



# Coping with water scarcity in agriculture: a global framework for action in a changing climate

An action-oriented contribution by FAO to support the development and implementation of policies and programmes for the sustainable use of water in agriculture worldwide

## Why?

*“Water is a precious resource, crucial to realizing the Sustainable Development Goals, which at their heart aim to eradicate poverty”*

United Nations Secretary-General Ban Ki-moon

Water scarcity is one of the greatest challenges of the twenty-first century.

Agriculture, comprised of crops, livestock, fisheries, aquaculture and forestry, is both a cause and a casualty of water scarcity. It accounts for an estimated 70 percent of global water withdrawals, while competition with other sectors for water is increasing.

Climate change also affects freshwater resources negatively, in terms of both quantity and quality. More frequent and severe droughts are having an impact on agricultural production, while rising temperatures translate into increased crop water demand.

Water withdrawals grew at almost twice the rate of population increase in the twentieth century, and a 60 percent surge in food demand is expected by 2050. There is an urgent need, therefore, to address water scarcity.

## Key facts

- Water scarcity is one of the leading challenges of the twenty-first century, and it is expected to intensify as a result of climate change.
- Population growth, economic development, urbanization, dietary changes, widespread civil unrest and regional conflicts, migration and pollution pressure water resources.
- For each 1-degree global warming, 7 percent of global population will see a decrease of 20 percent or more in renewable water resources.
- Irrigated agriculture contributes 40 percent of global crop production in 20 percent of total cultivated land.
- As much as 84 percent of the economic impact of drought falls on agriculture, with major impacts on food security.
- Deforestation, land degradation and desertification resulting from the overuse of natural resources and exacerbated by climate change have negative impacts on the quantity and quality of water resources.
- Water scarcity exacerbates the direct and long-term effects of desertification on land and soil quality, soil structure, organic matter and soil moisture and therefore on agricultural productivity.



# The global framework

**Coping with water scarcity in agriculture: a global framework for action in a changing climate** will support the development and deployment of policies, strategies, programmes and field capacity for the adaptation of agriculture to water scarcity, using context-specific approaches and processes tailored to specific circumstances and needs, including support for the formulation of transformational projects.

The Global Framework will help in efficiently achieving the water-related goals and targets of the *2030 Agenda for Sustainable Development*, especially Sustainable Development Goal 6 – “Ensure availability and sustainable management of water and sanitation for all”. Investments made now in water resource management will provide long-term payoffs for sustainable human development and economic growth and have immediate short-term benefits.

Climate adaptation measures in agriculture that build on existing good management practices can increase water security and thus contribute directly to sustainable development. Innovative technologies derived from applied research, combined with appropriate policies and strategies, are necessary for both adaptation to, and the mitigation of, climate change.

## Aim

The aim of **Coping with water scarcity in agriculture: a global framework for action in a changing climate** is to support the development and implementation of policies and programmes for the sustainable use of water in agricultural sectors, using context-specific approaches and processes. It will identify priority actions for the adaptation of agriculture to climate change and for the scaling up of successful responses to the threats to agricultural production posed by increasing water scarcity. In so doing, the Global Framework will help countries, communities and businesses satisfy their needs for increased food production in the face of climate change, while conserving ecosystems and the ecosystem services they provide.

## Climate Change Context and the Paris Agreement

The Paris Agreement has increased opportunities for climate change adaptation and mitigation actions in agriculture. It recognizes the fundamental goal of ensuring food security and ending hunger, as well as the vulnerability of food production systems to climate change. The Intended Nationally Determined Contributions (INDCs) recognize the importance of agriculture and water in coping with climate change. Ninety four percent of the 188 countries that submitted INDCs as of March 2016 included agricultural sectors and 80 percent included water in their mitigation and/or adaptation plans. Of the 130 countries that include an adaptation section, 77 percent specify measures for managing water scarcity and protecting water quality.

**Coping with water scarcity in agriculture: a global framework for action in a changing climate** can support countries implementing the Paris Agreement by driving action and innovation for agriculture adaptation to water-scarce conditions, which are likely to increase in intensity and frequency due to climate change.

More specifically, the Global Framework will:

- **Provide** countries with support to integrate climate change into policies for the sustainable use of water in the agricultural sectors;
- **Support** countries to implement their nationally determined contributions through actions in crop production, livestock, fisheries, aquaculture and forestry for adaptation of agriculture and food systems to water-scarce conditions;
- **Support** capacity-development for increased understanding of the complex interdependency of climate change, water, food and energy, including through cross-sectoral dialogue and technical training; and
- **Promote** initiatives that bring countries together to share knowledge and experiences on adaptation and mitigation actions in managing water in the agricultural sectors, as well as measures to optimize water use and reduce water pollution.





## Water governance and access

Securing access to water – especially in water-scarce countries – is crucial for achieving food security and improving rural and peri-urban livelihoods. Access can be limited by **physical water scarcity** – the lack of water of sufficient quantity or quality, or over-allocation; **economic water scarcity** – the lack of adequate infrastructure due to financial, technical or other constraints; or **institutional water scarcity** – the lack of an appropriate institutional framework or capacities for ensuring the reliable, secure and equitable supply of water.

**Action areas:** Policies, programmes and associated enabling structures to ensure optimal, context-specific combinations of interventions, monitoring and other measures; focused public and private investment, supported by incentives; and regulatory frameworks that encourage sustainability.

### Making a difference – potential actions in vulnerable regions

Water scarcity, in its various forms, is present in all regions of the globe. The more than 2 billion people living in the world's drylands are especially vulnerable to the impacts of climate change, such as drought, and they face chronic food and water insecurity. Examples of potential actions in vulnerable regions are given below.

#### Sub-Saharan Africa

**Action area:** Sub-Saharan Africa suffers severely from economic water scarcity, and existing institutional, financial and human capacities for managing water are weak. The situation is complicated by a lack of coordination among public entities, the unclear definition of roles and responsibilities, and a lack of harmonization of regulations and policies on water management. Many people in rural and peri-urban areas lack adequate access to water for agriculture and even for drinking and household needs.

**How:** Focused investments in water infrastructure; and the development of institutional and human capacities.

#### Asia and the Pacific

**Action area:** The region is undergoing a structural transformation of agriculture and a transition to sustainable agriculture. The poor performance of large-scale public surface irrigation systems in many parts of Asia and the Pacific is causing declines in the profitability of irrigated agriculture; and there are issues of suboptimal water distribution, salinization and other forms of land degradation; and issues in aquaculture. The situation is expected to worsen with climate change. There are also issues related to equity, resilience, governance, demand management, and water allocation and a lack of water infrastructure for irrigation.

**How:** Implementing sound and innovative water accounting and auditing to support decision-making and management as well as evolving risk management strategies for national food security policies under water constraints and economic transitions.

*Continued overleaf*



## Near East and North Africa

**Action area:** The region is suffering from increasing physical water scarcity, due partly to climate change, as well as weak water governance and a lack of technical and human resource capacity.

**How:** The development of a comprehensive agenda, including: a solid governance framework with well-designed institutions with clear authority and accountability and adequate capacities and resources; efforts to arrive at consensus (at the national level) on water allocation policy; and investment in localized irrigation systems, industrial water-use efficiency, rainwater harvesting and clean-water technologies.

## Latin America and the Caribbean

**Action area:** A lack of adequate response strategies, the suboptimal allocation of resources, and stresses arising from urbanization mean a lack of capacity for addressing declines in water quality, increased competition for water, and low water-use efficiency in both rainfed and irrigated agriculture.

**How:** The adoption of measures to align water-related policies and decisions made outside the water sector, such as those determining energy prices, trade agreements, agricultural subsidies and poverty reduction strategies; and the development of informed, sustainable, efficient and equitable strategies for increasing yields in rainfed agriculture, as well as water productivity.

## Europe and Central Asia

**Action area:** The main objective of the European Union's water policy is to ensure access to sufficient good-quality water for all and the 'good status' of all water bodies in Europe. Water scarcity in Central Asia is exacerbated by transboundary political disagreements, rising surface temperatures, and a lack of capacity in the region to manage water resources effectively.

**How:** Investment to increase institutional accountability, and the adoption of a service-oriented management approach, with proper stakeholder involvement.

## The Way Ahead

*"We cannot avoid droughts,  
but we can stop them from becoming famine"*

FAO Director-General Jose Graziano da Silva

There is no shortage of knowledge, technologies, resources and good practices for addressing water scarcity. **Coping with water scarcity in agriculture: a global framework for action in a changing climate** will promote and support partnerships to harness the knowledge and experiences of stakeholders and enable targeted actions for the sustainable use of water in agriculture, thereby addressing the challenges for agricultural production and livelihoods posed by climate change.

The global framework will involve:

- **stakeholders** at the national level, including the public and private sectors, local communities and indigenous groups;
- **cooperation** among countries, including through regional collaborative bodies and mechanisms; and
- **collaboration** between countries and key players in water management in agricultural sectors, including United Nations and other development organizations, financing institutions, and non-governmental and civil-society organizations.

You can be a partner in this global framework.

**Be informed, get involved!**

For more information, please contact FAO  
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