ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT
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BETTER POLICIES FOR BETTER LIVES DES POLITIQUES MEILLEURES POUR UNE VIE MEILLEURE

ENVIRONMENTAL OUTLOOK TO 2050:

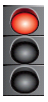
The consequences of Inaction

Key Findings on Water

Around the world, cities, farmers, industries, energy suppliers, and ecosystems are increasingly competing for their daily water needs. Without proper water management, the costs of this situation can be high – not just financially, but also in terms of lost opportunities, compromised health and environmental damage. In the absence of major policy changes and much better water management the situation will deteriorate and water availability will become increasingly uncertain. The OECD and its partner the PBL Netherlands Environmental Assessment Agency, have reviewed recent trends and projected plausible future trends to substantiate much needed policy reforms.

Trends and projections

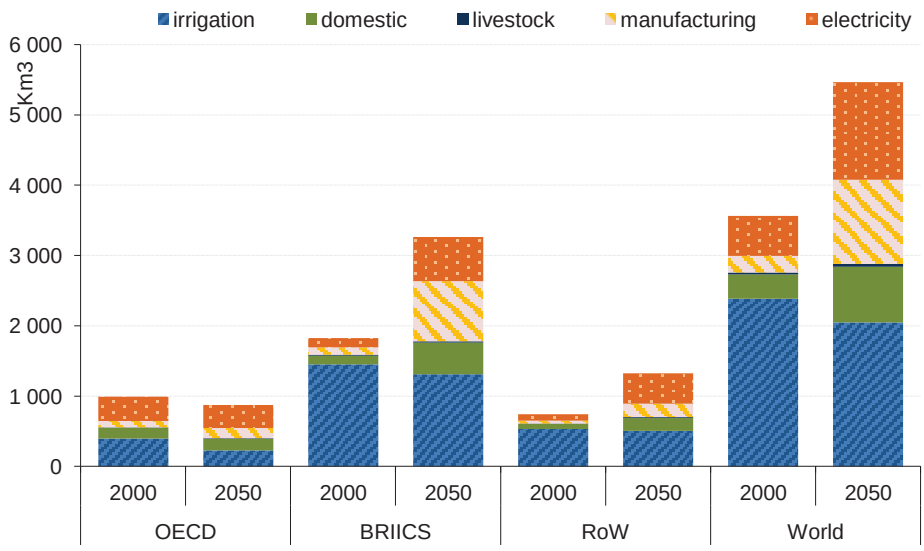
Water quantity



RED: The *Outlook Baseline* scenario, assuming no new policies, projects that by 2050 3.9 billion people - in total over 40% of the world's population - are likely to be living in river basins under **severe water stress**.

YELLOW: **Water demand** is projected to increase by 55% globally between 2000 and 2050. The increase in demand will come mainly from manufacturing (+400%), electricity (+140%) and domestic use (+130%). In the face of these competing demands, there will be little scope for increasing water for irrigation.

Global water demand: *Baseline* scenario, 2000 and 2050



Rapidly growing water demand from cities, industry and energy suppliers will challenge water for irrigation to 2050.

Note :BRIICS = Brazil, Russia, India, Indonesia, China and South Africa; RoW = rest of the world
Source: *Environmental Outlook Baseline*; output from IMAGE suite of models.

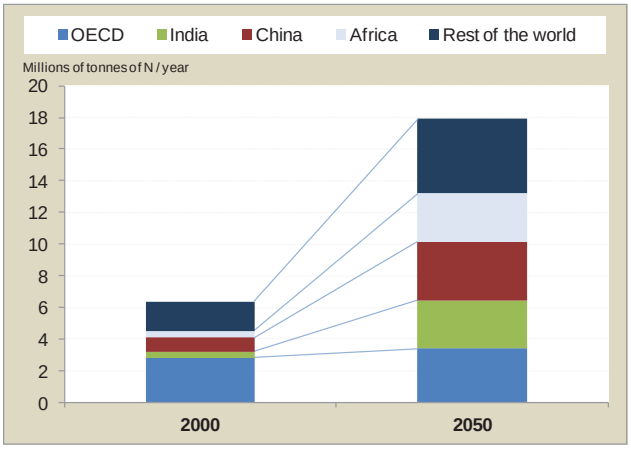
RED: In many regions of the world, **groundwater** is being exploited faster than it can be replenished and is also becoming increasingly polluted. The rate of groundwater depletion more than doubled between 1960 and 2000, reaching over 280 km^3 per year. Groundwater depletion may become the greatest threat to agriculture and urban water supplies in several regions in the coming decades.

Water quality

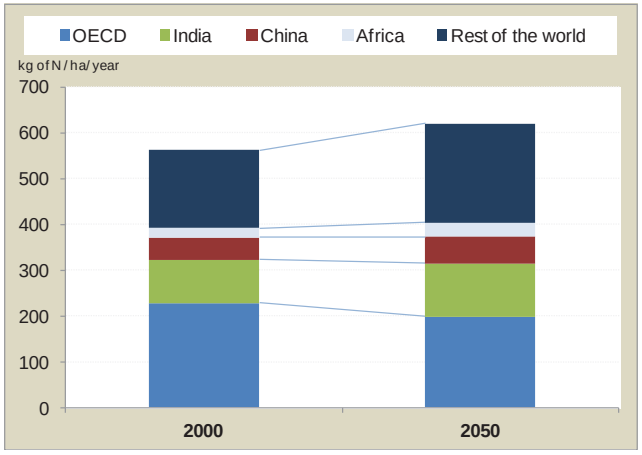
GREEN: Continued efficiency improvements in agriculture and investments in wastewater treatment in developed countries are expected to stabilise and restore **surface water and groundwater quality in most OECD** countries by 2050.

RED: The **quality of surface water 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. For example, the number of lakes at risk of harmful algal blooms will increase by 20% in the first half of this century.

Nitrogen effluents from wastewater: Baseline, 2000 and 2050



Nitrogen surpluses per hectare from agriculture: Baseline, 2000 and 2050



Source: Based on *OECD Environmental Outlook Baseline* scenario, from IMAGE suite of models

YELLOW: **Micro-pollutants** (medicines, cosmetics, cleaning agents, and biocide residues) entering water sources are an emerging concern in many countries.

Water supply and sanitation

GREEN: The number of people with **access to an improved water source** increased by 1.8 billion between 1990 and 2008, mostly in the BRIICS group (Brazil, Russia, India, Indonesia, China and South Africa), and especially in China.

RED: The Millennium Development Goal on water was to halve, by 2015, the proportion of the population without sustainable access to safe drinking water and basic sanitation, compared to 1990 levels. That basic commitment will not be met for water supply in Sub-Saharan Africa. While that commitment will be met for water supply in other regions, the fact remains that more than 240 million people (most of them in rural areas) will still be without **access to an improved water** source by 2050. The situation is even more daunting given that access to an *improved* water source does not always mean access to *safe* water. Globally, more city dwellers did not have access to an improved water source in 2008 than in 1990, as urbanisation is currently outpacing connections to water infrastructure.

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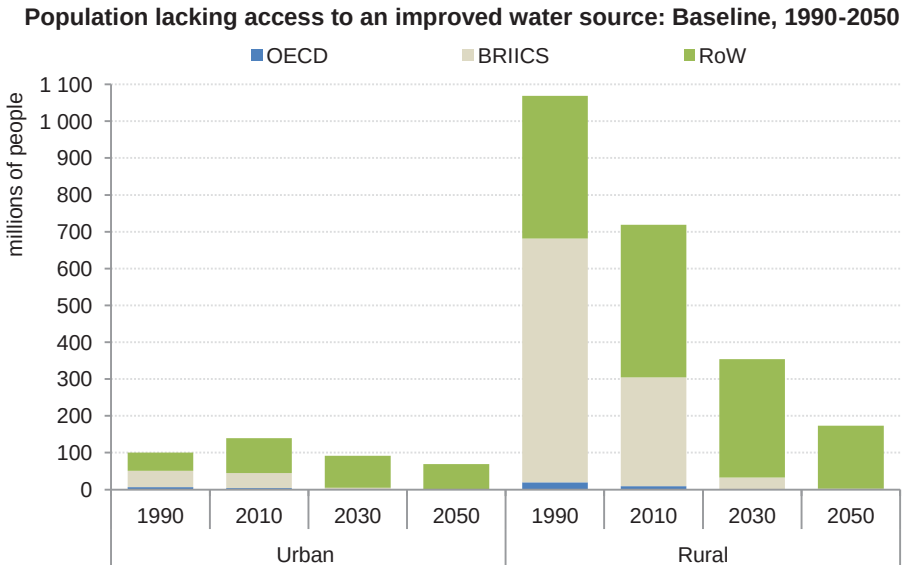

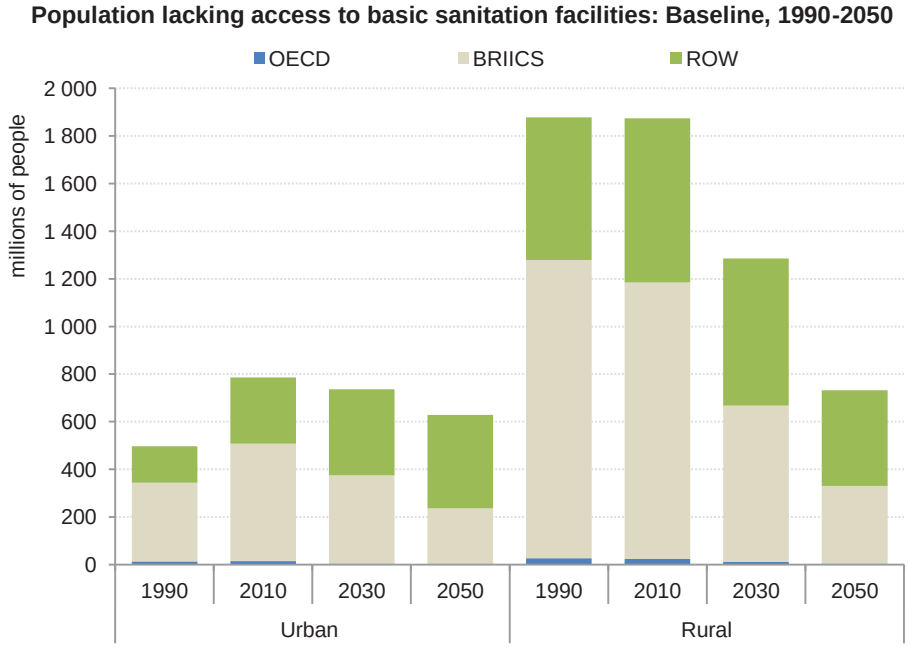

Note: BRIICS = Brazil, Russia, India, Indonesia, China and South Africa; RoW = rest of the world
Source: *OECD Environmental Outlook Baseline*; output from IMAGE suite of models.

RED: Almost 1.4 billion people are projected to be still without **access to basic sanitation** in 2050, mostly in developing countries. The Millennium Development Goal on sanitation will not be met, with severe consequences on health and environment, and hampering water uses downstream.

Water-related disasters

YELLOW: Today, 100-200 million people per year are **victims of floods, droughts and other water-related disasters** (affected or killed); almost two-thirds are attributed to floods. The number of people **at risk from floods** is projected to rise from 1.2 billion today to around 1.6 billion in 2050 (nearly 20% of the world's population). The economic value of assets at risk is expected to be around USD 45 trillion by 2050, a growth of over 340% from 2010.

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Policy options and needs

The Water chapter of the OECD *Environmental Outlook to 2050* explores the main policy responses governments should consider to address the challenges highlighted above. It argues that improved water efficiency remains a policy imperative in most regions of the world; this includes flexible mechanisms to allocate water where it creates most value. Water policies need to place quantity and quality issues on an equal footing; they need to encourage investment in green infrastructures; and they need to be integrated with policies that have an impact on water availability and use, primarily agriculture, energy, and land use. For all these, governance, the use of economic instruments, investment and infrastructure development are important dimensions. They all contribute to and facilitate water policy reforms in OECD countries and globally.

Create incentives for water efficiency

- **Water pricing** can be used to signal scarcity and to create incentives for efficient water use in all sectors (*e.g.* agriculture, industry, domestic). Social consequences are best addressed through well-designed tariff structures or targeted measures. In combination with regulations, standards and public support to innovation, water pricing will curb water demand and make alternative water sources (such as reusing treated wastewater) competitive.

- Governments would benefit from considering **flexible water allocation mechanisms**. For instance, when appropriately defined, water rights can facilitate allocation of water where it is most needed. They can allow uncertainty regarding the future availability of water to be factored in.

Improve water quality

- **Wastewater collection (sewerage systems) needs to be systematically coupled with wastewater treatment.** When this is not the case, wastewater is discharged untreated. Innovative techniques and business models will be needed; the private sector is an important player.

- Public support to water-related R&D is justified, to improve and increase the use of appropriate wastewater treatment equipment and techniques, and the efficient management of nutrients and agricultural run-off. The point is to **speed up and disseminate innovation** in developed and developing countries. Experience shows that building capacity (essentially that of farmers) in target economies, through training and education, is even more relevant and effective than transferring technologies.

Invest in green infrastructure

- **Water storage capacities must secure access to the resource. At the same time, they should not conflict with other environmental objectives** (*e.g.* preservation of ecosystem services, forests or biodiversity). Smart and green technologies (such as groundwater recharge, floodplains and wetlands restoration) are available in most parts of the world (see Box below).

- Restoring the ecosystem functions of floodplains and wetlands, paying attention to hydromorphology and removing incentives which encourage people to settle or invest in risk-prone areas will **reduce the impact and occurrence of water–related disasters**.

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Prioritising the environmental health of water courses: the case of Australia

The Australian Commonwealth Government is funding the Water for the Future initiative – a long-term initiative to secure the water supply of all Australians. Under this programme, which involves an AUD 12.9 billion investment over 10 years, the government is acquiring tradable water entitlements with the objective of returning more water to the environment. The water is acquired through direct buybacks of water entitlements from irrigators as well as savings from infrastructure upgrades. These entitlements become part of the Commonwealth environmental water holdings and are managed so that increased flows are provided to rivers and wetlands, particularly within the Murray-Darling Basin. Between June 2009 and July 2011, the Commonwealth government's environmental water holdings rose from 65 to 1 001 gigalitres. By 30 June 2011, over 550 gigalitres of Commonwealth environmental water had been delivered back to rivers, wetlands and floodplains of the Murray-Darling Basin. A strategic Basin Plan is also being developed in consultation with stakeholders from across the Murray-Darling to ensure the integrated and sustainable management of the basin in the longer term. A key part of the plan will be to set limits for water consumption in order to return sufficient water to the environment.

Source: Australian Government Commonwealth Environmental Water website*:* www.environment.gov.au/ewater/about/index.html

- **The deployment of water supply and sanitation infrastructure** in developing countries should remain a priority. This should be done at a much faster rate than in recent decades. Innovative options should be explored, which consume less water, energy or capital. OECD member states could assist by increasing the portion of official aid directed to these areas. The private sector can also play an essential role.

Ensure policy coherence

- **Water governance needs to be reformed** to ensure coherence with other policy areas such as energy, agriculture and urban planning. One prerequisite is the engagement of all relevant stakeholders (different levels of government, water user groups, and private companies).

- **A vast number of subsidies encourage unsustainable water use.** Governments would benefit from assessing them, with a view to phase out. This would help to ensure coherence between water policy objectives and initiatives in other sectors (including energy and agriculture). For example, the reform of agricultural support in the European Union has helped to better align agricultural and environmental objectives, typically by lowering the overall level of farm support and changing its composition. This has involved reducing production- and input-related support, and shifting toward agro-environmental measures thereby helping to ease stress on the environment, including water.

Fill in information gaps

The reform of water policies would benefit from additional investment in water-related information (*e.g.* on consumption, irrigation, and the impact of climate change on water resources).

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The *OECD Environmental Outlook to 2050* (OECD, 2012) was prepared by a joint team from the OECD and the PBL Netherlands Environmental Assessment Agency. The *Outlook* includes chapters on: socioeconomic developments, climate change, biodiversity, water, and health and environment.

http://www.oecd.org/environment/outlookto2050

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