

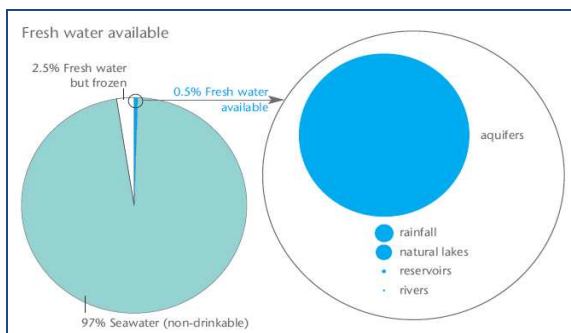
# Water

## In the Transition to a Green Economy

### A UNEP Brief

#### Context

Global economic growth over the past 50 years triggered an accelerated environmental decline. From 1981 to 2005, global GDP has more than doubled, but 60% of the world's ecosystems are now considered degraded or are being exploited in an unsustainable manner<sup>1</sup>. Although water plays a vital role in all aspects of human life, a chronic lack of interest and political support has led to poor governance and underinvestment. Lack of concern for the water sector is increasingly exposing the world to water-related disasters, environmental degradation, political instability and conflict. This, compounded by factors such as population growth, increasing consumption and climate change, has had serious effects on human development and on the achievement of the Millennium Development Goals.



WBCSD, *Water Facts and Trends*, 2009

- Less than 3% of the world's water is fresh, the rest is seawater and undrinkable
- Over 2.5% is frozen, locked up in glaciers, Antarctica, and the Arctic, and not available
- Humanity must rely on 0.5% for all human and ecosystem fresh water needs, of which:
  - 10,000,000 km<sup>3</sup> in underground aquifers
  - 119,000 km<sup>3</sup> net of rainfall falling on land after accounting for evaporation
  - 91,000 km<sup>3</sup> in natural lakes
  - Over 5,000 km<sup>3</sup> in manmade storage
  - 2,120 km<sup>3</sup> in rivers, constantly replaced from rainfall and melting snow and ice<sup>2</sup>

The world is not "running out of water", rather it is the drinking water that is constantly under

pressure, as it is not always available when and where people need it. Climate, normal seasonal variations, droughts and floods, all influence availability, amount and quality of water.

Clean water supplies and sanitation remain major problems in many parts of the world, with 20% of the global population lacking access to safe drinking water. Around 1.1 billion people globally do not have access to improved water supply sources, while 2.4 billion people do not have access to any type of improved sanitation facility. The lack of freshwater and sanitation has an economic impact through reduced work time, productive capacity and purchasing power due to diseases. About 1.8 million people - most of them children less than five years of age - die every year due to water-borne diseases from faecal pollution of surface waters<sup>3</sup> - the equivalent of about 15 killer tsunamis each year or 12 Boeing 747 crashes every day.

The direct and indirect human costs of these failings are enormous, including widespread health problems, heavy labour (particularly for women, who are forced to travel long distances to obtain water for their families), and severe limitations for economic development<sup>4</sup>. Improved water and sanitation facilities, on the other hand, bring valuable benefits for both social and economic development and poverty alleviation<sup>5</sup>

#### The Green Economy approach

Bold leadership and new approaches to business, investment and policy are required to confront the crises. Interventions are needed to mobilize and refocus the global economy towards investments and expenditures in economic sectors that can catalyze the creation of decent jobs and livelihoods sustained economic development, poverty reduction, and the regeneration of life-sustaining natural resources. This is the objective of UNEP's "Green Economy" approach to sustainable development. One sector that, by receiving the deserved attention and investments, will provide high levels of economic, social and environmental returns and can thus be a building block for the new Green Economy is water.

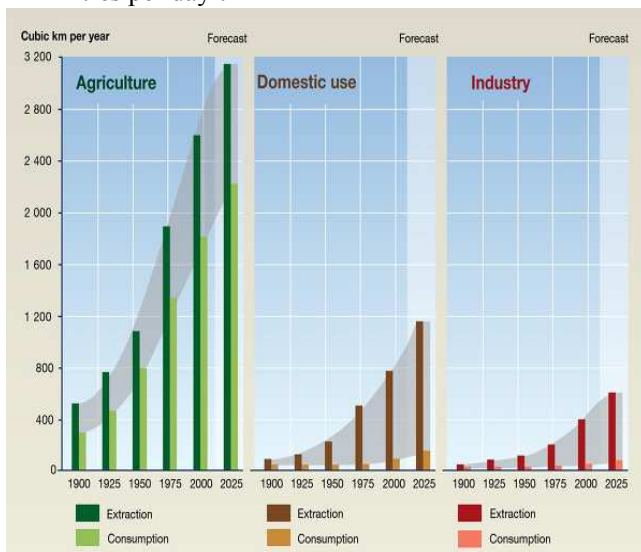
## Challenges for water

Human activities, combined with the natural forces affecting water resources, generate pressures that influence our planet's water systems. Many of these are highly dynamic; they change at a faster pace influencing water management strategies and policies.

Agricultural water use accounts for about 75% of total global consumption; in many developing countries irrigation represents over 90% of water used. Globally, about 15-35% of irrigation withdrawals are considered unsustainable<sup>6</sup>.

Industry uses about 20% of global freshwater withdrawals: 57-69% for hydro and nuclear power generation, 30-40% for industrial processes and 0.5-3% for thermal power generation<sup>7</sup>. Water used by industry is expected to reach about 24% of total freshwater withdrawal in 2025<sup>8</sup>.

5% is for domestic use. It is estimated that, in developed countries, the average person uses 500-800 litres per day, about 10 times more than in developing countries. In regions with insufficient water resources, this figure may be as low as 20-60 litres per day<sup>9</sup>.



*Vital Water Graphics*<sup>10</sup>

- More water will be needed to produce more food for an increasing number of people, estimated to reach 7 billion by 2011; this and the increasing competition for water could limit future food production
- Many developed countries need massive investment to replace the ageing infrastructure necessary to meet increasing demand and higher hygiene and water quality standards<sup>11</sup>
- Global economic expansion affects water through growth in the number of consumers, changes in their consumption habits, in the

way goods and services are produced and in the location of activities

- The need for energy will be 60% higher in 2030 than in 2002 (International Energy Agency). Alternative energy cannot cover the global demand, and water is needed for the production of any "classic" type of energy
- The global virtual water flow is 1,625 billion cubic metres a year, about 40% of total water consumption. About 80% of these virtual water flows relate to agricultural products trade<sup>12</sup>
- World population is growing by about 80 million people a year, implying increased freshwater needs of about 64 billion cubic meters a year. 90% of it takes place mainly in regions that are already in water stress and where the population does not have access to safe drinking water and adequate sanitation<sup>13</sup>
- By 2050, 22% of the world's population is expected to be 60 years old or older, up from 10% in 2005. At the same time, nearly half the world population is under the age of 25. Need for freshwater and sanitation facilities is expected to increase due to longer life expectancy<sup>14</sup>
- The urban population is expected to double between 2000 and 2030 in Africa and Asia. By 2030, towns and cities of the developing world will make up an estimated 81% of urban humanity<sup>15</sup>
- Coastal areas, with 18 of the world's 27 megacities (populations of 10 million or greater), are thought to face the largest migration pressures<sup>16</sup> and thus alteration and destruction of habitats and ecosystems
- Education helps people to better understand the need for sustainable use of water and the important environmental goods and services it provides. It can also lead to better health.
- Lifestyles and consumption choices are increasingly the most important drivers affecting water resources.
- Scarcity of water leads to increased production costs for businesses (e.g., from decreasing availability and reliability of supply, declining quality, supply chain interruptions)<sup>1</sup>

## Water: a building block for the Green Economy

- Investments in safe drinking water and sanitation are a path to economic growth. For each \$1 invested, the World Health Organization estimates returns of \$3-\$34, depending on the region and technology<sup>17</sup>

- Investments in "green" irrigation models (drip irrigation) can help addressing the increasing unsustainability of water withdrawals for irrigation, as well as the increasing competition for water which threatens to limit future food production.
- Investments in small scale projects that would provide access to safe water and basic sanitation could return in Africa an estimated overall economic gain of about \$28.4 billion a year, or around 5% of GDP.
- Inability to tackle hydrologic variability in Ethiopia has been estimated to cause a 38% decline in GDP and a projected 25% increase in poverty for 2003-2015; this can be avoided by investing in flood prevention and control
- The real price of water needs to be reflected in the final cost of all products, but mainly agricultural products as about 80% of the virtual water flows relate to agricultural products trade.
- Investments in simple hygiene interventions including hygiene education and promotion of hand washing leads to a reduction of diarrhoeal cases by 45%<sup>18</sup> which in turn would diminish the current 1 to 2 million deaths due to diarrhoeal diseases can be attributed to the "water, sanitation and hygiene".
- Improvements in drinking-water quality through household water treatment, such as chlorination at point of use and adequate domestic storage, leads to a reduction of diarrhoea episodes by 39%<sup>19</sup>
- An opportunity for green job creation appears as a result of the accelerating trend towards urbanization which triggers a need for large investment in water infrastructure in order to deliver water and to process wastewater both from individuals and from business.<sup>20</sup>
- A saving of as much as 90% energy and 70% water can be achieved by investing in recovery and reuse of water - recycling industrial and municipal wastewater that can be used as industrial or cooling water
- Groundwater represents about 90% of the world's readily available freshwater resources, and some 1.5 billion people depend upon it for their drinking water. Investing in wastewater treatment facilities will avoid pollution from organic chemicals, pesticides, nitrates, heavy metals and waterborne pathogens.
- Desalination is expected to increase about 15% per year due to the demands of a growing population. For a production of about 140,000 m<sup>3</sup> of drinking water per day, investing in green electricity would bring CO<sub>2</sub> emissions reductions to an estimate 200,000 tons compared to traditional desalination plants
- The annual water volume used by industry is expected to rise from 752 km<sup>3</sup>/year in 1995 to an estimated 1,170 km<sup>3</sup>/year in 2025, i.e. about 24% of total freshwater withdrawal. This opens opportunities for public-private partnerships that will provide economic development and employment
- Industry is also one of the biggest water polluters discharging yearly about 300-500 million tons of heavy metals, solvents, toxic sludge, and other wastes. In developing countries, 70% of industrial wastes are dumped untreated into waters. Investing in wastewater treatment would help preserve ecosystems and the health of people living on the border of the respective waters<sup>21</sup>
- Poverty means inadequate water resources and sanitation facilities, leading to water pollution, degradation of the ecosystems that are most often the source of poor people's livelihoods, and high levels of water associated diseases<sup>22</sup>. Investing in water and sanitation results in poverty alleviation.

The current economic crisis highlighted once again the necessity for sustainable development, emphasizing the necessity for balance between economic, social and environmental progress. Both public and private investors should take advantage of the crisis as it provides the opportunity to develop new green investments in infrastructure and operation of water-related businesses that can provide very good returns on investment, proving beneficial for both the economy and the environment.

### Enabling conditions

- Implementing an effective integrated water resources management to handle the increasing competition for water between agriculture, other uses and environmental needs; this requires better information
- Establishing a long-term plan for the sustainable management of water resources in agriculture taking into account climate change impacts, including protection from flood and drought risks
- Changing water management in agriculture from being largely focused on the physical supply of water, with emphasis on "supply-side" infrastructure, and harvesting the maximum amount from the resource, to emphasis on the sustainable use of water, with

a greater reliance on “demand-side” economic solutions.

- Increasing efforts to document and communicate the economic, social and environmental benefits of investing in water supply and sanitation, and in water resources management, particularly to economy and finance ministers, and to donors.
- Setting up an adequate regulatory framework to ensure that safe water is provided cost-effectively and sustainably. It's important to get water tariffs right, so that they meet the double objective of financial sustainability for the water suppliers and affordability for poorer families.
- Designing more effective communication with the public to explain the benefits that consumers receive from the charges they pay for water services
- Providing effective price signals, and moral and financial motivation for changes in infrastructure and technology standards, social habits and attitudes, and standard business practices.
- Providing finance for the management of water resources; investing in the institutions and mechanisms needed to allocate water among competing demands in an equitable and sustainable manner.
- On the demand side, better governance of the sector can help optimise the amount of investment required. For example, incentives for better management of water services provision can reduce water consumption and boost the operational efficiency of water operators

A crisis is not only a threat, but also an opportunity to reconsider the way we look at development in each of its three dimensions: economic, social and ecological. Governments, businesses and individuals alike need to learn to consider critical issues such as water, energy, climate change, food, land development, and ecosystem services together. Boosting water and energy use efficiency through investment in relevant green technologies and infrastructure are critical pathways to achieving the Millennium Development Goals and building the Green Economy of the future.

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