

WATER

G L O B A L E N V I R O N M E N T O U T L O O K

The fourth *Global Environment Outlook – environment for development (GEO-4)* assessment report is published in 2007, exactly two decades since the World Commission on Environment and Development (WCED) published its seminal report – *Our Common Future* – which placed sustainable development on the agenda of governments and other stakeholders. *GEO-4* is the most comprehensive UN report on the environment prepared by about 390 experts and reviewed by more than 1 000 others across the world.

Embargoed until after 11.30am New York time, 25 October 2007.

Climate change, misuse and degradation of aquatic ecosystems, and overexploitation of fish stocks are changing the state of the water environment, affecting human well-being and the implementation of the Millennium Development Goals.

Climate change

Warming of the climate system is unequivocal and the global water cycle is being affected by long-term changes in climate, threatening human well-being and the health of life-supporting aquatic ecosystems. Warming **ocean waters** and changes in surface currents are changing precipitation patterns, affecting freshwater and marine plant and animal communities.

Droughts and floods are becoming increasingly frequent and severe, leading to malnutrition and waterborne diseases, and destroying livelihoods. Decreasing rainfall and devastating droughts have affected the Sahel since the 1970s, while increased precipitation has been observed in eastern parts of North and South America, northern Europe and northern and central Asia. **Increased storminess** is exacerbating the threat to the security of people in low-lying coastal areas and islands affected by sea-level rise. **Continental ice sheets and mountain glaciers** have continued to melt and retreat over the last 20 years. Polar sea-ice cover and thickness have also declined significantly.

Freshwater resources

Freshwater resources and sustainable development are strongly interdependent. Changes in the hydrosphere can hinder achievement of the clean water, health and food security targets of the MDGs. Available freshwater resources continue to decline as a result of excessive **withdrawal of surface- and groundwater**, as well as decreased water runoff from the land surface attributed to climate change. Use of freshwater for agriculture, industry and energy has increased markedly over the last 50 years. In many parts of the world, **human water**

use exceeds the average annual natural water replenishment. While **damming** has been of enormous benefit to agricultural production, water supply and hydropower generation, the fragmentation of river flows by dams, diversions and canals is changing upstream and downstream lowering downstream agricultural yields and fish productivity, and increasing the salinization of estuaries.

Water quality

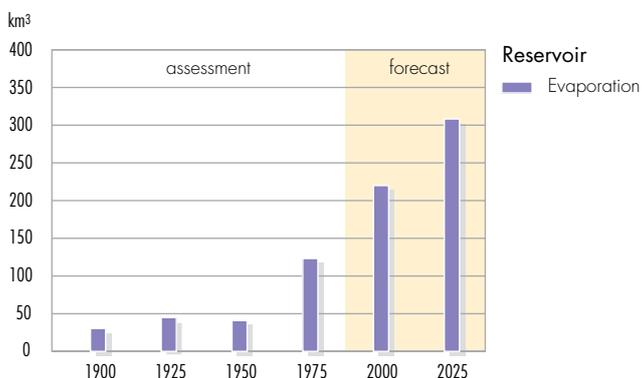
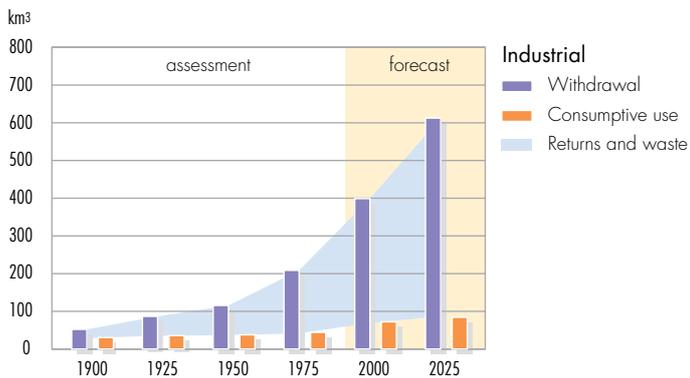
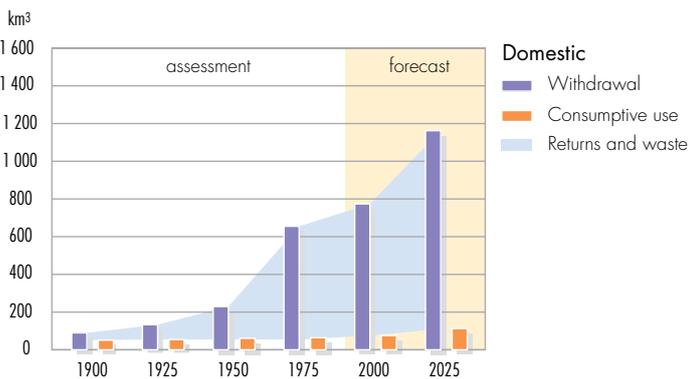
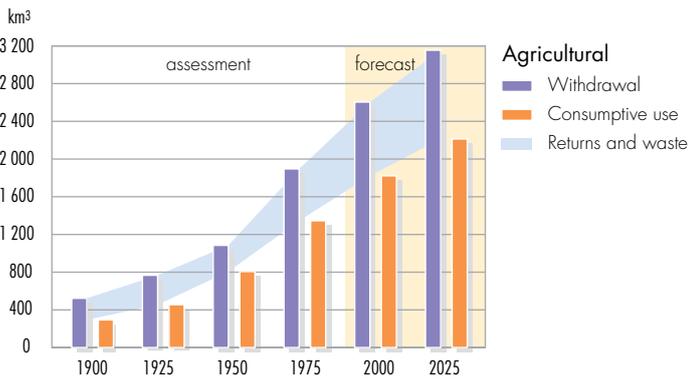
Water pollution and degradation of aquatic ecosystems directly affect human health. Contaminated water remains the greatest cause of sickness and death on a global scale.

Microbial pollution from inadequate sanitation facilities, improper wastewater disposal and animal waste is a major concern, with an estimated three million people dying of water-related diseases every year in developing countries, mostly children under five. Global population with access to improved water supply rose from 78 to 82 per cent during 1990-2000, while access to improved **sanitation** rose from 51 to 61 per cent during this same period. But an estimated 2.6 billion people still lack adequate sanitation facilities. Improved sanitation alone could reduce related deaths by up to 60 per cent and diarrhoeal episodes by up to 40 per cent.

An estimated 64.4 million Disability Adjusted Life Years (DALYs) are attributed to **water-related pathogens** linked to inadequate sanitation, with a prevalence of hepatitis, intestinal worms, and schistosomiasis. Wastewater-contaminated coastal waters cause more than 1.2 billion cases of gastrointestinal disease and 50 million cases of respiratory diseases annually and have an estimated economic cost of US\$12 billion per year.

Non-point-source pollution, notably by nutrients, sediments, organic chemicals and other water pollutants from agriculture, is a major cause of water quality degradation.

Changes in global water use by sector



Source: UNEP, based on Shiklomanov and UNESCO

Aquatic ecosystems

Many coastal and marine ecosystems and most freshwater ecosystems continue to be heavily degraded or lost, along with the services they provide for humanity. Wetland losses, for example, have changed flow regimes, increased flooding, and reduced wildlife habitat. Freshwater and marine species are disappearing faster than those of other ecosystems. The introduction of invasive exotic species also has disrupted communities in many freshwater and coastal ecosystems. Increasing application of **economic valuation of ecosystem services** provided by the water environment (such as water filtration, nutrient cycling, flood control, and biodiversity habitat) is a powerful tool for mainstreaming aquatic **ecosystem integrity** into development planning and decision making.

Fish stocks

Marine and inland fish stocks are declining because of unsustainable fishing pressures, habitat degradation and global climate change. **Total marine catches** are being sustained only by fishing further offshore and deeper in the oceans. Such declines are a major factor in biodiversity loss and have serious implications on human well-being. While total output from capture fisheries grew during 1987-2004 at an annual average rate of 0.76 per cent that from **aquaculture** (excluding aquatic plants) grew at a rate of 9.1 per cent. Since 1987, improved fisheries management efforts have focused on governance, economic incentives and property rights. Global responses include reducing fishing efforts, implementing ecosystem-based management approaches, property rights, economic and market incentives, marine protected areas, and enforcement of fishing regulations.

Water resource management

International water policy is increasingly emphasizing the need to improve **governance** in water resource management through suitable laws and policies and effective institutional structures; effective market mechanisms and technologies; and adaptation and restoration. To achieve these goals, decision-makers are increasingly adopting integrated, ecosystem-based adaptive management approaches, such as **Integrated Water Resource Management (IWRM)**.

Sources and credits for the information presented here are available and fully referenced in the **Fourth Global Environment Outlook - environment for development** report.



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