

New report highlights crucial role of water in development

Paris, 12 March



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Demand for water has never been as great as it is today, and it will only increase due to population growth and mobility, rising living standards, changes in food consumption, and increased energy production, especially biofuels. These are among the conclusions of the United Nations World Water Development Report 3, presented ahead of the Fifth World Water Forum in Istanbul (Turkey) from 16 to 22 March.

Published every three years, the report offers a comprehensive assessment of the planet's freshwater resources. This latest edition, *Water in a Changing World*, emphasizes the role of water in development and economic growth.

“With increasing shortages, good governance is more than ever essential for water management. Combating poverty also depends on our ability to invest in this resource,” says the Director-General of UNESCO, Koïchiro Matsuura, who will present the report on behalf of the United Nations on 16 March in Istanbul.

Demand is increasing, and some countries are already reaching the limits of their water resources. The effects of climate change are likely to aggravate this situation even further. Competition for water is intensifying – whether between countries, urban and rural areas, or different sectors of activity. This may make water an increasingly politicized issue.

Policies already exist to reduce water demand and loss, and improve water management. Furthermore, many countries have already passed legislation for the protection and sound management of their water resources. But, says the report, these reforms have yet to have any noticeable effect, because action is too often confined to the water sector alone while the key

decisions about water are taken outside the water sector. For decisions to be effective, they need to involve decision makers from all sectors, including agriculture, energy, trade and finance, as they all have a decisive impact on water management. The report also emphasizes the importance of partnerships between governments the private sector and civil society.

Access to water

A major issue observed by the report's authors is that access to basic water-related services (safe drinking water, sanitation and food production) remains inadequate in much of the developing world. The "business as usual" scenario means an estimated 5 billion people (67% of the world population) may still be without improved sanitation in 2030.

In this context, the prospect of achieving the Millennium Development Goals for water and sanitation* by 2015 is both promising and alarming. While current trends suggest that over 90% of the world population will have access to improved sources of drinking water by then, progress in basic sanitation remains inadequate.

The world is on track to meet the drinking water target of the Millennium Development Goals, apart from Sub-Saharan Africa which is seriously lagging behind with about 340 million people lacking access to safe drinking water. However, it is far from achieving the sanitation target. Half a billion people lack access to adequate sanitation in Africa alone and many other regions are also trailing behind. Current efforts will need to be doubled if we are to achieve the goals set by the United Nations.

The link between poverty and water resources is obvious: the number of people living on less than US\$1.25 a day coincides approximately with the number of those without access to safe drinking water.

This situation has a major impact on health. Almost 80% of diseases in developing countries are associated with water, causing some three million early deaths. For example, 5,000 children die every day from diarrhoea, or one every 17 seconds. In all, about one tenth of all illnesses worldwide could be avoided by improving water supply, sanitation, hygiene and management of water resources.

Pressure due to increased demand

While part of the population still lacks adequate access to water, demand has never been greater. Freshwater withdrawals have tripled over the last 50 years, while the area under irrigation doubled during the same period. This phenomenon is particularly linked to population growth. The world's population, currently estimated at 6.6 billion, is growing by about 80 million people each year. This means demand for freshwater is increasing by 64 billion cubic metres a year. Yet 90% of the population growth of three billion expected by 2050 will be in developing countries, many in regions which already are water scarce.

Population growth implies increased demand for agricultural products, and so increased demand for water. Agriculture is by far the greatest consumer of water, accounting for 70% of all water

consumption (compared to 20% for industry and 10% for domestic use). Unless agricultural water use is optimized, water demand for agriculture worldwide would increase by 70 to 90% by 2050, even though a number of countries are already reaching the limits of their water resources.

At the same time, there have been changes in lifestyles and eating habits in recent years, in particular an increase in the share of meat and dairy products consumed in emerging countries. The production of a kilo of wheat requires 800 to 4,000 litres of water, while a kilo of beef, takes 2,000 to 16,000 litres. It is estimated that the Chinese consumer who ate 20 kilos of meat in 1985 will eat over 50 kilos in 2009. This will mean an additional 390 km³ of water for China's production. By comparison, in 2002, the consumption of meat per inhabitant was 76 kilos in Sweden and 125 kilos in the USA.

The production of biofuels has also increased sharply in recent years, with significant impact on water demand. The production of ethanol, 77 billion litres in 2008, tripled between 2000 and 2007 and should reach 127 billion litres by 2017. Brazil and the USA, which satisfy 77% of world demand, are the main producers. In 2007, 23% of maize production in the USA and 54% of Brazil's sugar cane crop were used for ethanol production. In 2008, 47% of vegetable oils produced in the European Union were used for biodiesel fuel.

But, despite the increased use of crops for biofuels, the proportion of total production is still small. In 2008, the ethanol share of the transport fuel market was estimated at 4.5% for the United States, 40% for Brazil and 2.2% for the European Union. The report says that, despite their potential to help reduce dependence on fossil energy, biofuels, with current technology, are likely to place a disproportionate amount of pressure on biodiversity and the environment. The major problem is the need for large quantities of water and fertilizers to grow the crops. Between 1,000 and 4,000 litres of water are needed to produce a single litre of biofuel.

Meanwhile, energy demand is accelerating, with corresponding implications for water demand. Global energy demands are expected to grow by as much as 55% through 2030. China and India alone would account for about 45% of this increase. Electricity generation from hydropower is projected to increase at an average annual rate of 1.7% from 2004 to 2030 – an overall increase of 60%.

Criticized for their heavy footprint on the environment and their tendency to displace large numbers of people, dams nevertheless seem, for many, to offer a solution, given diminishing fossil fuel supplies, the need to shift to cleaner energy sources and the potential use of added storage in adapting to the increased hydrologic variability and uncertainty due to climate change. The energy aspect is particularly true for developing countries, where the potential for hydropower is considerable.

Effects of climate change

There is a consensus among scientists that global warming will result in an intensification and acceleration of the global hydrological cycle. This intensification could translate as increasing rates of evaporation and precipitation. While it is still uncertain what effects these changes will have on water resources, it is expected that a shortage of water will have repercussions on water

quality and the frequency of extreme events, such as droughts and flooding.

In 2030, 47% of world population will be living in areas of high water stress. In Africa alone, by 2020, between 75 and 250 million people may experience increased water stress due to climate change. Water scarcity in some arid and semi-arid regions will have major impacts on migration. From 24 to 700 million people are expected to be displaced because of a scarcity of water.

Investing in water

According to the authors of the report, investing in water is important for all countries, including those that are not rich. The future wealth of developing countries will partly depend on their investment in the water sector. Water resources development is a key component of economic and social development.

Investing in water can pay off in several ways. Each dollar invested in improved access to safe water and sanitation will produce an estimated return of US\$3 to US\$34. On the other hand, where investment is weak, gross domestic product (GDP) could be constrained by as much as 10%. On the African continent, the overall economic loss due to lack of access to safe water and basic sanitation is estimated to be about US\$28.4 billion a year, or around 5% of GDP.

Investing in sanitation infrastructure also has benefits for the environment. Over 80% of sewage in developing countries is today discharged without being treated thereby polluting rivers, lakes and coastal areas.

It is estimated that the total cost in industrial countries of replacing aging water supply and sanitation infrastructure may be as high as US\$200 billion per year.

Water is only one of the primary issues for developing countries. Yet considering the benefits that accrue from investment in water infrastructure and capacity development in the water sector, an inadequate percentage of budget allocation by governments and in official aid goes to these purposes. For example, overseas development assistance to the total water sector has been decreasing and remains at only about 5% of total aid flow.

Corruption

Corruption in the water sector may account for a rise of almost US\$50 billion in the cost of achieving the Millennium Development Goals on water and sanitation.

Typical examples include falsified meter readings, favouritism in public equipment purchases, and nepotism in the allocation of public contracts. Estimates indicate that 30% of budgets can be siphoned off in some countries. Yet these practices are rarely curbed, despite initiatives by some countries. The report cites several examples. Donors and investors have not been blind to this fact, and most developmental aid agencies have chosen to focus on countries with good anti-corruption records.

Improved water management

Confronted with growing scarcity, some countries have already started to integrate their water resource management strategies with their development plans. In Zambia the new integrated water resources management policy is intent on integrating water management throughout all sectors. As a result, many donors have incorporated water-related investment in their assistance packages to Zambia.

Turkey's Southeastern Anatolia Project (GAP) is a multisectoral, socioeconomic development project designed to raise incomes in this less-developed region. The overall cost of the GAP is projected at \$32 billion, of which \$17 billion has been invested. Per capita farm incomes have tripled since irrigation was expanded. Rural electrification and accessibility reached 90%, literacy rates rose, infant mortality rates fell, business start-ups increased, and a more equitable land tenure system evolved in irrigated areas. Urban settlements served with water supply quadrupled. The region is no longer the country's least developed economy.

Australia has also changed its policies, with a range of new measures. Restrictions have been introduced - on watering gardens, washing cars, filling swimming pools, etc - in the country's major cities. In Sydney, a dual water supply was introduced in 2008 - one for drinking water, another for other uses, which draws on recycled water.

Both urban distribution networks and irrigation schemes are highly inefficient if judged by the amount of water lost through leakage. In the Mediterranean region, it is estimated that 25% of water is lost in urban areas and 20% in irrigation canals. At least part of this loss could be avoided. Cities such as Tunis (Tunisia) and Rabat (Morocco) have succeeded in cutting their losses to 10%. And, in Bangkok (Thailand) and Manila (Philippines), leak-detection programmes are being implemented.

Wastewater treatment can also increase the availability of useable water. Some countries are already recycling treated wastewater for agricultural use. But urban wastewater use in agriculture remains limited, except in a few countries with very meagre water resources - 40% of uses in the Gaza Strip (Palestinian Territories), 15% in Israel and 16% in Egypt.

Desalination of sea water is another process used in arid regions. It is used to obtain drinking water and for industrial use in countries that have reached the limits of their renewable water resources (e.g. Saudi Arabia, Israel, Cyprus).

Coordinated by the World Water Assessment Programme (WWAP), the report is the result of a co-operative effort by the 26 United Nations agencies and entities that make up UN-Water. It is produced every three years by the WWAP, whose secretariat is hosted by UNESCO.

** To reduce by half, by 2015, the percentage of the population not having sustainable access to an improved supply of safe drinking water and basic sanitation.*

The report is available on request

- Author(s):Press Release N°2009-21
- Source:UNESCOPRESS
- 12-03-2009