



## WATER AND AGRICULTURE

### Highlights

- The agricultural sector faces increasing water risks, while remaining the main user of water and a major source of water pollution around the world.
- Governments have a role to play by bolstering farmers' resilience in areas facing increasing water risks and by creating incentives for farmers to improve water use and reduce polluting agricultural inputs. Governments also need to enforce existing water regulations and remove policies that support excessive use of water and polluting activities.
- OECD countries have made some progress in water and agriculture policy design, but more efforts are needed to improve water management in agriculture.
- Reforming policies effectively in this area involves continued preparatory efforts and taking advantage of windows of opportunity, while cautiously engaging into policy changes.

### What's the issue?

Agricultural regions in the OECD have been subject to extensive and increasing water constraints in recent years. Major droughts in Chile, Europe, and the United States, for example, have had major effects on agricultural production. Projections reveal that this trend is expected to continue, as agricultural production will have to rely on increasingly limited freshwater resources. Farmers in many regions will face increasing competition from non-agricultural users due to rising urban population density and water demands from the energy and industry sectors.

At the same time, [climate change](#) is projected to increase fluctuations in precipitation and surface water supplies, alongside a growing frequency of extreme weather events like [droughts, floods](#) and typhoons. In many regions, water quality is also likely to deteriorate due to the growth of polluting activities, salination caused by rising sea levels, and water supply changes.

These water challenges are expected to strongly impact agriculture – a water-dependent sector– undermining the productivity of rain-fed and irrigated crop and livestock activities in many regions. These changes could in turn further affect markets, trade and broader food security.

For as much as agriculture is impacted by these changes, it also contributes to these problems as a major – and often inefficient – user and polluter of water resources in many regions. As such, agriculture has a central role to play in addressing these challenges. Irrigated agriculture remains the largest user of water globally, accounting for 70% of water abstraction globally, and over 40% in many OECD countries. [Intensive groundwater pumping](#) for irrigation depletes aquifers and can generate costly environmental externalities. Yet in most countries, farmers do not pay for the full cost of the water they use. In addition, agriculture remains a major source of water pollution: pesticide use, fertiliser run-off and livestock effluents all contribute to the pollution of waterways and groundwater.

### What should policy makers do?

Responses at multiple levels are needed to improve agriculture's water use, to reduce the sector's impact on freshwater resources, and to increase its resilience to water risks, in line with the [2016 OECD Council Recommendation on Water](#). Governments should start by identifying agriculture's [water risk hotspots](#) to prioritise and tailor their policy actions for increased efficiency and effectiveness of their risk mitigation efforts.

#### **At the farm level**

- Establish farm-level information systems on water resources, water quality and risks.
- Encourage farmers to deploy water saving and risk resilient technologies and practices.
- Foster better farm management practices that internalise environmental costs by means of the polluter-pays principle.

### **At the watershed level**

- Improve information systems on surface and groundwater quality, resource and flows.
- Define property rights attached to water withdrawals, water discharges and ecosystem provision, and ensure that they sustainably reflect water availability.
- Develop flexible and robust water allocation systems that allow quantity to fluctuate – via market mechanisms, for instance – in response to seasonal conditions and shocks.
- Use regulatory, economic, and collective measures to control intensive agricultural groundwater use and water pollution.
- Co-ordinate efforts with private agro-food companies and other water using sectors.

### **At the national level**

- Enforce existing regulatory provisions on water use and water pollution, ensuring effective sanctions and penalties in case of non-compliance.
- Ensure that charges for water supplied to agriculture reflect at least full supply costs, using social and adjustment policies when needed to compensate the poorest farmers.
- Design risk management instruments that effectively increase the resilience of farmers to the uncertainties of weather events and climate change.
- Remove price-distorting policy measures, like water-related agricultural and energy subsidies, that can harm freshwater supplies.

### **At the international level**

- Foster transparent and open markets to absorb the impact of domestic water risks and to allow food to be produced where it is economically efficient and environmentally sustainable to do so.
- Collaborate with other countries to bolster resilience and limit the diffusion of water risks.

[OECD research](#) suggests that OECD countries have improved the design of their agriculture and water policies from 2009 to 2019, as measured in terms of alignment with the OECD Council Recommendation on Water. However, reported progress was partial and heterogeneous across countries. Moreover, [measuring policy progress](#) in this area also requires looking at progress in implementation capacity, and progress in terms of results.

[Reform processes](#) matter when seeking to improve water and agriculture policies. Policy makers should [take advantage of windows of opportunities](#), such as water crises, to adopt and implement agriculture and water policy changes effectively. While waiting for the best time, they should continue invest in research, education, raise awareness and improve water governance. When the time is right, they should build a robust evidence basis, align institutions with the policy change, consult stakeholders strategically, rebalance economic incentives, and set a flexible reform sequencing.

## **Further reading**

Gruère, G. and H. Le Boëdec (2019), "Navigating pathways to reform water policies in agriculture", *OECD Food, Agriculture and Fisheries Papers*, No. 128, OECD Publishing, Paris, <https://doi.org/10.1787/906cea2b-en>.

Gruère, G. and M. Shigemitsu (2021), "Measuring progress in agricultural water management: Challenges and practical options", *OECD Food, Agriculture and Fisheries Papers*, No. 162, OECD Publishing, Paris, <https://doi.org/10.1787/52b4db7e-en>.