OECD WORK ON WATER

OECD

BETTER POLICIES FOR BETTER LIVES

Contents

Overview

The global community increasingly understands how water defines growth and contributes to sustainable development. It also realises how water is part of the solution to multiple crises, on climate, biodiversity, inequity, migration, or even peace. It experiences how water risks affect people's health and well-being, the environment and economies, all over the world. The UN 2023 Water conference is a unique opportunity to make that case and connect water to other global agendas. The Global Commission on the Economics of Water has a critical role play, recasting water economics and building coalitions for action at multiple scales.

The OECD is working to help countries in the Global North and Global South meet the water challenge. With a multi-disciplinary team drawn from across the Organisation, the OECD contributes analyses to improve knowledge, identify good practices, and offer policy guidance. It provides a forum for exchanging country experiences. OECD work focuses on water economics and governance:

- How to manage water so that it contributes to sustainable growth and development. How to finance water-related infrastructure and services. How to protect against water-related risks: risks of too much, too little, or too polluted water, and risks to the resilience of freshwater ecosystems.
- How to enhance effective, efficient and inclusive water governance. How to manage water across levels of government and scales. How to engage with stakeholders. How to regulate water services. How to strengthen capacity, especially at the subnational level. How to foster integrity and transparency.

In addition to analytical work, the OECD works with selected regions and countries to facilitate the reform of water policies. This confirms OECD's aspiration to make reform happen.

The OECD has enhanced its convening power and capacity to structure discussion among stakeholders on water issues, by setting up the following international initiatives: the *Roundtable on Financing Water*, the *Water Governance Initiative*, and the *Network of Economic Regulators*.

This brochure presents OECD work underway on water, which supports governments and stakeholders with new approaches to water management, investment planning and financing that ensure our societies, our economies and our environment are robust and resilient to water-related risks, now and in the future.

OECD
BETTER POLICIES FOR BETTER LIVES

THE ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

The Organisation for Economic Co-operation and Development (OECD) is a multi disciplinary inter-governmental organisation, tracing its roots back to the post World War II Marshall Plan. Today, it comprises 38 member countries that are committed to democratic government and the market economy and the European Commission, with the major emerging economies increasingly engaged directly in the work.

The OECD provides a unique forum and the analytical capacity to assist governments to compare and exchange policy experiences, and to identify and promote good practices through policy decisions and recommendations.

The *OECD Council Recommendation on Water*, adopted by all OECD member states in December 2016, captures policy guidance developed by the OECD and can inspire water policy reforms in countries around the globe. Non-member countries are welcome to adhere to the Recommendation with a view to create a momentum for water policy reforms that contribute to water security and sustainable growth. The Toolkit for Water Policies and Governance compiles policies, governance arrangements and related tools that facilitate the design and implementation of water management practices in line with the OECD Council Recommendation on Water. It is designed to inspire and support countries which have either adhered to, are considering adhering to, or aim to converge towards the OECD standard. The practices reported in the toolkit have been compiled by the OECD Secretariat, in close consultation with delegates from adhering countries. Regular updates will be made available.

KEY LINKS

OECD website on water: www.oecd.org/water

The OECD Water Legacy 2006-2021: oe.cd/water-legacy-21

Did you know?

By 2050 over 40% of the world's population are likely to be living in river basins under severe water stress. Overall water demand is projected to increase by 55%.

Surface water quality outside the OECD is expected to deteriorate in the coming decades, through nutrient flows from agriculture and poor wastewater treatment. The consequences will be increased eutrophication, biodiversity loss and disease.

Micro-pollutants (medicines, cosmetics, cleaning agents, and biocide residues) are an emerging concern in many countries.

OECD Council Recommendation on Water

The OECD Council Recommendation on Water covers a range of topics relevant for water resources management and the delivery of water services:

- managing water quantity
- improving water quality
- managing water risks and disasters
- ensuring good water governance
- ensuring sustainable finance, investment and pricing for the water and water services.

The Recommendation captures the main messages that derive from over 40 years of OECD policy guidance on water to OECD members and non-OECD members. It sets out a number of measures to manage water for sustainable growth and development. Notably, it recommends that OECD member countries and countries which have adhered to the Recommendation set up and implement water policies that:

- are adjusted to local conditions, based on long-term water management plans and enhanced policy coherence with climate change adaptation and across various sectors (e.g. land management, food and energy security, urban development, spatial planning, biodiversity protection)
- combine water demand management with the promotion of water use efficiency and allocation regimes that are dynamic, flexible and adjustable to shifting circumstances at least social cost
- prevent, reduce and control water pollution through regulatory, economic and voluntary policy instruments that hold polluters accountable
- assess and prioritise water-related disaster risk reduction, and develop emergency management capabilities and financial protection strategies
- enhance the effectiveness and efficiency of, and trust and engagement in, water governance
- set up measures for the sustainable financing of water services, water infrastructures, water resources management and the protection of water-related ecosystems.

OECD work continues to seek i) adherence from non-member countries that consider the Recommendation to inspire or guide the reform of policies that contribute to water security and sustainable growth, and ii) develop a toolkit to facilitate the implementation of the Recommendation.

The OECD Toolkit for Water Policies and Governance crystallises country-specific evidence and policy guidance, which can expedite action and convergence towards international good practices for water management.

KEY PUBLICATIONS

OECD (2016), *OECD Council Recommendation on Water,* https://www.oecd.org/water/recommendation/#d.en.431326

OECD (2021), *Toolkit for Water Policies and Governance: Converging Towards the OECD Council Recommendation on Water,* OECD Publishing, Paris, https://doi.org/10.1787/ed1a7936-en

The Global Commission on the Economics of Water

The Global Commission on the Economics of Water (GCEW) is convened by the Government of the Netherlands and facilitated by the Organisation for Economic Co-operation and Development (OECD). It was launched in May 2022 with a two-year mandate.

The GCEW is executed by an independent and diverse group of eminent policy makers and researchers in fields that bring novel perspectives to water economics, aligning the planetary economy with sustainable water resource management.

Its purpose is to make a significant and ambitious contribution to the global effort to spur change in the way societies govern, use and value water. Completing the sustainability trilogy that began with the *Stern Review* on the economics of climate change (released in 2006) and the *Dasgupta Review* on the economics of biodiversity (issued in 2021), the GCEW will provide a fundamental reassessment of the way we manage and value water, and water's intrinsic role in addressing climate change and other global challenges.

The work of the GCEW entails a two-year process, with societal dialogues and calls for evidence. This will ensure a wider audience is reached and that the supporting material to work with is robust and up to date, and the coalitions for action are genuinely global. The work combines three pillars: analytics, societal dialogues and an action agenda.

Preliminary work argues that, for the first time in history, human activity and practices have put the global water cycle, on which all life depends, on an unsustainable course. The science also shows how communities and nations are hydrologically intertwined – not just by rivers and the surface water that we see, but through atmospheric moisture flows. Practices in any one region impact rainfall in others. It follows that water is best approached as a global common good. The question then is how can economics reflect that global dimension of the hydrological cycle? How to reimagine multilateralism to manage that global common good?

KEY LINK

Global Commission on the Economics of Water: www.watercommission.org

Water for sustainable growth

Water security and economic development

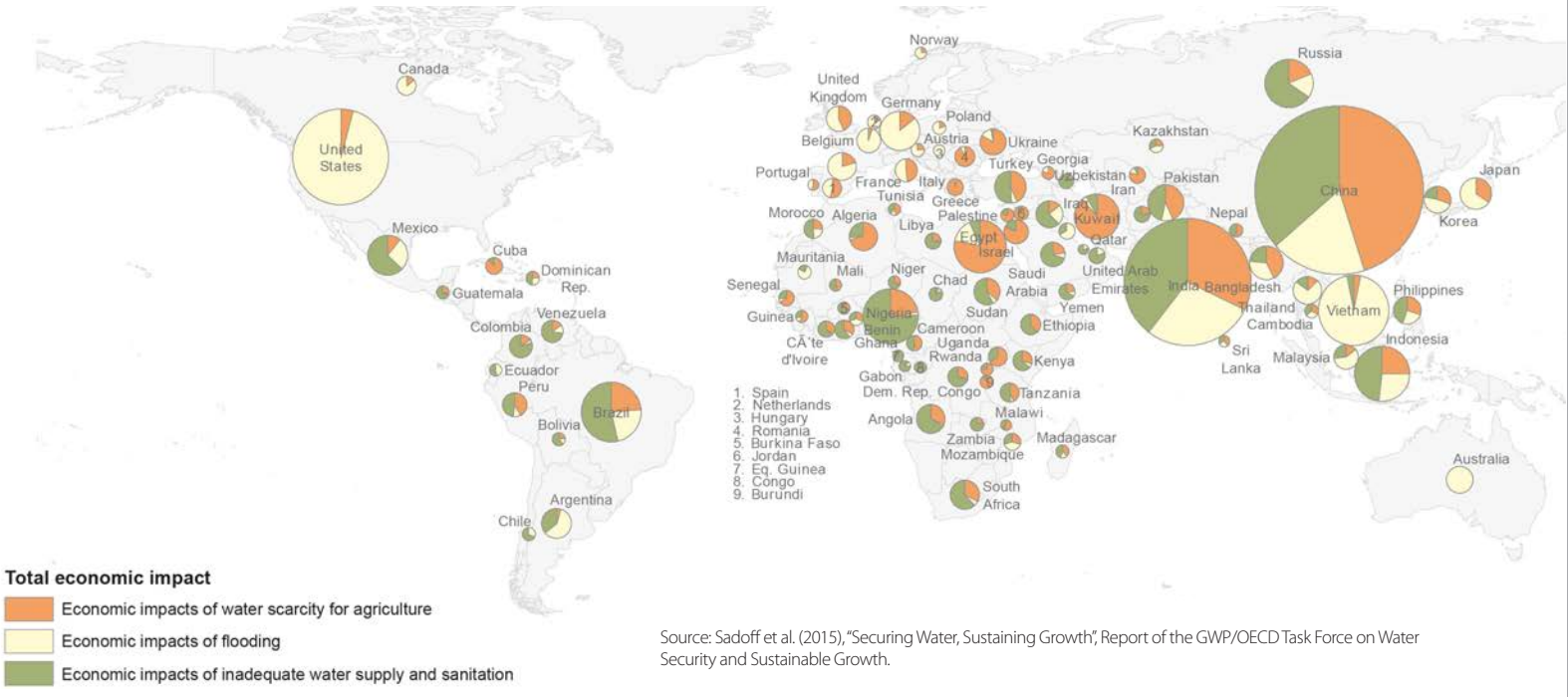
Water management is not merely an environmental issue. It is a development issue. The OECD-GWP Global Dialogue on Water Security for Sustainable Growth established how water security contributes to sustainable growth. This connection is highlighted by the role of water in the Sustainable Development Goals, with a stand-alone water goal and several references to water in other goals.

The Task Force on Water Security and Sustainable Growth demonstrated in their 2015 report *Securing Water, Sustaining Growth* that water resources can play a defining role in economic development. Water-related risks act as a drag on global economic growth, and the scale of the challenge that can be monetised is estimated to be in the order of USD 500 billion annually (excluding environmental risks).

Harnessing water to drive sustainable growth requires investments in water infrastructure, information and institutions. The Task Force argues that the most beneficial investments in water security are sequenced along strategic pathways. *Securing Water, Sustaining Growth* documents some of the pathways taken by cities, aquifers, and basins to water security.

On the occasion of the 7th World Water Forum in 2015 held in Korea, a High-Level Panel launched the report and an accompanying Policy Statement endorsed by leaders in water from around the world. In particular, leaders call for enhanced action and investment in water along three lines: invest in water security; invest in risk management; and invest in knowledge, people and partnerships. These messages can inform the water policy agenda, but are also relevant to the development community and for infrastructure planning. A rethink of how investment projects are assessed and valued is required, to account for their contribution to sustainable pathways (see section 6 of this brochure on financing water resources and water services).

Relative global economic impacts of water insecurity



Source: Sadoff et al. (2015), "Securing Water, Sustaining Growth", Report of the GWP/OECD Task Force on Water Security and Sustainable Growth.

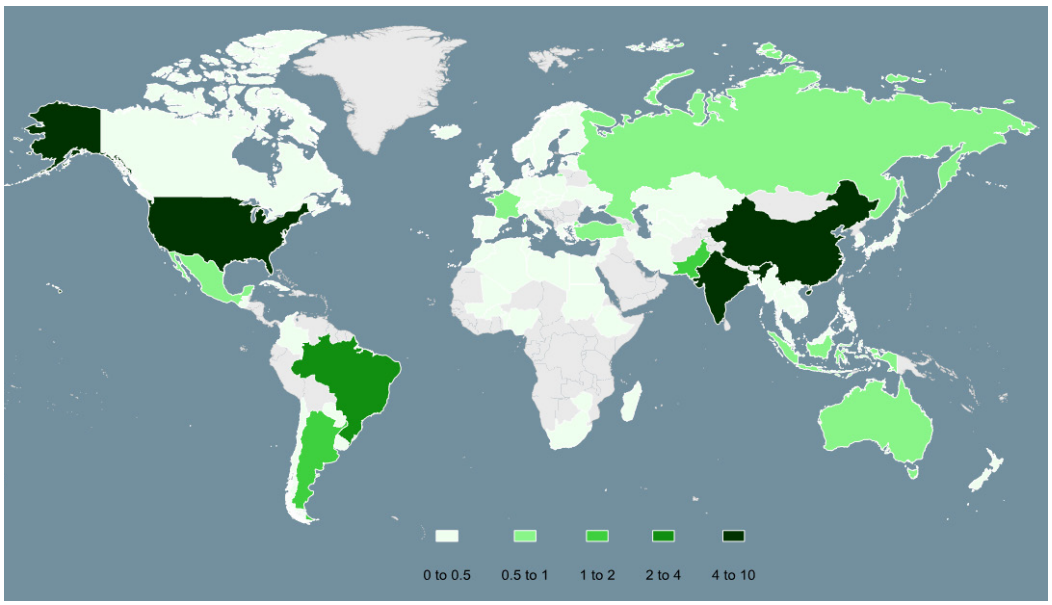
KEY LINK

Water for sustainable growth and the SDGs: www.oecd.org/water/sustainable-growth-and-sdgs.htm

Water security and food security

Water security is intrinsically linked to food security. Agriculture is expected to face increasing water risks that will affect food production, markets, trade and ultimately food security. Targeted policy actions, focusing on agricultural water risk hotspots, can provide more efficient and effective strategies to mitigate future water risks. The 2017 OECD report *Water Risk Hotspots for Agriculture* develops the use of such a targeted approach, provides an application at the global scale, and presents a policy action plan to mitigate the future impact of water risks on agriculture.

Future water risk hotspots for global agriculture production (2024-50 average)



Note: The index can be interpreted as the expected share of overall global production of the key agriculture commodities likely to face high water without adaptation action risks in each of the 77 largest agriculture-producing countries.
Source: OECD (2017), *Water Risk Hotspots for Agriculture*, based on a review of 64 publications, projections from the AgLink-Cosimo and IMPACT models.

Data to support water-related policies

Quality data are indispensable for developing water policies, monitoring their implementation and informing about the results obtained. The OECD produces international water data to support its policy analyses and country reviews, and to calculate OECD and SDG indicators, such as water use efficiency and water stress.

The main vehicle for data collection is the OECD questionnaire on inland waters used jointly with Eurostat, and the coordinated UNSD/UN Environment questionnaire, which together provide a global country coverage.

The data collected relate to freshwater resources and their use; wastewater treatment and discharges; and the quality of rivers and lakes. Other data relate to policy instruments for water management. They are maintained in the OECD "Policy Instruments for the Environment" database that covers about 100 countries. They typically include information on abstraction and pollution charges and on tariffs for water-related services.

Water-related indicators feature in the OECD flagship report *Environment at a Glance* whose 2022 edition includes interactive graphics to compare countries and a thematic webbook on water resources.

KEY LINKS

OECD (2017), *Water Risk Hotspots for Agriculture, OECD Studies on Water, OECD Publishing*, Paris, https://doi.org/10.1787/9789264279551-en

Policy Instruments for the Environment database: http://oe.cd/pine

Main datasets are available on the OECD Statistical Platform: http://dx.doi.org/10.1787/env-data-en

Water quantity management

River basins and countries around the world experience water shortages, as demand for water increases - driven by population growth and economic development and warmer temperatures - and water availability becomes uncertain - because of climate change. While the focus often is on supply augmentation (through additional storage, desalination or reclaimed water), demand management is part of the solution. It best combines pricing instruments (that discourage wastage) with robust water allocation regimes.

Allocation regimes determine who is able to use water resources, how, when and where.

Well-designed water allocation regimes allocate water to where it creates the most value for society—economically, socially and environmentally. They can also adjust to changing conditions and preferences at least cost for society.

Well-designed water allocation regimes reflect the different capacities of water users to take and adapt to risks of scarcity. They provide incentives for investment and innovation in water use efficiency. For instance, reforms of water entitlements in the Murray Darling Basin in Australia, have triggered innovative responses from irrigators, freeing water for valuable uses.

However, many allocation regimes are strongly conditioned by historical preferences and usage patterns. They show a high degree of path dependency, which manifests in laws and policies, and in the design and operational rules of existing water infrastructures. As a result, water use is often locked-in to uses that are no longer as valuable today as they once were. For example, adequate flows to support ecosystem functioning are not secured in many basins, and many countries still apply very low, or no charges at all, for water abstraction, even though the value of water has increased as competition for the resource has intensified.

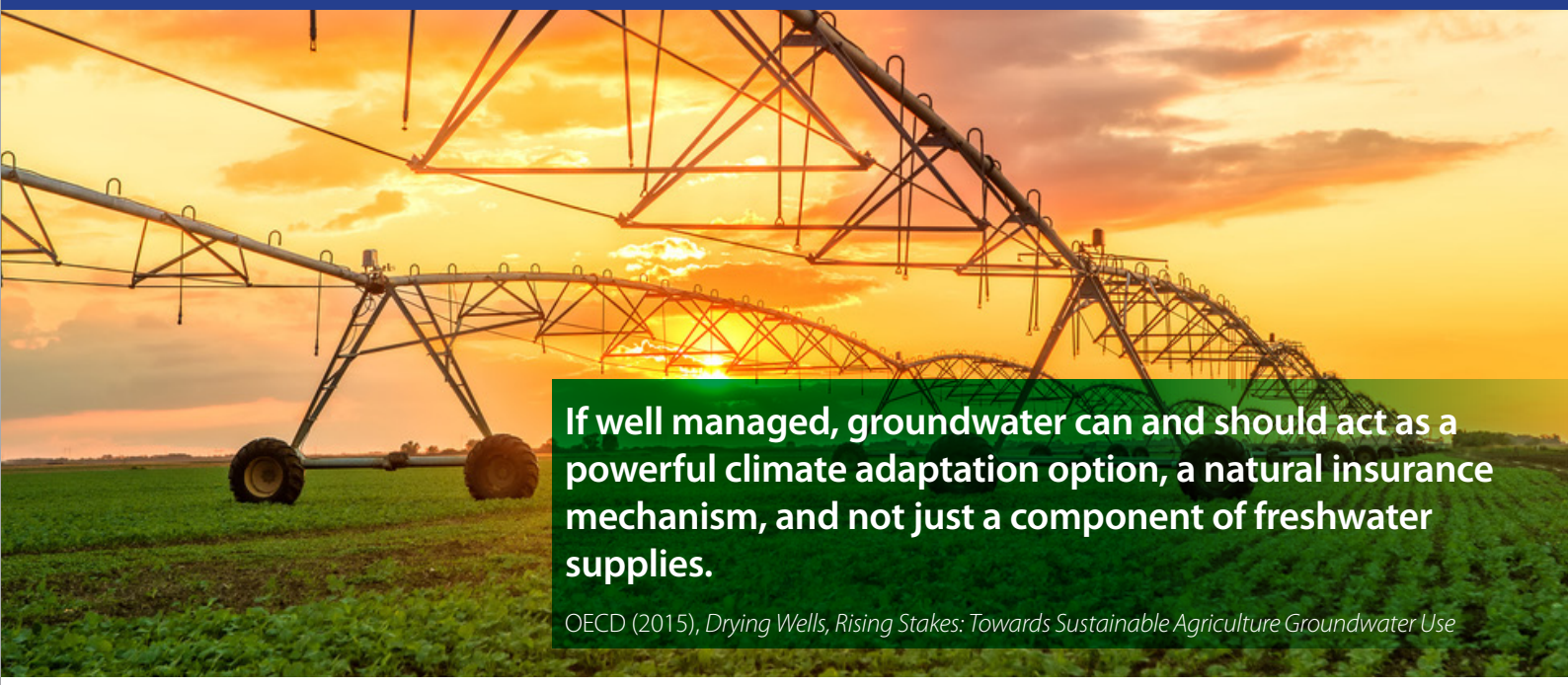
The OECD has developed a Health Check, which countries can use to assess how robust prevailing water allocation regimes are (see references below).

As part of the 2017 publication, a companion tool has been developed specifically for the allocation of groundwater. It builds on nine case studies (Denmark; Tucson, Arizona; Kumamoto, Japan; Mexico; the Upper Guadiana Basin, Spain; Texas; France; India; and North China) designed to show how groundwater allocation challenges are being addressed in diverse contexts.

A Health Check for improving water resources allocation

1. Are there accountability mechanisms in place for the management of water allocation that are effective at a catchment or basin scale?
2. Is there a clear legal status in place for all water resources (surface and ground water and alternative sources of supply)?
3. Is the availability of water resources (surface water, groundwater and alternative sources of supply) identified and possible scarcity well-understood?
4. Is there an abstraction limit ("cap") that reflects in situ requirements and sustainable use?
5. Is there an effective approach to enable efficient and fair management of the risk of shortage that ensures water for essential uses?
6. Are adequate arrangements in place for dealing with exceptional circumstances (such as drought or severe pollution events)?
7. Is there a process for dealing with new entrants and for increasing or varying existing entitlements?
8. Are there effective mechanisms for monitoring and enforcement, with clear and legally robust sanctions?
9. Are water infrastructures in place to store, treat and deliver water in order to allow for the allocation regime to function effectively?
10. Is there policy coherence across sectors that affect water resources allocation?
11. Is there a clear legal definition of water entitlements?
12. Are appropriate abstraction charges in place for all users that reflect the impact of the abstraction on resource availability for other users and the environment?
13. Are obligations related to return flows and discharges properly specified and enforced?
14. Does the system allow water users to reallocate water among themselves to improve the allocative efficiency of the regime?

Source: OECD (2015), *Water Resources Allocation: Sharing Risks and Opportunities.*



If well managed, groundwater can and should act as a powerful climate adaptation option, a natural insurance mechanism, and not just a component of freshwater supplies.

OECD (2015), *Drying Wells, Rising Stakes: Towards Sustainable Agriculture Groundwater Use*

Agriculture and water quantity management

Agriculture faces the enormous challenge of producing more with less water. Globally agriculture needs to produce almost 50% more food by 2030 and double production by 2050. This will likely need to be achieved with less water. At the same time, there will be growing pressures from urbanisation, industrialisation and climate change. In this context, it is critical that farmers receive the right signals to increase water use efficiency and improve agricultural water management, whilst preserving aquatic ecosystems.

In the 2010 report *Sustainable Management of Water Resources in Agriculture*, the 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. Groundwater provides a highly important resource for agriculture to cope with increasingly variable water supplies. However, intensive use of groundwater for irrigation leads to the lowering of water tables, reducing its potential for future use. It can also generate multiple negative externalities, including salinity, stream depletion, or land subsidence that directly affect agricultural productivity, water users and the environment.

The 2015 OECD report *Drying Wells, Rising Stakes: Towards Sustainable Agriculture Groundwater Use* provides a comprehensive review of agriculture groundwater management instruments. It identifies a combination of policy measures to alleviate the negative effects of agricultural groundwater use and sustain the capacity of aquifers for the future. It emphasises in particular the need for governments to invest in groundwater information systems to properly manage groundwater, which remain incomplete and insufficient in many OECD countries. In regions with intensive groundwater use, the OECD recommends employing a "tripod" combination of regulatory, economic and collective action policy approaches, customised to local circumstances.

KEY PUBLICATIONS

OECD (2015), *Water Resources Allocation: Sharing Risks and Opportunities,* OECD Studies on Water, OECD Publishing, Paris, https://doi.org/10.1787/9789264229631-en

OECD (2017), *Groundwater Allocation: Managing Growing Pressures on Quantity and Quality,* OECD Studies on Water, OECD Publishing, Paris, https://doi.org/10.1787/9789264281554-en

OECD (2015), *Water Resources Governance in Brazil,* OECD Studies on Water, OECD Publishing, Paris, https://doi.org/10.1787/9789264238121-en (see Chapter 4)

OECD (2022), *Managing and Financing Water for Growth in Thailand: Highlights of a National Dialogue on Water,* OECD Studies on Water, OECD Publishing, Paris, https://doi.org/10.1787/839a4f70-en (see Chapter 3)

OECD (2015), *Drying Wells, Rising Stakes: Towards Sustainable Agricultural Groundwater Use,* OECD Studies on Water, OECD Publishing, Paris, https://doi.org/10.1787/9789264238701-en

Water quality management

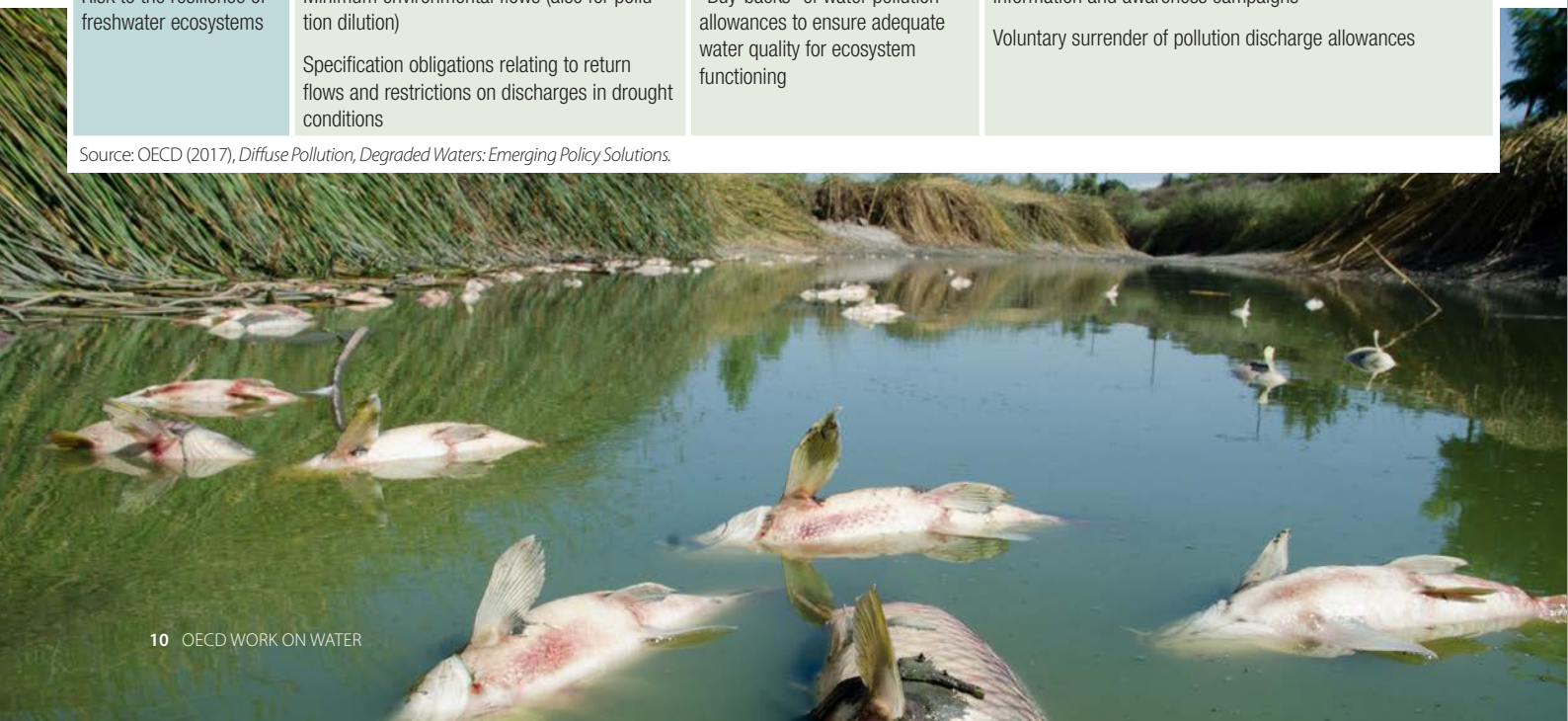
After decades of regulation and investment to reduce point source water pollution (e.g. municipal wastewater collection and treatment), OECD countries still face water quality challenges (e.g. eutrophication) from diffuse agricultural and urban sources of pollution; that is disperse pollution from surface runoff, soil filtration and atmospheric deposition. The relative lack of progress reflects the complexities of controlling multiple pollutants from multiple sources, their high spatial and temporal variability, associated transactions costs, and limited political acceptability of regulatory measures.

The OECD has analysed emerging policy solutions to address diffuse water pollution in member countries. The 2017 report *Diffuse Pollution, Degraded Waters: Emerging Policy Solutions* outlines the water quality challenges facing OECD countries today, presents a range of policy instruments and innovative case studies of diffuse pollution control, and concludes with an integrated policy framework to tackle diffuse water pollution. Work continues, with a focus on specific substances: pharmaceutical residues and micro-plastics. New work on endocrine disruption explores the opportunity to supplement substance-by-substance policy responses with new monitoring techniques such as effect-based monitoring. It is noteworthy that more stringent standards for water quality can increase treatment costs. This raises issues about the sustainability of prevailing financing models for water quality management. OECD analyses have supported the European Commission in the development of a legislative proposal to revise the Urban Wastewater Treatment Directive. Some of the outcomes (on projected costs, financing models, the role of economic regulation and benefits of reporting on the performance of service provision) are valuable beyond Europe.

Policy instruments to address diffuse water pollution and protect freshwater ecosystems

Water-related risk	Regulatory instruments	Economic instruments	Voluntary or information-based instruments
Water pollution	Water quality standards Mandatory best environmental practices and restrictions on inputs Pollution discharge permits Non-compliance penalties – non-renewal of resource permits or greater restriction on current permits Non-compliance fines	Pollution taxes (on inputs) Pollution charges (on outputs) Water quality trading Payment for ecosystem services	Information and awareness campaigns Farm advisory services for improved farming techniques (to minimise negative impacts on water quality) Contracts/bonds (e.g. land retirement contracts) Best environmental practices (or good management practices) Environmental labelling – products that meet certain environmental standards can be marketed and sold at a premium and/or subsidised
Risk to the resilience of freshwater ecosystems	Minimum environmental flows (also for pollution dilution) Specification obligations relating to return flows and restrictions on discharges in drought conditions	"Buy-backs" of water pollution allowances to ensure adequate water quality for ecosystem functioning	Information and awareness campaigns Voluntary surrender of pollution discharge allowances

Source: OECD (2017), *Diffuse Pollution, Degraded Waters: Emerging Policy Solutions.*



The management of contaminants of emerging concern in freshwater

Contaminants of emerging concern (CECs) comprise a vast array of contaminants that have only recently appeared in water, or that are of recent concern because they have been detected at concentrations significantly higher than expected, and/or their risk to human and environmental health may not be fully understood. Examples include pharmaceuticals, microplastics, industrial and household chemicals, personal care products, pesticides, and their transformation products.

Microplastics are ubiquitous in the natural environment. The 2021 report *Policies to Reduce Microplastics Pollution in Water* synthesises the current state of knowledge on the sources, fate and risks of microplastics pollution. It focuses on two sources of microplastics pollution, textile products and vehicle tyres. The report proposes policy insights on measures and strategies that could help minimise microplastics emitted unintentionally from products and their potential impacts on human health and ecosystems. Similarly, the 2019 OECD report *Pharmaceutical Residues in Freshwater: Hazards and Policy Responses* provides policy guidance to cost-effectively reduce pharmaceuticals in freshwater, and their associated risks to human and environmental health.

New work focuses on endocrine disruption. It explores if and under which conditions new analytical methods, such as effect-based monitoring and bioassays, can support innovative and cost effective regulations for water quality.

Did you know?

Pharmaceuticals are essential for human and animal health. However, they are increasingly recognised as a contaminant when their residues enter freshwater systems and affect environmental and human health. For example: endocrine disrupting pharmaceuticals can cause reproduction toxicity in fish and increased risk of breast or prostate cancer in humans; and the overuse of antibiotics is linked to antimicrobial resistance – a global health crisis.

KEY LINKS

OECD (2019), *Pharmaceutical Residues in Freshwater: Hazards and Policy Responses*, OECD Studies on Water, OECD Publishing, Paris, https://doi.org/10.1787/c936f42d-en

OECD (2021), *Policies to Reduce Microplastics Pollution in Water: Focus on Textiles and Tyres*, OECD Publishing, Paris, https://doi.org/10.1787/7ec7e5ef-en

OECD website on water quality and quantity: www.oecd.org/water/water-quantity-and-quality.htm

Managing water-related disasters

The economic and social costs of water-related disasters are high and increasing. In 2017 three of the strongest and costliest hurricanes hit the northern Atlantic, leaving damages of more than USD 245 million in their wake. Dramatic floods in Pakistan have taken lives and shattered development opportunities for years, if not decades. The severity of droughts continues to increase - in 2018 over three million people were affected by them in Kenya alone. Across Europe hot and dry summers are causing increasingly severe heatwaves and drought conditions that affect farmers and health systems across the continent. The impacts of climate change are expected to increase both the frequency and the severity of water-related disasters.

The OECD's work on climate change adaptation and disaster risk management supports countries' efforts to prepare for the effects of a changing climate and related disaster risks by providing robust analysis, policy advice and supporting the sharing of experiences between the public and private sectors. It seeks to assist countries in their efforts to design an enabling environment for adaptation action and disaster risk management measures adopted by all responsible stakeholders. The OECD's work on water-related disasters contributes to international discussions by way of various platforms such as the OECD High-Level Risk Forum. It also drives local action: in cooperation with local stakeholders, the OECD assesses the economic and social costs of severe drought in the metropolitan area of Paris. Analyses can inspire measure to enhance the resilience of the metropolitan Paris area.

KEY LINKS

OECD work on climate adaptation: www.oecd.org/climate-change/resilience/

OECD work on risk governance: www.oecd.org/governance/risk

OECD Recommendation on the Governance of Critical Risks: www.oecd.org/gov/risk/recommendation-on-governance-of-critical-risks.htm

The governance of water-related disasters

The OECD High-Level Risk Forum provides a venue for risk managers from governments and the private sectors to discuss governance mechanisms that reduce water-related disaster risks. In 2014 an OECD Council Recommendation on the Governance of Critical Risks was adopted to establish a benchmark for a whole of-society effort to better assess, prevent, respond to, and recover from the effects of extreme events.

The OECD *Policy Tookit on the Governance of Critical Infrastructure Resilience* proposes practical steps to focus resilience efforts on where the potential of disruptions by water-related risks can create the most damaging cascading consequences.

To address the particular vulnerability of coastal regions to the impacts of climate change, the OECD developed the report Responding to Rising Seas that reviews how OECD countries can use their national adaptation planning processes to respond to this challenge. Specifically, the report examines how countries approach shared costs and responsibilities for coastal risk management and how this encourages or hinders risk-reduction behaviour by households, businesses and different levels of government. The report outlines policy tools that national governments can use to encourage an efficient, effective and equitable response to ongoing coastal change. It is informed by new analysis on the future costs of sea-level rise, and the main findings from four case studies (Canada, Germany, New Zealand and the United Kingdom).

OECD Recommendation on the Governance of Critical Risks

The OECD Recommendation on the Governance of Critical Risks calls on OECD member countries to:

- Identify and assess risks, taking interlinkages and knock-on effects into account. This helps set priorities and inform allocation of resources.
- Invest more in risk prevention and mitigation such as in protective infrastructure, but also non-structural policies such as land use planning.
- Develop flexible capacities for preparedness, response and recovery, which help manage unanticipated and novel types of crises.
- Establish transparent and accountable risk management systems that learn continuously and systematically from experience and research.

The financial management of water-related disasters

Flooding is one of the most common, wide-reaching and destructive natural perils causing, on average, more than USD 200 billion in damages annually. The financial management of flood risk presents a significant policy challenge in many countries, requiring careful consideration of the relative effectiveness of various tools for managing flood risk, from investments in risk prevention and public awareness, to the use of risk transfer tools to protect against significant post- disaster costs. The OECD report *The Financial Management of Flood Risk* applies the lessons from the OECD's guidance andanalysis of disaster risk financing practices to the specific case of floods.

The fiscal impact of water-related disasters on a government's budget can be sizeable. Expenditures for the government arise from both explicit and implicit commitments to compensate for disaster losses. The joint OECD/World Bank report Fiscal Resilience to Natural Disasters identifies the most important sources of disaster costs for governments. Damages to public infrastructure assets and related service disruptions are among the largest sources of the costs governments assume, and they are also the most difficult to control. The report also shows that many of such costs arise through claims made by subnational government agencies, state-owned enterprises or other partners that own or operate infrastructure assets and services. The report recommends countries to design clear framework rules for a government's post-disaster financial assistance. Moreover, it recommends countries to include the assessment of disaster related contingent liabilities in fiscal risk management frameworks and to manage remaining fiscal risks through multi- pronged financial protection strategies.

OECD Recommendation on Disaster Risk Financing Strategies

The OECD Recommendation on Disaster Risk Financing Strategies provides guidance on the development of strategies for the financial management of disaster risks. It provides a set of high-level recommendations for designing a strategy for addressing the financial impacts of disasters on individuals, businesses and sub-national levels of governments, as well as the implication for public finances. It specifically targets issues related to the financial management of disaster risks, while recognising the importance of an integrated approach to disaster risk management and the contribution of risk assessment, risk awareness and risk prevention to the financial management of disaster risks, complementing the OECD Recommendation on the Governance of Critical Risks.

KEY LINKS

OECD/The World Bank (2019), *Fiscal Resilience to Natural Disasters: Lessons from Country Experiences*, OECD Publishing, Paris, https://doi.org/10.1787/27a4198a-en.

OECD (2016), *Financial Management of Flood Risk*, OECD Publishing, Paris, https://doi.org/10.1787/9789264257689-en.

Managing water-related risks in agriculture

Agriculture is expected to be the most economically affected sector by climate change, most notably due to an increase in rainfall variability. Long-term changes in precipitation, changes in crop water requirements, and the increasing frequency of extreme weather events are expected to affect crops and livestock production systems in many regions. As countries develop climate adaptation policies in agriculture, water management will play a key role in increasing agriculture's resilience to climate change.

The 2016 OECD report *Mitigating Droughts and Floods in Agriculture: Policy Lessons and Approaches* proposes a policy framework to overcome market, policy and behavioural failures. The report *Managing Weather-Related Disasters in Southeast Asian Agriculture* applies this framework to evaluate policies in place in Myanmar, the Philippines, Thailand and Viet Nam.

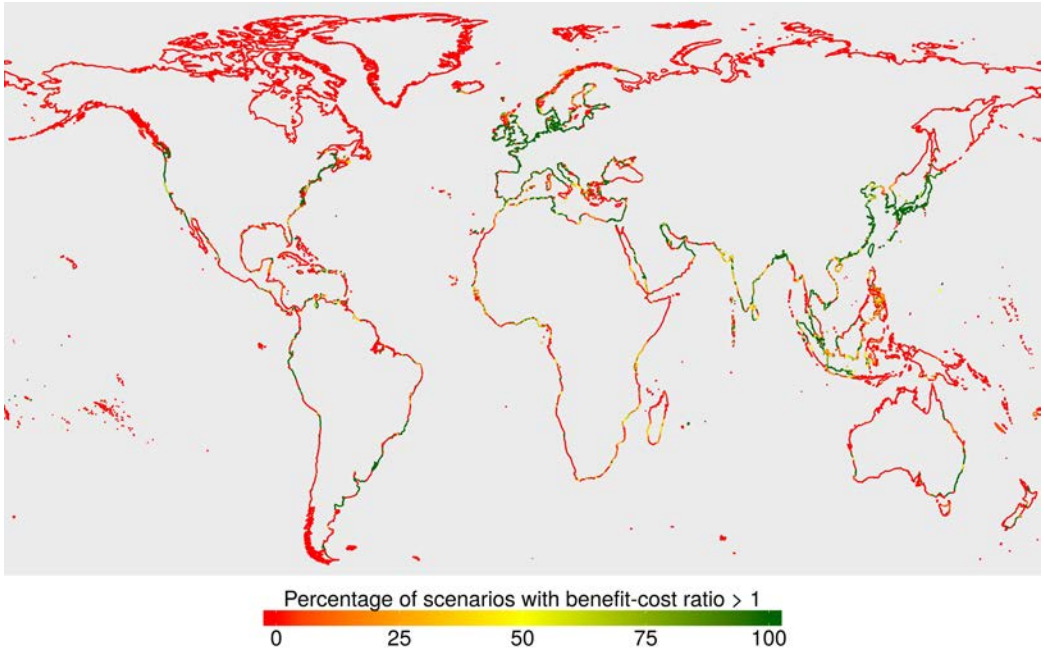
The 2017 OECD report *Water risk hotspots for agriculture* analyses the type of risks, from scarcity to risk related, projected for the sector. It identifies regions particularly exposed to these risks and assesses the possible impacts these risks may have on agriculture production and food prices. The report recommends that government take a strategic approach to risk, prioritizing responses in water risk hotspot areas.

OECD's contribution to international discussions on water-related disasters

The OECD supports several international discussions on water- related disaster risk management:

- As a founding member of the United Nations High Level Experts and Leaders Panel on Water and Disasters (UN-HELP), the OECD provides policy support to ensure that water-related disasters stay high on the international policy agenda.
- In support of the G20 work on quality infrastructure, the OECD developed a background report on Climate-Resilient Infrastructure, which highlights the needs and ways countries can integrate a resilience lense, including to water-related disasters, when conceiving and maintaining infrastructure assets over time.
- The OECD also supports countries in their implementation of the UN Sendai Framework for Disaster Risk Reduction, especially on their efforts towards improving risk governance.

Economic robustness of coastal protection globally



Note: This map shows where it is economically robust to invest in coastal protection, under five scenarios of 21st century global mean sea-level rise (from 0.3m to 2.0m). The results show that coastal protection is economically robust across all scenario combinations for 13% of the world's coastline, which account for 90% of the global coastal population. Conversely, it is robust not to protect 65% of the world's coastline, which corresponds to a small fraction of global coastal floodplain population (0.2%). For the remaining 22% of the world's coastline, the optimal adaptation strategy varies across scenarios. Source: Lincke, D. and J. Hinkel (2018), "Economically robust protection against 21st century sea-level rise", Global Environmental Change.

KEY PUBLICATIONS

OECD (2018), *Managing Weather-Related Disasters in Southeast Asian Agriculture*, OECD Studies on Water, OECD Publishing, Paris, https://doi.org/10.1787/9789264123533-en

OECD (2016), *Mitigating Droughts and Floods in Agriculture: Policy Lessons and Approaches*, OECD Studies on Water, OECD Publishing, Paris, https://doi.org/10.1787/9789264246744-en

Policy responses to adapt to climate risks: Nature-based solutions against water-related climate risks

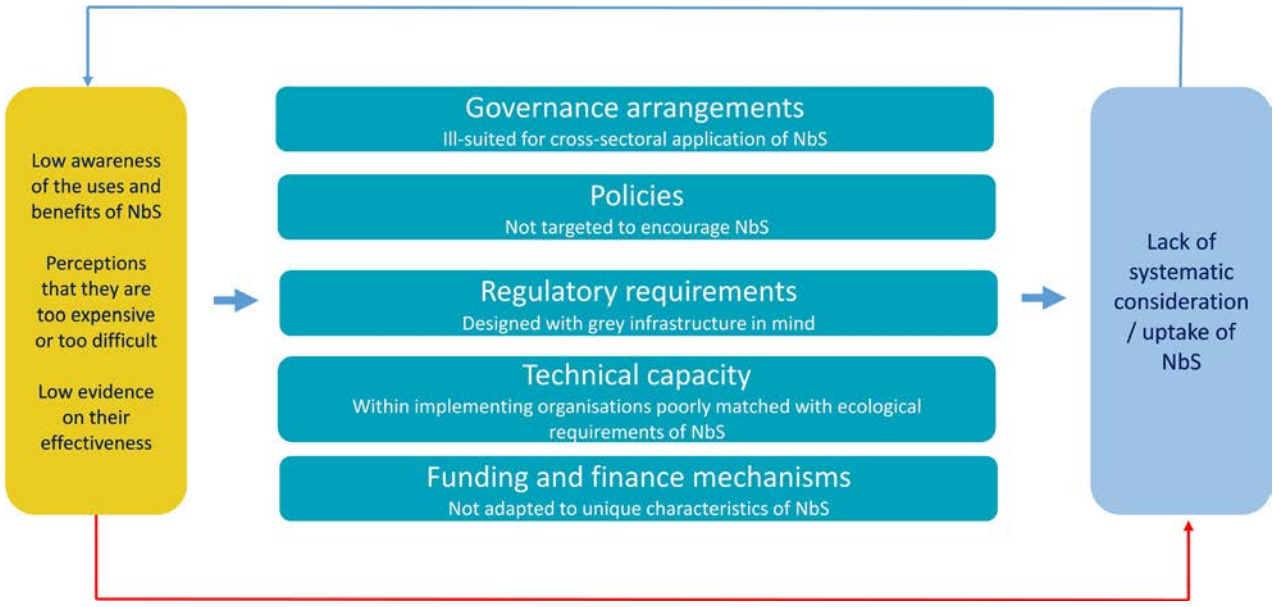
The OECD work aims to identify and stay abreast of innovative and effective policy responses that countries and specific sectors can adopt to effectively adapt to evolving climate risks. Nature-based solutions, which may include actions such as wetland restoration of forest conservation, have been increasingly identified for their potential in adapting to the current and future threats of climate change. OECD work looks at how to strengthen the enabling environment for these solutions and scale-up their use.

Nature-based solutions for climate resilience

Healthy ecosystems, and their associated services, can provide effective natural protection against climate-related risks. For example, floodplains and wetlands can protect communities from floods through increasing water retention, which is an ecosystem service. Nature-based Solutions (NbS) have been increasingly recognised for their potential in adapting to the current and future threats of climate change as they provide flexible and cost-effective ways to reduce vulnerability and exposure. The OECD Council Recommendation on Water highlights the use of ecosystem-based approaches as a cost-effective way of improving water quality and managing flood and scarcity risks.

The OECD work shows that while the adaptation and multiple other co-benefits of NbS have been widely recognised, their uptake remains piecemeal and often limited to one-off smaller scale projects. The OECD has therefore focused its work to support countries in establishing an enabling environment for Nature-based Solutions.

OECD policy evaluation framework for nature-based solutions



Legend: Yellow box: factors that limit the consideration/uptake of NbS; Light blue boxes: components of the policy evaluation framework that have been found to limit NbS uptake; Turquoise box: result.

Note: NbS: nature-based solutions.

Work from the organisation on nature-based solutions includes:

- *Scaling up Nature-based Solutions to Tackle Water-related Climate Risks* (2021).
- *Strengthening adaptation-mitigation linkages for a low-carbon, climate-resilient future* (2021).
- *Nature-based solutions for adapting to water-related climate risks* (2020).
- *Increasing green and blue infrastructure at municipal level in Hungary* (forthcoming).

Drought risk/water scarcity work

There is strong evidence that climate change will increase drought risk in the future. Land area subject to increased drought frequency and severity will expand with important regional disparities. Understanding the environmental, social, and economic impacts of droughts is essential to designing effective policy responses that help mitigate undesirable impacts.

Building environmental, social and economic resilience against present and future drought risk requires the adaptation of current drought risk management to climate change. To effectively adapt to the impacts of a changing climate in drought management, adapting emergency preparedness measures (such as water restrictions and water allocation mechanisms) will not be enough.

The OECD aims to improve countries' resilience to drought risks under changing climatic conditions by developing integrated drought risk policies. It will provide an outlook of global projected drought risk, its distributional impacts as well as the expected consequences and inter-connected impacts for society, ecosystems, and economies. This will provide a basis for understanding if and how institutional arrangements, policies and actual measures need to be adjusted to adapt to these future challenges.

As part of its work on droughts, the OECD will also focus on water scarcity risks as one of the most pressing and damaging water impacts resulting from droughts.

Water scarcity already affects half of the global population at least a month every year. This phenomenon is expected to increase because of climate change, and it will not spare water abundant countries. Building resilience to climate-induced water scarcity will require concerted efforts, especially at local level where water is often managed. As part of its work on droughts and possible water scarcity consequences, the OECD, with financial support from the City of Paris, the Metropole du Grand Paris and the EPTB Seine Grands Lacs supports the Paris urban area to improve its resilience to water scarcity.

This project has a twofold objective. It seeks to assess the future expected costs of climate-induced water scarcity for the metropolitan region of Paris. It will focus and model the direct and indirect economic costs quantitatively and provide a discussion of the broader set of social and environmental impacts. On that basis the project aims to evaluate whether the current policies in place need to be adapted, and if so how, to address future water scarcity risks. The ultimate objective is to provide policy recommendations that help enhance the future climate resilience of the Paris' metropolitan area to climate change-induced drought risk.

Water governance

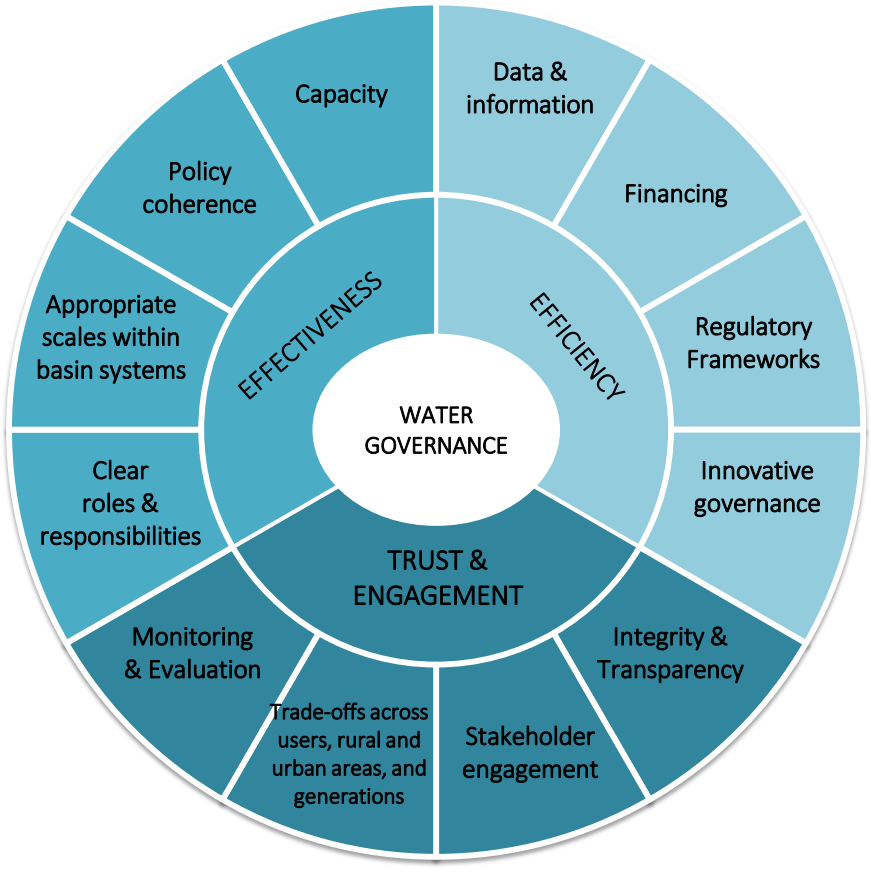
Coping with current and future challenges requires robust public policies, targeting measurable objectives in pre-determined time-schedules at the appropriate scale, relying on a clear assignment of duties across responsible authorities and subject to regular monitoring and evaluation. In other words, it is necessary to get water governance right. Water governance is a means to an end. It is defined as the set of rules, practices, and processes (formal and informal) through which decisions for the management of water resources and services are taken and implemented, where stakeholders articulate their interest and decision-makers are held accountable.

In order to support governments at all levels in improving their water governance systems, the OECD has developed standards, implementation tools and reviews at national and subnational level in Latin America (Argentina, Brazil, Mexico, Peru), Europe and Middle East (Netherlands, Jordan, Tunisia), Asia-Pacific (48 countries) and Africa (36 cities and Cape Town, South Africa).

OECD Principles on Water Governance

The OECD Principles on Water Governance, approved by the OECD Regional Development Policy Committee, and welcomed at ministerial level in June 2015, set standards for more effective, efficient and inclusive design and implementation of water policies. The Principles were developed by the OECD Water Governance Initiative, through a bottom-up approach. To date, they have been endorsed by 170+ stakeholder groups or governments: all OECD Member Countries, seven Non-Member Countries and 140 Stakeholder Groups, gathered in a Global Coalition for Good Water Governance.

OECD Principles on Water Governance



Source: OECD (2015), *OECD Principles of Water Governance*, www.oecd.org/governance/oecd-principles-on-water-governance.htm.

The OECD Principles on Water Governance consider that governance is good if it can help solve key water challenges, using a combination of bottom-up and top-down processes while fostering constructive state-society relations. It is bad if it generates undue transaction costs and does not respond to place-based needs. The 12 Principles are organised around three mutually reinforcing and complementary dimensions of water governance: how you hit the targets (effectiveness), at the least cost (efficiency) and with whom (trust and engagement). They have been applied across different scales, stakeholders and sectors, either as a tool to understand how water governance systems are performing at local, basin or national level, or as a reading template to guide decisions for water stakeholders and institutions on specific water functions (e.g. service delivery, water resources management, flood risk prevention, etc.).

Following the adoption of the Principles, the OECD developed tools to support their implementation. These include the OECD Water Governance Indicator Framework and a How-to Guide to support governments at all levels to carry out self-assessment, based on a 10 step methodology. The self-assessment tool helps countries to evaluate the state of play of water governance policy frameworks (what), the institutions (who) and instruments (how), and their needed improvements over time.

The OECD Water Governance Initiative

The OECD Water Governance Initiative was created on 27-28 March 2013 as an international multi-stakeholder network of 100+ members from the public, private and non-profit sectors gathering twice a year to share knowledge and experience on water reforms, projects and policy. It has several objectives:

- Provide a multi-stakeholder technical platform to share knowledge, experience and best practices on water governance across levels of government.
- Advise governments on necessary steps for effective water reforms through peer-to-peer dialogue and stakeholder engagement across public, private and non-profit sectors.
- Provide a consultation mechanism to raise the profile of water governance in the global agenda (Sustainable Development Goals, climate COPs etc.).
- Support the implementation of the OECD Principles on Water Governance in countries, basins and cities.

Objectives of the OECD Water Governance Initiative

Source: https://www.oecd.org/water/regional/aboutwgi/.

Water governance in cities

Cities are facing growing water-related risks, exacerbated by population growth, rampant urbanisation and climate change. With a projected world population of 9.7 billion by 2050, of which 55% will be urban, demand for water is set to rise by 55% compared to 2000 levels. By then, more than 570 low-lying coastal cities could face sea level rise of at least 0.5 metres, threatening more than 800 million people. The OECD project "Cities and Regions for a Blue Economy" supports cities in tackling these risks and fostering a resilient, inclusive, sustainable and circular (RISC-proof) blue economy that contributes to economic growth, social well-being and ecosystem preservation.

The project builds on the 2016 OECD report *Water Governance in Cities*, which argues that a successful recipe for better water governance in cities relies upon effective co-ordination across policies, people and places, to favour inter-sectoral complementarities, enhance inclusive decision-making and foster co-operation between cities and their surroundings.

The OECD 2021 report *Water Governance in African Cities* and *Water Governance in Cape Town, South Africa* focus on multi-level governance challenges and solutions in the continent. In addition, the OECD- UCLG-Africa Roundtable of African Mayors for Water Security aims to facilitate the design and implementation of robust local water policies by producing granular data and evidence, sharing knowledge, experience and best practices, and enhancing collaboration among Mayors.

Did you know?

92% of surveyed cities signalled that ageing or obsolete infrastructure is a major factor affecting water governance in cities.

KEY PUBLICATIONS

OECD (2018), *Implementing the OECD Principles on Water Governance: Indicator Framework and Evolving Practices*, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264292659-en

OECD (2019), *Applying the OECD Principles on Water Governance to Floods: A Checklist for Action, OECD Studies on Water*, OECD Publishing, Paris, https://doi.org/10.1787/d5098392-en

OECD (2019), *Water Governance in Argentina*, OECD Studies on Water, OECD Publishing, Paris, https://doi.org/10.1787/bc9ccbf6-en

OECD (2021), *Water Governance in Peru*, OECD Studies on Water, OECD Publishing, Paris, https://doi.org/10.1787/568847b5-en

OECD (2021), *Water Governance in African Cities*, OECD Studies on Water, OECD Publishing, Paris, https://doi.org/10.1787/19effb77-en

OECD (2021), *Water Governance in Cape Town*, South Africa, OECD Studies on Water, OECD Publishing, Paris, https://doi.org/10.1787/a804bd7b-en

OECD (2021), «Water Governance in Asia-Pacific», OECD Regional Development Papers, n° 13, OECD Publishing, Paris, https://doi.org/10.1787/b57c5673-en

OECD (2022), *Fostering Water Resilience in Brazil: Turning Strategy into Action*, OECD Studies on Water, OECD Publishing, Paris, https://doi.org/10.1787/85a99a7c-en

KEY LINKS

The OECD Water Governance Programme: https://www.oecd.org/water/regional/

The OECD Principles on Water Governance: https://www.oecd.org/governance/oecd-principles-on-water-governance.htm

The OECD project on Cities and Regions for a Blue Economy: https://www.oecd.org/cfe/cities/Cities_for_a_blue_economy_flyer.pdf

Financing water resources and water services

OECD work on financing water consists of multiple pillars, informed by discussions at the Roundtable on Financing Water.

The Roundtable on Financing Water

The Roundtable on Financing Water is a joint initiative of the OECD, the World Water Council, the Netherlands and the World Bank. It draws upon political leadership and technical expertise, with the ambition of facilitating increased financing of investments that contribute to water security and sustainable growth.

Both thematic and regional Roundtable meetings offer a platform of exchange and discussion for actors from the public and private sphere. Past meetings covered the Americas, Europe and Asia; a regional meeting will focus on Africa in 2023. Thematic meetings have focused on agricultural water, and climate action.

Analytical work on financing water

We are documenting financing flows, needs and capacities in different regional contexts (most recently Europe and Asia).

We are developing analytical tools and new approaches related to water financing. Examples of our current work include:

- A scorecard to assess the enabling environment for water-related investment and finance.
- An analysis of the role of intermediaries in closing water-related transactions.
- An analytical framework for strategic investment pathways that optimise value created by water-related investment in a particular landscape.
- Analysis on how water-related risks may impact on the financial sector.

Our future work focuses on:

- Launching the OECD Observatory on Financing water Supply, Sanitation and Water Security, which provides a unique repository to document good practices on financing water related investments and encourages peer-to-peer learning.
- Developing an OECD Framework on Financing Water to distil policy recommendations, providing high-level guidance to strengthen the policies and institutional arrangements.
- The definition of metrics and data to document the financial materiality of water risks, as a first step to engage with financial regulators and explore policy and regulatory responses.

Did you know?

Water insecurity generates significant economic and social impacts. If water-related risks were considered financially material in the financial system, more money might be going into the reduction the physical or economic exposure and vulnerability to water-related risks - and less money would be supporting investments that increase exposure and vulnerability to such risks. This is a direction for future work, in collaboration with the finance community.

Financing a Water Secure Future

The OECD report *Financing a Water Secure Future* distils important insights from the Roundtable on Financing Water and related analyses from 2017-21, providing an up-to-date summary of the key challenges of financing water-related investments and the different opportunities to address them. Investments in water services and water resources improve the well-being of people and the resilience of ecosystems and economies – and yet, a substantial financing gap persists. Investments in water security connect multiple sectors and policy agendas, including environment, biodiversity, agriculture, energy, urban development and public health. Due to their cross-cutting nature, investments in water security are central to achieving the Sustainable Development Goals (SDGs), global climate and biodiversity goals and to contributing to a green and resilient recovery from the COVID-19 crisis. The report provides a strong foundation for new initiatives such as the OECD Global Observatory on Financing Water Supply, Sanitation and Water Security, which will provide a dedicated knowledge hub to share good practices and support peer-to-peer learning. The report sets a vision for future OECD work on financing water and provides emerging guidance to move beyond bottlenecks to finance a water secure future.

KEY PUBLICATIONS

OECD (2022), *Financing a Water Secure Future*, OECD Studies on Water, OECD Publishing, Paris, https://doi.org/10.1787/a2ecb261-en

Leckie, H., H. Smythe and X. Leflaive (2021), «Financing water security for sustainable growth in Asia and the Pacific», OECD Environment Working Papers, No. 171, OECD Publishing, Paris, https://doi.org/10.1787/3bc15c5b-en

OECD (2020), *Financing Water Supply, Sanitation and Flood Protection: Challenges in EU Member States and Policy Options*, OECD Studies on Water, OECD Publishing, Paris, https://doi.org/10.1787/6893cdac-en

OECD (2019), *Making Blended Finance Work for Water and Sanitation: Unlocking Commercial Finance for SDG 6*, OECD Studies on Water, OECD Publishing, Paris, https://doi.org/10.1787/5efc8950-en

KEY LINK

The Roundtable on Financing Water: https://www.oecd.org/water/roundtable-on-financing-water.htm

Blended finance for water-related investment

Water flows as a prerequisite through all of the Sustainable Development Goals (SDGs). However, commercial finance flows to the water sector have generally been limited to date. Preliminary OECD data on amounts mobilised from the private sector estimates that development finance mobilised an additional USD 2.1 billion of private resources in 2012-17 for water and sanitation[1], which represents 1.4% of total finance mobilised in that period.

The OECD is identifying best practices and examining challenges in applying blended finance to water investments. Blended finance, defined as the strategic use of development finance for the mobilisation of additional finance towards sustainable development in developing countries[2], offers a promising approach to crowd in additional commercial finance in investments that contribute to achieveing SDG6 and related goals.

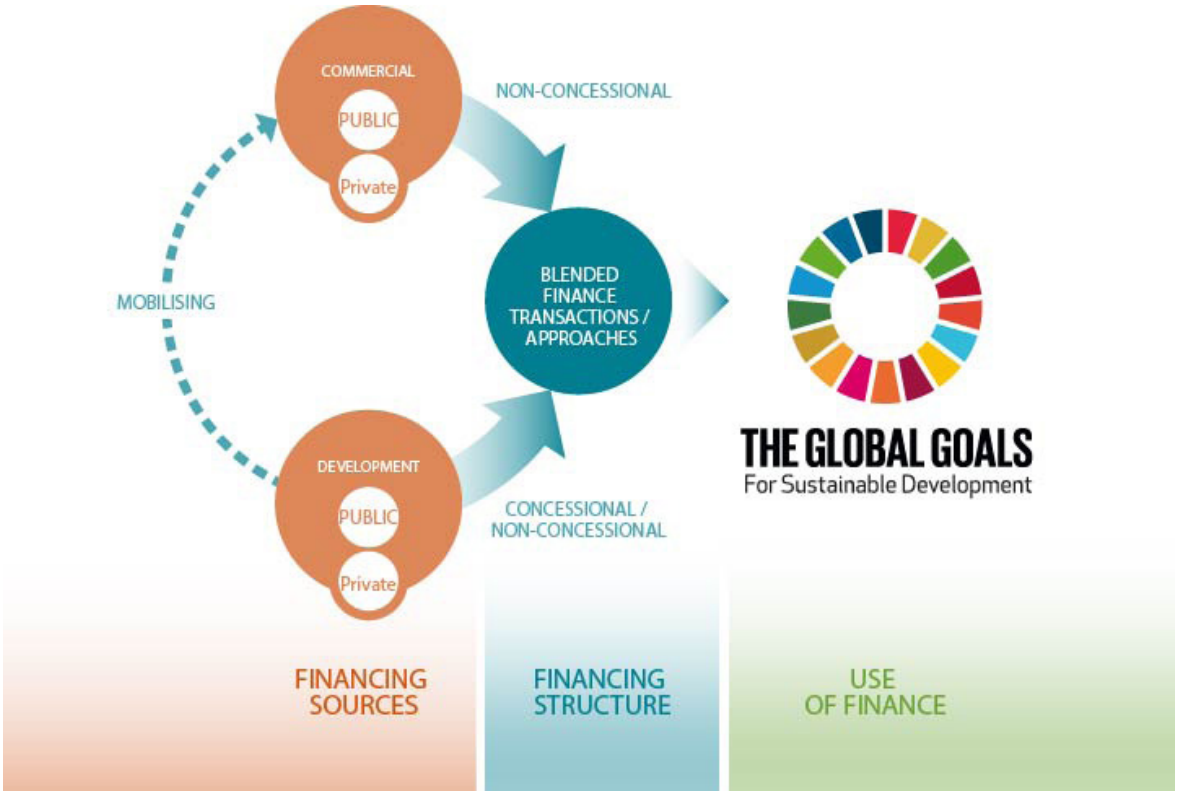
In the 2019 OECD report *Making Blended Finance Work for Water and Sanitation*, the state and potential of blended finance for water-related investments are assessed, drawing on analysis from three sub- sectors:

1. Water and sanitation utilities;

2. Small-scale off-grid sanitation services; and

3. Multi-purpose water infrastructure and landscape-based approaches.

Blended finance approach



Source: OECD (2018), "Making Blended Finance Work for the Sustainable Development Goals", OECD Publishing, Paris.

1. Data as of April 2019: https://www.slideshare.net/OECDdev/amountsmobilisedfromtheprivatesectorbydevelopmentfinanceinterventionsin201217
2. OECD (2018), *Making Blended Finance Work for the Sustainable Development Goals*, OECD Publishing, Paris, https://doi.org/10.1787/9789264288768-en.

KEY LINK

Blended Finance: Blended Finance: https://www.oecd.org/dac/financing-sustainable-development/blended-finance-principles/

Development finance for water supply and sanitation

The OECD collects and regularly updates statistics on development finance for water supply and sanitation. The data collection is based on a standard methodology and agreed definitions which ensures that data can be used to analyse trends and compare the efforts of donors.

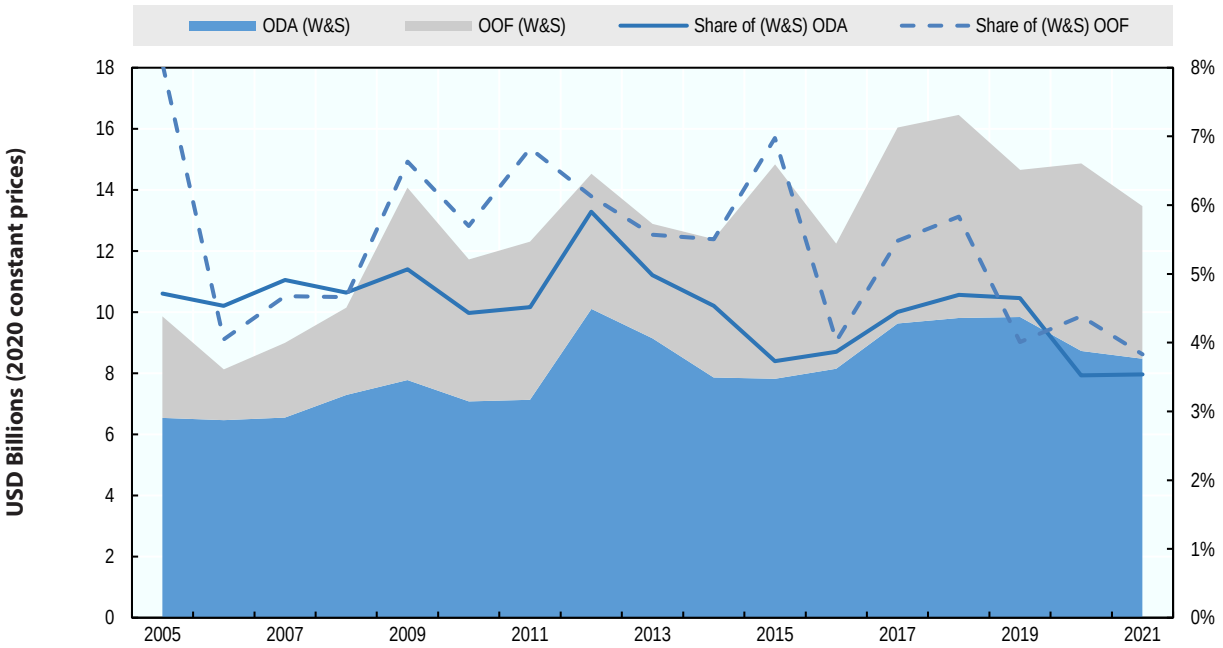
Data cover flows from members of the OECD Development Assistance Committee (DAC), non-DAC providers of development assistance, and multilateral agencies including the World Bank, regional development banks, UN agencies and other agencies such as the Arab institutions or Global Environment Facility. The coverage improves from year to year.

In addition to official development assistance (ODA), non-concessional developmental flows for water extended by bilateral development finance institutions and multilateral agencies are collected through the Creditor Reporting System. Data collection has also started from private charitable foundations.

OECD analysis provides insight on how and where development finance for water is spent. Regular statistical briefs cover the following aspects:

- Monitoring trends
- Commitments versus disbursements
- Geographical allocation of resources
- Nature of projects financed
- Water and climate change
- Water and gender equality

Development Finance for Water Supply and Sanitation, 2005-21



Source: Figures are based on OECD statistics (2022) available on https://stats.oecd.org/

Data compiled by the OECD tracker suggest an upward trend over the last 15 years, but a plateau of the last 2 years on record. Official Development Finance for the water and sanitation sector surpassed USD 14 billion in 2017 where it has remained stable since. In 2019 ODA represented 67% of the total (USD 9.5 billion), while Other Official Flows (OOF) accounted for 4.6 USD billion.

Both components grew in absolute terms with respect to 2005-06, when they amounted to USD 6.3 billion ODA and USD 3.2 billion OOF. In relative terms, ODA and OOF for water and sanitation as shares of total ODA and OOF remained stable in the range 4% to 5% for ODA and 4% to 7% for OOF. The annual average is for ODA to account for 65% of Water and Sanitation flows.

KEY LINK

Development finance data: https://www.oecd.org/dac/financing-sustainable-development/development-finance-data/

Water and agriculture

There is a large, complex and dynamic set of linkages between agriculture and water. Irrigated agriculture makes a substantial contribution to the growth in agricultural production across many countries. Yet, agriculture can have significant impacts (both positive and negative) on water ecosystems, and both agriculture and water are becoming increasingly vulnerable to climate change.

In most OECD countries, agriculture is a major consumer of water and a significant source of diffuse water pollution. While agriculture often suffers the most from droughts, it can also help reduce the impact of floods on the rest of the economy. OECD's examination of these linkages focuses on economic and policy analysis, supported by economic and environmental data.

Overall, OECD work is seeking to provide policy advice to governments that could help move agriculture onto a sustainable path in the overall management of water systems. Governments should consider the use of a mix of policy instruments at the farm, watershed and national levels to improve agriculture's water use, reduce its impacts on water resource and bolster farmers' resilience to water risks while ensuring that existing agriculture policies are aligned with these objectives.

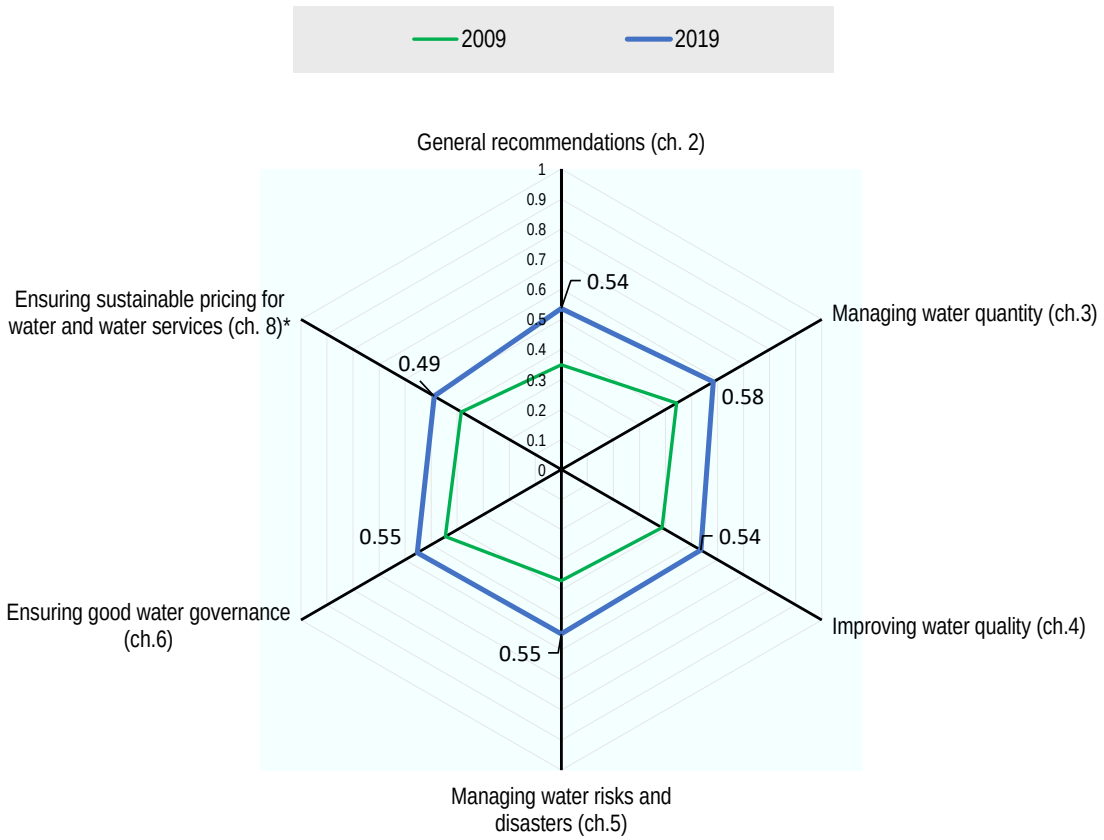
The knowledge of policy responses to the water challenges faced by agriculture, does not, however, guarantee their effective introduction and implementation. Changing policies can be a difficult process that governments often overlook. Recent OECD reports in 2018-19 examined strategies to support reform processes for agriculture and water policies.

One of the key elements to guide governments towards effective agriculture and water policy changes is to evaluate policy performance over time. The 2020 report *Agriculture and Water Policy Changes* looks back at the evolution of policies in this area and develops indicators measuring changes in policy alignment with the OECD Council Recommendation and where relevant the 2017 G20 Agriculture Ministers Action Plan. Looking forward, the 2021 report *Measuring Progress in Agricultural Water Management* characterises methods to gauge improvement in policies, considering progress in policy design, implementation capacity and policy results, and applies its characterisation to the cases of sustainable irrigation and the control of diffuse pollution.

Recent work also analyses means to build agricultural resilience to water related disasters, through case studies of the management of droughts in Italy and Turkey, floods in New Zealand and the United States and typhoons and heavy rains in Japan.

Overall alignment of agriculture and water policies with specific chapters of the Council Recommendation on Water in all 39 considered countries, 2009 and 2019

Indices range from 0 to 1, higher indices (outside) indicate a higher alignment



Note: indices of alignments were adjusted to account for text caveats, but they remain imperfect and should be subject to cautious interpretation.
Source: Gruère, G., M. Shigemitsu and S. Crawford (2020), "Agriculture and water policy changes: Stocktaking and alignment with OECD and G20 recommendations", OECD Food, Agriculture and Fisheries Papers, No. 144, OECD Publishing, Paris, https://doi.org/10.1787/f35e64af-en

Measuring progress in agricultural water management: type of assessment, principles and challenges

Progress dimension	Type of assessment	Key principles	Key challenges
A. Progress in agriculture and water policy design	A.1. Screening a policy set to gauge alignment with a cross-cutting policy objective	Clear criteria that of alignment with the cross-cutting objectives	Ensuring that all main cross-cutting policy levers are considered
	A.2. Benchmarking a policy set to a reference policy design	Evaluation grid to match a set of policies with the reference design	Defining quantitative indicators, accounting for context, and for the limitations of the reference design
B. Progress in agriculture and water policy implementation capacity	B.1. Determining progress in implementation capacity	Comparing the implementation capacity with capacity needs or their potential to deliver outcomes	Limited data availability and knowledge on implementation needs
	B.2. Measuring progress in water governance conducive to improved implementation	Identification of multi-level governance gaps and their evolution	Setting the right level of analysis
C. Progress in agriculture and water policy results	C. Evaluating the results of agriculture and water policy.	Well defined outcomes and timeline Accounting for a plausible counterfactual Attributing the outcome to the actual policy change Cost-effectiveness determination	Setting the right scope of analysis (farm, watershed, region) Ensuring that all relevant factors are measured and accounted for. Including and determining the effects of all other relevant policy changes Measuring characteristics that could affect the policy change

Source: 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.

KEY PUBLICATIONS

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.

OECD (2021), "Country profiles: agriculture ad water policies", main characteristics and evolution of agriculture and water policies from 2009 to 2019 for 35 OECD countries, https://www.oecd.org/agriculture/topics/water-and-agriculture/

OECD/FAO (2021), Building Agricultural Resilience to Natural Hazard-induced Disasters: Insights from Country Case Studies, OECD Publishing, Paris, https://doi.org/10.1787/49eefdd7-en.

Gruère, G., M. Shigemitsu and S. Crawford (2020), «Agriculture and water policy changes: Stocktaking and alignment with OECD and G20 recommendations», OECD Food, Agriculture and Fisheries Papers, No. 144, OECD Publishing, Paris, https://doi.org/10.1787/f35e64af-en.

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.

KEY LINK

Water and agriculture: https://www.oecd.org/agriculture/topics/water-and-agriculture/

Did you know?

Agriculture accounts for an estimated 70% of total water withdrawal globally and over 40% in many OECD countries and a much larger proportion of total water consumption.

Water and cities

Cities are major contributors to national economies and play a key role as nodes in global markets. But cities can only develop sustainably when they provide reliable water supply and sanitation services to city dwellers, and manage risks of too much, too little and too polluted water.

In OECD countries, cities have achieved high levels of protection against droughts, floods and water pollution, and a vast majority of city dwellers enjoy reliable water services. This remarkable performance derives from distinctive combinations of infrastructures, business models and institutional arrangements. However, whether and how such combinations are fit for future challenges is unclear.

The economic, social and environmental costs of water security are increasing, driven by urban growth, competition among water users, urban and agricultural pollution, and climate change. Existing infrastructures are also ageing and need to adapt to new contexts. In addition, city dwellers have rising expectations as regards to the quality of water services and water security.

The 2015 OECD report Water and Cities: Ensuring Sustainable Futures establishes that cities that effectively manage water for future challenges combine:

- Innovation. Technical innovation is burgeoning in cities, but is not fully exploited. Cities would benefit from having wide latitude to explore technologies that fit local contexts, often in combination with non-technical innovation.
- Financing. The financial conundrum in OECD countries is changing rapidly, with rising investment needs to renew ageing infrastructures, declining water demand in city centres, and fierce competition to access public finance. Tariff structures and business models need adjusting accordingly.
- Rural-urban linkages. The urban-rural interface can contribute a great deal to OECD cities' water security, now and in the future, at least cost to society. National governments should provide incentives and institutional mechanisms to foster the use of co-operative arrangements benefiting cities, surrounding communities, and ecosystems.
- Governance. Three issues deserve particular attention: stakeholder engagement; dedicated regulatory agencies; and metropolitan governance. The OECD explores good international practice, drawing on dedicated networks of stakeholders and practitioners.

OECD cities will not be in a position to respond to all the future water challenges on their own. A number of initiatives by other tiers of governments, clustered around three categories – regulation (on land use, reclaimed water and public procurement), resource provision (e.g. information and education) and incentives (e.g. financial) – will also contribute to urban water management. Governments can use urban policies and infrastructure financing to promote water-sensitive urban design, especially in high-risk regions. The interplay between national and local initiatives on water management will shape the cities of the future, including their capacity to thrive and contribute to bettering the lives of their residents.

KEY LINK

Water and cities: https://www.oecd.org/water/water-and-cities.htm

Making water reform happen: National Policy Dialogues on Water

OECD analyses confirm that water management needs to change in most OECD and non-member countries:

- Fiercer competition to access limited and more variable water resources puts more pressure on allocation regimes.
- More uncertainty about the future availability of water challenges the way water services and infrastructures are designed and operate.
- New technologies and innovative management practices generate opportunities to deliver better services at least cost for the community.

Water governance needs to adapt to better reach out to communities whose behaviour affects water demand and availability (farmers, city dwellers, energy suppliers) and to engage stakeholders in complex policy decisions.

The OECD is committed to supporting governments in their efforts to reform policies that influence the availability, use and management of water. The OECD has worked directly with a number of countries to support National Policy Dialogues, helping to make water reform happen. National Policy Dialogues are a structured process for stakeholder engagement supported by robust and tailored analytical work and lessons learnt from international experience. The dialogues have been undertaken in a range of countries focussing on various elements of water policy reform, including financing and pricing, governance, allocation, water security and private sector participation.

The policy dialogues are demand-driven. Some originate from bilateral discussions between interested governments and the OECD. Others coalesce in the context of regional partnerships.

In Eastern Europe, the Caucasus and Central Asia, the OECD has been partnering with the European Commission and UNECE to support water policy reforms since 1990s.

In Asia, the Ministry of Environment of the Republic of Korea, the OECD and the Asia Water Council support the achievement of the Sustainable Development Goals through addressing Asian water issues in (potentially) 8 countries. This project builds on the strengths and expertise of the project partners: the Asia Water Council brings its convening power in the region and expertise in the development and diffusion of water-related technologies; the OECD brings experience with facilitating water dialogues at national level; it brings particular expertise as regards the enabling conditions to finance water-related investments and the reform of water-related policies. Thailand and then Indonesia requested to benefit from this regional collaboration. The OECD is grateful to the Korean government for the financial support to this initiative.

In Europe, long-standing cooperation with DG Environment in the context of the update of existing Directives supports thematic discussions with EU member states on issues of common interest. In 2022, the OECD and DG Environment convened a series of thematic workshops to facilitate the implementation of the economic dimension of the Water Framework Directive, with a focus on enhancing investment planning and financing decisions, on further aligning with the polluter pays principle, or on cost recovery. Policy dialogues in Estonia and Lithuania explored practical options to support consolidation of fragmented water utilities to generate economies of scale and enhance the water sector's capacity to meet current and future investment needs. The financial support of DG REFORM is gratefully acknowledged.

National Policy Dialogues in Eastern Europe, the Caucasus and Central Asia (EECCA)*

The OECD assists the EECCA countries in adopting a more integrated approach to water management, applying robust economic and financial analyses and improving multistakeholder participation. It also helps in identifying and removing some of the key obstacles to effective and efficient water management, while reflecting countries' level of socio-economic development. This work is part of the GREEN Action Task Force water programme, and the OECD is a strategic partner, together with the United Nations Economic Commission for Europe (UNECE) for facilitation of NPDs. Funded by the European Union and with co-financing from Germany and Switzerland, the programme included the EUWI+ project which concluded in 2021 and supported countries of the EU's Eastern Partnership to improve river basin management and bring their legislation closer to the EU water acquis. This project was delivered in partnership with the Austrian Environment Agency and the International Office of Water of France.

A follow-up project EU4Environment Water and Data in Eastern Partnership Countries commenced in January 2022 with focus areas including improving the use of economic instruments and mobilising finance to the water sectors in partner countries.

* The EECCA countries are: Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Tajikistan, Turkmenistan, Ukraine and Uzbekistan.

KEY PUBLICATIONS

Botta, E., M. Griffiths and T. Kato (2022), «Benefits of regional co-operation on the energy-water-land use nexus transformation in Central Asia», OECD Green Growth Papers, No. 2022/01, OECD Publishing, Paris, https://doi.org/10.1787/7fcec36c-en

OECD (2021), Developing a Water Policy Outlook for Georgia, the Republic of Moldova and Ukraine, OECD Studies on Water, OECD Publishing, Paris, https://doi.org/10.1787/512a52aa-en.

Oshakbaev, D., Z. Akisheva and A. Martoussevitch (2021), «Developing a national water security indicators framework in Kazakhstan», OECD Environment Working Papers, No. 177, OECD Publishing, Paris, https://doi.org/10.1787/9ce9aa8c-en.

The use and management of water resources in Central Asia: A consultation on future directions - Policy Perspectives (2021), https://issuu.com/oecd.publishing/docs/central_asia_water_management-web

OECD (2020), Towards Water Security in Belarus: A Synthesis Report, OECD Studies on Water, OECD Publishing, Paris, https://doi.org/10.1787/488183c4-en.

Policy Perspectives for Irrigation Sector Reform in Tajikistan: A Paper for Decision Makers (2020), https://issuu.com/oecd.publishing/docs/tajikistan_irrigation_pp_2020_web

OECD (2019), Enhancing the Economic Regulatory System for Moldova's Water Supply and Sanitation, OECD Studies on Water, OECD Publishing, Paris, https://doi.org/10.1787/8696bde7-en.

NPDs jointly facilitated by the OECD and UNECE are fed by robust analytical work which often lead to practical implementation of policy advice. The OECD focuses on the economic aspects of water resources management (policy coherence, managing water for growth and making the best use of economic instruments for water management), and on the financial sustainability of water supply and sanitation services (strategic and mid-term financial planning and financial support mechanisms to the sector). The UNECE focuses on the co-operation related to the trans-boundary waters.

In Central Asia, dialogues consider the interlinkages between water, energy, food and climate security. A new multi-year regional programme to mainstream the energy, water and land-use nexus into development processes will be launched in 2023. The project will be implemented by a consortium led by the OECD, in partnership with the European Bank for Reconstruction and Development (EBRD), the Food and Agriculture Organization of United Nations (FAO), the Scientific-Information Center of the Interstate Commission for Water Coordination of Central Asia (SICICWC) and UNECE.

Tools for strategic financial planning that have facilitated reforms in EECCA include:

- **Strategic financial planning for water supply and sanitation at national or regional level.**
- **Financial planning tool for water utilities.**
- **Multi-year investment planning tool for municipalities.**
- **Guidelines for the development of performance based contracts for water utilities.**
- **Toolkit for benchmarking water utility performance.**

KEY LINK

OECD Water Policy Reforms: https://www.oecd.org/env/outreach/water-eecca/

Consolidation of water utilities in Estonia and Lithuania

Both Baltic States face similar issues regarding the sustainability of the water supply and sanitation sector. They did particularly well to build new infrastructures over the last 2 decades, with financial support from the European Commission. Today, in each country, the sector is characterised by a high level of fragmentation, with a vast majority of small utilities. As a consequence, the sector is struggling to enhance operational efficiency, attract technical skills and finance investments to operate and maintain newly built infrastructures. This affects the capacity of each state to comply with the Drinking Water, Urban Waste Water and Water Framework Directives, now and in the future.

Both countries have attempted to consolidate utilities, to reap economies of scale and enhance the technical and financial sustainability of the sector. Progress has been slow for a number of reasons. Both countries called on the OECD to facilitate these reforms. The OECD reviewed the state of play in some depth, shared experience from similar attempts to consolidate WSS in other European countries, and developed policy recommendations that have supported stakeholder consultation in both countries. The recommendations have a lot in common, typically on the potential benefits of economic regulation to monitor and incentivise operational performance of service providers, on non-financial incentives to accelerate consolidation.

KEY PUBLICATIONS

OECD (2022), Towards Sustainable Water Services in Estonia: Analyses and Action Plan, OECD Studies on Water, OECD Publishing, Paris, https://doi.org/10.1787/b82d71c6-en

OECD (2022), Reform of Water Supply and Wastewater Treatment in Lithuania: Practical Options to Foster Consolidation of Utilities, OECD Studies on Water, OECD Publishing, Paris, https://doi.org/10.1787/f966a980-en

National Policy Dialogue on Water in Brazil

Severe droughts between 2013 and 2018 in the Northeast including water crises in São Paulo and Brasília, increasing episodes of floods and unequal access to safe drinking water and sanitation, highlighted the need to enhance water security and resilience through effective multi-level governance and adequate finance.

A decade of work by the National Water and Sanitation Agency (ANA) and OECD has focused on 'who does what, why, how and who pays' to improve water resources management and offer innovative solutions to future challenges, drawing on established OECD principles and lessons from best practices around the world.

The 2015 OECD report *Water Resources Governance in Brazil* highlights two critical conditions for more sustainable, inclusive and effective water policies in Brazil: (1) better water allocation regimes to manage trade-offs across water users and uses to cope with future water risks; and (2) a stronger multi-level governance. The OECD report *Water Charges in Brazil: The Ways Forward* (2017) focuses on setting and governing water charges, including how to design economic instruments, govern water charges and manage the revenues. Finally, the 2022 report Fostering Water Resilience in Brazil: Turning Strategy into Action suggests how to improve multi-level governance and financing to enhance water resilience in Brazil and cope with pressing and emerging environmental, economic and social challenges.

KEY LINK

Building Water Resilience in Brazil:
https://www.oecd.org/cfe/cities/BrazilWaterResilience.pdf

National Policy Dialogue on Water in Peru

Although Peru has made good progress in water management, significant water security challenges remain in terms of floods, droughts, pollution and universal access to drinking water and sanitation. Between 2000 and 2020, floods affected an estimated 4 million people, while the inadequate management of solid waste and informal and illegal mining affect water quality, leading to severe public health issues, and social conflicts, including with indigenous communities. Moreover, still 3 million Peruvians (9.2% of the population) lack access to water services and 8.2 million Peruvians (25.2%) lack access to sewerage services.

In the face of climate change and demographic growth, improving water governance in Peru is a means to achieving long-term water security, and aligning individual user behaviour and collective action. In line with the OECD Principles on Water Governance, the OECD report on *Water Governance in Peru* suggests a series of tailored policy recommendations to: strengthen the multi sectoral approach to water; improve the use of economic instruments to protect and sustainably use water resources, its sources and related ecosystem services; and strengthen regulatory conditions to improved access to safe drinking water and sanitation in urban and rural areas.

National Policy Dialogue on Water in Argentina

Ensuring long-term water security is essential in the pathway towards climate change adaptation, inclusive growth and sustainable development in Argentina. Floods are responsible for 95% of annual economic losses caused by disasters, severe droughts have a devastating impact on an economy where agriculture accounts for 6.4% of GDP, and the country is home to some of the most polluted basins in the world.

Since the launch of an ambitious National Water Plan in 2016 and the creation of a dedicated Secretary of Infrastructure and Water Policy, water policy gained higher profile in the national agenda. Moving forward, managing concomitantly the risks of "too much", 'too little" and "too polluted" waters, while ensuring universal coverage to drinking water and sanitation is essential for the country to fit for the future.

As such, the OECD report *Water Governance in Argentina* identifies three areas of action to make water policies fit for the future: i) a stronger multi-level governance system that reconciles national and provincial priorities; ii) a more functional approach aligning administrative and hydrological boundaries to manage water at the right scale; and iii) an effective regulatory framework to provide better quality water services.

Water Policy Dialogue in Korea

In 2016, the OECD and the Ministry of Land, Infrastructure and Transport (MoLIT) embarked on a policy dialogue aimed at advancing the water agenda under the responsibility of MoLIT, with a focus on enhancing water use efficiency in Korea.

The policy dialogue focused on three key areas:

- Economic instruments under the remit of MoLIT and K-water.
- The promotion of innovation, in particular the smart water management initiative.
- Water allocation regimes.

The water policy dialogue outlined the remarkable capacity in Korea to develop water resources so that they support rapid economic growth and urbanisation. It also highlighted a growing push towards demand management and smart technologies that can help make the best use of available water resources and assets.

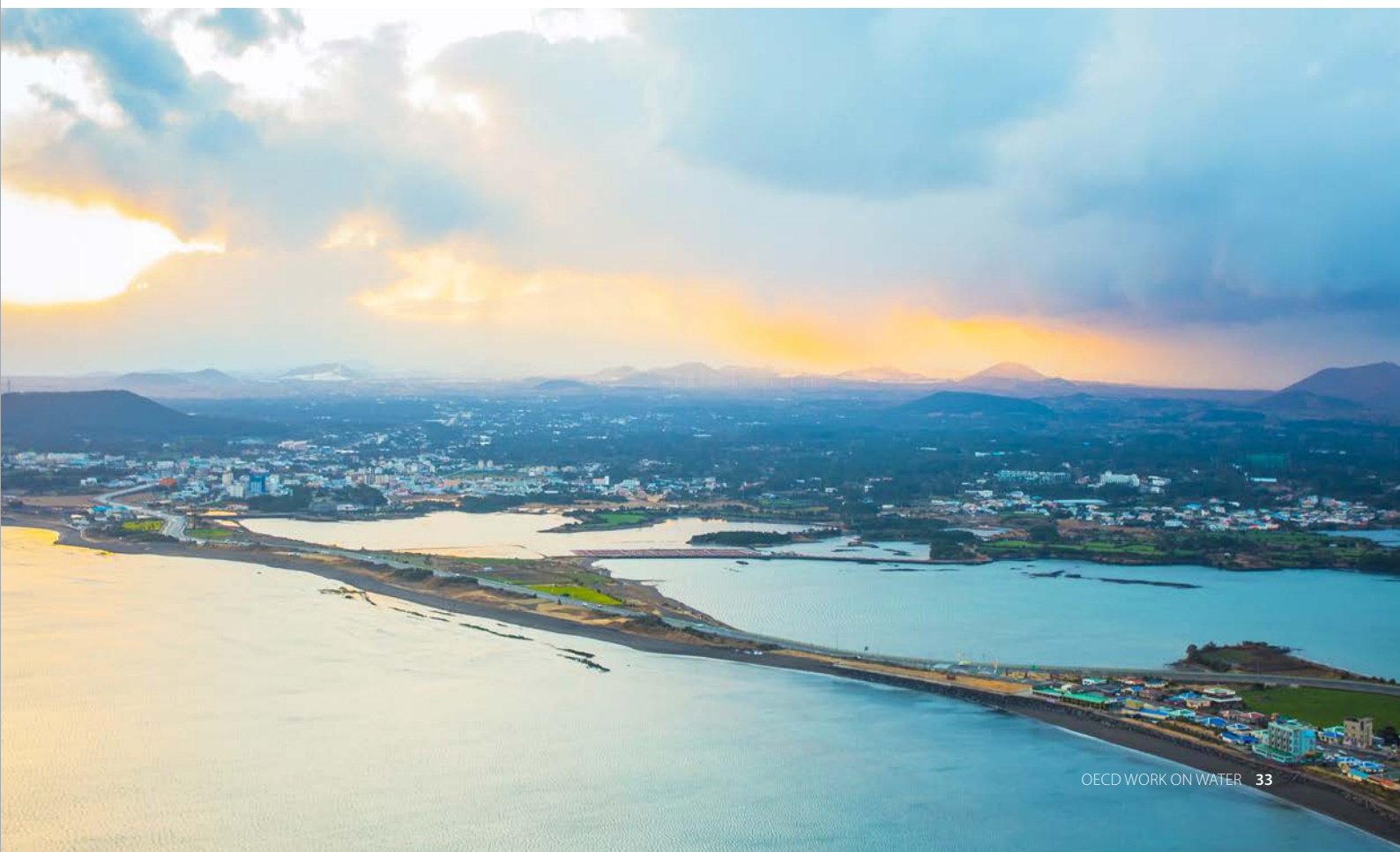
The dialogue unveiled specificities of water management in Korea, in particular the well-entrenched objective to supply water under the same conditions across the country. This explains why charges for water or river water and tariffs for multiregional services do not reflect local conditions. The report was released in September 2017.

A new dialogue started in 2017, spearheaded by the Ministry of Environment, leading a whole-of-government approach. The dialogue focused on the management of the water-food-energy- land nexus, and on the role of basin organisations.

Tailored recommendations derived from an analysis of the state of play in Korea and international good practices. They covered:

- co-ordinated planning across areas of the water-food- energy-land nexus
- future-proofing water policies and management
- policies for water quality management
- governance; in particular how to enhance basin-level water management in Korea and to engage with stakeholders.

These are very exciting times to review water policies in Korea, as the government reorganises responsibilities in this domain and reorients policies towards making the best use of available resources and assets, with less emphasis on augmenting supply.



Managing and Financing Water for Growth in Thailand

The National Dialogue on Water in Thailand was initiated in 2021 under the regional initiative with the Ministry of Environment of the Republic of Korea (MoE), the Asia Water Council (AWC) and the OECD. The Dialogue covers two main topics selected by the Government of Thailand (ONWR). The first one is water demand management, with a focus on the Eastern Economic Corridor. The second one is financing water supply and sanitation. Both combine to support a sustainable and resilient development pathway for Thailand's fast-growing economy. The analyses and policy recommendations cover issues such as the design of economic policy instruments, water allocation regimes, increasing demand for reclaimed water, or benchmarking the performance of water utilities, and blended finance for water supply and sanitation services. They are informed by the expertise of Thai stakeholders, the OECD and the Asia Water Council. They can be a source of inspiration in other contexts in South East Asia and globally.

KEY PUBLICATION

OECD (2022), *Managing and Financing Water for Growth in Thailand: Highlights of a National Dialogue on Water*, OECD Studies on Water, OECD Publishing, Paris, https://doi.org/10.1787/839a4f70-en

The National Dialogue on Water in Indonesia

The National Dialogue on Water in Indonesia was initiated in 2022 under the regional initiative with the Ministry of Environment of the Republic of Korea (MoE), the Asia Water Council (AWC) and the OECD. It was undertaken as the demand of – and in close cooperation with - Bappenas (the Ministry of National Development Planning) and PUPR (the Ministry of Public Works and Housing).

The Dialogue's scope will focus on two priority topics:

- Non-Structural measures to mitigate water-related disasters, most particuarly: Water resources information systems, including satellite information; Water-related disaster forecasting and early warning systems; and Land use planning.
- Enabling environment for private finance on water infrastructure investment. This pillar comprises of analyses and policy recommendations for tariffs for drinking water supply services; charges for water abstraction and pollution; and land value capture as an innovative source of funding.

OECD
BETTER POLICIES FOR BETTER LIVES

For more information:

www.oecd.org/water/

@OECD_ENV

OECD Environment