World Water Development Report - Executive Summary

Political inertia exacerbates water crisis, says World Water

Faced with “inertia at the leadership level”, the global water crisis will reach unprecedented levels in the years ahead with “growing per capita scarcity of water in many parts of the developing world”, according to a United Nations report made public today. Water resources will steadily decline because of population growth, pollution and expected climate change.
The World Water Development Report - Water for People, Water for Life - is the most comprehensive, up-to-date overview of the state of the resource. Presented on the eve of the Third World Water Forum (Kyoto, Japan, March 16 – 23), it represents the single most important intellectual contribution to the Forum and the International Year of Freshwater (http://www.wateryear2003.org), which is being led by UNESCO and the UN Department of Economic and Social Affairs.

To compile the report, every UN agency and commission dealing with water has for the first time worked jointly to monitor progress against water-related targets in such fields as health, food, ecosystems, cities, industry, energy, risk management, economic evaluation, resource sharing and governance. The 23 UN partners constitute the World Water Assessment Programme (WWAP), whose secretariat is hosted by UNESCO.

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

“No region will be spared from the impact of this crisis which touches every facet of life, from the health of children to the ability of nations to secure food for their citizens,” says Mr Matsuura. “Water supplies are falling while the demand is dramatically growing at an unsustainable rate. Over the next 20 years, the average supply of water world-wide per person is expected to drop by a third.”

Despite widely available evidence of the crisis, political commitment to reverse these trends has been lacking. A string of international conferences over the past 25 years has focused on the great variety of water issues including ways to provide the basic water supply and sanitation services required in the years to come. Several targets have been set to improve water management but “hardly any”, says the report, “have been met.”

“Attitude and behaviour problems lie at the heart of the crisis,” says the report, “inertia at leadership level, and a world population not fully aware of the scale of the problem means we fail to take the needed timely corrective actions”.

Many countries and territories are already in a state of crisis. The report ranks over 180 countries and territories in terms of the amount of renewable water resources available per capita, meaning all of the water circulating on the surface, in the soil or deeper underground (see chart).

The poorest in terms of water availability is Kuwait (where 10 m3 is available per person each year) followed by Gaza Strip (52 m3), United Arab Emirates (58 m3), Bahamas (66 m3), Qatar (94 m3), Maldives (103 m3), Libyan Arab Jamahiriya (113 m3), Saudi Arabia (118 m3), Malta (129 m3) and Singapore (149 m3).

The top ten water-rich countries (with the exception of Greenland and Alaska) are: French Guiana (812,121 m3 available per person per year), Iceland (609,319 m3), Guyana (316,689 m3), Suriname (292,566 m3), Congo (275,679 m3), Papua New Guinea (166,563 m3), Gabon (133,333 m3), Solomon Islands (100,000 m3), Canada (94,353 m3), New Zealand (86,554 m3).

By the middle of this century, at worst seven billion people in 60 countries will be faced with water scarcity, at best 2 billion in 48 countries, depending on factors like population growth and policy-making. Climate change will account for an estimated 20% of this increase in global water scarcity, according to the report. Humid areas will probably see more rain, while it is expected to decrease and become more erratic in many drought-prone regions and even some tropical and sub-tropical regions. Water quality will worsen with rising pollution levels and water temperatures.

The water crisis “is set to worsen despite continuing debate over the very existence of such a crisis,” says the report. About 2 million tons of waste are dumped every day into rivers, lakes and streams. One litre of wastewater pollutes about eight litres of freshwater. According to calculations in the report, there is an estimated 12,000 km3 of polluted water worldwide, which is more than the total amount contained in the world’s ten largest river basins at any given moment. Therefore, if pollution keeps pace with population growth, the world will effectively lose 18,000 km3 of freshwater by 2050 – almost nine times the total amount countries currently use each year for irrigation, which is by far the largest consumer of the resource. Irrigation currently accounts for 70% of all water withdrawals worldwide.

The report ranks 122 countries according to the quality of their water as well as their ability and commitment to improve the situation (see chart). Belgium is considered the worst basically because of the low quantity and quality of its groundwater combined with heavy industrial pollution and poor treatment of wastewater. It is followed by Morocco, India, Jordan, Sudan, Niger, Burkina Faso, Burundi, Central African Republic and Rwanda.

The list of countries with the best quality is headed by Finland followed by Canada, New Zealand, United Kingdom, Japan, Norway, Russian Federation, Republic of Korea, Sweden and France.

“The poor continue to be the worst affected, with 50% of the population in developing countries exposed to polluted water sources,” says the report. Asian rivers are the most polluted in the world, with three times as many bacteria from human waste as the global average. Moreover, these rivers have 20 times more lead than those of industrialized countries.

“The future of many parts of the world looks bleak,” says the report, in reference to projected population growth, which will continue to be a driving factor in the water crisis. Per capita water supplies decreased by a third between 1970 and 1990, according to the report. Even though birth rates are slowing down, the world’s population should still reach about 9.3 billion by 2050 (compared to 6.1 billion of 2001).

“Water consumption has almost doubled in the last 50 years. A child born in the developed world consumes 30 to 50 times the water resources of one in the developing world. Meanwhile water quality continues to worsen […]. Every day, 6000 people, mostly children under the age of five, die from diarrhoeal diseases,” says the report. “These statistics illustrate the enormity of the problems facing the world with respect to its water resources, and the startling disparities that exist in its utilization.”

Against this background, the report takes an in-depth look at every major dimension of water use and management – from the growth of cities to the threat of looming water wars between countries. A single thread runs through each section: the water crisis - be it the number of children dying of disease or polluted rivers - is a crisis of governance and a lack of political will to manage the resource wisely.

“Globally, the challenge lies in raising the political will to implement water-related commitments,” says the report. “Water professionals

need a better understanding of the broader social, economic and political context, while politicians need to be better informed about water resource issues. Otherwise water will continue to be an area for political rhetoric and lofty promises instead of sorely needed actions."

With more than 25 world maps, numerous charts, graphs and seven case studies of major river basins, the report analyzes how diverse societies cope with water scarcity, including policies that work or don't work. It lays the foundations – through the World Water Assessment Programme - for the UN to regularly monitor and report on the state of the resource by developing a set of standardized methodologies, data and indicators.

The report will be formally presented to the international community on World Water Day, March 22nd, (www.waterday2003.org) during the World Water Forum in Kyoto. A series of high-level panel discussions will be organized to discuss the results.

Chapter highlights:

Health and Economics
"The 21st century is the century in which the overriding problem is one of water quality and management," says the report. More than 2.2 million people die each year from diseases related to contaminated drinking water and poor sanitation. Water vector-borne diseases also take a heavy toll: about a million people die from malaria each year and more than 200 million suffer from schistosomiasis, known as bilharzias. "Yet these terrible losses, with the waste and suffering they represent, are preventable."

The international community pledged in the UN Millennium Development Goals (2000) and at the World Summit on Sustainable Development (Johannesburg, 2002) to halve the proportion of people without access to safe drinking water and basic sanitation by 2015. To achieve these targets, an additional 1.5 billion people will require improved access to water supply (by 2015). This means providing services for another 100 million people each year (274,000/day) from 2000 to 2015.

"The challenge for sanitation is more daunting," says the report. An additional 1.9 billion people will need improved access, which means another 125 million each year (342,000/day) from 2000 to 2015. The report explains that cultural factors further complicate the logistical and financial difficulties in providing adequate sanitation.

If the current level of investment were maintained, all regions in the world could reach or come close to both goals, with the exception of sub-Saharan Africa, according to the report. But “in absolute terms, the investment needs of Asia outstrip those of Africa, Latin America and the Caribbean combined.” It is estimated that the first interventions would cost about US$12.6 billion.

Questions remain as to the source of this investment. “Financing the Millennium Development Goals will probably be one of the most important challenges that the international community will have to face over the next 15 years,” says the report.

The report outlines debates over water pricing and privatization. “Although it is considered essential to involve the private sector in water resource management,” according to the executive summary of the report, “it should be seen as a financial catalyst – not so much as a precondition – for project development […]. Control of the assets and the resource should remain in the hands of the government and users.”

The report also insists that any privatization or water-pricing scheme must include mechanisms to protect the poor. “A disturbing fact is that poor people with the most limited access to water supply have to pay significantly more for water.” In Delhi (India), for example, vendors charge the poor US$4.89 per m3, while families with piped connections pay just US$0.01, according to a survey published in the report. In Vientiane (Lao PDR), vendors charge $US14.68 per m3, compared to municipal tariffs of US$0.11.

Agriculture

About 25,000 people die every day from hunger, according to the report. An estimated 815 million people suffer from undernourishment: 777 million in developing countries, 27 million in countries in transition and 11 million in industrialized countries.

“The absolute number of undernourished people is reducing at a much slower rate,” says the report, despite the fact that “food production is satisfying the market demand at historically low prices”.

The international community has pledged through the Millennium Goals (2000) to halve the proportion of people suffering from hunger by 2015. However, this may not be achieved before 2030 according to new findings presented in the report. Previous estimates did not distinguish between rainfed and irrigated crops. By factoring in this distinction, the report presents more precise projections concerning the water required to feed the world today and in the future.

According to these new calculations, another 45 million hectares will be irrigated by 2030 in 93 developing countries, where most of the population growth will take place. About 60% of all land that could be irrigated will be in use. This will require an increase by 14% of irrigation water, according to the report.

Of the some 170 countries and territories surveyed, 20 are already using more than 40% of their renewable water resources for irrigation , "a threshold used to flag the level at which countries are forced to make difficult choices between their agricultural and urban water supply sectors", says the report. Another 16 countries use more than 20%, "which can indicate impending water scarcity. By 2030 South Asia will on average have reached the 40% level, and the Near East and North Africa not less than 58%."

By contrast, sub-Saharan Africa, Latin America and East Asia are likely to remain far below the critical threshold. These regions will see the bulk of agricultural expansion in the next 30 years.

The challenge lies in improving efficiency of land and water use. Irrigation is extremely inefficient – close to 60% of the water used is wasted. This will only improve by an estimated total of 4%. There is a tremendous need to improve the financing of better technology and to promote better management practices.

On a more positive note, average grain yields doubled between 1962 and 1996, from 1.4 to 2.8 tons/hectares/crop. This means that less than half the amount of arable land is now required to grow the same amount of grain. "By 2030, it is expected that 80% of increased crop production will come from higher yields, increased multiple cropping and shorter fallow periods," says the report.

"Towards 2050, the world could enjoy access to food for all," says the report. "The fact that 815 million are presently ravaged by chronic undernourishment is not due to a lack of capacity to produce the required food, but to global and national social, economic and political contexts that permit, and sometimes cause, unacceptable levels of poverty to perpetuate."

According to the World Water Development Report:

* Using treated wastewater could ease the water crisis. Farmers already use this resource for about 10% of irrigated land in developing countries and could use more. With proper treatment, it can actually improve soil fertility.

* Food security is improving globally. Per capita food consumption in developing countries rose from 2,054 kcal per day in 1965 to 2,681 in 1998.

* Pastures and crops take up 37% of the Earth's land area.

* About 10% of the world's irrigated lands have been damaged by waterlogging and salinization because of poor drainage and irrigation practices.

Ecology

"By the year 2025, it is predicted that water withdrawal will increase by 50% in developing countries and 18% in developed countries," says the report. "Effects on the world's ecosystems have the potential to dramatically worsen the present situation…"

The report describes a vicious circle unleashed by growing water demand. By depleting and polluting rivers, lakes and wetlands, we are destroying ecosystems which play an essential role in filtering and assuring freshwater resources.

In the United States, 40% of water bodies assessed in 1998 were not deemed fit for recreational use due to nutrient, metal and agricultural pollution. Furthermore only five out of 55 rivers in Europe are considered pristine, according to the report and, in Asia, all rivers running through cities are badly polluted. 60% of the world's 227 largest rivers are severely fragmented by dams, diversions and canals leading to the degradation of ecosystems.

Turning to the animal life of inland waters, the report says that 24% of mammals and 12% of birds are threatened. Between 34 and 80 fish species have become extinct since the late 19th century, six since 1970. Only about 10% of the world's fish species, the majority from inland waters, have been studied in detail, yet a third are at risk.

International Conflict and Cooperation

As demand for water grows, there is much talk of looming water wars. The report presents empirical data indicating the contrary. While water scarcity will intensify conflicts between states, there is little evidence to suggest that these situations will explode into full-fledged water wars.

The report highlights the findings of a study of every single water-related interaction between two countries or more over the past 50 years. Of the total of 1,831 interactions, the overwhelming majority,

1,228, were cooperative. They involved the signing of about 200 water-sharing treaties or the construction of new dams.

There is a total of 507 conflictive events. Only 37 involved violence, of which 21 consisted of military acts (18 between Israel and its neighbours).

“Some of the most vociferous enemies around the world have negotiated water agreements or are in the process of doing so concerning international rivers,” says the report. “The Mekong Committee, for example, continued to exchange data throughout the Viet Nam War. The Indus River Commission survived through two wars between India and Pakistan. And all ten Nile riparian states are currently involved in negotiations over development of the basin.”

There are 261 international rivers basins, involving 145 nations. About one third of these basins are shared by more than two countries, and 19 involve five or more. According to the report, a good part of Africa and the Middle East depend upon these shared resources for more than half their water supplies as does the southern tip of Latin America.

While much attention has been paid to international rivers, groundwater supplies (aquifers) have been largely ignored, despite the massive volumes of generally high-quality water involved (estimated at 23,400,000 km3 compared with the 42,800 km3 in rivers). Many decision-makers are not even aware that they share aquifers with other countries. The report presents the preliminary findings of a UN initiative to compile the first global map and inventory of these resources.

It also presents the first map of the world’s groundwater resources. Aquifers store as much as 98% of accessible water supplies. Between 600 to 700 km3 are extracted each year, providing about 50% of the world’s drinking supply, 40% of industrial demands and 20% of irrigated agriculture, according to the report. These proportions vary widely from country to country and are presented in a detailed chart.

Cities

“When infrastructure and services are lacking, urban areas lacking water infrastructure are among the world’s most life threatening environments,” says the report. According to a survey of 116 cities, urban areas in Africa are the worst served, with only 18% of households connected to sewers. The connection rate in Asia is just over 40%.

“The poor of these cities are the first victims of sanitation-related disease, flooding and even a rising rate of water-borne disease like malaria, which is now among the main causes of illness and death in many urban areas,” says the report. In South Asia, for example, the Anopheles stephensi mosquito has actually adapted its breeding habits around the ubiquitous rooftop water storage tankers.

“From a public health perspective,” says the report, “it is better to provide a whole city’s population with safe supplies to taps within 50 metres of their home than to provide only the richest 20% of households with water piped to their home.”

The report also outlines several reasons as to why cities and towns should take priority over rural areas when choices must be made. First, the unit costs of the required infrastructure are lower because urban areas provide significant economies of scale and proximity. Secondly, many cities have a more prosperous economic base than rural areas, providing greater possibilities to raise revenues for water provision. Thirdly, “urban areas concentrate not only people and enterprises but also their wastes.”

Industrial Use

Today industry accounts for 22% of total water use in the world: 59% in high-income countries and 8% in low-income countries. The report predicts that this average will reach 24% by 2025, when industry uses an estimated 1,170 km3/year.

Every year, 300 – 500 million tons of heavy metals, solvents, toxic sludge and other wastes accumulate in water resources from industry. More than 80% of the world’s hazardous waste is produced in the United States and other industrial countries.

Natural Disaster Risk

The report outlines the need to make risk reduction an integral part of water resource management. While the number of geophysical disasters like earthquakes and landslides has remained fairly steady, the scale and number of water-related events (droughts and floods) has more than doubled since 1996. During the past decade, 665,000 people were killed by natural disasters. Over 90% lost their lives in floods and droughts. 35% of these disasters occurred in Asia, 29% in Africa, 20% in the Americas, 13% in Europe and the rest in Oceania.

Energy

Hydropower is the most important and widely used renewable source of energy, providing 19% of total electricity production in 2001. Industrialized countries are exploiting about 70% of their electricity

potential, compared to 15% in developing countries, according to the report. Canada is the largest producer followed by the United States and Brazil. Untapped hydro-resources are still abundant in Latin America, India and China.

“By developing half of this potential, we could reduce greenhouse gas emissions by about 13%,” says the report. However, it also points to the many negative impacts of dam construction, including displacement of local populations and environmental damage (like loss of biodiversity and wetlands).

World Water Portal
WWAP, together with other partners, is developing the World Water Portal http://www.unesco.org/water/wwap/index.shtml, to provide seamless access to a wide body of water information to decision-makers, water managers, technicians and the public at large. Before going global, a prototype water portal has been developed for the Americas to test ways of sharing information among local, national and regional water organizations. http://www.waterportal-americas.org

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Chart: Water availability per person per year
Chart: Water quality indicator values in selected countries