



CLIMATE-SMART AGRICULTURE

Managing Ecosystems for
Sustainable Livelihoods

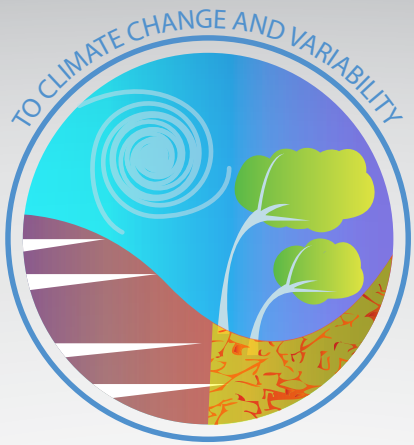


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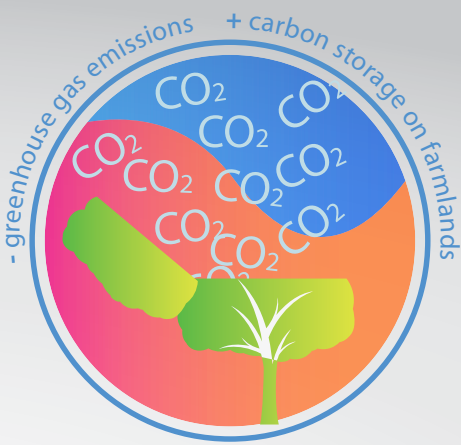
SUSTAINABLY INCREASES



STRENGTHENS RESILIENCE



REDUCES AGRICULTURE'S CONTRIBUTION TO CLIMATE CHANGE



ENHANCES THE ACHIEVEMENT OF NATIONAL FOOD SECURITY AND DEVELOPMENT GOALS



EXAMPLES





What do we need?

Agricultural sectors must become **climate-smart** to successfully tackle current food security and climate change challenges.

Agriculture, including forestry and fisheries, is crucial for food security and rural incomes as well as other essential products, such as energy, fiber, feed and a range of ecosystem services.

Climate-smart agriculture is a pathway towards development and food security built on **three pillars**: increasing productivity and incomes, enhancing resilience of livelihoods and ecosystems and reducing and removing greenhouse gas emissions from the atmosphere.

Climate-smart agriculture contributes to a cross-cutting range of **development goals**.

There are many opportunities for capturing **synergies** between the pillars of climate-smart agriculture, but also many situations where **trade-offs** are inevitable.

How do we achieve it?

Working at the **landscape** level with an **ecosystems approach**, combining forestry, fisheries, crops and livestock systems is crucial for responding to the impacts of climate change and contributing to its mitigation.

Inter-sectoral approaches and **consistent policies** across the agricultural, food security and climate change are necessary at all levels.

Institutional and **financial support** is needed for farmers, fishers and forest dependant peoples to make the transition to climate-smart agriculture.

Some effective climate-smart **practices already exist** and could be scaled-up, but this can only be done with serious investments in building the knowledge base and developing technology.

Investments in climate-smart agriculture must **link finance** opportunities from public and private sectors and also integrate climate finance into sustainable development agendas.

What next?

Early action is needed to identify, pilot and scale-up best practices, strengthen institutional capacities, and build experiences that can help stakeholders make informed choices to make the transformation to climate-smart agriculture.

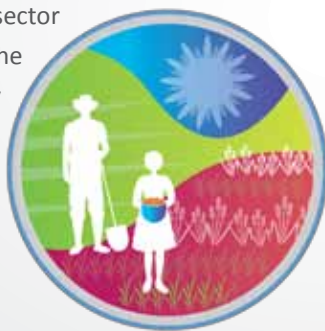
Tools and knowledge on climate-smart agriculture must be further developed and shared. We must invest in education, capacity development and communication.

Financial mechanisms that link climate finance to agriculture investment must be established.

UNDERSTANDING THE CHALLENGES OF CLIMATE CHANGE AND FOOD SECURITY

Business-as-usual scenarios of population growth and food consumption patterns indicate that agricultural production will need to increase by 70 percent by 2050 to meet global demand for food. The impacts of climate change will reduce productivity and lead to greater instability in production in the agricultural sector (crop and livestock production, fisheries and forestry) in communities that already have high levels of food insecurity and environmental degradation and limited options for coping with adverse weather conditions.

The agriculture sector is not only among the most vulnerable sectors to the impacts of climate change, it is also directly responsible for 14 percent of global greenhouse gas emissions. In addition, the sector is a key driver of deforestation and land degradation, which account for an additional 17 percent of emissions. The agricultural sector can be an important part of the solution to climate change by capturing synergies that exist among activities to develop more productive food systems and improve natural resource management.



A transformation of the agricultural sector, including crop and livestock production, fisheries and forestry, is urgently needed to respond to climate change and sustainably increase agricultural productivity and incomes.

Sustainable utilization of natural resources will require management and governance practices based on ecosystem approaches that involve multi-stakeholder and multi-sectoral coordination and cooperation. This is a crucial element for the transformation to climate-smart agriculture.

Climate-smart agriculture is rooted in sustainable agriculture and rural development objectives which, if reached, would contribute to achieving the Millennium Development Goals (MDGs) of reducing hunger and improved environmental management. More productive and resilient agriculture is built on the sound management of natural resources, including land, water, soil and biodiversity. Conservation agriculture, agroforestry, improved livestock and water management, integrated pest management and ecosystem approaches to fisheries and aquaculture can all make important contributions in this area.



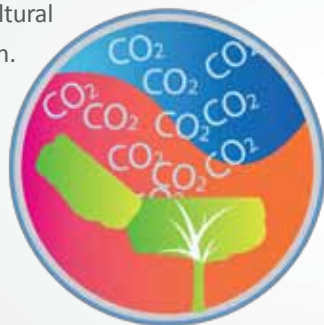
Numerous practices and technologies that can contribute to reaching the objectives of climate-smart agriculture already exist and are well tested. However, increased investments are needed to build the institutional capacity to support their adoption. Investments will also be needed to address gaps in knowledge and technology to support uptake at the local level.

PLANNING FOR CLIMATE-SMART LANDSCAPES

To support food security and boost incomes, agricultural systems in developing countries will be under pressure to increase productivity sustainably and strengthen the resilience of agricultural landscapes. Improved agricultural systems can also potentially emit lower levels of greenhouse gases.

Strategies exist to sequester carbon and reduce greenhouse gas emission reductions in the agricultural sector. Many of these strategies also improve food security, foster rural development and help communities adapt to climate change. However, trade-offs may have to be made when seeking to reach different development goals, such as climate change mitigation and adaptation, sustainable agricultural production and poverty reduction.

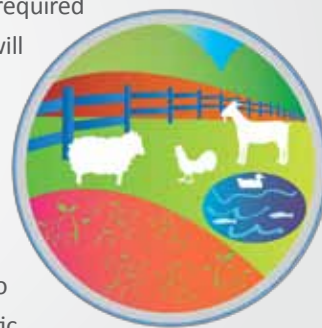
The challenge is to capture potential synergies among these activities, while avoiding as much as possible trade-offs that may increase food security.



Early action should facilitate piloting of good practices in new locations. When these practices are adapted to local circumstances and stakeholders engaged, they should then be up-scaled. Investments must strengthen institutional capacities, improve education, develop local skills and foster communication so that stakeholders can make informed development choices.

Balancing these trade-offs requires that interventions be planned and implemented in a coordinated manner over different time frames and across different sectors and landscapes. Although climate-smart agriculture's central focus is on farming, pastoral, forestry and fishing systems, a broader perspective is needed to achieve its overall goals. The ecosystem approach provides a framework for the better management of ecosystem services, such as carbon storage, freshwater cycling, biodiversity protection and pollination, that require larger interventions.

Improved natural resource management will need to be supported by strengthening infrastructure, institutions, legal frameworks and policies. The investments required to foster these improvements will need to include the transfer and implementation of supporting technologies, such as weather forecasting, early warning systems and risk insurance. Further research and development is also needed to keep pace with climatic, social and ecological changes.



Regional, national and international policies must be reviewed to better reflect the need for consistent and comprehensive approaches for developing the agricultural sector, addressing climate change and safeguarding food security.



Climate-smart agriculture is a holistic concept. It unites numerous issues related to agricultural development and other global development objectives. It covers environmental issues, for example energy and water, as well as social issues, such as gender, and economic issues. Achieving the four dimensions of food security (availability and access to food, utilization of food for adequate nutrition, and stability of food supply) needs to be the overall goal of food production and distribution systems in developing countries. Multiple components contribute to food security, and adapting food systems to climate change involves a diversity of approaches and resources.

To ensure investments are sufficient to make the transition to climate-smart agriculture, financial mechanisms are needed that can blend and coordinate funding from different sources, including public, private, agricultural development and climate financing.

FAO'S CONTRIBUTION TO CLIMATE-SMART AGRICULTURE

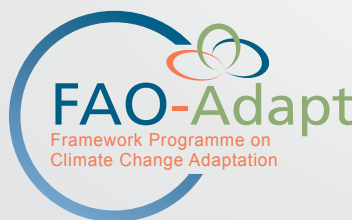
FAO has decades of experience in promoting agricultural practices and policies that ensure food security while safeguarding the natural resource base for future generations. Agriculture policies are the basis for achieving food security and improving livelihoods. An effective combination of sustainable agriculture and climate change policies can boost green growth, protect the environment and contribute to the eradication of hunger and poverty.

FAO works closely with many of the world's most vulnerable populations to help them increase their agricultural productivity, while ensuring that the natural resources they depend on are not exploited or depleted. FAO is working to support countries in transitioning to climate-smart agriculture in a number of ways. Key ongoing initiatives include:

FAO-Adapt

FAO-Adapt is an organization-wide framework programme that offers general guidance and provides principles, priority themes, actions and implementation support to FAO's activities related to climate change adaptation. FAO-Adapt promotes activities in agriculture, forestry and fisheries that enhance sustainable production while strengthening the resilience of agricultural ecosystems to cope with the impacts of current and future climate change. It is a part of a family of FAO climate-smart programmes designed to improve the capacity of Member Nations to implement climate change adaptation measures and assist them in making climate-smart decisions regarding agricultural

practices. To support planning and decision making, a number of methodologies and tools have been developed by FAO. Further information about FAO-Adapt and the tools are available at



www.fao.org/climatechange/fao-adapt.

The MICCA Programme

The Mitigation of Climate Change in Agriculture (MICCA) Programme builds the knowledge base on climate change mitigation in agriculture by conducting life cycle analyses of agricultural production chains, analysing global mitigation potentials and costs, and reviewing opportunities and obstacles for mitigation at the farm level. It also supports decision-making by analysing policy options and farmer decision-making processes, and by supplying information to the UNFCCC negotiations. MICCA also generates reliable data by addressing the large variations and gaps in data related to greenhouse gas emissions from agriculture and forestry and strengthens countries' capacity to carry out their annual greenhouse gas inventories. In addition, the Programme carries out pilot projects to produce quantifiable evidence that climate-smart agricultural practices can mitigate climate change, improve farmer

livelihoods and make local communities better able to adapt to climate change. More information is available at and make local communities better able to adapt to climate change. More information is available at



www.fao.org/climatechange/micca.

The UN-REDD Programme

The UN-REDD Programme is a collaborative partnership between FAO, the United Nation Development Programme (UNDP) and the United Nations Environment Programme (UNEP) that supports countries to develop their capacity to reduce emissions from deforestation and forest degradation (REDD) and implement a future REDD+ mechanism, which includes the conservation, sustainable management of forests, and the enhancement of forest carbon stocks. Forests and agriculture are intimately linked. Agriculture is a key driver of deforestation in many countries. To protect the natural resource base, realize mitigation potentials and enhance output from production systems, the forestry and agriculture sectors need to coordinate their planning, policies and strategies, using a landscape approach. There are many opportunities for coordinated activities, and the UN-REDD programme supports their development in several ways. More information is available at www.fao.org/climatechange/unredd.

UN-REDD
PROGRAMME



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FAO's Forest and Climate Change Programme

The Forest and Climate Change Programme seeks to strengthen national and international actions on forests and climate change adaptation and mitigation. The Programme raises awareness, strengthens technical capacities, creates enabling policy environments for action and encourages cross-sectoral and landscape approaches to climate change. One of its key activities is to work with countries and other partners to develop two specific tools to assist countries mainstream climate change into the forest sector at both the policy and forest management levels. 'Climate Change for Forest Policy Makers' is a tool designed to assist forest policy makers develop strategic goals and operational actions to integrate climate change into forest policy, legislation, governance arrangements and institutional frameworks. This tool also enhances capacity, research, information, communication and financing in forests and climate change. The second tool is a set of guidelines to assist forest managers adjust forest management practices to improve climate change adaptation and mitigation. This tool is relevant to all forest types, all management objectives and all forest managers. FAO support the use of both tools. More information is available at



www.fao.org/forestry/climatechange.

FAO's Fisheries and Aquaculture Climate Change Programme

The Fisheries and Aquaculture Climate Change Programme supports Member States and partners in adapting to and mitigating the impacts of climate change for fisheries, aquaculture and aquatic ecosystems, through policy development, exchanges of knowledge, normative outputs, practical demonstrations and capacity building.

Key activities include:

- developing and supporting global, regional and local climate change action partnerships including the public and private sectors, community groups and non-governmental organizations;
- building the knowledge base for local, national and international policy development for climate change and the fisheries and aquaculture sector to raise awareness of the importance of the sector with respect to climate change mitigation and adaptation, its contribution to the MDGs, the vulnerability of communities and the ways in which climate change responses can be developed;



- identifying and implementing climate change mitigation actions for the fisheries and aquaculture sector at the global, regional and national levels;
- identifying and promoting effective climate change adaptation strategies within the fisheries and aquaculture sector, developing frameworks at the global, regional and national levels and identifying resources to support prioritized actions at all levels;
- initiating lesson-learning and capacity-building processes with partners to establish more effective climate change responses through specific tools, including the development of strategies and best practices; and
- developing and implementing a communication strategy for climate change mitigation and adaptation for a range of audiences and outlining a coordinated approach to global planning and feedback.

More information is available at www.fao.org/fishery/topic/13788.

Partnership and Sourcebook on Climate-Smart Agriculture

FAO, together with the World Bank, CGIAR, IFAD, WFP, UNEP and the Global Mechanism have initiated a collaborative partnership to coordinate action on climate-smart agriculture. For interventions to have sustainable impacts, there is also a need for leadership in bringing together practitioners, farmers and decision-makers on a strategic level to enable early action and broad involvement of stakeholders.

One of the first elements of the Partnership's collective work programme is the development of a Sourcebook and knowledge platform on climate-smart agriculture. The Sourcebook will take stock of the concept of "climate-smart agriculture" and describe how it simultaneously addresses food security and livelihoods, climate change adaptation and mitigation. The Sourcebook will help stakeholders to plan climate-smart production systems and landscapes by providing an overview of key principles, areas of interventions and good practices in management and governance. The online knowledge platform will build on the content of the sourcebook and provide more detailed information on technologies, case studies and other ongoing initiatives.







Economics & Policy Innovations for Climate-Smart Agriculture - EPIC

The Economic and Policy Support for Climate-Smart Agriculture Programme provides technical and policy assistance to countries to establish climate-smart agricultural systems. Working with national policy and research partners, the Programme:

- provides technical support in identifying the synergies and tradeoffs between food security, adaptation and mitigation that may arise in transforming smallholder agricultural systems;
- identifies the local institutions needed to support the transition to climate-smart agricultural systems;
- provides assistance for strategic planning that integrates climate change, agricultural development and food security policy objectives and investments; and
- builds mechanisms and investment plans to combine climate finance with agricultural investment finance to support the transition to climate-smart agriculture

FAO EX-ACT (EX-Ante Carbon Balance Tool)

EX-ACT is a tool developed by FAO to provide ex-ante estimations of the impact of agriculture and forestry development projects on greenhouse gas emissions and carbon sequestration and indicate their effects on the carbon-balance. EX-ACT is intended to improve the accuracy of accounting for greenhouse gas emissions and mitigation potential from agricultural productions systems and processes. It is designed to help farmers, practitioners and policy makers make more informed decisions and facilitate the transition to climate smart agricultural systems. By contributing to improved greenhouse gas accounting, EX-ACT also support investments in climate-smart agriculture. EX-ACT was tested in project case studies in 2009 and peer reviewed in early 2010. FAO, in partnership with the World Bank, the International Fund for Agricultural Development (IFAD), the African Development Bank, GIZ and others organizations, has started to pilot up-scaling. It is currently being used in 19 countries. EX-ACT has also been used in value chain and policy analyses.

More information is available at www.fao.org/tc/exact.

FAO Framework Programme: Disaster Risk Reduction for Food and Nutrition Security

Assisting countries in reducing vulnerability to crises, threats and emergencies is a corporate priority of FAO. In the context of climate-smart agriculture, FAO's work on disaster risk reduction (DRR) promotes better preparedness to the increasing impacts of climate variability, change and extreme events at regional, national and local levels, and advises on the integration of disaster risk reduction measures for food and nutrition security into policies, programmes and interventions.

FAO's new Disaster Risk Reduction Framework Programme builds on existing DRR initiatives, good practices and technical capacities to assist countries for the design and implementation of enhanced disaster risk reduction for food and nutrition security and agriculture. It proposes longer-term time frames and encourages a programmatic and people centered approach to address DRR for food and nutrition security. The DRR framework's key objectives include:

- institutional capacity development;
- food and nutrition security information and enhanced early warning systems;
- better preparedness for disaster response; and
- building resilience of ecosystems and livelihoods to threats and disasters through the application of good practices, processes and technologies in farming, fisheries, forestry, and natural resource management.



FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS (FAO)
www.fao.org/climatechange/climatesmart