

7 *water resources*

'Of all the social and natural crises we human face, the water crisis is the one that lies at the heart of our survival and that of our planet Earth', UNESCO Director-General Koïchiro Matsuura.

2003 is the international year of freshwaters. The recently released World Water Development Report - Water for People, Water for Life describes the situation of freshwater in the world. Pursuant to this report, freshwater accounts for 2.53 percent of the water in the world, while the rest is salt water. Freshwater resources are reduced by use and appropriation and by pollution. 2 million tons of waste per day are disposed of within receiving waters, including industrial wastes and chemicals, human waste and agricultural waste. It is estimated that by the middle of the 21st century, at best 2 billion people in 48 countries will be water-scarce, and at worst 7 billion in 60 countries. Asian rivers are the most polluted with three times as many bacteria from human waste as the global average and 20 times more lead than those of industrialized countries.

Poor water management is one of the major factors limiting sustainable development during the next few decades. The water crisis is a crisis of governance and a lack of political will to manage the resource wisely.

Water pollution - use

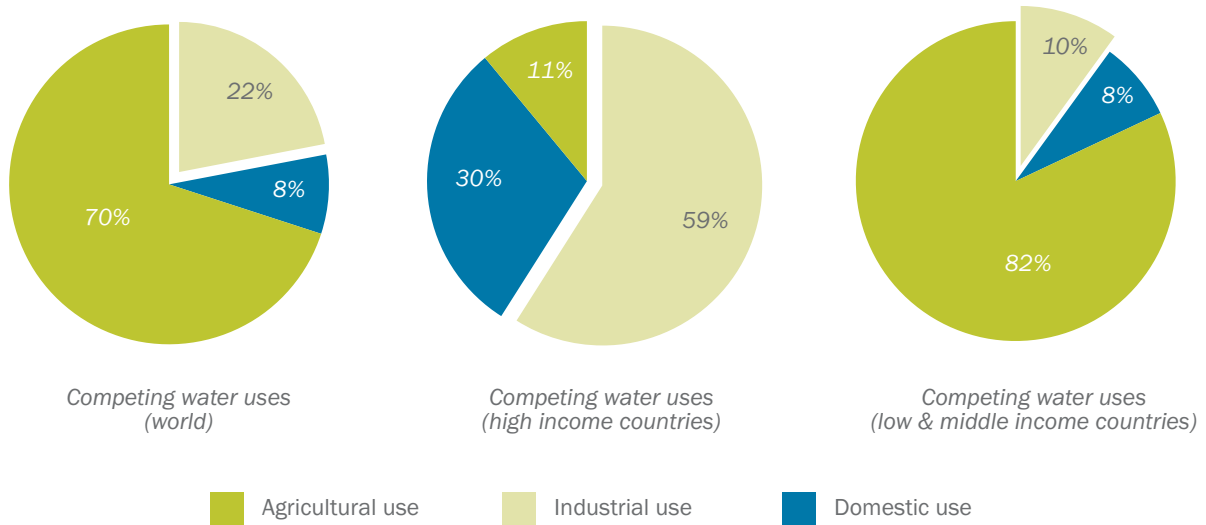
Globally, agriculture is responsible for about 69 percent of total freshwater abstraction. Global annual water use by industry is expected to rise from an estimated 725 km³ in 1995 to about 1.170 km³ by 2025, by which time industrial water usage will represent 24 percent of all water abstractions. The most water-intensive industries include pulp and paper, chemicals, and food and beverages.

Industry is the fastest growing user of freshwater resources worldwide and demand from this sector is expected to more than double over the next two decades. However, there is a decline of industrial water abstraction in OECD countries in recent years, which is primarily the result of increased water use efficiency but may also reflect a shift of water-intensive industries to non-OECD countries.

In the past two decades, industry in OECD countries has significantly increased its efficiency of water use, reducing total industry and energy-related use by 12% and increasing water recycling and reuse. This has come in response to higher industrial water charges and stricter ambient water quality standards.

The implementation of integrated permit systems ensures that major polluting industries operate under a regulatory framework designed to prevent major pollutions. Water extraction and discharges are regulated by the permit, which contains stringent limit values to be complied with. This is also a tool to control water usage by businesses, in requiring efficient use of water and high water performance.

Another aspect of water shortage in many regions of the world is that companies may face disruption in the provision of water. Water intensive industries will no longer be able to operate in regions suffering from water shortage in the future. Industries in general will have to adapt their production processes to ensure a sustainable consumption and usage of water. The growing awareness of the population will definitely push the authorities towards ensuring that the industry puts in place efficient water management tools. In Australia, New South Wales, voluntary water restrictions apply between 8 am and 8 pm. The Government decided to introduce penalties if the water storage levels continue to drop.



Graphics: Competing water uses for main income groups of countries. World Bank, 2001

Water pricing

One of the key elements to effective water management is water pricing, i.e. levy charges that reflect the real marginal costs of water services provisions and thus provide incentive for efficient water use. In the OECD countries, pricing structures for industrial water services increasingly reflect the full cost of providing the services.

A more systematic application of the polluter pays principle can be expected. While the Indonesian government is promoting the use of cleaner production technologies and regulates water pollution [ID 1567], several actions are taken in Malaysia [ID 5575], Taiwan, or China [ID 3242] to reduce river pollution. In China, the Beijing city government increased water price in the city to US\$ 0.08 per cubic meter from 20 January 2003, in order to ensure subsistent city development and promote savings in the use of water. The Hong Kong government is considering boosting charges for sewage and water. Water strategies or legislation, including cost issues, are being developed in several countries: South Africa [ID 5411], Australia, Victoria [ID4486], Queensland [ID 3939], France [ID 4472], Canada, Ontario [ID 5571].

An efficient water pricing constitutes an incentive to reduce pollution and improve the efficiency of water use. As the European Commission points out, 'it is argued that the lack of importance given to economic and environmental issues in designing

existing water pricing policies, as opposed to more general social or development objectives, has led to current situations of inefficient use, over-exploitation and degradation of surface and groundwater sources'.

Water pricing designed to attain full cost recovery, in combination with public information campaigns will be more and more developed and put into place by countries all over the world. In many countries, industry will be expected to implement best available techniques in order to participate in water consumption savings. Following the implementation of a water fee systems in South Korea on 16 July 2002, steel manufacturers that utilize water from the Seomjin and Nakdong rivers are deploying water conservation measures in order to face the additional water usage costs.

Country	USD/m ³
Germany	1.91
Denmark	1.64
Belgium	1.54
Netherlands	1.25
France	1.23
UK (incl Northern Ireland)	1.18
Italy	0.76
Finland	0.69
Ireland	0.63
Sweden	0.58
Spain	0.57
USA	0.51
Australia	0.50
South Africa	0.47
Canada	0.40

Table: Comparison of water pricing in selected countries (source Watertech Online 2001)

Focus: the EU approach

The EU Directive 2000/60/EC on a framework for Community action in the field of water policy (Water-Framework Directive) introduces a river basin management approach [ID 285]. The aim of the Directive is to establish a sustainable framework for the protection of inland surface waters, transitional waters, coastal waters and groundwater. It shall be transposed by the Member States by the end of 2003.

Water pricing will need to be integrated with other measures to ensure environmental, economic and social objectives are met cost-effectively.

The Decision 2455/2001/EC of 20 November 2001 establishes a list of 33 priority substances in the field of water policy [ID 3484]. The list contains substances that have been identified as highly dangerous to the aquatic environment and to human health via the aquatic environment. Specific measures to tackle the discharge and emissions of these substances into the aquatic environment must be adopted at

Community level and should be aimed at the cessation or phasing out of discharges, emissions and losses within 20 years after their adoption at Community level.

The 33 substances identified are the following: alachlor, anthracene, atrazine, benzene, brominated diphenylethers, cadmium and its compounds, C10-13-chloroalkanes, chlorpyrifos, 1,2-dichloroethane, dichloromethane, di(2-ethylhexyl)phthalate (DEHP), diuron, endosulfan, fluoranthene, hexachlorobenzene, hexachlorobutadiene, hexachlorocyclohexane, isoprutoron, lead and its compounds, mercury and its compounds, naphthalene, nickel and its compounds, nonylphenols, octylphenols, pentachlorobenzene, pentachlorophenol, polyaromatic hydrocarbons, simazine, tributyltin compounds, trichlorobenzenes, trichloromethane (chloroform), and trifluralin.

The integrated pollution prevention control, as it is regulated at the EU level, covers the water use of the activities subject to permitting under this legislation. Reference documents have been prepared to help those industries to comply with the regulatory requirements. They apply to pulp and paper manufacture, cooling systems, steel production, etc [\[ID 4963, 4964, 4965, 4966\]](#).

2002-2003 Regulatory Developments

The following is a list of regulatory developments related to water resource protection that occurred in 2002 and the first half of 2003 in addition to those cited above. The overview is taken from the EPC-Update. The ID-number after each reference refers to the corresponding database record of the EPC-Update. For more details on any of these developments one can subscribe to the "EPC-Update" which provides an abstract of each development. A more detailed two-page summary and analysis of each initiative is also available via this service.

Country • 2002-3 Regulatory/Policy initiative • EPC-Update Record ID

European Union: Water Framework Directive adopted [\[ID 285\]](#)

European Union: Decision on a list of priority substances dangerous for the water [\[ID 3484\]](#)

European Union: IPPC reference document for pulp and paper manufacture published [\[ID 4963\]](#)

European Union: IPPC reference document for iron and steel production published [\[ID 4964\]](#)

European Union: IPPC reference document for the cement and lime production published [\[ID 4965\]](#)

European Union: IPPC reference document for cooling systems published [\[ID 4966\]](#)

France: Draft Water Law published [\[ID 4472\]](#)

South Africa: Proposed National Water Resource Strategy [\[ID 5411\]](#)

China: Reform of the Waste Water Discharge Fee Collection, Management and Use [\[ID 3242\]](#)

Australia, Victoria: Draft outline of the State Environment Protection Policy (Waters of Victoria) [\[ID 4486\]](#)

Indonesia: Adopted Regulation on control of water pollution [\[ID 1567\]](#)

Malaysia: Proposed Water Development Master Plan [\[ID 5575\]](#)

Canada, Ontario - Sustainable Water and Sewage Systems Act 2002 adopted [\[ID 5571\]](#)

USA - Final rule for measuring chronic toxicity of industrial effluents [\[ID 5615\]](#)

On the web

World Bank

<http://www.worldbank.org>

Link to the report on "Water Resources Sector Strategy" endorsed by the Bank's Board of Executive Directors in February 2003. The strategy focuses on how to improve the development and management of water resources while providing the principles that link resource management to the specific water-using sectors.

UNESCO World Water Assessment Programme for development, capacity building and the environment

<http://www.unesco.org/water/wwap>

Provides links to the current UNESCO and UNESCO-led programmes on freshwater and will serve as an interactive point for sharing, browsing and searching websites of water-related organizations, government bodies and NGOs, including a range of categories such as water links, water events, learning modules and other on-line resources.

OECD web site

<http://www.oecd.org>

Link to the 2003 report "Improving Water Management: Recent OECD Experience". This report summarizes some of the main lessons learnt through a range of OECD projects related to the development and implementation of better water management policies.

United Nations Environment Programme (UNEP), Vital Water Graphics

<http://www.unep.org/vitalwater>

An Overview of the State of the World's Fresh and Marine Waters. UNEP, Nairobi, Kenya. ISBN: 92-807-2236-0. Focuses on the critical issues of water quantity, quality and availability. Covers freshwater resources and coastal and marine waters.

Official site of the international year of freshwater 2003

<http://www.wateryear2003.org>

Link to the UN World Water Development Report 2003 launched at the occasion of the world water day on 22 March 2003, during the third world water forum in Kyoto.

A water sustainability tool

GEMI's Water Sustainability Work Group has developed a tool to help industry better understand and guide the organization's relationship to water. The water sustainability tool includes five modules to help industry to achieve sustainable management of water.

Module 1 explains how to analyse water use, impact and source assessment. Key questions shall identify the key water uses, the key water impacts and the key water sources.

Module 2 is about business risk assessment and ensures that water risks are prioritized.

Module 3 addresses business opportunity assessment.

Module 4 is about strategic direction and goal setting and its objective is to identify business case for action, water-related goals and strategic directions.

Module 5 covers the strategy development and implementation. It helps defining key organizational roles and water strategy and action plan.

The tool is available on the Global Environmental Management Initiative (GEMI) water strategy web site

<http://www.gemi.org/water/>



World Resources Institute information database on world's river basins

http://pubs.wri.org/pubs_description.cfm?PubID=3818

Provides maps of land cover, population density and biodiversity for 154 basins and sub-basins around the world. It lists indicators and variables for each of these basins and, where appropriate, provides links and references to relevant information. It contains 20 global maps portraying relevant water resources issues.

The European Commission Directorate General for Environment, Water Policy page

<http://europa.eu.int/comm/environment/water>

Information on EU water policies and legislation.

Web site of Sydney Water, Australia

<http://www.sydneywater.com.au/html/wcr/index.cfm>

Develops several initiatives to save water. Web site dedicated to water conservation and recycling.

Prototype water portal

<http://www.waterportal-americas.org>

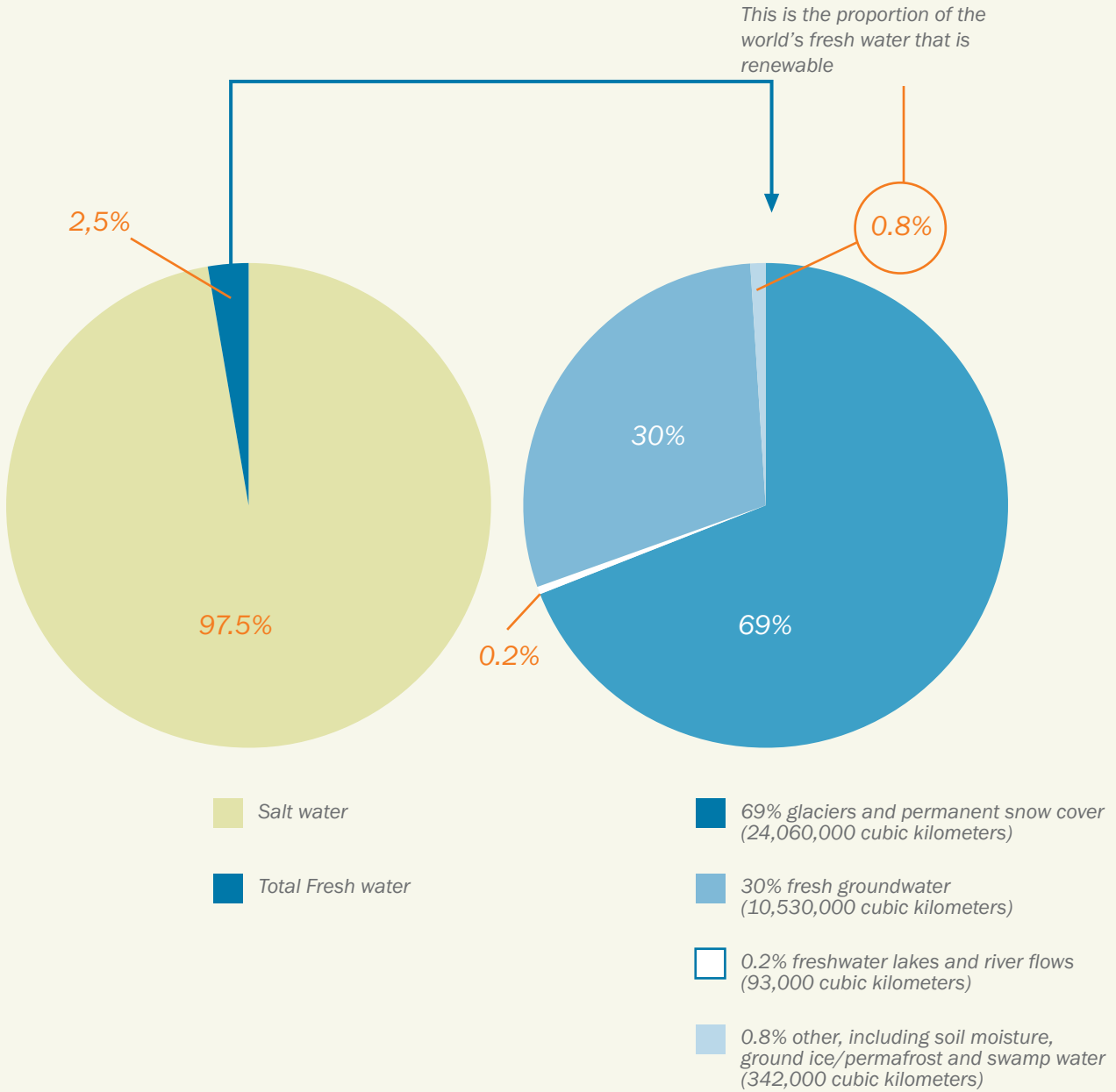
Water information service, including an Internet web site and other initiatives to enhance the availability of quality water information. The goal is to provide both an entryway (portal) to water information and to create a water information network, community, and resource that will provide qualified, trusted, and verifiable information and contacts. It intends to improve access to information thus facilitating the decision-making process.

ITT Industries web site

<http://itt.com/waterbook/intro.asp>

ITT Industries Guidebook to Global Water Issues. Provides information on water needs, water consumption, water pricing globally.

The world's water



Source: Igor Shiklomanov, "World Fresh Water Resources" in Peter H. Gleick, ed., *Water in Crisis: A Guide to the World's Fresh Water Resources*, 1993