing climate risks
Djibouti	Fish stocks moving further out to sea because of ocean warming	Improved post-harvest cooling and storage systems to counter effects of fish stock migration
Mali	More erratic weather and timing of growing seasons	Crowd-sourcing of weather information to improve meteorological forecasts
Mozambique	Temperature-related changes in pest vectors	Updated pest management practices
Nicaragua	Coffee crop vulnerable because of higher temperatures	Preventive measures to reduce water stress in the coffee value chain (e.g. through shade crops)
Rwanda	Food storage/ processing facilities not equipped for stronger storms and higher temperatures	Storm- and heat-resistant building codes for post-harvest processing and storage facilities
Viet Nam	Sea-level rise and reduced flow in the Mekong River	A salinity monitoring system in the Mekong Delta
Yemen	Flash floods washing away topsoil	Rehabilitation and improvement of rural feeder roads to capture runoff from extreme rainfall events

The value of local innovations that do not need external inputs should not be underestimated, especially because they can easily be scaled up in similar ecosystems. An example is IFAD's support to the scaling up of soil and water conservation practices through its portfolio of investments in Burkina Faso during the past 30 years. This has resulted in a spectacular increase in the number of trees – a phenomenon known as the “re-greening of the Sahel”. In the central plateau of Burkina Faso, these practices have led to the rehabilitation of 200,000-300,000 hectares of land and the production of an additional 80,000 tons of food per year. (IFAD, 2011b)

Promoting, revitalizing and scaling up existing technologies and strengthening the deployment of new ones is a straightforward pathway for scaling up because when technologies are successful, they are spontaneously taken up by the private sector.

In IFAD10, technical support for climate mainstreaming will be increased through full implementation of the Platform for Agricultural Risk Management (PARM) to increase sensitization to and investment in ecosystem- and finance-based risk reduction.

### **Box 2: Access to technologies – the Flexi Biogas system**

In Kenya, Biogas International has installed 200 Flexi Biogas systems since 2011. Since April 2012, IFAD has worked in partnership with Biogas International to install nine systems on dairy farms, as part of its Smallholder Dairy Commercialization Programme in Nakuru, and four systems in an orphanage school in Naivasha. At the school the systems use kitchen and human waste to produce electricity for lighting and Internet access. These systems have been installed as part of the Making Biogas Portable: Renewable Technologies for a Greener Future project, under the Initiative for Mainstreaming Innovation funded by the United Kingdom Department for International Development (DFID).

In a pilot project replicated in Rwanda with US\$20,000 of funding from the IFAD Policy and Technical Advisory Division, the biogas systems were complemented with the Government of Rwanda's One Cow per Farmer Programme (Girinka). A system was also installed at the Indian Institute of Technology in Delhi, which collaborated with IFAD on assessing the technical, social and economic viability of the technology. To create a platform for scaling up the system internationally, IFAD has supported South-South cooperation between Kenyan engineers and the Indian Institute of Technology and facilitated the travel of a Kenyan company representative to China to find ways of bringing down production costs, improving quality and reducing manufacturing time. (IFAD, 2012c)

## **Knowledge generation and sharing**

Knowledge management and lesson sharing aim to contribute to international and country-level policy dialogue, including on national climate change and environmental policies. A crucial part of IFAD's role in climate-resilient agricultural development is leadership in the management of knowledge to guide future investments by governments and other development agencies.

Lack of evidence on effective climate-resilient approaches appears to be a major barrier to better climate and environmental policy and implementation so providing demand-driven research outputs to policymakers and practitioners is a core mechanism for improving the effectiveness of climate-resilient development actions among their ultimate beneficiaries – smallholder farmers. Efforts to link research, monitoring and evaluation (M&E) and policy formulation and implementation are important but require an iterative rather than a linear process. Better-informed policymakers and practitioners will enact better programmes with better outcomes.

Documented evidence and learning are essential in raising support for scaling up so increasing communication and knowledge sharing on lessons and results from IFAD's climate-related work should be central to IFAD's role.

Knowledge-related pathways include: (i) expanding the use of IFAD grants as a tool for mainstreaming climate change-related considerations in IFAD's work at the regional and country levels – grants can be used to support first pilot projects and then methods and experiences likely to be scaled up into broader programmes; (ii) increasing technical staff capacity in climate adaptation, both at IFAD headquarters and at the project level, through tailored training programmes; (iii) increasing technical support for climate mainstreaming through deeper partnerships with knowledge and technical service providers, such as the Research Program on

Climate Change, Agriculture and Food Security (CCAFS) of the Consultative Group on International Agricultural Research (CGIAR) or the World Agroforestry Centre's (ICRAF's) geoscience laboratory for earth observation; and (iv) expanding use by IFAD of satellite/GIS tools so that GIS maps are available where needed to highlight climate issues in target landscapes for IFAD-supported projects and M&E.

### **Box 3: Access to finance – *Concursos* in Peru and the Plurinational State of Bolivia**

Competitions or *concursos* are an innovation adopted by the IFAD-supported Puno-Cusco Corridor Project (2000-2008) to allocate resources based on contests that facilitate poor rural people's access to quality services and their ability to become competitive entrepreneurs. Groups or communities compete for funds to invest in a range of natural resource management practices and related technical training. Each of the committees running the *concursos* has regulations approved by the local municipal council, and committee members are legitimized by the local population. The winners of a competition invest the prize funding plus a matching sum from their own resources. Their investment in and ownership of the project is a powerful factor in motivating them to maximize the impact of technical assistance, hire service providers that support their needs and achieve results. The *concursos* system proved very efficient in channelling locally available resources to motivated and organized stakeholders who acquired new knowledge and skills in several areas beyond natural resource management, such as in production, marketing and dealing with financial institutions.

The Economic Inclusion Programme for Families and Rural Communities in the Territory of the Plurinational State of Bolivia (ASAP/ACCESOS) applies the same competition approach but focuses specifically on climate risk management, funding investments at the landscape or larger territorial level to complement those at the community/group level funded by the baseline ACCESOS project. The programme is based on recognition of the complexity of people's interactions with landscapes and the potential for investments or management practices in one part of a landscape unit to produce benefits or reduce climate risks in other parts, well beyond the local administrative borders.

## **Key spaces for scaling up**

The pathways for scaling up occur in different "spaces", where opportunities can be created and potential obstacles need to be removed to open up the space for interventions to grow.

### **Financial space**

The creation of a well-aligned and comprehensive system of financial incentives that encourages innovation, competition and additional demand for services from the grass roots can be a catalyst in the scaling up of multiple-benefit approaches. Such approaches typically involve initial costs related to higher capital and knowledge inputs. A little finance can go a long way in changing behaviours, especially for smallholder farmers who are unable or reluctant to wait long for returns on investments and yield increases or to take on the transition costs and risks associated with investments in natural resource management – investments in agroforestry, for example, can take about five years to reach their full potential. Enabling local institutions to test, implement and finance risk management options improves the robustness of a wide range of decision-making processes.

Financial partners that can support climate/environment incentives include the GEF Adaptation Fund and other cofinancing resources, such as the Green Climate Fund.

### **Political space**

Understanding the political economy and the roles of key stakeholders, especially when they manage common pool resources, is a prerequisite for effective policy engagement.

Support to processes that clarify responsibilities within and among levels of government, increase cooperation, build the capacity and experience of policymakers and provide evidence and knowledge to inform policymakers and processes (such as the NAP) can help build political commitment, as illustrated in IFAD's policy engagement and knowledge management actions described in the previous section.

## Institutional space

The scaling up of climate-resilient approaches can be facilitated by incorporating an understanding of the local institutional environment into the design of progressive interventions and by establishing linkages with learning networks that can respond to the capacity-building needs of local institutions and organizations.

Greater attention to developing local institutions' capabilities to deal with uncertainty, change and surprise is essential to the scaling up of climate-resilient development. There is need to build local institutions' capacity and ability to: (i) obtain access to climate information for guiding decision-making; (ii) prioritize issues, areas, sectors and community groups in a transparent manner; (iii) coordinate and harmonize action at multiple levels, within and outside government; (iv) manage information to support risk management activities; (v) identify and pilot different adaptation and risk management technologies; and (vi) work with different sources of finance.

## Partnership space

Disseminating weather information and new technologies, including local innovations, requires coordinated and flexible relationships among actors. Collaboration among national and international research institutes, government agencies and the private sector is essential to satisfy the increasing demand for services that is generated by widespread adoption of successful approaches. Agents that may facilitate the scaling-up process include financial institutions; insurance, logistics, consulting, research and development partners, and knowledge providers.

## Cultural space

Management of natural resources and environment has a strong cultural dimension, which has to be taken into account, especially when dealing with access/tenure rights and other issues affecting women and indigenous peoples. Possible cultural obstacles need to be identified and natural resource management interventions adapted to permit scaling up in similar ecosystems with diverse cultures.

Supporting the development of vision and leadership among farmers through the use of participatory approaches such as farmers' action research and participatory mapping may be an effective strategy for triggering behaviour changes. Individual farmers and local communities play an important role as models of sustainable natural resource management practices and new technologies for adoption at a larger scale, demonstrating the long-term impacts of conservation agriculture, changing other farmers' perception of trees as "crop competitors", etc.

## Monitoring and evaluation

Appropriate indicators need to be identified to monitor the pathways. Climate adaptation indicators have been added to the Results and Impact Management System (RIMS) (IFAD, 2014b), and IFAD portfolio review templates have been updated to include climate change. To the extent possible, project monitoring systems should be integrated into national reporting systems associated with NAPs and National Communications to UNFCCC.

To help IFAD track institutional progress on the scaling up of climate-related interventions, in early 2013 new quality assurance climate markers were introduced to evaluate projects' sensitivity to climate change. Measurement is based on a series of questions regarding the extent to which the project demonstrates awareness of environmental and climate-related risks and integrates measures to reduce these risks. The climate markers are integrated into IFAD's Results Measurement Framework (RMF) under the "Environment and climate change" indicator. The RMF also measures the "Poor smallholder household members supported in coping with the effects of climate change" indicator, which refers to the number of men and women who directly or indirectly benefit from climate change adaptation measures under IFAD's ASAP.

## Key messages

Scaling up climate-resilient agricultural development requires:

- better analysis of climate risks and vulnerabilities at the COSOP and project levels
- increased technical support for climate mainstreaming by building staff capacity and establishing deeper partnerships with knowledge and technical service providers
- provision of access to climate information
- expanded use of GEF and other cofinancing resources, including grants
- addressing of policy failures by supporting the rule of law, appropriate environmental policies and the use of subsidies.

## References

- IFAD. 2010. *Climate Change Strategy*. Rome. <http://www.ifad.org/climate/strategy/e.pdf>
- IFAD. 2011a. *Environment and Natural Resources Management Policy: Resilient livelihoods through the sustainable use of natural assets*. Rome. [http://www.ifad.org/climate/policy/enrm\\_e.pdf](http://www.ifad.org/climate/policy/enrm_e.pdf)
- IFAD. 2011b. *Regreening the Sahel: Developing agriculture in the context of climate change in Burkina Faso*. Information sheet West and Central Africa. Rome. <http://www.ifad.org/operations/projects/regions/pa/infosheet/sahel.pdf>
- IFAD. 2012a. *Adaptation for Smallholder Agriculture Programme – ASAP*. Brochure. Rome. <http://www.ifad.org/climate/asap/asap.pdf>
- IFAD. 2012b. *Climate-smart smallholder agriculture: What's different?* IFAD Occasional Paper No. 3. Rome. <http://www.ifad.org/pub/op/3.pdf>
- IFAD. 2012c. *Flexi Biogas systems: inexpensive, renewable energy for developing countries*. <http://www.ifad.org/pub/thematic/biogas.pdf>
- IFAD. 2013. *The importance of scaling up for agricultural and rural development. And a success story from Peru*. IFAD Occasional Paper No. 4. Rome. <http://www.ifad.org/pub/op/4.pdf>
- IFAD. 2014a. 10-Point Plan for Climate Mainstreaming. (draft document for IFAD10)
- IFAD. 2014b. *Results and Impact Management System RIMS: First and Second Level Results Handbook*. Rome. <http://www.ifad.org/operations/rims/handbook/e.pdf>



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