



Chapter 16

The way forward

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Key messages

- ◆ Water and water systems must be managed to achieve social and economic development objectives and to sustain development. Water resources, properly managed, are critical to the survival and well-being of individuals. They can ensure equity and security in water and sanitation for families, businesses and communities. And they can ensure adequate water for food, energy and the environment as well as protection from floods and droughts.
- ◆ Decision-making on water requires seeking synergies and selecting appropriate trade-offs. It also requires distinguishing between short-term 'fire-fighting' – responding to the urgent issues of the day – and long-term strategic development. Developing multipurpose water schemes and reusing water wherever feasible can lessen the need for trade-offs by enabling the same volumes of scarce water to deliver multiple outcomes.
- ◆ The donor community can incorporate water into the broader frameworks of development aid and focus assistance on areas where it is needed most – in sub-Saharan Africa, in Asian and Latin American slums and in states recovering from conflict. Recent G-8 efforts in this direction are promising.
- ◆ The chief executives of the UN agencies, following the example of their joint discussions of and collective responses to climate change, can convene to examine the role of water, water systems and water management in development and environmental services, providing direction to agencies and advice to member countries.
- ◆ The World Water Assessment Programme and its partners are working to help reduce uncertainty, facilitate decision-making and accelerate investment by highlighting the links between socioeconomic development and investment in water management capacity and infrastructure in other sectors.
- ◆ The challenges are great, but unsustainable management and inequitable access to water resources cannot continue. We might not have all the information we would like to have before acting, but we do know enough now to begin to take significant steps. Actions must include increased investment in water infrastructure and capacity development. Leaders in the water domain can inform the processes outside their domain and manage water resources to achieve agreed socioeconomic objectives and environmental integrity. But leaders in government, the private sector and civil society will determine the direction that actions take. Recognizing this responsibility, they must act now!



Making water an integral part of all planning and management decisions

Good water resources management can transform social systems for the better and sustain development. It can alleviate the anxiety and fear arising from concerns about too little water – or too much. It can respond to humanity's concerns for natural and social changes and to our growing understanding of uncertainties, thus helping avoid political instability in fragile states. Action today is more important than ever – for the poor as for those better off.

Meeting the many objectives of water resources management with limited human, financial and institutional resources will require more integrated and collaborative procedures and stronger water management institutions and capacity. It will require better monitoring, data analysis and information products to fill the gaps in knowledge of how water is used and managed today and over time – and of the health of ecosystems that supply it. And it will require securing sustainable financing to meet the costs of service provision using existing infrastructure and to invest in essential new infrastructure, both physical and institutional.

The challenges are daunting. But they are surmountable. Managers and professionals in the water sector can work with leaders and decision-makers in all sectors to meet the challenges. They need to act within a framework that:

- Ensures accountability and transparency in planning and implementation, particularly through greater stakeholder participation, with the appropriate incentives and disincentives.
 - Integrates gender-sensitive and equitable approaches in water issues.
 - Provides options for decision-makers outside the 'water box', informed by clear messages substantiated by sound analyses from a water community that understands its role in the broad development agenda.
 - Develops solutions that strike a convincing balance between objectives and alternative means of achieving them, through consultation, innovation and research.
 - Provides data and information to reduce uncertainty.
 - Secures financing for investment in physical and institutional water infrastructure, using a variety of financing instruments.
 - Develops capacity to improve the effectiveness and scales of progress.
 - Recognizes that nature also needs water, to ensure the continuing delivery of life-supporting environmental goods and services.
- But leaders in the water sector, acting alone, risk being overlooked in broader decision-making for social and economic development. And leaders outside the water sector risk making uninformed and suboptimal development decisions. The most valuable evolution of integrated water resources management could be its extension into dialogue and partnerships with water-using sectors whose policies and strategies are governed by many factors outside the water sector.
- Chapter 14 offers practical examples of solutions within the water domain. Options that show promise involve:
- Institutional and human capacity development, to prepare institutions for current and future water and related challenges.
 - Water law, both formal and customary, including regulations in other sectors that affect water resources management.
 - Consultation with stakeholders and accountability in planning, implementation and management to build trust, as effective management involves pluralistic governance, transparency and interactions among parties with different interests.
 - Use of financial options and economic instruments to support the reliability and quality of the services provided.
 - Innovation and research to develop appropriate realistic and sustainable solutions.
 - Payment for environmental services as an incentive for improving water management efforts and for supporting sustainable ecosystems and water security.
 - Creation by water sector decision-makers of a favourable investment climate



based on sound water management and accountability.

Working through practical partnerships

For decades hydrologists and water professionals have been writing about and advocating for the essential role of water resources management in addressing social and economic development, pointing to the need to balance objectives under financial, human and institutional constraints. But decisions on water development and management objectives, and the allocation of human, financial and environmental resources to meet them, are made by leaders in government, the private sector and civil society, not by water professionals alone. Therefore, water professionals need to inform the decisions of these leaders outside the water domain on such issues as spatial and development planning, demographic planning, health, education, agriculture, industry, energy, economic development and the environment.

As government, business and community leaders respond to the needs and initiatives of water users, they should be guided by sound information about the economic and environmental trade-offs in providing these services. The international development community can provide guidance by collecting evidence on successful and failed interventions and introducing this information into national planning. Decision-makers can learn from the examples in chapters 14 and 15.

This Report takes as a starting point that decisions and actions are most effective when implemented at the lowest institutional level qualified to do so. Where individuals are capable of meeting a challenge, their efforts should be supported. Where individual efforts are not enough, community members, including the professional and business community, can come together to meet the challenge, often working with local governments. To facilitate this possibility, a higher level of government may need to step in to delegate authority and provide the needed technical or financial support.

Other actions may be beyond the capacity of individual communities and local governments. Controlling and allocating surface water and groundwater on a basin and aquifer scale and establishing pollution control standards require the involvement of the water authority or ministry. For national well-being, the president or prime minister is the ultimate water

manager, supported by the cabinet as the water management team.

International organizations, especially the UN agencies, can provide support for the member states, capacity assistance for civil society and catalytic guidance for the private sector in their efforts to incorporate water in decision-making processes within and outside the water domain. The leadership of the UN system and inter-governmental organizations can provide counsel, drawing on their experience worldwide. As in the joint discussion and collective response on climate change, the chief executives of the UN agencies could meet on the role of water and water management in socioeconomic development processes, environmental sustainability and achievement of the Millennium Development Goals. Donor governments and philanthropic organizations can enter this discussion, in ways compatible with their mission and objectives.

Municipalities, decentralized bodies and local administrations are all engaged in delivery service and managing water resources. These responsibilities have typically been decentralized by the central governments, but often without transferring the necessary financial and human resources. These local bodies face difficult choices in managing water systems, water resources and water and sanitation systems – on whether to regulate through concessions and contracts with private partners and on how to engage with non-governmental organizations. They can inform their decisions by drawing on a growing base of water management experience worldwide. All groups with a stake in water resources management can work together to craft national development plans for water and sanitation, guided by poverty reduction and environmental strategies and international guidelines.

Obtaining and sharing information

Reducing environmental and social risks today and preparing for a future of increasing climate variability and climate extremes require information about the availability and variability of water resources today and tomorrow and about trends in demand. Mechanisms for gathering this information are needed even as countries proceed with infrastructure construction. Information and tools for decision-making under uncertainty will help to avoid making decisions for the short term that have irreversible harmful environmental and social effects over the long term.



Hydrology has moved out of catchments and basins. While the volume of water in circulation on our planet remains constant, climate change models suggest some significant movements in water resources and changes in local ecosystems in response to human use and misuse. Data on water resources – where the water is, where and how it flows – are essential for understanding these global changes. Yet the necessary data are not being collected. As the need for information is increasing, attention to collecting environmental data is waning, even though technologies for collecting data, democratizing data access and gathering are becoming more affordable. We must invest in these technologies and in often-neglected local data-gathering systems to enhance our common understanding of water systems, water resources and water management.

Equally important is information about how much water is being used, by whom and for what purposes, the ability and willingness of water users to pay, cost recovery rates and the investments needed to achieve socioeconomic objectives.

Water synergies, balances and trade-offs

Because the demands on water are many and diverse, water management needs to be guided by broader social and economic development objectives that clarify expected outcomes. ‘Integrated’ development plans – such as national development strategies, poverty reduction strategies, rural development strategies and regional, district and city development plans – should identify the full set of expected outcomes for water managers.

Because drivers, demands and what can reasonably be achieved given limited resources differ, there will necessarily be trade-offs. Where water is abundant, trade-

offs may have little detrimental impact on concerned parties or the natural environment. As water becomes increasingly scarce, trade-offs will be harsher, requiring sound leadership to guide decision-making.

A key area of decision-making concerns economic and environmental trade-offs, a highly political process. It is important to differentiate between short-term ‘fire-fighting’ – responding to the urgent issues of the day – and strategic development. Multipurpose schemes and water reuse can reduce the need for trade-offs by enabling the same volumes of scarce water to deliver multiple outcomes.

In negotiating trade-offs, interest groups strive to protect the interests of their members. Industry generally lobbies for self-regulation rather than control. Governments are concerned with enforcing laws and regulations. Local pressures and international regulators sometimes encourage price controls, which can have negative as well as positive impact, including preventing harmful price manipulations by speculators. Some international groups advocate for global public goods and services. Non-governmental organizations advocate for water as a human right, charging governments with responsibility for service provision and users and beneficiaries for use that ensures long-term social, economic and environmental sustainability.

Choices about water uses

Options depend on social, economic and environmental conditions, the availability of water over space and time, and the threat of droughts and floods, all of which vary around the world.

Where water is scarce, the challenge is to select the development path that attains the best social, economic and environmental outcomes. Such decisions shift the trade-offs away from water resources alone to broader concerns of environmental, economic and social benefits. Making decisions about water in this context can sometimes introduce inefficiencies in other development activities. For example, importing food rather than producing it domestically may permit water to be used for higher value outputs, but many farmers will then need to find other ways to earn a living.

Scales of space and time

Actions are constrained by the time horizon for which they are planned (box 16.1). Politicians and water managers can find long-term planning difficult, because the

Box 16.1 Timescales for long-term planning

Planning and response timescales may be categorized as follows:

- Responses to crises (such as droughts, floods, civil strife) (1-2 years).
- Human resources changes (2-3 years).
- Political horizons (3-5 years).
- Small infrastructure horizons (3-5 years).
- Outcomes horizons (5-8 years).
- Behavioural change horizons (10 years).
- Large infrastructure horizons (10-20 years).
- Development horizons (15- 20 years).
- Long-term capacity and intra-generational equity horizons (25+ years and beyond, depending on the level of the plan).

Source: Authors' compilation.



plans and objectives often exceed the time horizon of their tenure. Overcoming this requires frameworks and incentives that support long-term planning.

Status of economic development

The stage of economic development and the financial and human resources available affect which water management options are feasible. For example, when financial resources are limited, choices may have to be made on allocating funds to sectors with the highest economic rate of return or to those that provide basic services. Lack of resources may require finances from sources outside the budget and using resources from outside the country.

High-income countries are experiencing water management problems that are very different from those of poor countries. While high-income countries can afford to pay more attention to the environment and to long-term water system sustainability, developing countries prioritize eliminating poverty and raising the overall level of health and well-being, sometimes at the expense of environmental sustainability.

The challenge is to build a new dialogue between developed countries and developing countries on water management and its role in sustainable development. Developed countries and developing countries must work together to identify socioeconomic priorities and to invest in and use water to power the engines of growth. They must break cycles of poverty while avoiding the harmful environmental and health consequences of unbridled development experienced in many developed countries. Cooperation between developed countries and developing countries can build mitigation, adaptation, avoidance and no-regret measures into decision-making, to avoid incurring the costs of neglected environmental management later.

Working towards better development outcomes

A nation's water resources are used and managed most effectively when they are linked to broader development objectives. What are the objectives, for example, for feeding the population, for providing power for industry, commerce and households, for job creation and incomes, and for child education and health? What are the relations between these objectives, and water and water systems? How should water be managed to achieve these objectives?

To incorporate these and other water considerations, countries need strategic policies and plans. Such plans must incorporate continuity despite changes in personnel and avoid loss of direction when administrations change or key individuals leave. Development partners can consult these plans to stay informed of government intentions and to direct water-related investments into actions responsive to the country's needs.

Actions in a world of change, risk and uncertainty

Risk and uncertainty are part of decision-making. What level of protection is affordable (complex dams or simple refuges)? What are the trade-offs between investments that provide direct benefit (hospitals, schools) and those that protect against possible extreme events (flood protection)? How much should be invested in research where the stakes are high, but the results uncertain? Perception of risk is not fixed but is coloured by socioeconomic conditions, culture and religion, as well as environmental realities.

Risk management encompasses more than managing extremes such as floods and droughts. It entails the use of a structured approach to manage uncertainty regarding these events. Decision-makers must take into account multiple uncertainties, including those associated with limited or low-quality data and information and the inherent unpredictability of climate and other environmental factors. A promising approach for dealing with climate risk is to integrate management of current climate variability and extremes with adaptation to climate change.

The world faces major choices in meeting the challenge of climate change and its potential environmental and socioeconomic impacts. Public policy, so far dominated by mitigation, could benefit from a better balance between mitigation and adaptation. Carbon is a measure of the anthropogenic causes of climate change – water is a measure of its impacts. The international community also has to balance investing for tomorrow's likely problems of greater climate variability and global warming against investing for today's problems of climate variability to prevent losses from droughts and floods. While both are vital, focusing on today's problems can also create greater resilience for dealing with tomorrow's problems.

Because of uncertainty, decisions on current problems should leave the way open



for future options. No-regrets strategies – actions that would significantly reduce the adverse impacts of change but would not cause harm if projections of impacts of change are wrong – are important in responding to climate change. In contrast, failure to act carries risks because the situation may deteriorate if no action is taken.

The World Water Assessment Programme and its partners are working to reduce uncertainty, facilitate decision-making and accelerate investment by identifying the links between socioeconomic development, environmental sustainability, water management capacity and investments in water-related infrastructure and other sectors. Work has begun, in concert with UN-Water, to identify indicators and supporting databases to guide decisions on water policies and actions by leaders inside and outside the water sector. It will expand the information base on options tested in many contexts. The World Water Assessment Programme is also working on scenarios linking external drivers to the water sector that could be applied globally, regionally and nationally. The next *United Nations World Water Development Report* will include the fruits of that work, along with additional examples of how challenges are being addressed on the ground.

Targeting official development assistance and philanthropic aid

For members of the international community there are choices between pursuing their traditional regional financial and political interests and focusing on areas where aid of all types is needed most. The greatest gaps in access to such water-related services as drinking water supply and sanitation are in sub-Saharan Africa, Asian and Latin American slums and countries recovering from conflict. Inefficient water use in agricultural production also is a continuing problem in many countries around the world, both developed and developing.

The 2008 World Economic Forum in Davos led to calls for policies to encourage a minimum water impact alongside a minimum carbon footprint; the 2009 forum included appeals to fight water scarcity. At the 2009 G-8 meeting in Italy the G-8 leaders are scheduled to review the 2003 G-8 Evian Water Action Plan and discuss strategies with their African partners for enhancing its implementation.

Against a background of political and strategic alignments, the international community must look for ways to support the construction of the infrastructure required to provide a range of direct and indirect services provided by water systems, including water supply and sanitation, production of food and energy and adaptation and mitigation of climate variability. National and local governments can optimize their investments by identifying actions that will produce the greatest socioeconomic and environmental benefits. Supporting countries already on track to achieve the Millennium Development Goals at the expense of countries lagging behind can only entrench global divisions. sub-Saharan Africa in particular suffers from lack of development of its water resources infrastructure for multiple uses.

Deciding – and acting!

Informed decisions – based on expected results and the consequences of failing to act – are needed now. Lagging investment in water leaves hundreds of millions of people exposed to the risks of environmental degradation and water-related disasters and susceptible to political unrest. Billions of the world's people suffer from water-related diseases and hunger. Acting to reduce such exposure can improve their health and well-being and provide access to healthcare for millions more. Country examples indicate that proper water management could increase gross domestic product by 5% to 14% – an impact that may be unachievable through any other intervention.

The challenges are great, but the unsustainable management and inequitable access to water resources cannot continue – because the risks of inaction are even greater. We might not have all the information we would like to have before acting, but we know enough to begin to take significant actions. Some leaders are already acting, showing the way. Others are ready to act. Leaders inside and outside the water domain have critical, complementary roles. Leaders in the water domain can inform the processes outside this domain and manage water resources to achieve agreed socioeconomic and environmental objectives. But leaders in government, the private sector and civil society determine the direction that actions will take. Recognizing this, they must act now!