



# 15

## Governing Water Wisely for Sustainable Development

By: UNDESA (United Nations Department of Economic and Social Affairs)/UNDP (United Nations Development Programme)/UNECE (United Nations Economic Commission for Europe)

### Table of contents

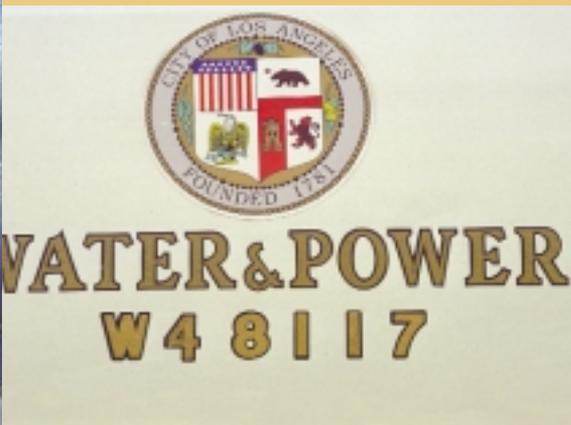
<b>Water Governance and the International Water Agenda</b>	<b>370</b>
<b>What Is Water Governance?</b>	<b>371</b>
Some criteria for effective water governance	373
Box 15.1: Examples of water governance issues	372
Box 15.2: Japan promotes public participation	374
Who owns the water?	373
Box 15.3: Property rights	375
Box 15.4: Governing water wisely – a Russian basin-level approach	376
Whose water governance?	375
<b>Water Governance and Water Management</b>	<b>375</b>
An integrated approach	376
Figure 15.1: Framework for moving towards IWRM	376
Box 15.5: Water reform in South Africa	378
Decentralization and participation	378
Box 15.6: Taiz water management planning – possibilities for rural/urban conflict resolution	379
Public-private partnerships	380
Box 15.7: Public-private water partnership in France	380
Water governance and financing	381
Box 15.8. Financing water development in Africa	382
<b>Conclusions</b>	<b>383</b>
Progress since Rio at a glance	383
<b>References</b>	<b>384</b>
<b>Some Useful Web Sites</b>	<b>384</b>



Never doubt that a small group of thoughtful, committed citizens can change the world. In fact, it is the only thing that ever has.

Margaret Mead

**A**s the world is changing, so must our ideas about water problems and their place in the broader picture of human development and needs. Perhaps the greatest shift has occurred in our emerging appreciation of the key role that governance plays. Yes, water is unevenly distributed, with some areas having too much and others not enough. Yes, there are issues of water quality and competition among users. But as this chapter illustrates, good management – that includes integrated and participatory approaches – can go a long way towards attenuating the water crisis. Many encouraging examples are given. These suggest that dynamic new partnerships are forming, preventive actions are being taken and effective institutional and regulatory frameworks are being put in place at levels ranging from the local community on up to central government.



**A**LTHOUGH WATER GOVERNANCE AND HOLISTIC AND INTEGRATED APPROACHES to water resources management feature strongly in the international water agenda, in many countries water governance is in a state of confusion. The specific water governance issues vary. In some countries there is a total lack of water institutions, and others display fragmented institutional structures (sector-by-sector approach) and overlapping and/or conflicting decision-making structures. In many places conflicting upstream and downstream interests regarding riparian rights and access to water resources are pressing issues that need immediate attention; in many other cases there are strong tendencies to divert public resources for personal gain, or unpredictability in the use of laws and regulations and licensing practices, which impede markets and voluntary action and encourage corruption and other forms of rent-seeking behaviour.

Over the past decades, there has been increasing competition for the available water resources, and increasing water pollution. Consequently, water shortages, water quality degradation and destruction of the aquatic ecosystem are seriously affecting prospects for economic and social development, political stability, as well as ecosystem integrity. In developing countries, scarcity and degradation of water resources may have a severely limiting impact on development options, especially for poor people. In order to meet basic human and ecological needs and services, societies need to address and solve several serious water challenges and must come to terms with dwindling water resources, their uneven geographic and seasonal distribution, and inadequate and inequitable allocation of water services.

The water crisis is essentially a crisis of governance and societies are facing a number of social, economic and political challenges on how to govern water more effectively. The way in which societies organize their water resource affairs is critical for promoting and supporting sustainable development as an integral part of a poverty-focused development strategy. Sustainable development challenges are, at their core, a question of both governance and of how societies can balance economic and social development with ecosystem integrity. Sound and effective governance of water resources and related services are paramount to facilitating and supporting an enabling environment for Integrated Water Resources Management (IWRM). If we do not change the way in which water is governed, negative development impacts will be even more widely felt. It is also important to note that much wider governance issues and policies outside the water sector affect water resource issues. In effect, the challenges facing the sector are systemic in nature and inextricably linked to broader social, political and economic issues of water governance. For example, agricultural and industrial policies, covered in chapters 8 and 9, may have substantial impacts on the water sector.

This chapter focuses on how societies are attempting to govern water in more effective ways. It also contains a discussion on water governance, some of its components and how it can improve water management and service delivery.

## Water Governance and the International Water Agenda

The world has changed since Agenda 21 was endorsed in Rio. The end of the Cold War has opened up borders, and globalization and economic and political liberalization have become socio-economic forces that all countries must deal with in order to reap their benefits or avoid their negative impacts. Current understanding is that water governance is a complex issue and very variable. Those who govern must be able to function in situations of rapid change, and often need to become agents for positive change. They also have to deal with competing demands for the resource. There is an ever-growing disparity between those who adapt quickly and easily and those who do not, created in part by the complexity, unpredictability and pace of events in our world. Weaknesses in governance systems are one of the major reasons behind the difficulties encountered in both following a more robust sustainable development pathway and balancing socio-economic needs with environmental sustainability. There is thus a strong need for improved institutions and social arrangements.

Agenda 21 set out a number of challenges for various areas of sustainable development and, in general, there have been huge difficulties converting principles into concrete actions. Although governance of water was not explicit as a programme area in Chapter 18 of Agenda 21, it was represented within most programme areas for water. It envisaged, *inter alia*:

- national comprehensive policies for water resources management, which are holistic, integrated and environmentally sound;
- Institutional strengthening and reform in conjunction with reform of water laws; and
- IWRM based on dynamic, interactive, iterative and multi-sectoral approaches. Its evolution would embrace spatial and temporal integration and all water users, and would be integral to socio-economic planning.

Agenda 21 set a specific target: that by 2000, national action programmes, appropriate institutional structures and legal instruments would be implemented, with water use attaining sustainable patterns. This target remains unfulfilled. It was also stated that subsectoral targets of all freshwater programme areas would be achieved by 2025. National reports to the Commission on Sustainable Development (CSD) were anticipated in order to report on progress towards target implementation, but few national reports contain any such information: a global or regional overview of the formulation of national water policies has therefore yet to emerge. Nevertheless, monitoring progress in relation to water governance is an essential tool for informed decision-making and development of future water governance requirements. Currently, there are very few indicators that can be applied and it is essential to develop the appropriate tools and mechanisms for collecting data at the national level.

Based on experience since Rio, some contextual aspects are important in understanding progress related to more effective water governance. One is the preoccupation that many governments have shown about debt and deficit reduction. During the past decade, these governments have significantly reduced their expenditures on environment-related infrastructure and services, which has generally had a serious negative impact on agencies responsible for water. Many more governments have been steadily backing away from concern for, or commitment to, environmental issues, and instead have emphasized strategies for economic growth based on a neo-liberal ideology and strategy. As a result of a newly emerging political economy in many countries, governments have devolved responsibilities for water and other services to lower levels of government that frequently have not had the human and institutional capacities or financial resources to maintain levels of services. Additionally, governments have been commercializing or privatizing such services. Increasingly, modified management processes should reflect a 'business model' in which efficiency, results-based management and tangible products have been emphasized, and less interest has been shown in providing systematic and transparent consultation processes with the public regarding policy development and implementation.

Since Rio, significant international water goals relating to governance have been set. The Second World Water Forum in The Hague in 2000 identified water governance as one of the highest priorities for action and expressed the need to govern water wisely through the involvement of the public and in the interests of all stakeholders. At the United Nations (UN) Millennium Assembly in 2000, heads of state emphasized conservation and stewardship in protecting our common environment and focused in particular on preventing unsustainable exploitation of water resources through the development of water management strategies at all levels, promoting equitable access and adequate supplies.

Although water-related objectives in Agenda 21 remain unfulfilled, progress has been made in the areas of water governance and management. There now exists a much better global awareness and understanding of the role water plays in ecosystem conservation and the overall cultural, social and economic value of water. The increasing focus on water governance, IWRM and demand-driven approaches marks an important shift in how water is being governed in terms of equitable distribution and efficiency. In general, progress has been made in the following three areas.

- The increasing recognition of water governance and required reforms of policies and institutions as the key to sustainable water development, of which the adoption of appropriate legislation, policies and institutions is only a part of the governance issue: it is the way in which enhanced institutions and policies are being established and implemented that matters. The existence of sufficient rules and regulations means little if they cannot be effectively enforced, due to power politics, vested interests and lack of funds, or the public's absence from the decision-making process.
- Reform of water institutions and policies is now taking place in many countries to address incoherent water property rights, fragmented institutional structures, inadequate policies, lack of incentives for increased partnerships and participation and various other aspects of water governance. However, progress has so far been too slow and too limited.
- Integrated approaches are widely accepted as the main vehicle or instrument to manage water in more effective ways, and the international community has made considerable efforts and progress in increasing awareness of water resources and their management. However, their implementation remains incomplete in both developed and developing countries.

## What Is Water Governance?

Governance refers to relationships that can be manifested in various types of partnerships and networks. A number of different actors with different objectives are involved, such as government and civil society institutions and transnational and national private sector interests. An important shift in governance thinking is that development is now increasingly seen as a task that involves society as a whole and not the exclusive domain of governments (Pierre, 2000).

The notion of water governance and its meanings are still evolving and there is no agreed definition. Its ethical implications and political dimensions are all under discussion. Different people use the notion differently, relating it to different cultural contexts.

Some may see governance as essentially preoccupied with questions of financial accountability and administrative efficiency. Others may focus on broader political concerns related to democracy, human rights and participatory processes. There are those who look at governance with a focus on the relationship between the political-administrative and the ecological systems. Other approaches see governance entirely in terms of management, and the operation and maintenance of infrastructure and services. The United Nations Development Programme (UNDP) defines governance as the exercise of economic, political and administrative authority to manage a country's affairs at all levels. It comprises the mechanisms, processes and institutions through which citizens and groups articulate their interests, exercise their legal rights, meet their obligations and mediate their differences.

In this particular context, governance refers essentially to the manner in which power and authority are exercised and distributed in society, how decisions are made and to what extent citizens can participate in decision-making processes. As such, it relates to the broader social system of governing, as opposed to the narrower perspective of government as the main decision-making political entity. Governance of water is perceived in its broadest sense as comprising all social, political and economic organizations and institutions, and their relationships, insofar as these are related to water development and management.

Governance is concerned with how institutions rule and how regulations affect political action and the prospect of solving given societal problems, such as efficient and equitable allocation of water resources. The rules may be formal (codified and legally adopted) or informal (traditionally, locally agreed and non-codified). Sound and effective water governance systems are crucial to pursuing various sustainable water development and management goals.

In essence, water governance refers to the range of political, social, economic and administrative systems that are in place to develop and manage water resources and the delivery of water services, at different levels of society.

Water governance issues are also dependent on properly functioning legal and judicial systems and electoral processes. For example, legislative bodies made up of freely and fairly elected members and representing different parties are important to popular participation and accountability. It is essential that legal and judicial systems protect the rule of law and human rights. Open electoral processes help build political legitimacy. Water reforms that, for example, include decentralization and increased democratization may require constitutional, legal and administrative reforms that enhance the legitimacy and authority of the judiciary and legislative bodies and executing agencies.

### Box 15.1: Examples of water governance issues

The water governance issues that need to be addressed and reflected in water policy, law, institutions and management include the following:

- Basic principles such as equity and efficiency in water distribution and allocation, water administration based on catchments, the need for holistic and integrated management approaches, the need to balance water use between socio-economic uses and uses to maintain ecosystem integrity, etc.
- Clarification of the roles of the government, civil society and the private sector and their responsibilities regarding ownership, management and administration of water resources. Under this heading the following issues will be included:
  - absence of or conflicting water rights legislation;
  - lack of effective mechanisms for intersectoral dialogue;
  - lack of economic incentives;
  - fragmentation of water management and administration;
- lack of mechanisms for the participation of the community or other stakeholders;
- the role of women in water management;
- the effects of vested interest;
- the absence of water quantity and quality standards; and
- the absence of mechanisms for coordination and conflict resolution.
- Issues related to IWRM, including:
  - inappropriate price regulation and subsidies to resource users and polluters;
  - inappropriate tax incentives and credits;
  - overregulation or underregulation;
  - bureaucratic obstacles or inertia and corruption;
  - conflicting or absent regulatory regimes;
  - mechanisms to incorporate upstream and downstream externalities (environmental, economic and social) in water-planning processes; and
  - mechanisms to resolve disputes.

### Some criteria for effective water governance

Governance affects economic, social and environmental outcomes. Water resource institutions regulate who gets what, when they will get it and how much of it they will get. Adequate governance can decrease political and social risks, as well as institutional failures and rigidity. It can also improve capacities to cope with shared problems. Research suggests that there is a strong causal relationship between improved governance and improved development outcomes such as higher per capita incomes, lower infant mortality and higher literacy (Kaufman et al., 1999).

Defining the various components required for effective water governance is a complicated task. In general, we are more familiar with failures than with effective water governance. What makes governance effective can differ from context to context and depends on cultural, economic, social and political settings. More effective governance systems need to be designed and created to deal with governance shortcomings and to increase the development potential of civil society agencies, local communities and the private sector. Box 15.1 presents some of the water governance issues that need to be addressed and reflected in water policy, law, institutions and management. Many of these issues are serious challenges to the development of wise governance.

Effective governance of water resources requires the combined commitment and effort of governments and various civil society actors, particularly at local/community levels, as well as the private sector. Policies must deliver what is needed on the basis of clear objectives and informed decision-making, which should occur at the appropriate level. Policies should also provide clear economic and social gains for society as a whole. Given the complexities of water use within society, managing it effectively and equitably entails ensuring that the disparate voices are heard and engaged in decisions concerning the waters in which they have an interest. Water governance can be said to be effective when there is equitable, environmentally sustainable and efficient use of water resources and its benefits. Such efficient use includes minimizing transaction costs and making the best use of a resource. Although there is no single model for effective governance, the following basic attributes are likely to represent some of its features.

- **Participation:** all citizens, both men and women, should have a voice – directly or through intermediate organizations representing their interests – throughout processes of policy- and decision-making. Broad participation hinges upon national and local governments following an inclusive approach.
- **Transparency:** information should flow freely within a society. The various processes and decisions should be transparent and open for scrutiny by the public.
- **Equity:** all groups in society, both men and women, should have opportunities to improve their well-being.
- **Accountability:** governments, the private sector and civil society organizations should be accountable to the public or the interests they are representing.
- **Coherency:** the increasing complexity of water resource issues, appropriate policies and actions must be taken into account so that they become coherent, consistent and easily understood.
- **Responsiveness:** institutions and processes should serve all stakeholders<sup>1</sup> and respond properly to changes in demand and preferences, or other new circumstances.
- **Integrative:** water governance should enhance and promote integrated and holistic approaches.
- **Ethical considerations:** water governance has to be based on the ethical principles of the societies in which it functions, for example by respecting traditional water rights.

These attributes are examples and represent ideal situations, which may not all be found in any single country. Through wide participation and consensus-building, societies should aim at identifying those attributes and actions that are most relevant to them. In this regard, inclusive dialogues at national and local levels are important to identify the appropriate challenges and actions for a given context. An example of public participation in the processes of water governance in Greater Tokyo is given in box 15.2.

### Who owns the water?

Property laws often determine who owns or has the right to control, regulate and access water resources. Water rights are often complicated by the variable nature of the resource. Additionally, there are economic, social and environmental values attached to water rights, and any effective water governance structure will need to address this complexity.

There is increasing pressure to recognize and formalize water rights. This is happening in many countries, although it raises complex questions about the multiplicity of claims and water uses, and it may not be sufficient to secure equitable access to water resources. The

1. Stakeholders are sometimes defined as individuals or groups who have a legal responsibility or mandate relative to a decision, and who will be directly or indirectly affected by a decision. The concept of stakeholders has increasingly been used to highlight that while it is not reasonable to involve everyone in every decision, it is important to ensure that those who have legal responsibilities or could be directly or indirectly affected by decisions are represented when decisions are taken.

### Box 15.2: Japan promotes public participation

In 1997, the River Law in Japan was revised, and a clause targeting improvement and conservation of the river environment was added. A planning system designed to incorporate the opinions of local residents was also introduced with the aim of establishing a river administration system for flood control, water use and environmental conservation. This system aims to make river areas healthier, while at the same time challenging the public to become more involved in the process.

In order to satisfy the people's need for improvement and conservation of the river environment, and to base such improvement on riverine and regional characteristics such as climate, landscape and culture, it is essential to cooperate closely with local communities. The river improvement plan is twofold: one part deals with matters constituting the fundamental river management policy, and the other deals with the river improvement and conservation plan. The new planning system includes procedures for incorporating the opinions of the local government and residents.

The Tamagawa River System Improvement Plan was implemented in March 2001, the first such plan in Greater Tokyo and the second in Japan. Discussion groups are formed to set up both the planning process and the river basin

committee as prescribed by the River Law. The Tamagawa River Basin Discussion Groups (which include the local basin communities, scientific experts, companies, relevant local government authorities and river administrators) are engaged in an ongoing exchange of opinions and information relating to the development of the Tamagawa River and the river basin environment. This exchange enables them to build mutual trust and deepen their cooperation. These meetings are organized to foster a gradual consensus towards creating a healthy river and town.

Another river improvement plan is being implemented, meanwhile, in the Yodogawa River basin, which comprises the cities of Kyoto and Osaka. The River Law provides for setting and implementing goals, but step-by-step consensus-building is also an integral part of the process.

Without a thorough understanding of the current situation and of the problems facing the basin, a consensus cannot be built, and without a consensus, it is impossible to discuss future steps and take action. The entire process, although very lengthy, therefore rests on public involvement, and this trial should provide a basis for partnerships between river administrators and the public.

*Source:* Prepared for the World Water Assessment Programme (WWAP) by the Ministry of Land, Infrastructure and Transport (MLIT) of Japan, 2002.

process of formalization is all too often biased in favour of the rich and powerful who may abuse the system. In many developing countries, local regulations, customary laws and traditional rights assign rights and responsibilities that differ from state regulations. It is therefore important for formal rights to consider traditional practices.

For formal and informal rights to be meaningful, it is essential that they retain the capacity to protect against competing water users. Due to the nature of water resources, illegal abstractions are generally easy and commonplace. They can be difficult to resolve since the transaction costs for controlling and excluding non-members or owners, particularly in irrigated agriculture, can be very

high. Excessive illegal use threatens to break down property rights and established institutions, as well as depleting water resources.

Water can be seen as a common resource system.<sup>2</sup> All water use creates positive or negative externalities (social, economic and/or environmental). The effective governance of water requires that water rights and obligations be clearly defined. For some definitions of property rights, see box 15.3. Such rights and obligations stipulate who is entitled to what quantity and quality of water, and when they are entitled to it. Water entitlements may also include obligations, such as respecting the rights of downstream water users and the discharge of wastewater (Lundqvist, 2000).

Although the state will normally legislate on the issues of property rights, many of the current problems of water governance derive from hierarchical and centralized control by the state and its inability to provide sufficient water-related services or to enforce regulations. It is often held that the local community, together with water users' organizations, can govern common resources in equitable and efficient ways (Bromley, 1992; Ostrom, 1990).

2. The use of common property resources is here seen in similarity with Ostrom's terminology 'common pool resources', which refers to 'a natural or man-made resource system that is sufficiently large as to make it costly (but not impossible) to exclude potential beneficiaries from obtaining benefits from its use' (Ostrom, 1990). Ostrom distinguishes between resource systems and resource units. The former contains groundwater basins, physical infrastructure such as sewerage lines and roads, water basins, etc. The latter is what can be used from the resource systems, e.g. fish, quantity of water withdrawn from a lake or a river.

### Box 15.3: Property rights

- Open access property: There is no defined group of users or owners and the water resource is open to anyone.
- Common property: The group in charge of the resource, such as a local community or a particular user group, has a right to exclude non-members from uses and benefits. Members of the management group have both rights and obligations with respect to use and maintenance of the water resource.
- State property: Water users and citizens in general have an obligation to observe use and access rules determined by the controlling government agencies.
- Private property: Within the existing institutional framework the owner has the right to decide on water access and uses. Those without rights or financial means to acquire water are excluded from consumption.

Although rights may be defined on paper, water resources may in practice be considered free-for-all. In many instances, particularly in agriculture, water rights are closely linked to land rights: any reform in water rights has therefore also to address land rights and vice versa. This is being addressed in South Africa's water policy reform (see box 15.5) where land and water rights are being disconnected and the riparian principle may thus not necessarily apply.

Advocates of free market policies are likely to favour private and transferable water rights and pricing that reflects the growing scarcity of the resource. They suggest that this will lead to efficient and equitable allocation of resources and will provide the greatest incentives to avoid wasteful practices. Private property rights imply that the owner can exclude those without rights or those who cannot afford the good. A legitimate concern with privatization and increased commercialization is that such a policy may exclude poorer segments of society from reasonable access to water.

#### Whose water governance?

It is important to consider to what extent the processes of institutional reform and devolution of water rights serve society, both in its entirety and its component groups. Currently, poor people in both rural and urban areas tend to be disadvantaged in accessing water and sanitation services and in accessing water for food production. If the water resource is managed primarily through private markets, only those having property or sufficient income may have easy access. If public authorities manage water, it is still not certain that poor, isolated or socially immobilized elements will gain improved access. Consensus on public policies in governing water is a problematic issue and raises many questions. Any water governance reform should aim for social and political stability. Mechanisms to compensate those members of society who lose out in the short term may be difficult to establish, or may be omitted if they are few and not politically strong. However, robust and flexible

governance structures should be able to cope with such problems.

Changes in water rights and uses can be a very controversial issue. For example, Sri Lanka is preparing a new water act to foster decentralized management of water through river basin organizations representative of the basin-level stakeholders. The new river basin organizations will become responsible for planning, implementing and regulating water allocations between water users in each basin. A National Water Resource Agency will oversee local implementation of the planning and allocation processes. However, the water resource management concepts that underpin the act, including water rights, have proved to be contentious, largely due to fears over possible new water charges and loss of traditional water usage rights. These fears have delayed presentation of the act to Parliament. For more details, see chapter 18, the Ruhuna basins case study.

The Russian Federation is an example of a very large country that has also implemented management units in river basins (see box 15.4). Special consideration must be given to large river basins, particularly where they cross national boundaries. In such situations, the state must be responsible for issuing clear regulations and limiting the rights of local communities where this is necessary to protect downstream users. Such regulations should, where appropriate, reflect international agreements. These issues are discussed in chapter 12 on the sharing of water resources.

### Water Governance and Water Management

Governance and management are interdependent. Effective governance systems should enable the more practical management tools to be applied correctly. Public-private partnerships, public participation, economic, regulatory or other instruments will not be

### Box 15.4: Governing water wisely – a Russian basin-level approach

The basin-level approach to water management that is underscored in the Water Framework Directive of the European Union (EU) is also the basis for Russian water management policy. The Russian Federation is divided into seventeen big water basins, managed by the specially appointed Water Basin Administrations under the Ministry of Natural Resources. These administrations are responsible for protecting water and managing it in a sustainable manner. Where river basins are shared by several users within the Federation, basin agreements are signed, defining the rights and responsibilities of all regions with regard to water quality. These agreements also form the basis for joint environmental monitoring and data collection needed for joint water management. According to the legislation, agreements should be accompanied by the creation of basin councils representing all main stakeholders. So-called Schemes of Complex Use of

Water Resources (which resemble river basin management plans) should be created for each river or lake basin.

However, these measures are often not as efficient as they might be, for the following reasons:

- There is an absence of legislative framework for the work of basin councils.
- Basin agreements have been signed, but their implementation is difficult due to problems with financing water protection measures.
- The Schemes of Complex Use of Water Resources remain undeveloped because of economic constraints.

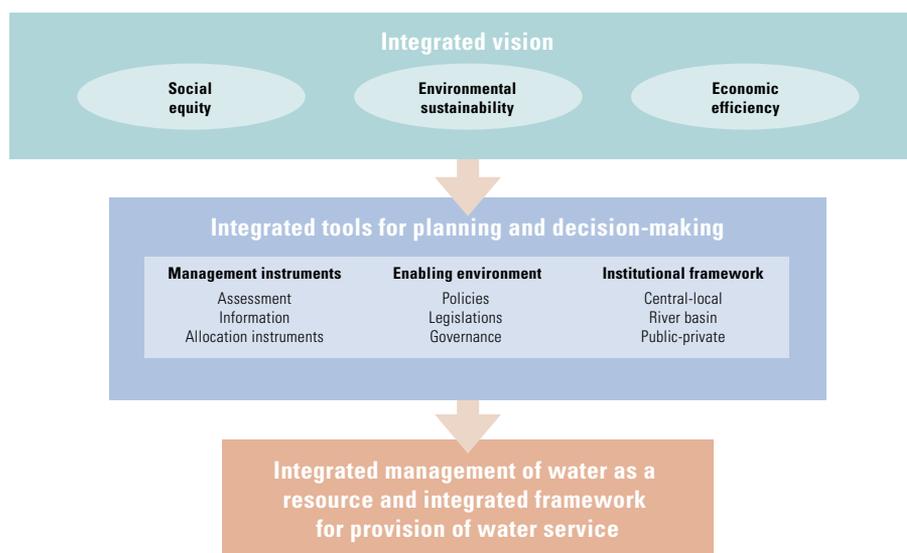
*Source:* Prepared for the World Water Assessment Programme (WWAP) by the government of the Russian Federation, 2002.

effective unless the political will exists and broader administrative systems are in place. For example, the polluter pays principle is a management tool specifically designed to decrease water pollution. However, before such a principle can be enforced, it is essential that appropriate rules and regulations, clear mandates for different agencies and transparent financial arrangements be implemented and communicated.

#### An integrated approach

There is a wide acceptance of IWRM as the appropriate management tool for sustainable use of our water resources and for improved delivery of water services. IWRM promotes participatory approaches, demand and catchment-area management, partnerships, subsidiarity and decentralization, the need to strike a gender balance, the environmental, economic and social value of water and basin or

Figure 15.1: Framework for moving towards IWRM



*Source:* Based on GWP, 2002b.

catchment management (GWP, 2000). It replaces the traditional, fragmented sectoral approach to water management that has led to poor services and unsustainable resource use.

IWRM is based on the understanding that water resources are an integral component of the ecosystem, a natural resource and a social and economic good. Physical processes, such as the naturally occurring interplay between the hydrological cycle, land, flora and fauna, take place in an integrated manner. The challenge is to create governance systems, institutions and management instruments that take into account and reflect such physical complexities in planning, decision-making and implementation processes, while at the same time balancing them with social, economic and environmental needs and objectives.

The Global Water Partnership (GWP) Technical Committee has proposed a simple framework as the starting point for IWRM as illustrated by figure 15.1. Concurrent development and strengthening of three elements is needed: an enabling environment, appropriate institutional roles and practical management instruments.

The enabling environment comprises national, provincial and local policies and legislation. These constitute the 'rules of the game', which allow all stakeholders to play their respective roles. The 'rules' should promote both top-down and bottom-up participation of all stakeholders, from the national level down to the village or municipality, or from the level of a catchment or watershed up to the river basin level.

The government's role should be that of activator and facilitator, rather than top-down manager. Important aspects of the government's role include formulating national water policies and legislation, enacting and enforcing the legislation, and encouraging and scrutinizing the private sector.

In the area of governance and institutional roles, development, financial and human resources, traditional norms and other circumstances will play a large part in determining what is most appropriate. Nevertheless, institutional development is critical everywhere to the formulation and implementation of IWRM policies. Clear demarcation of responsibilities between actors, separation of regulation from service provision functions, adequate coordination mechanisms, filling jurisdictional gaps and eliminating overlaps and matching responsibilities to authority and to capacities for action are all parts of institutional development.

Finally, practical management instruments should be developed to help water managers. The art of IWRM lies in selecting, adjusting and applying the right mix of these tools for a given situation. Five categories deserve special attention.

- Water resource assessment: comprising data collection networks, environmental impact assessment techniques and risk management tools, e.g. for floods and droughts.
- Communication and information: raising awareness is often a potent instrument for improving management, particularly when accompanied by opportunities for informed stakeholder participation.
- Tools for water allocation and conflict resolution: allocation could be done through a mix of regulatory and market instruments based on valuation of costs and benefits; and conflict resolution tools could provide guidance in issues of upstream versus downstream, sector versus sector and human versus nature.
- Regulatory instruments: including direct controls such as land use plans and utility regulation, as well as economic instruments (prices, tariffs, subsidies and others) and encouragement of self-regulation, for example by transparent benchmarking.
- Technology: both new and traditional technologies might provide scope for progress, within the water sector as well as in others that affect water demand.

Integrated management will need to tackle sectoral agencies protecting their traditional roles and responsibilities as well as the problems of overlapping or conflicting legal mandates and responsibilities. The limited array of senior and powerful advocates for the concept of IWRM make it difficult to alter the well-entrenched existing water governance systems, which tend to reflect sectoral approaches

As water-related services are extended to promote public health and food production, uncoordinated institutions can be confusing and lead to water resource depletion. In the Zambian village of Mbala, people received no less than three different pieces of advice from government agencies on how to protect a local water source: to uproot trees, to plant trees around the water source, and to uproot trees and replant them with orange trees to protect the water source (Visscher et al., 1999).

It is equally alarming that in many countries, a large number of water supply and sanitation projects and water management policies continue to be developed in isolation from each other (Visscher et al., 1999).

During the last decade many country initiatives have been taken, ranging from relatively simple changes (creation of interagency coordinating groups) to fundamental reallocations of power and changes in basic values or principles. Some examples of implementation of integrated approaches, although limited, can be found in river basin management in France and in new water laws that encourage cross-sectoral management in South Africa and Zimbabwe. These latter reforms show many similarities in issues of ownership, catchment-based management and the need to obtain a permit for any water use (see box 15.5).

### Box 15.5: Water reform in South Africa

The political changes in South Africa and the emergence of a democratic system have allowed for reform of the water sector as regards policy, organizational structure, water rights and legislation. This water reform is often cited as a very comprehensive and innovative approach to water management.

The new water law sets out to meet the objective of managing water quantity and quality to achieve optimum long-term environmentally sustainable social and economic benefits for society, while ensuring that all people have access to sufficient water. Water is considered a national resource vested in the state. The law provides for nineteen catchment management agencies, which have to prepare a management plan, issue water licences, actively promote community participation and perform other functions for implementation of the water law.

In many areas, water services have expanded rapidly. However, in some cases decentralization of service provision and responsibilities for some other areas of the water law has been difficult due to limited human and institutional capacities as well as a shortage of financial resources.

Improving water governance will help to address government, market and system failures. In Latin America there has recently been a move to address aspects of market failure. For example, the Chilean water reforms have placed major emphasis on the correct pricing of water to reflect opportunity costs over and above the tariff. Similar attempts are underway in Costa Rica and Ecuador where downstream users pay the watershed owners and managers for watershed services. The Chilean experience is instructive but the context may be location-specific, since there was a major commitment to developing the entire economy based on an export-oriented open economy. There have been many frictions due to such changes; issues of openness, transparency, participation and ecosystem concerns are now being tackled (Rogers and Hall, 2002). The water reform work in Chile is a case in point of the need to sequence reforms to meet the most urgent requirements, and, along with the example of South Africa, illustrates that water reform is often triggered from outside the water sector (for example, by political and economic liberalization). Experience in the United States suggests that reduced water demand appears to be largely due to reductions in water use subsequent to changes in the energy and agricultural sectors as well as enforcement of federal instream water requirements for ecosystem maintenance (Rogers and Hall, 2002).

### Decentralization and participation

Effective water governance requires changes in attitudes and behaviour among individuals, institutions, professionals, decision-makers – in short, among all involved. Participation by the public or stakeholders is an important tool in implementing such changes as it facilitates more informed decision-making and eases conflict resolution. It can also guarantee that voices of relatively powerless groups, such as women and indigenous people, are heard. Participation offers people the opportunity to meet their responsibilities, as well as the opportunity to claim their rights.

Key aspects of sustainability include empowerment of local people, self-reliance and social justice. These reflect concern about principles of equity, accountability and transparency. One way to incorporate these principles into real-life management is to move away from conventional forms of water governance, which have usually been dominated by a top-down approach, and professional experts in the government and private sector and move towards the bottom-up approach, which combines the experience, knowledge and understanding of various local groups and people. An important lesson during the 1990s was recognizing the benefits of combining expert knowledge with local knowledge. The self-help Orangi Pilot Project (OPP), which provided low-cost sanitation to the urban poor, is a good example of the bottom-up approach. The entire project was managed and financed by the local population, clearly illustrating that water governance is an important issue even at local levels (see box 7.6 in chapter 7 for more details on this scheme). Local participation can also be a powerful tool for conflict resolution. An enlightening case is provided by the Taiz region in Yemen (see box 15.6), where social and political conflicts, arising from competing demands on scarce water resources, have started to be resolved by engaging local stakeholders in a continuous dialogue. However, the anticipated end result of this particular case has still to be achieved.

The actual progress in participatory approaches has been modest and uneven. Many governments have a very instrumental view of local communities and related community-based organizations, and their active involvement is normally sought only for implementation of water projects. Participation in a truer sense would entail involvement throughout the whole policy or project cycle. Progress has also been uneven in overcoming the gender gap. Increased attention to gender can enhance project effectiveness as well as provide support for equity issues: it is encouraging that in some places such as Burkina Faso and Bangladesh, thinking and experience have moved beyond women and development to gender and development. In effect, in Burkina Faso, women and men each have their own forms of organization with their own rights to water and land for agriculture: the women in the river valleys, the men on higher ground. When the state took over the land for irrigation, it only gave out plots and water rights to male heads of households

### Box 15.6: Taiz water management planning – possibilities for rural/urban conflict resolution

In recent years, efforts have been made by the National Water Resources Authority (NWRA) in Yemen to minimize social and political conflicts. This was done by implementing a system of water transfers from rural to urban communities in the Taiz region within the context of IWRM. Key features of this system included both demand management measures (such as input taxation and raising of public awareness) and social measures (through definition of a regime of tradable water rights). It was felt that the demand management measures would only make meaningful contributions towards achieving the objective of sustainable water resource management if adopted in conjunction with the social measures.

Defining a system for rural/urban water transfers called for detailed consultations with the local rural communities, especially farmers, who did not seem to have much faith in the institutions engaged in the consultative process. Discussions often led to heated arguments. Nevertheless, the process continued over more than three years. The process was followed seriously as a confidence-building opportunity and special efforts were made not to let the dialogue break down at any stage. There were many rounds of discussion, sometimes with large groups of farmers, at other times only with influential community leaders. Each round of discussion built upon the issues and concerns raised in the previous round.

The end result was that communities agreed to the following main principles for rural/urban water transfers:

- There should be clearly defined rights, taking into account ethical considerations such as priority for drinking water needs.
- Water should be allocated through market-like processes, with the exception of water needed for drinking and basic needs.
- Water rights should be tradable, and, to the extent possible, there should be direct compensation of individuals willing to transfer their water rights to others, commensurate with the rights transferred.
- Water transfers should be verifiable. Those who agree to transfer their water rights must reduce their water use accordingly.
- The local communities should participate in designing the rules and mechanisms to govern rural/urban transfers, including a mechanism for monitoring compliance and punishing violators.
- NWRA should have an oversight role in rural/urban transfers to ensure resource sustainability and equity.

*Source:* Based on a project by UNDESA, 2002. Prepared for the World Water Assessment Programme (WWAP).

and created only male water users' groups. The women lost their production and harvest rights, their traditional organization went unrecognized and they lost their motivation for agriculture. When the government realized this, new plots were also given out to the women and productivity, as well as operation and maintenance of the watercourses, improved.

In Bangladesh, with an abundance of groundwater, large-scale farmers were the first to benefit from state subsidies to install deep wells with mechanized pumps. When shallow wells and smaller pumps became available, this irrigation technology was placed within the reach of the smaller-scale farmers. Out of necessity, they used water more efficiently than the large-scale farmers, and so accumulated a surplus of water that they sold to landless farmers and women, who united and bought pumps to sell water for

agriculture. In Bangladesh agriculture, men have access to water technology and land; it is they who mobilize labour, arrange inputs and have the ultimate say over the harvest. Continuing exclusion of women from the developments in water technology has widened the gap. But as water vendors, women have found other opportunities to benefit from the new technology (Van Koppen, 1997).

Institutional reforms have, at least in part, been justified by the principle of subsidiarity (management at the lowest appropriate level). Many national and state governments have delegated responsibility for water and other environmental services to lower levels of existing government, to new institutions created specifically to take on responsibilities at lower tiers of governments. Not all delegation has been within-government: the new Water Law of Zimbabwe, for example, delegates catchment management

responsibilities and day-to-day duties of water rights allocation and administration to stakeholder-elected catchment councils. Each catchment council is composed of sub-catchment councils, composed of local water user groups and associations. However, recent political instability in Zimbabwe is seriously threatening attempts to reform the water sector.

The catchment is increasingly accepted as the appropriate scale for water resource management. However, for it to be more useful would require overcoming certain obstacles. Strong sectoral or local interests may secure water first. River basins do not always match existing administrative boundaries, which can make it more difficult for riparians to solve common problems. Many local communities and civil society organizations are facing problems in mobilizing resources and the required human and institutional capacities. It is important that decentralization of water responsibilities to local communities or new catchment-based organizations be done in a transparent and participatory way to prevent powerful local groups from claiming the entire water resource, further marginalizing poor people, women and other politically weak groups.

It is further necessary that local catchment-based management groups respect the rights of other basin users downstream and, where appropriate, international river basin agreements.

### Public-private partnerships

The ways in which various government agencies, civil society organizations, private firms and the market relate to each other is crucial for effective public-private partnerships. Governance draws explicit attention to these relationships. Partnership formation can bring about substantial benefits. In cases where less public funding is available for water-related initiatives, partners outside government have sometimes contributed, through money or voluntary action, to expediting activities that would otherwise have been difficult to support. In this manner, partnership arrangements have shown that they can help to maintain or to improve water services.

The Ministerial Declaration at Bonn, 2001, encouraged private sector participation. It also noted that this does not imply private ownership of water resources and that water service providers should be subject to effective regulation and monitoring. Private sector involvement in water may take many forms and is not new. At the most basic level, water service providers have always bought in goods and services from the private sector, and governments have enlisted the private sector to assist in assessing and monitoring water resources, for example in groundwater investigations. In recent years, the trend has been to give the private sector a larger role in managing, operating and maintaining water and wastewater systems. These may be broadly divided into the following:

### Box 15.7: Public-private water partnership in France

In order to meet their responsibilities in terms of water services, French communities are often organized into inter-municipality drinking water associations (67 percent of the population) and, more rarely, sanitation associations (16 percent of the population for water collection). They also make use of public/private partnerships by delegating operation, maintenance and development of public potable water and sanitation services to private companies (85 percent of the population for potable water, 36 percent for sanitation). However, they retain ownership of the system and the private service provider must return the network in proper working condition at the end of the contract period. This system allows a clear delineation of roles and exchanges of experience, as private operating companies manage the water services of many different communities. Delegation is also favourable to efficiency, because of the technical expertise and the economic constraints of the private companies.

*Source:* Based on the Seine-Normandy Basin Agency (AESN), 2002. Prepared for the World Water Assessment Programme (WWAP).

- **Divestiture of assets:** this model has been used in England and Wales. The private sector owns the infrastructure and is responsible for planning and financing its development, as well as for its operation and maintenance. The driver for privatization of the water industry in England and Wales was the need for investment, and the key to its implementation, a strong regulatory framework. The water and wastewater companies are regulated by an economic regulator, the Office of Water Services (OFWAT), which has limited prices, the Environment Agency, which controls water abstractions and wastewater discharges, and the Drinking Water Inspectorate, which controls the quality of water supplied.
- **Concessions:** these are granted for the management, operation and development of systems for a limited period (usually about twenty-five years), but ownership of the infrastructure remains with the government. This is the dominant system in France, where there is no regulator, but the interests of consumers are represented by the contract between the service provider and the local government, which owns the assets (see box 15.7). Shorter contracts with minimal investment by the operator (leases) are sometimes employed.

- Build-Operate-Transfer (BOT) and the Build-Own-Operate-Transfer (BOOT) schemes: these involve the private sector in the financing, construction and operation of works. They are usually used for treatment plants and the private investor makes a return on his investment from the revenue for water sold or fees for treated wastewater. The private sector is again controlled through the terms of the contract by a local government or a public utility.
- Service contracts: many utilities use service contracts, that is, they will buy in some goods and services from the private sector. In recent years, some utilities have contracted out substantial parts of their operations, e.g. billing and revenue collection, which would have previously been regarded as a responsibility of the public utility itself.

Pressure from international funding agencies has led to the increased involvement of the private sector in developing countries, largely through concession contracts for the major European companies in the field. In Macao, privatization resulted in an improved level of service. In Buenos Aires, private sector involvement has resulted in increased coverage of services and more reliable water supplies. However, it has been criticized because of lack of transparency in the renegotiating of contracts and tariff increases and decisions to disconnect customers whose payments are late. In all cases involving concession contracts and private sector involvement, success appears to rely on the presence of effective regulation by central or local government agencies. A problem in many developing countries is the lack of capacity and experience to develop an adequate regulatory system.

There is considerable potential for increased private intervention in the near future in providing services to more affluent urban areas of developing countries. However, participation in the extension of service to the urban and rural poor remains more problematic, as this hinges on pricing and cross-subsidy policies that would enable private utilities to generate a fair return on their investments.

A further problem in developing countries is the lack of the necessary skills within the private sector to operate, maintain and develop water and wastewater systems. In this case, private sector participation often implies foreign companies taking over utilities. However, the use of smaller service contracts for specific activities could employ indigenous private companies, thus encouraging the development of greater skills within these companies and enabling local governments to gain more experience in preparing and managing contracts.

The rights to abstract water and discharge wastewater are important to all service providers and are normally controlled by public authorities. However, some economists argue that active

trading in water rights promotes water use efficiency as market mechanisms allocate water to the highest valued use. Trading of water rights takes place in parts of some developed countries, such as the United States and Australia.

An alternative to government provision of services to rural and poor urban communities is community-based service delivery. It is often claimed that various civil society organizations are capable of delivering services more effectively than government agencies. Community-based organizations, water users' associations and non-governmental organizations (NGOs) can play important roles, independently or in partnership with government agencies. In addition to delivering services, they can act as a link between state and community, be directly responsible for natural resource management, or act as a 'watchdog'. Much of the competence of civil society organizations is found in their knowledge about and links in the local context, which are important in choosing appropriate solutions. Local knowledge can form a basis for flexible, innovative and dynamic institutional frameworks for sustainable water development. However, many civil society organizations have limited funds and membership, and rely on voluntary work and charismatic leadership. In many cases, the NGOs and other civil society organizations have been inconsistent in their work and have faced difficulties in maintaining and expanding their activities (Tropp, 1998). As previously mentioned, government agencies tend to perceive civil society organizations in a rather narrow instrumental manner and their involvement is normally sought only for project implementation.

Partnership practices have illustrated that there is no blueprint to determine the appropriate model to use. It is obvious that many different kinds of partnerships are needed, ranging from personal or informal to voluntary or legally binding arrangements. They may be short-term and project-specific or long-term and broad in scope. They may involve sharing of work or financial costs, or the sharing only of information. Experience suggests that key ingredients in successful partnerships are a shared vision, compatibility, equitable representation, legitimacy, communication, adaptability, mutual trust and understanding, perseverance, fixed formal or informal rules and transparency. In many parts of the world there is a huge distrust between the state, civil society and the market, which does not render the formation of partnerships any easier.

### **Water governance and financing**

In terms of financing, governance is essentially about creating a favourable environment to increase water investments and to ensure that investment is used correctly. Governance is also concerned with how capital is being spent and how more can be done with existing resources, or even with less. The economic rationale behind governance is that effective water governance is supposed to lower

### Box 15.8: Financing water development in Africa

- Water should be explicitly included in Poverty Reduction Strategy Papers (PRSP).
- In most African countries, water management is dispersed between other sectors (agriculture, health, energy, etc.) and is not the responsibility of a specific ministry or authority.
- A fixed percentage of African government budgets (for example 5 percent) could be devoted to water resources development and management.
- Bilateral and multilateral aid could be earmarked as matching funds to African governments' budgetary commitments.
- Urban revenue could be transferred for rural water supply development and human and institutional capacity-building efforts.
- Private finance and public-private partnerships may be best suitable for urban areas. The role of private sector involvement in the African water sector is subject to debate.
- No amount of financial resources can solve Africa's water challenges without firm commitment by its political leaders and decision-makers. Efficient utilization of financial resources can only be achieved when a basic system of effective governance, including transparency, accountability and subsidiarity, is in place to guide public functions.

Source: UNECA, 2002.

transaction costs by preventing corruption and increasing financial efficiency. A fundamental insight is that countries cannot 'construct' themselves out of water problems and capital-intensive infrastructure development must go hand-in-hand with developments in governance of water financing.

It is evident that the water sector is underfinanced and governments have not reached the financial targets set out in Chapter 18 of Agenda 21. However, the limited funds in many water development endeavours should not paralyse action. Currently, the main cost for water-related services in developing countries is carried by governments through taxation and service charges and, to a lesser degree, by donor assistance. The private sector is only modestly involved in water-related services. Governments of developing countries have not been able to raise adequate funds through taxation or the application of water tariffs for enhanced cost recovery. A recent report on financing water development in Africa pointed to some specific sources for additional funding (see box 15.8). But, most importantly, it acknowledged the interdependence between effective water governance, increased funding and efficient utilization of existing resources. The challenging task of raising additional funds should also render decision-makers aware of the need to complement capital-intensive investments with alternative low-cost technology, especially in the sanitation sector.

High levels of corruption and other financial mismanagement reduce the rate of economic growth. Corruption has a pervasive and troubling impact on poor people since it distorts allocation of water resources and related services in favour of the wealthy and powerful. Thus, poor people will receive a lower level of services and infrastructure investment will be biased against projects that serve the poor (UNDP, 1997). The introduction of more effective governance systems with a strong autonomous regulatory authority and transparent and accountable processes would attract new financing. Improving capacity to prepare and manage contracts would also reduce bad utility practices, both public and private.

Throughout the past decade, many developing countries have sought to reduce debts and deficits. This has resulted in large reductions in infrastructure and services expenditure, with serious negative impacts on agencies responsible for water. Policy objectives of debt and deficit reduction have led to significant withdrawal of human and financial resources in supporting environmental services, including water. However, the Heavily Indebted Poor Countries (HIPC) initiative is attempting to reverse this trend. Debt relief is being linked to poverty reduction and, therefore, not only are more funds being made available for the provision of basic services, but countries are being actively encouraged to spend more on these. It may be expected that this will lead to an expansion of funds for water supplies and sanitation services for the poor in both rural and urban areas.

The heavy dependence on public funding and unclear financing mechanisms, institutions and policies are some of the investment characteristics in many developing countries. These issues have to be addressed together with the need for increased financing. The government plays an important role in providing incentives to private finance by establishing clear regulatory and institutional frameworks. Governments should also ensure that poor people are served and can afford water-related services. Countries' economies and prospects for economic growth remain highly dependent on water and other natural resources. There is a growing need to adequately reflect the use of water and other natural resources in national income accounts. Additionally, there is an increasing demand for policies and institutional frameworks that can correct market failures and the economic and social undervaluation of water resources.

## Conclusions

The water crisis is essentially about how we as a society and as individuals perceive and govern water resources and services. Although progress in water governance and related management areas has been incredibly slow and uneven, there are encouraging signs that water governance reform is taking place in many countries, promoting and

facilitating coherent policy frameworks and institutional integration instead of fragmentation, partnerships and participation.

Water governance will be improved by raising the political will to overcome obstacles and implement water-related commitments made at Rio and afterwards. Although water reforms are evolving in many countries, much remains to be done to achieve the objectives of integrated approaches, sustainable development of water resources and the delivery of adequate water services.

Water resource issues are complex and transcend the water sector itself: indeed, there is an urgent need to broaden the horizon of water issues outside of the water sector. Macro-economic development, population growth and other demographic changes have greater impacts on water demands than water policy. This emphasizes the importance for water professionals to increase their understanding of broader social, economic and political context, while politicians and other key decision-makers need to be better informed about water resource issues. Otherwise water will continue to be an area for political rhetoric and lofty promises instead of implementation of sorely needed actions.

### Progress since Rio at a glance

#### Agreed action

#### Progress since Rio

Establish by 2000 national action programmes for IWRM

Emphasize beneficiaries' involvement in all aspects of water resource management and development

Ensure that interests of all stakeholders are included in the management of water resources

Establish appropriate institutional structures and network of institutions for IWRM

Devise legal instruments for equitable sharing of water resources and for the implementation of IWRM

Establish subsectoral targets for all freshwater programme areas

Initiate effective programmes for institutional and human capacity-building for IWRM

Effective mobilization of financial resources held by various stakeholders

Unsatisfactory

Moderate

Satisfactory

## References

- Bromley, D.-W. (ed.). 1992. *Making the Commons Work: Theory, Practice and Policy*. San Francisco, Institute for Contemporary Studies.
- Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, and Federal Ministry for Economic Co-operation and Development. 2001. Ministerial Declaration, Bonn Keys, and Bonn Recommendation for Action. Official outcomes of the International Conference on Freshwater, 3–7 December 2001, Bonn.
- GWP (Global Water Partnership). 2000a. *Integrated Water Resources Management*. TAC Background Paper, No. 4.
- . 2000b. *Towards Water Security: A Framework for Action*. Stockholm.
- Jordans, E. and Zwartveen, M. 1997. *A Well of One's Own, Gender Analysis of an Irrigation Program in Bangladesh*. Bangladesh, International Irrigation Management Institute and Grameen Krishi Foundations, International Water Management Institute.
- Kaufman, D.; Kraay, A.; Zoido-Lobaton, P. 1999. *Governance Matters*. Policy Research Working Paper, No. 2196. Washington DC, World Bank.
- Kooiman, J. (ed.). 1993. *Modern Governance, New Government – Society Interactions*. London, SAGE.
- Lundqvist, J. 2000. 'Rules and Roles in Water Policy and Management: Need for Clarification of Rights and Obligations'. *Water International*, Vol. 25, No. 2.
- Ministerial Declaration of The Hague on Water Security in the 21st Century. 2000. Official outcome of the Second World Water Forum, 3–7 December 2001, The Hague.
- Ostrom, E. 1990. *Governing the Commons: The Evolution of Institutions for Collective Action*. Cambridge, Cambridge University Press.
- Pierre, J. (ed.). 2000. *Debating Governance*. London, Oxford University Press.
- Rogers, P. and Hall, A.-W. 2002. *Effective Water Governance*. GWP TAC Background Paper.
- Tropp, H. 1998. *Patronage, Politics and Pollution – Precarious NGO-State Relationships: Urban Environmental Issues in South India*. Motala, Linköping Studies in Arts and Science 182.
- UN (United Nations). 1992. Agenda 21. Programme of Action for Sustainable Development. Official outcome of the United Nations Conference on Environment and Development (UNCED), 3–14 June 1992, Rio de Janeiro.
- UNDP (United Nations Development Programme). 1997. *Corruption and Good Governance*. MDGD Discussion Paper 3. New York.
- UNECA (United Nations Economic Commission for Africa). 2002. 'Development Challenges of Water Resources management in Africa'. A Briefing Note.
- Van Koppen, B. 1997. *Waterbeheer en armoedeverlichting*. Wageningen, Department of Irrigation and Soil Conservation.
- Visscher, J.-T.; Bury, P.; Gould, T.; Moriarty, P. 1999. *Integrated Water Resources Management in Water and Sanitation Projects: Lessons from Projects in Africa, Asia and South America*. Occasional Paper Series OP31E, Delft, International Water and Sanitation Centre.

## Some Useful Web Sites\*

### Global Water Partnership (GWP)

<http://www.gwpforum.org/>

A working partnership among all those involved in water management.

### International Water Management Institute (IWMI)

<http://www.cgiar.org/iwmi/>

Deals with issues related to water management and food security: water for agriculture; groundwater; poverty; rural developments; policy and institutions; health and environment.

### United Nations Development Programme (UNDP)

<http://www.undp.org/>

UN's global development network, advocating for change and connecting countries to knowledge, experience and resources to help people build a better life.

### World Bank, Law Library

<http://www4.worldbank.org/legal/lawlibrary.html>

Organized database of links and tools on international organizations, laws, treaties and laws of nations with links to their constitutions, legislation.

\* These sites were last accessed on 7 January 2003.