

## Chapter

- 6 Water's many benefits
- 7 Evolution of water use
- 8 Impacts of water use on water systems and the environment
- 9 Managing competition for water and the pressure on ecosystems

## Chapters 6-9

### Coordinator

Jean-Marc Faurès  
(FAO)

### Facilitator

Domitille Vallée





Author: Domitille Vallée

History shows a strong link between economic development and water resources development. Abundant examples can be drawn of how water has contributed to economic development and how development has demanded increased harnessing of water. Such benefits came at a cost and in some places led to increasing competition and conflicts between users and pressure on the environment.

While demand from all sectors is on the rise, in most places it is agriculture that accounts for the bulk of water use. Steadily rising demand for agricultural products to satisfy the diverse needs of a fast growing population (for food, fibre and now fuel) has been the main driver behind agricultural water use – and such demand is expected to continue to grow. In parallel, changing lifestyles and consumption patterns and rapidly growing cities and industries are claiming increasing amounts of water and are putting heavy pressure

on local resources. The effects of water depleting and polluting activities on human and ecosystem health remain largely unreported or difficult to measure, and the need grows stronger for effective protection of ecosystems and the goods and services they produce – on which life and livelihoods depend. As competition among demands on water increases, society will need to respond with improved water management, more effective policies and transparent and efficient water allocation mechanisms. The drivers described in part 1 create pressures on society that lead to changes in water use (see table).

The 2003 and 2006 editions of The United Nations World Water Development Reports examined many aspects of water use. Some, such as the use of groundwater, are covered more extensively in this edition. Similarly, the availability of new information is reflected in the treatment here of water supply and sanitation.



### Drivers create pressures that influence water use patterns

Users	Demographic growth	Economic growth	Social change	Technological innovation	Policies, laws and finance	Climate change
Agriculture	Rising demand for food and subsequent pressure on land and water resources	Rising demand for meat, fish and high-value agricultural products	Environmentally sensitive behavioural changes can lead to more vegetarian diets	Greater agricultural water productivity	Agriculture and trade policy (subsidies, import/export quotas, etc.) dictates crop yields and water requirements	Shifts in crop patterns, greater reliance on irrigation in places, generally greater crop evapotranspiration
Energy	Rising demand and pressure to develop more energy sources	Rising demand and pressure to develop more energy sources, sometimes 'dirty' resources (e.g., tar sands)	Awareness can lower demand Consumption lifestyles can increase demand	Greater efficiency (production and supply) Development of new or 'dirty' sources	Energy policy (and price speculation) dictates supply sources (hydro and renewables, fossil, nuclear)	Change in production patterns, with different water demands (quantity and quality implications)
Health	Urbanization and potential for increased disease transmission	Greater access to medical services, safe water and sanitation	Education increases good health possibilities	Increasing quality of health care Unexpected negative impacts (e.g., pesticides)	Health care and education policy (e.g., universal coverage, subsidies)	Shifting limits and timing of vector-borne diseases Greater vulnerability of the poor (floods, droughts, disease outbreaks)
Industry	Increased demand for basic goods and services	Positive feedback loop Greater resources needs and environmental degradation	Rising living standards change demands for consumer products	Can increase or decrease environmental impacts (both in some cases)	Can promote or impose standards	Increased uncertainty and risk Can prompt energy and water efficiency
Environment	Increased competition for land and resources	Can increase natural resource use and pollution	Awareness can lower impact Consumption lifestyles can increase impact	Can increase or decrease impacts – sometimes both	Can impose protection measures	Threatens ecological balances Leads to shifting habitats
Poverty focus	Growth of informal human settlements	Can aid in poverty reduction if services and opportunities are available Increased need for natural resources to fuel economic growth	Increasing expectations for poor communities	Low-cost technologies are increasingly accessible	Can impose equity rules on allocation and pricing policies May hinder efficient provision of needed services	Will affect the poor the most Impacts will affect developing countries (with limited resources) more than developed countries

Source: Compiled by Richard Connor.