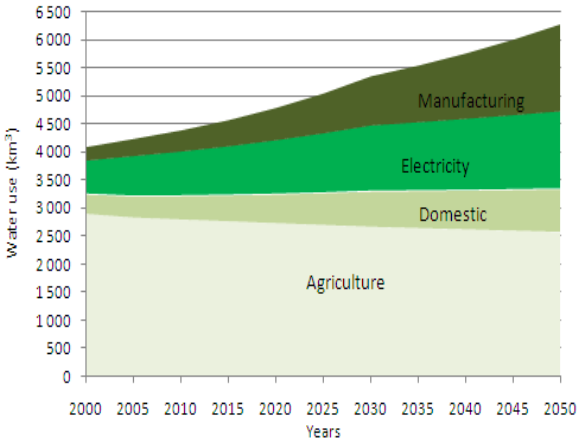
WATER RESOURCES IN AGRICULTURE: OUTLOOK AND POLICY ISSUES

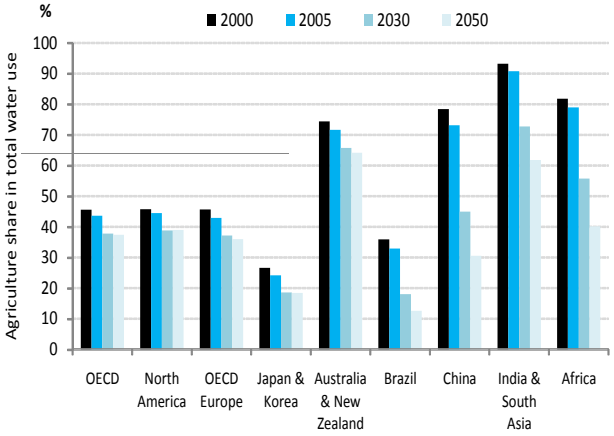
World agriculture faces an enormous challenge over the next 40 years: to produce almost 50% more food up to 2030 and double production by 2050. This will probably have to be achieved with less water, mainly because of pressure from growing urbanisation, industrialisation and climate change. Hence, it will be important in future that farmers receive the right signals to increase water use efficiency and improve agricultural water management, especially as agriculture is the major user of water in most countries.

OECD Projected world water withdrawals from 2000 to 2050:

By sector



Share of agriculture in total water withdrawals



Water projections to 2050

OECD water use projections to 2050 highlight a number of issues that policy makers need to address. Among these include an increase to 47% of the world's population living under severe water stress, mostly in developing countries, compared to 44% in 2005. Agriculture's quantity and share of global water use may decline, reflecting improvements in water use efficiency.

Many Asian, African and Middle Eastern countries will encounter the greatest pressure on water resources, largely due to growth in non-agricultural water use. Technology and better resource management can help.

It is likely that OECD countries will continue to be major agricultural exporters to these countries, necessitating that the management of water resources in agriculture in OECD countries be improved, while ensuring water needs for the environment are met.

If rising water and energy prices lead to higher food prices, they could stimulate more widespread adoption of modern irrigation technologies, saving water and raising yields. But this could also result in expansion of irrigation onto fragile lands.

Climate change, agriculture and water

The Intergovernmental Panel on Climate Change, and many reports from OECD government agencies, project shifts and variability in hydrological regimes resulting from climate change. For agriculture this implies changes in the seasonal timing of rainfall and snow pack melt and the higher incidence and severity of floods and droughts.

Mitigation and adaptation approaches to climate change in agriculture need to be strengthened. These approaches are likely to be more effective if they are embedded in longer term strategies closely linked to agricultural policy reform, risk management policy and market approaches.

Water and agricultural support policies

Given the anticipated growth in demand for food and water and increasing pressures from climate change, agriculture will be a key target for policy makers as it consumes about 70% of the world's freshwater withdrawals (45% in OECD countries).

The level of charges for water supplied to farms has risen in OECD countries. Frequently, however, farmers are only paying the operation and maintenance costs for water supplied, with little or no recovery of agriculture's share of capital costs for water infrastructure (see table below).

Where countries have raised water charges to farmers, available evidence indicates that it has not led to reduced agricultural output. But water charges rarely reflect scarcity and social values or environmental costs and benefits.

Groundwater policies usually involve licenses and other regulatory instruments. But illegal groundwater pumping is difficult to observe or control and remains a major challenge for the sustainability of farming.

Agricultural support policies linked to production can encourage less efficient use of water, lead to off-farm pollution and exacerbate flooding. Isolating and quantifying the overall economic efficiency and environmental effectiveness of farm support on water resources, however, is difficult and further analysis on causation is needed.

There has been some progress across OECD countries in lowering support levels and in decoupling support from production and inputs (including water and energy). These reforms are leading to more efficient use of water, better adaptation to water scarcity, and lower off-farm pollution.

Future challenges

Future policies to address the management of water resources in agriculture will be influenced by many and diverse drivers. For OECD countries farm management and technology; climate change and climate variability; and energy costs for pumping water are particularly important.

In *Sustainable Management of Water Resources in Agriculture*, OECD analyses the challenges of moving towards more efficient management of water resources in agriculture and responding to growing food demands and the impacts of climate change. The OECD report suggests that it will be important for policy makers to:

1. Recognise the complexity and diversity of water resource management in agriculture, in the context of varying regional and national water resource supply and demand balances.
2. Strengthen institutions and property rights for water management in agriculture.
3. Ensure charges for water supplied to agriculture at least reflect full supply costs.
4. Improve policy integration and coherence between agriculture, water, energy and environmental policies.
5. Enhance agriculture's resilience to climate change and climate variability impacts.
6. Address knowledge and information deficiencies to better guide water resource management.

Full supply cost recovery[1] for surface water delivered on-farm across OECD countries[2]: 2008

100% cost recovery of Operation and Maintenance and Capital Costs:
Austria; Denmark; Finland; New Zealand; Sweden; United Kingdom

100% cost recovery of Operation and Maintenance Costs, but less than 100% recovery of Capital Costs:
Australia, Canada, France, Japan, United States

Less than 100% cost recovery of Operation and Maintenance and Capital Costs:
Greece; Hungary; Ireland; Italy; Mexico; Netherlands; Poland; Portugal; Spain; Switzerland; Turkey

Less than 100% cost recovery of Operation and Maintenance Costs, with Capital Costs fully supported:
Korea

1. Full supply costs for water deliveries to farms include: operation and maintenance costs (*e.g.* maintaining and repairing the irrigation infrastructure) and capital costs, both renewal capital costs (*e.g* replacing irrigation canals) and new capital costs (*e.g.* constructing dams).

2. No information is available on the following OECD countries: Belgium; Czech Republic; Germany; Iceland, Luxembourg, Norway, Slovak Republic.