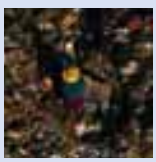
SECTION 1

Changing Contexts

The key challenges of water management can only be understood within the context of water's role in the world today. Many of the world's socio-economic systems are becoming linked at an unprecedented rate. Fast developing communications and transportation systems – including television, Internet and mobile phones – enable many of us to see first hand, and often in real time, what is happening in the world and even take us there should we wish. We are witnessing the impact of extreme climates in floods and drought conditions as well as that of poverty, warfare and disease, which still bedevil so many people of the world, often in increasingly crowded urban conditions.

It is within this setting that the world's water managers have to manage what is an increasingly scarce resource. The pressures and complexity that they face, in what is often a fast changing setting where the available resources can vary greatly in time and space, are huge. This section gives an overview of this and the increasingly refined techniques necessary to secure the equitable management of one of the planet's most precious resources.

Global Map 1: *Index of Non-sustainable Water Use*
Global Map 2: *Urban Population Growth*

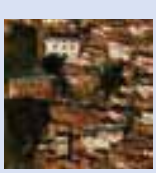


Chapter 1 – **Living in a Changing World**

Emphasizing the central role of water use and allocation in poverty alleviation and socio-economic development, this chapter discusses some of the many ways in which demographic and technological change, globalization and trade, climate variability, HIV/AIDS, warfare, etc., affect and are impacted by water. Key concepts of water management, sustainability and equity are introduced, as is the pivotal role of the many activities of the UN system in the water sector.

Chapter 2 – **The Challenges of Governance** (UNDP with IFAD)

Recognizing that the water crisis is largely a crisis of governance, this chapter outlines many of the leading obstacles to sound and sustainable water management: sector fragmentation, poverty, corruption, stagnated budgets, declining levels of development assistance and investment in the water sector, inadequate institutions and limited stakeholder participation. While the progress towards reforming water governance remains slow, this chapter provides recommendations for balancing the social, economic, political and environmental dimensions of water.



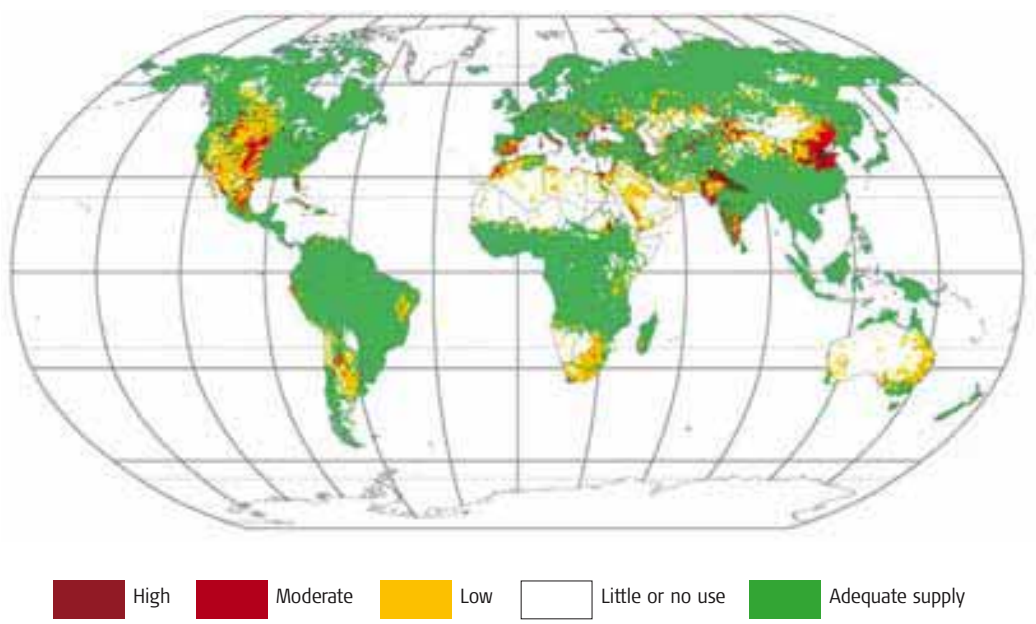
Chapter 3 – **Water and Human Settlements in an Urbanizing World** (UN-HABITAT)

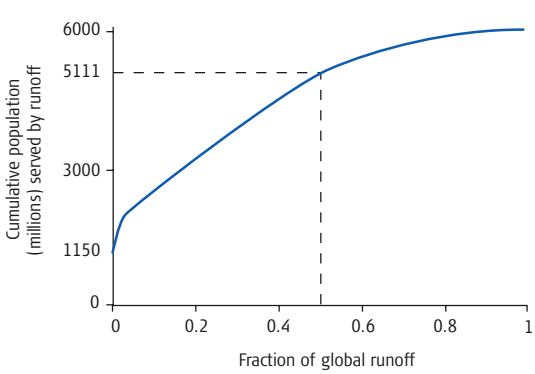
Increasing population growth is creating major problems worldwide. Growing urban water supply and sanitation needs, particularly in lower- and middle-income countries, face increasing competition with other sectors. Rising incomes in other portions of the world population fuel demand for manufactured goods and environmental services and amenities, all of which require water. This chapter emphasizes the scale of the growing urban water challenges, pointing out that nearly one-third of urban dwellers worldwide live in slums.

Index of Non-sustainable Water Use

In general, human society has positioned itself in areas with locally sustainable water supplies, in the form of runoff, and/or river and stream flows (Postel et al., 1996; Vörösmarty et al., 2005b). This map illustrates where human water use (domestic, industrial and agricultural) exceeds average water supplies annually. Areas of high water overuse (highlighted in red to brown tones) tend to occur in regions that are highly dependent on irrigated agriculture, such as the Indo-Gangetic Plain in South Asia, the North China Plain and the High Plains in North America. Urban concentration of water demand adds a highly localized dimension to these broader geographic trends. Where water use exceeds local supplies society is dependent on infrastructure that transports water over long distances (i.e., pipelines and canals) or on groundwater extraction – an unsustainable practice over the long-term. Both the map and the graph below understate the problem, as the impact of seasonal shortages are not reflected. The consequences of overuse include diminished river flow, depletion of groundwater reserves, reduction of environmental flows needed to sustain aquatic ecosystems, and potential societal conflict.

Water use in excess of natural supply (average annual)





The graph (left) shows that in 2000, of the world's total population 20% had no appreciable natural water supply, 65% (85% minus the 20% with no appreciable water supply mentioned above) shared low-to-moderate supplies (≤50% of global runoff) and only 15% enjoyed relative abundance (>50% of global runoff).

Source: Water Systems Analysis Group, University of New Hampshire. Datasets available for download at http://wwdrii.sr.unh.edu/

Urban Population Growth

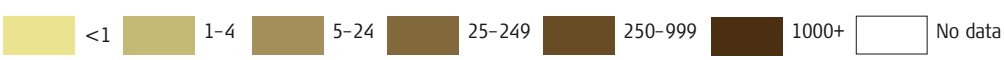
In 1950, the world's population was about 2.5 billion people; by 2000, global population was just over 6 billion, an increase of nearly 150 percent in only 50 years. During this time, the proportion of the global population living in urban areas increased from 29 to 47 percent and it is estimated that by 2010, more than 50 percent of the global population will be urban dwellers (UN, 2003).

In less developed regions of the world, this increase has been even more dramatic: in Africa and Asia the fraction of urban population has nearly tripled in the last 50 years (see graph below). Between 2000 and 2030, most population growth is expected to occur within the urban areas of less developed countries, while overall, rural population is expected to decline slightly.

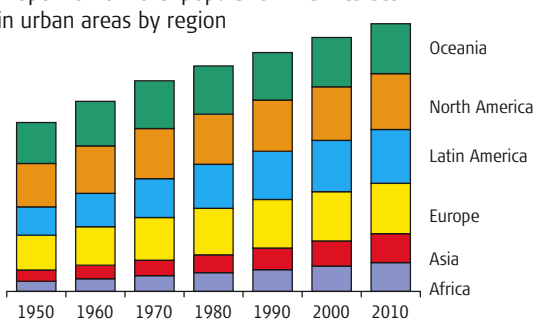
Global Population Density, 2000

Global Rural Urban Mapping Project (GRUMP) alpha Centre for International Earth Science Information Network (CIESIN) Columbia University in the City of New York

Persons per square km



Proportion of total population that resides in urban areas by region



Roughly 3% of the earth's land surface is occupied by urban areas, with the highest concentrations occurring along the coasts and waterways. The historical importance of water as a means of transport as well as a resource has meant that inland water and river corridors have been important in determining the spatial organization and distribution of human settlements.

Sources: Center for International Earth Science Information Network, Columbia University, Water Systems Analysis Group, University of New Hampshire
Data available for download at http://wwdrii.sr.unh.edu/