IPAC
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ISRAEL'S SUSTAINABLE WATER MANAGEMENT PLANS

Key messages

Israel is highly vulnerable to the impacts of climate change, mounting pressure on already scarce water resources. To provide its rapidly growing economy with sufficient and reliable water, Israel has combined institutional and regulatory reforms with massive infrastructure investment. Large-scale reuse of wastewater and desalination of seawater, along with effective regulatory and price signals, has allowed Israel to gradually reduce overexploitation of freshwater resources and to become more climate resilient.

Country: Israel
Sectors: Agriculture | Water | Adaptation
Scales: Local | National

Zero hunger | Clean water and sanitation | Industries, innovation and infrastructures | Responsible consumption and production | Climate action

Challenge

Israel is highly vulnerable to the impacts of climate change. In recent years, extreme weather events have been more frequent and lasted longer, including years that were either exceedingly wet or dry. Under a "high emissions scenario", the mean annual temperature could rise by up to 4.4°C by the end of the century; 60% of days could be "hot days". Meanwhile, total annual precipitation could decrease by 25%, with large year-to-year variability in drought conditions (WHO and UNFCCC, 2022). This will lead to, among other impacts, reduced recharge of groundwater aquifers and negative impacts on freshwater ecosystems; reduced water levels and increased salinity of Lake Kinneret; and more desertification of the southern part of Israel. The country needs to deal with multiple sources of risks and large climatic uncertainty.

To date, Israel already faces a high level of water stress; deserts make up more than half of its surface. Nevertheless, the vast majority of Israeli citizens enjoy water supply through a direct connection to the national water system. However, the projected population growth and the diminishing supply of water from natural sources present a challenge for maintaining this access. For example, tens of thousands of Bedouins living in unrecognised villages in the Negev have only partial access to water.

Despite the widespread use of irrigation technology, freshwater still accounts for about half of water use in agriculture, contributing to high levels of water stress. The country needs to gradually reduce

overexploitation of freshwater resources, improve water allocation among sectors and to nature, while ensuring a fair distribution of the country's scarce freshwater resources.

Approach

To provide its rapidly growing economy with sufficient and reliable water, Israel has combined institutional and regulatory reforms with massive infrastructure investment. Large-scale reuse of wastewater and desalination of seawater, along with effective regulatory and price signals, have allowed Israel to gradually reduce overexploitation of freshwater resources.

The 2012 National Long-term Master Plan for the Water Sector through 2050 is at the heart of this process. The plan defined Israel's vision, goals and objectives of the national water sector, as well as policies on major water issues. It provides a medium- and long-term forecast for the balance of water resources in the country with a view to anticipating future water challenges and addressing climatic uncertainty.

A national bulk water conveyance system allows for optimisation of water distribution from various sources depending on demand. Massive public awareness campaigns have emphasised the value of water. Quasi-universal water metering allows for strict enforcement of water abstraction quotas. Israel has built a sophisticated infrastructure network that can efficiently transport the water from north to south and from east to west, with a low-to-zero-water leakage rate.

Climate change forced the country to further adapt to extreme weather events. In 2018, the government adopted a strategic plan for coping with periods of drought for 2018-30. The main measures include increasing supply of desalinated water, reducing demand and encouraging water conservation, and reinforcing protection of Lake Kinneret. The Water Authority notably imposed permanent cuts in agricultural water quotas of up to 41% for irrigators accessing the national water system. Farmers could voluntarily waive part of the quota in exchange for support.

Moreover, to increase the resilience of natural systems, the Israel Nature and Parks Authority, the Ministry of Environmental Protection and the Water Authority jointly issued in 2013 a Master Plan for the Supply of Water to Nature. An inter-ministerial team prepared river plans to see how much water is needed for individual ecosystems. Approved plans exist for several major rivers. They determine how much water to discharge, what type and when. In some places, they set aside a minimum quota of water for ecosystems. A manual describes the bodies and institutional and regulatory framework involved in preparing water plans.

Results

Israel managed to adapt to its arid climate, scarce water resources and climatic uncertainty. Its water consumption per capita is among the lowest in OECD member countries (138 m^3 per capita compared to 691 m^3 per capita in the OECD area, 2020). Israel is the largest user of recycled effluent water for agriculture across OECD member countries: more than 87% of wastewater effluent is reused for agriculture.

Using advanced reverse osmosis technologies and improved process engineering, Israel's five desalination plants are among the most efficient in the world, supplying over 80% of the country's domestic urban water (i.e. water not used for irrigation). However, desalination has adverse environmental impacts.

About 94% of all wastewater is collected and treated, and 87% is reused, primarily for agriculture. Overall, between 2000 and 2018, agriculture's share of freshwater abstractions decreased from 64% to 35% of total water abstractions. Nutrient pollution of groundwater caused by extensive fertiliser use in agriculture remains a problem.

Israel has also made significant progress in improving water allocation among sectors and to nature. Water plans have helped determine the flow regime, water quality and actions necessary to protect the ecosystem or rehabilitate it, considering other uses and needs from upstream to downstream.

Lessons learnt

Israel is at the forefront of innovation for sustainable water management. Its sustainable water plans allowed the country to reduce overexploitation of freshwater resources and to improve water allocation among sectors and to nature. Over time, Israel has accumulated a wealth of technological innovation and knowledge in sustainable water management in all sectors of the economy. Disseminating new technologies of water production, water treatment and advanced management tools could benefit other arid countries and regions, and thus proactively prepare them to adapt to climate change in arid environments.

Further information

OECD (2023), OECD Environmental Performance Reviews: Israel 2023, OECD Environmental Performance Reviews, OECD Publishing, Paris, *forthcoming.*

Featured publication

OECD (2023), OECD Environmental Performance Reviews: Israel 2023, OECD Environmental Performance Reviews, OECD Publishing, Paris, *forthcoming.*

Link to https://www.oecd.org/water.

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