Mexico 2006
4th World
Water Forum

Local
Actions
for a
Global
Challenge

IMPLEMENTING INTEGRATED WATER RESOURCES MANAGEMENT (IWRM)

UN Department of Economic and Social Affairs

Global Water Partnership

Integrated Water Resources Management:

Strengthening Local Action

Thematic Document
Framework Theme 2
Integrated Water Resources Management
Fourth World Water Forum
Mexico City, March 2006

Prepared by the Global Water Partnership

About this Document

This document has been prepared under the supervision of the Technical Committee of the Global Water Partnership (GWP), as part of GWP's responsibilities as beacon for the theme on implementing Integrated Water Resources Management (IWRM) for the 4th World Water Forum. It aims to serve as the reference point for the discussion to take place at the Forum on what needs to happen to strengthen local action to develop, manage and use water resources in an integrated way. It pays particular attention to the way in which IWRM and Water Efficiency Strategies, as called for in the Johannesburg Plan of Implementation and reinforced by the 2005 World Summit Outcome Document, can act as catalysts for change.

The document builds on the experience of the many countries around the world with which the GWP is working to promote the adoption of IWRM approaches and the preparation of IWRM and Water Efficiency Strategies and plans. It draws on the recent GWP publication "Catalyzing Change: A Handbook for the developing integrated water resources management (IWRM) and water efficiency strategies", which is available at www.gwpforum.org.

The document is organized in five sections: an executive summary of the document and key political messages; a general introduction to integrated water resources management and sustainable development; a discussion of IWRM in the context of the five crosscutting perspectives of the Forum; a set of conclusions and future perspectives; and a summary of key documents and organizations dealing with the subject.

Executive Summary and Key Messages

Water is a critical element in sustainable development and also poses its own development challenges. How countries overcome these challenges and meet the water needs of people, industries, and ecosystems depends on their situation and development priorities, but in order to optimize the contribution of water to sustainable development, countries need to consider the numerous and complex links between activities that influence and are influenced by how water is developed and managed, and how to encourage more efficient use of water as a limited resource. To address these questions, more and more countries are moving towards Integrated Water Resources Management approaches.

Conceptually, IWRM approaches promote the coordinated development and management of water, land, and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems. Operationally, they involve applying knowledge from various disciplines as well as the insights from diverse stakeholders to devise and implement efficient, equitable and sustainable solutions to water and development problems. Simply put, IWRM is a problem-solving approach to address key water challenges in ways that are economically efficient, socially equitable and environmentally sustainable.

As the set of local IWRM actions registered for the Forum clearly demonstrate, IWRM approaches can take on a very wide variety of forms, depending principally on the nature of the water and development problem at hand. They can be used to address problems both **within** specific water use sectors such as water and sanitation and irrigation as well as **across** sectors, across the full gamut of water resources development, management and use. Importantly, they can be used to address problems at all levels, from the very local to the national, regional and even global levels. While efforts to prepare national IWRM and Water Efficiency strategies and plans quite naturally emphasize national action, the end result should be action at lower levels, from the household and community levels on up.

In the last several years, many countries have found that the process of creating an IWRM and water efficiency strategy or plan — as called for in the Johannesburg Plan of Implementation and reinforced by the 2005 World Summit — is an opportunity to take a coherent approach to improving how they develop, manage and use water resources to further sustainable development goals and meet development challenges. Some countries have chosen to create new strategies and plans from scratch. Others have built on existing IWRM or water plans or incorporate water into current national development strategies. Regardless of the initial approach, strategies and plans are striving to go beyond the actions needed to solve current problems or to achieve immediate objectives, and aim at institutionalizing changes that will promote more strategic and coordinated decision-making on an on-going basis.

Experience in many countries over the last several years has shown that creating an effective IWRM strategy requires a somewhat different process than that entailed in creating a one-off water resources planning document. Key differences include involvement from multiple sectors, broader focus, dynamic rather than static framework, and strong stakeholder participation

In September 2005, the 2005 World Summit added an important proviso to the WSSD Plan of Implementation: it called for assisting developing country efforts to prepare IWRM and water efficiency plans as part of comprehensive national development

strategies to achieve the Millennium Development Goals (MDG). This development raised an important challenge: how to prepare national MDG-based development strategies to mainstream water resources considerations in these strategies.

As an approach to devise and implement efficient, equitable and sustainable solutions to water and development problems, the Forum's IWRM theme is not only important in itself but also cuts across all the themes of the Forum: water for growth and development, water and sanitation services, water for food and the environment, and risk management. In addition, the IWRM theme embodies within it all five cross-cutting perspectives of the Forum. In particular:

- Moving towards an IWRM approach at the national level requires positive change in the enabling environment, in institutional roles, and in management instruments. This includes change in (water) governance, i.e., the range of political, social, economic and administrative systems that are in place to develop and manage water resources and deliver water services, at different levels of society.
- Many countries are finding that the adoption of integrated approaches comes with significant and long-term capacity-building needs. Clearly, IWRM approaches require technical capacities in a number of specialized areas. But capacity is also needed to manage the participatory processes that are such a vital component of effective implementation –meaning skills in communications, negotiation, conflict resolution, facilitation, consensus building, time management, and community mobilization.
- Defining indicators, establishing benchmarks, and setting up mechanisms to ensure on-going monitoring and evaluation are all key activities in moving towards more integrated problem-solving approaches. Monitoring and evaluation is important not only at national and sub-national levels, but also at regional and global levels —to see whether the process of developing IWRM and Water Efficiency Plans as called for in the Johannesburg Plan of Implementation is on track, to measure impacts, and to determine if actions are contributing to larger sustainable development goals.
- Since integrated approaches involve applying knowledge from various disciplines to devise innovative solutions to water and development problems, science and technology, innovation, and applying knowledge all lie at the heart of the IWRM approach.
- From an IWRM perspective, the key issue in formulating a financing strategy is to reconcile the often competing goals of economic efficiency, social equity and environmental sustainability. This frequently poses thorny problems that require careful analysis; for example, while making water affordable to the poor is a pre-requisite for a socially equitable policy, cost-related water pricing is desirable from the point of view of sustainability.

Clearly, there are no universal blueprints or prescriptions to follow in moving towards more integrated approaches to water resources development, management and use. However, countries and communities can draw on existing tools and learn from each other's experiences –thereby increasing their chances of success. The World Water Forum can play a key role in this process of global learning.

Introduction: Integrated Water Resources Management and Sustainable Development

Water is a critical element in sustainable development. It is a key ingredient in generating rural livelihoods, growing food, producing energy, encouraging industrial and service sector growth, and ensuring the integrity of ecosystems and the goods and services they provide. Water also poses its own development challenges –floods, droughts, and water–related diseases can have a huge impact on communities and indeed on national economies. So how can countries overcome these challenges and meet the water needs of people, industries, and ecosystems? How each country chooses to answer this question depends on its situation and development priorities, but in order to optimize the contribution of water to sustainable development, any answer needs to consider:

- The numerous and complex links between activities that influence and are influenced by how water is developed and managed.
- How to encourage more efficient use of water as a limited resource.

To address these questions, many countries are adopting Integrated Water Resources Management approaches. Conceptually, these approaches promote the coordinated development and management of water, land, and related resources in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems[1].

Operationally, IWRM approaches involve applying knowledge from various disciplines as well as the insights from diverse stakeholders to devise and implement efficient, equitable and sustainable solutions to (complex and multi-faceted) water and development problems. Simply put, IWRM is a problem-solving approach to address key water challenges in ways that are economically efficient, socially equitable and environmentally sustainable.

Boxes 1-4 describe four case studies that have been registered as "local actions" in the Forum under the IWRM theme. As the examples in Boxes 1-4 clearly demonstrate, IWRM approaches can take on a very wide variety of forms, depending principally on the nature of the water and development problem at hand. However, at their heart these approaches have four defining characteristics:

- They apply to problems both within specific water use sectors such as water and sanitation and irrigation as well as across sectors.
- The problems they address encompass the full gamut of water resources development, management and use. The approach is thus central to such big ticket issues as infrastructural development and water and sanitation services, and not only to water "management" in the narrow sense of the word.
- They apply to problems at all levels, from local to global. The examples in Boxes 1-4 illustrate the use of integrated approaches at the community, city, district and national level.
- The specific tools to be employed in any instance depend on the problem at hand. IWRM approaches should thus not be equated with specific tools, such as economic instruments for water allocation or particular policies and institutional mechanisms.

The core of the IWRM approach is thus not necessarily "integration", and especially integration across sectors,

Box 1. Improving Water Management in Lachi Tehsil, Pakistan

Kohat District is located in the North West Frontier Province (NWFP) of Pakistan, and about 70% of the population live below the official poverty line with a monthly household income of less than Rs 850 (US$ 20). Lachi Tehsil (sub-district) is one of the poorest and most conservative parts of Kohat district with many households living in very marginal and deprived conditions due to several factors including the arid or semi-arid climate, the hilly topography, the predominance of sandy soils with low fertility, remote and isolated communities, and the over-grazing of rangeland. The Lachi Poverty Reduction Project (LPRP) has been working with communities in Lachi to address their need for improved water resources by mobilising communities to form Community Organisations (COs) and supporting a range of measures to improve the well-being and livelihoods of communities including schemes to improve the utilisation of available water resources.

The water resources schemes promote the construction of mini-dams and installation of wells, designed to intercept runoff and pond water. The mini-dams provide water closer to homesteads or to where water will be used for domestic or productive purposes. The height of the mini-dams ranges from 10-35 ft (3-10 m) and the volume of water stored by each scheme ranges from 5,000 to 120,000 m3. The stored water is used for multiple purposes such as domestic uses, livestock watering and recharging groundwater for extraction in nearby wells. Additional works such as pumps and a piped distribution network were also constructed where sufficient stored water was available year round and homesteads are located nearby.

COs with support from LPRP have planned and implemented 78 mini-dams and 6 well schemes. The schemes address real needs and bring significant benefits to all socio-economic groups in the poor, isolated communities of Lachi. Communities are willing to operate and maintain the mini-dams and the related water distribution systems using their own financial and physical resources. The water resource schemes achieved their purpose of improving community access to water and improving the availability of water for domestic, agricultural and other uses. The number of beneficiaries from each scheme ranged from 40-120 households or 280-840 people.

In addition to contributing 30% of the construction costs, households are willing to pay operation and maintenance costs (ranging from Rs 5 to Rs 180 (US$ 0.10 to US$ 4) per household per month). The fees charged to operate and maintain schemes are much less than the cost of Rs 1250 (US$30) per month that households spend (on donkeys to carry water, the pots and containers to carry and store water etc.) to fetch water from traditional water sources that are often 7-10 km distant from homesteads. In addition, as the new schemes provide water sources within 0.5 km of homesteads, the time taken to fetch water or water livestock is greatly reduced.

There are many significant benefits of the water schemes including reduction in the drudgery of women who are responsible for the collection of water; more time available for women to carry out other beneficial tasks such as caring for children and elderly, food preparation and cleaning homesteads; improved health of all family members as more water is available for washing, cleaning etc.; improved health of livestock; increased productivity of livestock (increased milk production, weight gain etc.); increased scope for homestead (kitchen) gardening using the water available for irrigation; potential for fish production and irrigating of vegetable and field crops. The increased economic opportunities resulting from water being more accessible and more readily available reduced the need for households to migrate to find income-earning opportunities. The reduction in migration also gives more opportunities for community development activities.

All households, including poor and destitute households, within the vicinity of water schemes are able to access water for various purposes including domestic uses and livestock watering. The benefits are often available to non-members and to households in neighbouring communities. The broader potential impacts of schemes were often recognized during the planning, and local traditional organizations were used to discuss common problems. In many schemes, the planning process included a successful mix of local traditional institutions and the new institutions facilitated by the project, that is COs. Overall, the water schemes have positive environmental impacts, including improved health and well-being of villagers from better access to water and improved sanitation and hygiene attributable to more water being available. Some of the schemes have been operated and maintained successfully by COs for 5 to 7 years.

Taken from the Local Actions database of the 4th World Water Forum: http://www.worldwaterforum4.org.mx/home/local.asp?lan=

Box 2. Community Approaches to Flood Management in Bangladesh, India and Nepal

The recurrence of annual monsoonal floods in South Asia affects farming practices, public health, communication systems, and infrastructure, including homes. Floodplain agriculture as well as aquaculture, fisheries and livestock —the main sources of livelihoods for people in the region— are all severely affected and often require major rehabilitation activities. To reduce the number of people negatively affected by floods in terms of lost livelihoods and property, health impacts, loss of life and the entrenchment of poverty, the project, Community Flood Management in Bangladesh, India and Nepal: Building Resilience through Community Participation, was initiated by local NGOs in the three countries in cooperation with the World Meteorological Organisation (WMO) and the Global Water Partnership (GWP) to develop and utilize a comprehensive community approach to manage floods at the local level through enhancing self-help community activities.

Initiated in 2003, communities were organized under the leadership of local government institutions and provided hands-on training to:

- collect and disseminate flood warnings by use of cellular tele-technology;
- utilize precautionary measures for reducing loss burden;
- organize flood-shelters for relocation;
- improve local water supply systems;
- produce low-cost water purifying systems as a preventive to water-borne diseases;
- evacuate people from remote places;
- manage flood-shelters with local and institutional support;
- facilitate restoration of living conditions in damaged homes and rehabilitation of agriculture post-flood.

Community flood management manuals were developed and successfully field-tested in the monsoon period of 2004. Activities are on-going to improve flood management based on lessons learned. Results have been largely achieved through increased capacity building on the community level and targeted training activities geared to enhance self-help capabilities of communities to manage floods in an integrated manner on local and sub-district levels. Reducing vulnerability of communities to floods has helped increase net growth of income and helped to reduce poverty as a result of reduced losses of property and livelihoods, improved health and therefore improved economic productivity of community members.

Enhancement of local capacity and organization offers a sustainable solution to a millennia-old recurrent problem of the region, which may be tested elsewhere. The Government of Bangladesh has already accepted the approach and it is in the process of moving the concept forward through designing and activating its Disaster Management Committees, which will become part of the emerging Disaster Management Act. On the political level, national workshops are being planned in each of the countries to promote the approach of the project and its success and to gain further support to multiply communities that can benefit from the project approach. On a regional level, a regional meeting is being planned to obtain a regional outreach with the aim to propagate the project approach and its success story to other countries in the region in collaboration with governmental authorities, regional organizations and bilateral as well as institutional donors.

The project was designed and implemented based on the concept of Integrated Flood Management (IFM) which balances the positive and negative aspects of floods in a coherent, cross-sectoral management approach within the context of Integrated Water Resources Management (IWRM). The originality of the project lies in the approach to introduce new self-organizational structures and institutions on the community level that are capable of implementing flood management activities and measures that have been agreed upon by representatives of the communities and community members in general. Organizational changes brought about changes in attitude and social response to flood management including the emergence of a communal sense of neighbors helping neighbors. In several communities this concept did not exist prior to the project, where every household was mainly looking only at their own household members and did not envisage that the welfare of households depends also on the strength of the entire community.

Taken from the Local Actions database of the 4th World Water Forum: http://www.worldwaterforum4.org.mx/home/local.asp?lan=

Box 3. Communities and Water Resource Management in Municipal Sustainable Development Projects in Brazil

Impacts associated with uncontrolled urban developments, illegal occupation and pollution of urban watersheds, flooding of low-lying areas unsuitable for housing development, landslides on unstable hillsides occupied by slums, and disposal of solid waste all affect the urban poor more acutely than any other segment of the population. Such issues also present particular challenges to the management of water resources within an urban and watershed context, with the potential to undermine efforts toward developing an environmentally sustainable platform in support of continued economic growth. In Brazil, improving the quality of life among these communities and fostering opportunities through continued economic growth are placing unprecedented pressures upon local government structures. In response, the government of Brazil has requested the World Bank to provide policy and lend support to local municipalities, such as those of Brasilia, Betim and Cubatão. In all three cities, uncontrolled urban expansion, environmental degradation, stressed ecosystems, and degraded water quality has worsened public health and the quality of life for citizens.

With support from the World Bank, the GoB and municipal structures are enhancing capacity to manage urban development with a view to improving water resources and land management issues to address increasing urban and regional environmental pressures through; (a) promoting sustainable socio-environmental development; (b) reducing inequality; and (c) enhancing the quality of life through integrated investments in urban environmental infrastructure, particularly water, and social services coupled with broader efforts to improve municipal governance, regulatory policy and institutional strengthening.

Implementation of specific interventions are alleviating immediate pressures on water resources within these regions and improving the quality of life among urban poor. These short-term impacts are being achieved primarily through local service provision, including basic water supply and sanitation services, construction of sewage plants and information management systems, including cadastre mapping. These actions, supported by institutional reforms and reinforcement of protected areas measures, are aimed at improving watershed protection, reducing negative impacts on water resources and improving the quality of life through, among others, the reduction of health risks. Longer term interventions are focused on enhancement of existing planning instruments and policies, supported through the development of new tools aimed at ensuring long-term, environmentally sustainable growth. These include municipal development plans, water resources management and monitoring systems, enforcement procedures measures, social inclusion, and environmental education.

Stakeholders have been variously engaged depending on their role and capacity. Government-supported and project-sponsored workshops are being used to engage stakeholders in the decision making and development process. Local communities are participating in municipal interventions, while other stakeholders, such as government agencies and international institutions, are providing an enabling environment through financial and technical support.

Through local level investments in infrastructure and various capacity instruments, the municipal project approach will improve long-term sustainability of water resources and opportunities for economic growth. For example, investments in water supply and sanitation connections and sewage works will provide an infrastructural network to ensure efficient service delivery, facilitating waste removal and water treatment. Development of policy and planning instruments, such as Municipal Development Plans will integrate environmental and water resource management measures, providing long-term solutions in support of improved and sustained water resources management.

Lessons learned:

- Recommendations, lessons learned and actions undertaken toward the integration of sustainable solutions to urban environmental planning with a view to ensuring improvements in water resources management.
- Strengthening partnerships among different levels of government and sectoral stakeholders in support of mechanisms facilitating integration of local actions within broader regional frameworks to address sustainable water resources management.
- Mechanisms to address service provision to poor urban communities within a sustainable water resources management framework.

Taken from the Local Actions database of the 4th World Water Forum: http://www.worldwaterforum4.org.mx/home/local.asp?lan=

Box 4. Egypt's Integrated Irrigation Improvement and Management Project (IIMP)

Egypt is facing increasing challenges in the water sector which require the following three most critical tasks: 1) to increase the productivity of agriculture and the incomes of the rural poor in a sustainable manner; 2) to manage looming water scarcity with the related water quality issues due to water-logging, salinity and degradation by pollution; and 3) to have a more systematic approach to the development of agricultural exports.

Egypt's Ministry of Water Resources and Irrigation (MWRI) recognizes that better water management is essential for maintaining a viable agricultural sector while facing ever-increasing demands from other sectors of the economy. Water management is best improved by an integrated package of services and technical assistance that responds to the user's demand. The components of the IIMP project are: 1) preparation and implementation of Integrated Water Management Plans in the selected areas; 2) Institutional development and capacity building through the proper establishment, expansion and scaling up of water user organizations and establishment and mainstreaming of integrated water management organizations; 3) improvement and modernization of irrigation and drainage infrastructure; 4) environmental mainstreaming and implementation of environmental management plans to demonstrate how improvements in water quality can be achieved; and 5) improved on-farm water management. These activities will be implemented in two command areas of about 500,000 feddans (210,000 ha) in Lower Egypt, Nile Delta, (in Alexandria, Behira, Kafr El-Shiekh, and Gharbeia Governorates).

Expected results as presented in the feasibility studies of the project from an economical perspective are water savings (10%-30%), increases in crop yields (up to 20%), a shift to more profitable cash crops, and in general the ERR=20.5% and NPV=U$141 million. From the social perspective, expected results are that farmers will recognize the benefits of Mesqa (irrigation ditch) improvements, a reduction of disputes between farmers throughout WUOs, and improved conditions of rural communities. From the environmental perspective, the overall environmental impact of the IIIMP is expected to be positive, leading to improved land and water management in the Nile delta. The rehabilitation of the irrigation and drainage infrastructure will help maintain the water table at a low level, prevent water logging and soil salinization, and increase overall water use efficiency. The on-farm irrigation component will lead to more efficient and productive use of irrigation water, as well as to increased yields, evolving from the introduction of "continuous flow (on-demand)" irrigation at the tertiary canal and branch canal levels. The integration of water resources planning and management within the MWRI and the development of WBs and WUAs at the district, branch canal and tertiary canal levels will strengthen overall water and land management at the local level.

The design criteria for system modernization that are to be introduced under the project will lead to a marked reduction in the estimated improvement cost at the tertiary-level and bring the improvement package more into line with international norms. Furthermore, extensively applied but relatively minor incremental investments in on-farm water management and irrigated agriculture improvements will result in substantial incremental benefits. Experience has suggested that significant cost-savings could be achieved by, for instance, substituting the current practice of using diesel pumps by electric pumps, even though the latter would require augmentation of the power grid in the project areas. The grouping of small tertiary canals for service from a single pump house would also be considered. The newly introduced modernization and integrated management approach, and its model project will become a clear poverty alleviation mechanism for rural areas in Egypt. Many kinds of technology and expertise will be used to optimize the results of our activities (on farm water management technology transfer, institutional development expertise, environmental mainstreaming expertise, financial expertise, procurement expertise, technical assistance expertise). The Ministry's contribution will be to provide training activities including software and hardware, day-to-day management and field coordination, financial mainstreaming for project activities, inter-ministerial and cross-sectoral coordination among all involved parties.

A new approach for system modernization and integrated management as an initiative that might be scaled up for use in other similar regions has been developed and thoroughly studied from different perspectives. It directly addresses the issue of highest priority to Egypt's farmers, which are the efficient use and management of water and land resources for agricultural production. A more participatory planning and decision making process is expected to develop substantially under the approach through the creation of capable water user organizations.

Taken from the Local Actions database of the 4th World Water Forum: http://www.worldwaterforum4.org.mx/home/local.asp?lan=

important though this may be in particular instances. Rather, the core of the approach is about finding imaginative and innovative solutions that advance and reconcile the goals of economic efficiency, social equity and environmental sustainability. While "integration" is an important descriptor, the other three words in the IWRM term (shorthand for water resources development, management and use) are the operative ones - with the "I" part symbolizing the kind of water resources development, management and use that countries should strive for and that really matters.

IWRM approaches can thus take on a wide variety of forms, depending on the context and level of the problem at hand. For example, an IWRM approach may entail more coordinated development and management of:

- land and water,
- surface water and groundwater,
- the river basin and its adjacent coastal and marine environment, and
- upstream and downstream interests.

For policy-making and planning, taking an IWRM approach will frequently require that:

- policies and priorities take water resources implications into account, including the two-way relationship between macro-economic policies and water development, management, and use,
- there is cross-sectoral integration in policy development,
- stakeholders are given a voice in water planning and management, with particular attention to securing the participation of women and the poor,
- water-related decisions made at local and river basin levels are in-line with, or at least do not conflict with, the achievement of broader national objectives, and
- water planning and strategies are integrated into broader social, economic, and environmental goals.

Fostering IWRM approaches at all levels generally requires giving water an appropriate place on the national agenda; creating greater "water awareness" among decision-makers responsible for economic policy and policy in water-related sectors; creating more effective channels for communication and shared decision-making between government agencies, organizations, interest groups and communities; and encouraging people to think "outside the box" of traditional sectoral definitions.

Advantages of an IWRM approach

Clearly, the key advantage of an IWRM approach is that it solves problems. Many countries are experiencing water-related problems that are proving intractable to conventional approaches - problems such as drought, flooding, groundwater overdraft, water-borne diseases, land and water degradation, on-going damage to ecosystems, chronic poverty in rural areas, and escalating conflicts over water. The solutions to such problems may fall outside of the normal purview of the agencies tasked with addressing them, and usually require cooperation from multiple sectors. An IWRM approach makes identifying and implementing effective solutions much easier, and also avoids the all too common situation where solving one problem creates another.

Other advantages of an IWRM approach include:

Avoiding poor investments and expensive mistakes: Decision-making based on a short-term, sectoral view is rarely effective in the long-haul and can result in some very expensive mistakes-in terms of unsustainable gains, unforeseen consequences, and lost opportunities.

Investment decisions need to be based on an evaluation of costs and benefits that is both wide-ranging and long-term. They need to consider the economic implications of infrastructure maintenance, water services and potential for cost-recovery, and both short- and long-term environmental impacts. Decision makers also need to consider the prevailing macroeconomic environment, and the way in which macroeconomic policies such as interest and exchange rates affect the insertion of water into development and the sustainability of water utilities. Chile is a good example of how sound macroeconomic policies foster the incorporation of water into developmental processes and the affordability of water utility services.

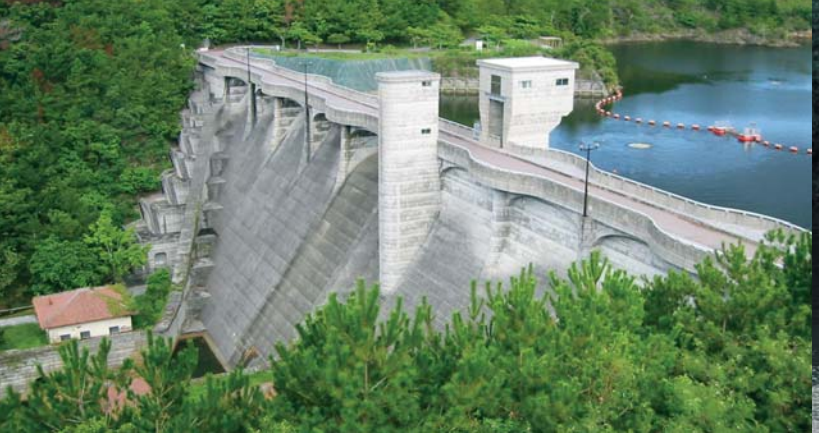
In short-sighted or sectoral thinking, it is often the environment that comes out the loser —with negative consequences for both social and economic development. For example, the Aral Sea disaster, where irrigation development resulted in the loss of valuable fisheries, regional climate change, and on-going problems due to the drying up of the sea. An IWRM approach promotes considering environmental impacts from the outset. This avoids the losses associated with unsustainable development and the high costs of undoing the damage later.

Getting the most value for money from investments in infrastructure: Planning, designing and finally managing infrastructure using an IWRM approach ensures maximum returns —both social and economic— on investments. Infrastructure development on its own has limited payoffs; often other ingredients are needed for people to benefit. To take a very simple example, imagine the situation of one of the growing numbers of female farmers in sub-Saharan Africa, trying to produce food for her children and a basic income from the family plot. She can take advantage of the opportunity provided by irrigation infrastructure only if she and her family are in good health, she is able to enforce her rights to water and reliable irrigation service, and she has access to agricultural inputs, knowledge, markets, credit, and the means to plough, harvest and transport her crops. Integrating water development into larger development planning processes helps insure that investments work together synergistically, producing greater returns than possible through a single-sector approach.

An IWRM approach in designing and managing infrastructure also makes it possible to capitalize on potential synergies. For example, combining fisheries and irrigation systems or developing water supply schemes that provide people with water for domestic and productive uses.

Allocating water strategically: Many countries upon examining their current approach to water have found: 1) that they have not been considering allocation strategically enough, in the light of national goals, 2) that water allocation, while left to the lowest appropriate level, needs to be guided by a framework that is conceived at the river basin or national level; and 3) that the links between allocation decisions and national development and economic planning processes are weak or missing.

Strategic allocation requires subordinating the needs of individual sectors and user groups to the larger goals of the society. An IWRM approach frees countries to look at allocation in the context of the "big picture" of sustainable development goals.



Strategic allocation is rarely accomplished through administrative fiat. More commonly it is achieved indirectly —often through gains in water efficiency— using tools such water pricing and tariffs, the introduction of appropriate incentives and subsidies, and the removal of ill-considered incentives and subsidies both inside and outside the water sector. In northern China, the government was able to transfer water out of agriculture to meet the needs of growing cities and industries through an integrated program of water pricing, incentives, and the introduction of technological innovation. Making effective use of the range of "indirect" reallocation tools requires cooperation across sectors.

From local to global: creating links across scales

As indicated earlier, integrated approaches can and should be applied to water and development problems at all levels, from local to global. However, the form that an integrated approach takes will differ significantly from level to level.

Moving towards more integrated approaches will require vigorous work at many levels. While efforts to prepare national IWRM and Water Efficiency strategies and plans (see below) quite naturally emphasize national action, the end result should be action at lower levels, from the household and community levels on up.

Importantly, actions at one level will need to be reinforced by actions at other levels. Local actions such as those illustrated in Boxes 1-3 are and will always be vitally necessary, but may often not be sufficient. National policies, for example, will clearly be needed to provide the appropriate enabling environment for initiatives at the municipal level. While the Dublin Principles[2] properly stress that decisions should always be taken at the lowest appropriate level, it is important to recognize that the lowest appropriate level may vary significantly from case to case - in transboundary water basins, for example, the appropriate level for many decisions will need to be international. All this highlights the importance of creating links across scales —i.e., integrating vertically— to achieve lasting results.

A key institutional instrument for vertical integration and improved water management is the establishment of River Basin Organisations. River basin management enables all stakeholders dependent upon the same surface water, as well as the related land use and ecology, to be brought together. It thus provides an ideal unit for resource management. This has been adopted in many countries and is increasingly promoted as a scientific/rational means of administration for water.

Basin management provides an ideal forum for coordination, community involvement, conflict resolution and resource assessment. There are good experiences throughout the world that provide lessons and give different experiences of basin management that are shared through networks such as the International Network of Basin Organisations, the African Network of Basin Organisations and the Network of Asian River Basin Organisations. Although desirable, river basin management should not be approached lightly, particularly at transboundary level, and is often more difficult to apply in practice than theory may suggest. Political reality must not be ignored; basin boundaries overlap administrative jurisdictions, so the roles of the basin and political authorities need to be clearly understood. Basin authorities do not usually have revenue generating powers and thus depend on central government budgets and whims. Moreover, in many parts of the world groundwater is more critical than surface water and aquifers do not follow basin boundaries. It is thus important that basin management is established in line with national policies, laws and institutional structures with a clearly defined mandate. Again,

integrating basin management vertical with other scales is relevant to an IWRM approach.

IWRM Strategies and Plans: a mechanism to spark and guide change

Most countries that have honestly evaluated their current water situation have chosen to move towards an IWRM approach and to encourage the adoption of more integrated approaches at all levels. They found that conventional approaches were in fact failing to deliver in a number of key areas. In Malaysia, conventional approaches proved unable to effectively allocate scarce water, control flooding or pollution, and protect the environment. In Costa Rica, they were failing to address conflicts in water use, environmental issues, and flooding. In Yemen, they were unable to stop severe groundwater mining or to help revitalize a stagnating economy.

In the last several years, many countries have found that the process of creating an IWRM and water efficiency strategy or plan — as called for in the Johannesburg Plan of Implementation and reinforced by the 2005 World Summit — is an opportunity to take a coherent approach to improving how they develop, manage and use water resources to further sustainable development goals and meet development challenges.

Some countries have begun by considering the various ways in which water resources development and management have the potential to advance or hinder development goals. Others have chosen a more targeted approach and focused on specific water-related problems that are hampering development.

Some countries have chosen to create new strategies and plans from scratch. Others have built on existing IWRM or water plans or incorporate water into current national development strategies.

Regardless of the initial approach, strategies and plans are striving to go beyond the actions needed to solve current problems or to achieve immediate objectives, and aim at institutionalizing changes that will promote more strategic and coordinated decision-making on an on-going basis.

To do this, strategies and plans are generally encompassing changes in the enabling environment, in institutional roles, and in management instruments. Fundamentally, creating a strategy is about catalyzing change in some thirteen "change areas" (see Box 5).

Box 5. The Thirteen Key IWRM Change Areas

The enabling environment

1. Policies – setting goals for water use, protection and conservation.
2. Legislative framework – the rules to follow to achieve policies and goals.
3. Financing and incentive structures – allocating financial resources to meet water needs.

Institutional roles

4. Creating an organisational framework – forms and functions.
5. Institutional capacity building – developing human resources.

Management instruments

6. Water resources assessment – understanding resources and needs.
7. Plans for IWRM – combining development options, resource use and human interaction.
8. Demand management – using water more efficiently.
9. Social change instruments – encouraging a water-oriented civil society.
10. Conflict resolution – managing disputes, ensuring sharing of water.
11. Regulatory instruments – allocation and water use limits.
12. Economic instruments – using value and prices for efficiency and equity.
13. Information management and exchange– improving knowledge for better water management.

While moving towards a more sustainable and integrated approach to water management and development does require change in many areas and at many levels, this does not mean that major initial reforms are essential. First steps that can easily be implemented have often been enough to catalyze the change process. A well-thought-out set of changes —the kind embodied in a strategy— will produce more sustainable results than either an attempt to completely overhaul the whole system or an ad hoc approach to change.

Not just a water plan

Experience in many countries over the last several years has shown that creating an effective IWRM strategy requires a somewhat different process than that entailed in creating a one-off water resources planning document. Key differences include:

Involvement from multiple sectors: While a water plan is usually designed and implemented by a water agency, an IWRM strategy requires input and buy-in from all sectors that impact and are impacted by water development and management —for example, health, energy, finance, tourism, industry, agriculture, and environment.

Broader focus: Whereas water plans tend to be driven principally by water issues alone, an IWRM strategy looks at water in relation to other ingredients needed to achieve larger development goals or meet water challenges.

Dynamic rather than static: Unlike a water plan, which lays out a definitive sequence of actions and decisions, an IWRM strategy aims at laying down a framework for a continuing and adaptive process of strategic and coordinated action.

Stakeholder participation: Because it calls for change —and therefore buy-in-at multiple levels— strategy development requires broader and more extensive participation from stakeholders than a traditional planning process.

Core stakeholders to engage in formulating a strategy may include government ministries and related institutions involved in such areas as domestic water supply and sanitation, irrigation, agriculture, energy, health, industry, finance, transport, fisheries, environment, and tourism; and water utilities, agencies, river basin organizations and related bodies. Other stakeholders will need to be involved at key stages of the process, including communities and civil society and private sector organizations.

Key messages from the World Summit on Sustainable Development (WSSD) action target

Article 26 of the WSSD Plan of Implementation, in addition to calling for the development of IWRM and water efficiency strategies by 2005, also includes a number of specific recommendations on the issues such strategies should address — and to some extent how they should be addressed. Countries have to

Table 1. Roles and responsibilities in formulating a strategy

National government	• Lead role, 'owner' of the process • Mobilize funding • Set macro-economic policy environment
Steering committee (group with wide representation)	• Guide the process • Mobilize support across sectors and interest groups • Guarantee quality output • Monitor implementation progress
Management team (group of qualified professionals)	Manage day-to-day processes for strategy development, implementation and capacity building
Facilitating institution, where appropriate (for example, national NGOs, GWP Country or Regional Partnerships, or local UN country teams)	• Provide neutral platform for dialogue • Support strategy development process by providing advice and sharing knowledge • Foster capacity building and training

Clear definition of roles and responsibilities from the outset is one of the keys to effective strategy development and implementation. Another is high-level commitment to the process.

evaluate which recommendations are useful to them and which are irrelevant or low-priority. Some generic messages derived from Article 26 that are useful in developing a strategy include:

- Strategies should help countries and regions move towards integrated water management and more efficient use of water resources —employing the full range of policy instruments.
- Strategies should cover institutional, financial and technological change and promote action at all levels.
- The river (or water) basin should be used as the basic unit for water management.
- Strategies should give priority to meeting basic human needs, and take extra care to ensure access for the poor.
- Strategies should address the challenge of balancing the need to restore and protect ecosystems with the needs of other water users (see Box 4: Meeting the water for environment challenge).
- Stakeholder participation, capacity-building, monitoring performance, and improving accountability of public institutions and private companies are all elements of an effective strategy.

Strategies should respect and be adapted to local conditions.

Key messages from the 2005 World Summit

The year 2005 was a critical one for water on the global agenda. In April, the second of the two Commission on Sustainable Development (CSD) sessions on water, sanitation and urban settlements was completed. In September, the 2005 World Summit achieved agreement on a global strategy and partnership to achieve the MDGs, which not only calls for the rich countries to substantially increase their development assistance beyond the additional $50 billion a year by 2010 already committed, but also resolves that all developing countries should adopt and implement comprehensive national development strategies to achieve the MDGs. Importantly, the document also calls for assisting developing country efforts to prepare IWRM and water efficiency plans as part of these national development strategies.

Box 6. Key recommendations for policy-makers on developing and implementing a national IWRM and water efficiency strategy

- Use national development goals or water-related challenges as a starting point.
- Secure commitment at the highest level, but ensure a broad base of support which reaches down to the grass-roots.
- Involve high-level officials in water-related sectors from the outset, and assign the task of developing the strategy to a multi-sectoral steering group.
- Ensure that stakeholders are meaningfully involved in the process, taking particular care to give women and poor people a voice.
- View the strategy as an opportunity to establish more integrated decision-making processes, rather than as a one-off checklist of actions.
- Ensure a realistic plan of implementation that includes a clear definition of roles and responsibilities, a sound financing strategy, provision for capacity-building, and systems to monitor progress and make adjustments as needed.
- Link to and build on other national plans and strategies—including poverty reduction strategy papers (PRSPs), national strategies to meet the Millennium Development Goals, and strategies called for by key environmental conventions.

These two developments raise an important set of interrelated challenges. The first is how to maintain high-level political focus on water resources management and development issues in the next decade, taking into account that the CSD will not directly focus full attention on these issues for another decade. The second is how to assist countries preparing national MDG-based development strategies to mainstream water resources considerations in these strategies. This requires both a greater conceptual understanding of the relationship between IWRM and the MDGs, and support systems and guidance to assist countries in developing national development strategies that truly embody water resources development, management and use. Meeting this latter requirement in turn will mean developing improved guidance materials and strengthening existing support systems — involving the UN system and its partners as well as the ongoing work to facilitate the preparation of IWRM plans.

Discussion of IWRM in the Context of the Five Crosscutting Perspectives of the Forum

As an approach to devise and implement efficient, equitable and sustainable solutions to water and development problems, the Forum's IWRM theme is not only important in itself but also cuts across all the themes of the Forum: water for growth and development, water and sanitation services, water for food and the environment, and risk management. In addition, the IWRM theme embodies all five cross-cutting perspectives of the Forum: institutional development and political processes; capacity building and social learning; targeting monitoring and implementation assessment; application of science, technology and knowledge; and new models for financing. Let us take each of these topics in turn.

Institutional development and political processes

As emphasized earlier, moving towards an IWRM approach at the national level requires positive change in the enabling environment, in institutional roles, and in management instruments. This includes change in water governance, i.e., the range of political, social, economic and administrative systems that are in place to develop and manage water resources and deliver water services, at different levels of society.

It would be easy for policy makers and practitioners faced with the prospect of wholesale governance change to conclude that it is all too complex with too many difficult trade-offs and choices to make. But experience in a growing number of countries shows that adopting more integrated approaches at the national level needn't mean throwing everything away and starting over. More often it means adapting and building on existing institutions and planning procedures to achieve a more integrated approach.

Change can be painful and is often resisted as it makes people feel insecure even if they understand the need. Often good laws or revised procedures can fail as they are not understood or accepted by officials or citizens. Institutional reform needs to be done with a participatory and consultative approach, involving the formal and informal sectors, to develop understanding and ownership of the change process. Reforming policies and practices for water management is highly political and involves making difficult trade-offs. Some stakeholders will win and others will lose.

While each country must decide how to enact reform-depending on its current situation and what it wants to achieve in the future —experience collected in the GWP ToolBox provides some basic lessons:

- Reforms should be done in a coherent and integrative way and suit the broader social and political policies of the country.
- Trying to enact too many reforms too quickly can provoke resistance. A more effective approach is to decide on priorities and a measured sequence of actions to suit those priorities.
- Avoid unrealistic reforms that are not politically or socially acceptable.
- Raising awareness, sharing information and meaningful participatory debate are key elements of any reform process.

- Reform is a dynamic, iterative process and the only certainty is change itself.
- Vested interests and special interest groups should be included in debates but decision-makers should avoid being 'captured' by special interest groups.
- In any reform, regulation of service providers, both public and private, is a key element and regulators must be independent and strong.
- Reforms should avoid confusing the roles of resource management (government responsibility) and service provision (public or privately operated utilities)
- Water governance reforms must not be limited to the water sector, but must take into account other sectors that impact and are impacted by water decision-making.

Capacity building and social learning

Many countries are finding that the adoption of integrated approaches carries with it significant and long-term capacity-building needs. Clearly, IWRM approaches require technical capacities in a number of specialized areas. But capacity is also needed to manage the participatory processes that are such a vital component of effective implementation —meaning skills in communications, negotiation, conflict resolution, facilitation, consensus building, time management, and community mobilization.

Experience suggests that building capacity for strategy development and implementation of integrated problem-solving approaches is a continuous process. Each step demands new knowledge and competences to help understand new directions, build commitment, and develop appropriate responses to resource management challenges.

Capacity-building needs are likely to include:

- Technical expertise in management areas, including monitoring and evaluation; engineering and applied science, including hydrology and ecology; and the social sciences, especially economics, political science, law and public administration.
- Modelling and analysis of data, and developing and maintaining databases
- Conflict resolution, negotiation skills, transboundary cooperation and planning, mobilizing financial resources.
- Training (preparing short-term project-based modules to serve as refresher training for water managers, decision makers and politicians, promoting staff exchanges and sharing experiences).

Capacity-building efforts shouldn't be limited to government management agencies, but should also include knowledge institutes, relevant private sector entities, and non-governmental, community-based organizations, and individual stakeholders who wish to participate.

Experience in many countries also suggests that individual professional development and training is not very effective unless it is also accompanied by institutional strengthening, i.e. improving the governance and management of institutions. Examples of institutional strengthening include ensuring each institution has a clear mission, strategy and workplan; orienting the recruitment of staff to the needs of the institution; and ensuring that institutions have an operating budget inline with their mission and strategy. Offering salaries and opportunities attractive enough to retain capacity within the country and

prevent the well-known phenomenon of "brain drain" is also an issue that many countries are trying to address. The overall goal is to have strong institutions, staffed by skilled professionals.

Importantly, many countries have begun addressing these capacity-building needs in a concrete way. Across the globe, new educational and training programmes and many training materials addressing IWRM have been developed, building new cadres of water professionals with skills in water management. However there is still a long way to go.

Targeting, Monitoring and Implementation Assessment

Defining indicators, establishing benchmarks, and setting up mechanisms to ensure on-going monitoring and evaluation are all key activities in any successful strategy or plan to move towards more integrated problem solving approaches. Monitoring and evaluation activities have three main objectives: to see whether the implementation process is on track, to measure both short- and long-term impacts, and to evaluate impacts to determine if actions are indeed contributing to the larger development goals defined in the Strategy. Four points should be emphasized in this context:

- **Monitoring and evaluation (M&E) criteria:** Monitoring and evaluation of an IWRM process takes place at many different levels, from simple project progress to impact on national socio-economic and environmental aggregate indicators. The higher the levels, the more methodological issues arise and the more difficult it becomes to find descriptive indicators to ascertain impacts. It is imperative to start the process by setting the goals and levels also considering the feasibility of the M&E, the validity and significance of expected results and the use and usefulness of these results.
- **Defining Indicators:** Indicators are needed to measure the progress of the implementation process, the direct outcomes of interventions, and the longer-term impacts. Determining indicators to measure the extent to which planned actions are contributing to national economic, social and environmental goals may take some extra thought given the many factors involved, but it is well worth the effort. Carefully defined indicators can help clarify objectives during the Strategy development process; without them, the fine-tuning that should take place during the implementation process becomes difficult if not impossible.
- **Involving stakeholders:** Good monitoring and evaluation involves stakeholders for two reasons: 1) often qualitative assessment is not possible without stakeholder input, and 2) assessment can be a powerful tool for mobilizing support for the implementation process, but only if stakeholders have faith in the assessment process and are aware of the results. Involving women and other disadvantaged groups may be particularly important for an accurate picture of how effective interventions are in furthering development goals.
- **Fostering learning:** M&E results should feed back into the process. They should include useful information on failures as well as successes. Knowing what's not working and why is arguably even more important than knowing what's going right, in terms of the long-term success of the strategy.

Monitoring and evaluation is important not only at national and sub-national levels, but also at regional and global levels —to see whether the process of developing IWRM and Water Efficiency Plans as called for in the Johannesburg Plan of Implementation is on track, to measure impacts, and to determine if actions are contributing to larger sustainable development goals. Several efforts are currently underway to assess the extent to which countries have progressed towards meeting the IWRM Plan action target, which will provide governments and the international community with solid information on IWRM policies, strategies and plans prepared to date. GWP, for example, is carrying out a survey to extract the facts about IWRM policies, strategies and plans in various countries, and has called for close coordination in the communication of the results of ongoing efforts. While the main purpose of these surveys is to collect basic facts on current IWRM policies and plans, it is anticipated that they will also be forerunners of more comprehensive future efforts that will gain more detailed information on the extent to which more integrated approaches are being adopted on the ground, as well as on their impact.

Application of science, technology and knowledge

Science and technology, innovation, and applying knowledge lie at the heart of the IWRM approach. As emphasized earlier, an IWRM approach fundamentally involves applying knowledge from various disciplines to devise innovative solutions to water and development problems.

Importantly, while much progress has been made over the last several years in articulating and advancing the concept of integrated water resources management, these advances have principally come about as pragmatic responses to current shortcomings. And while the IWRM approach has certainly drawn on concepts from systems analysis, sustainable development, participatory management and other fields, the scientific basis for the approach as a whole is still not well developed. Much needs to be done, therefore, to strengthen IWRM's scientific underpinnings.

Practical innovation, on the other hand, has flourished, not only in the technological area but also in the financial, policy and institutional arenas - though much more work is needed. Progress towards the sanitation target, for example, is still constrained by the lack of technologies that are reliable and affordable enough to implement on a wide scale without having negative impacts on environmental sustainability[3]. Innovative service delivery systems that help service providers to ensure effective relationships with households and communities are sorely needed, as are effective, affordable and simple-to-operate sewage treatment plants that can be located close to residential areas. Integrated systems that advance more than one goal simultaneously are particularly needed, such as multiple use systems to meet the domestic and livelihood water needs of the poor, mechanisms to improve crop per drop and thus both spur progress towards the hunger goal and reduce the demand for water, and foster programs for the reuse of waste water in agriculture, which could contribute to both the sanitation and hunger targets.

Developing an effective knowledge base is also a fundamental part of a strategy or plan to move towards more integrated problem-solving approaches. There are two aspects to creating a knowledge base for a strategy: 1) pulling together the knowledge needed to identify key water-related challenges, determining

Box 7. Challenges associated with building a knowledge base:

- Frequently, the knowledge needed for strategic development and decision-making exists only in an ad-hoc form among professionals and practitioners within water resources and water relevant sectors.
- In some cases, data may be unreliable or altogether lacking. However, lack of good data should not be held as an excuse for not getting on with the job. Good professionals can often go a long way without a complete database.
- Sharing knowledge is often not the norm and requires: breaking down bottlenecks such as bureaucratic rules which prevent the free exchange of knowledge between departments and agencies; building trust; and providing incentives for sharing knowledge is important.

Box 8. Lessons in knowledge sharing (from the GWP ToolBox for IWRM):

- Transferring knowledge from one country to another must take account of specific cultural and political contexts.
- Sharing knowledge requires an open mind, stimulated by suitable incentives; mutual confidence may take time to build but is essential.
- At a technical level, information and data sharing systems should be:
  - Based on people management (empowerment and capacity building of organisations) as well as technologies, and able to integrate multidisciplinary information.
  - Demand-driven so that system design and construction and outputs are directed toward the end users.
  - Flexible so that the sharing system can be used in a variety of locations or situations.
  - Transparent and rigorous so that technical and non-technical persons (wide range of stakeholders) can follow the process of information generation and evaluation.
  - Interactive, to ensure a participatory decision-making process.
  - Easy to understand and helpful in increasing awareness of the issues.

where change is needed, and setting a baseline for monitoring progress and impacts; and 2) developing systems to feed knowledge into the decision-making process on an on-going basis.

When building a knowledge base, involving the end users helps ensure that: 1) the knowledge base addresses people's needs, 2) it is presented in a way that is easily accessible, and 3) end users are aware of the resources available. Frequently, information is only available to a select group of experts or officials leading to "information asymmetry". Concrete actions are needed to redress this imbalance. Accessible knowledge is vital for good decision-making, measuring progress, and ensuring accountability. Of course, just making knowledge available is not enough. It is also necessary to consider the social, political and economic factors that enable knowledge to be effectively used in decision-making processes.

New models for financing local water initiatives

Two aspects need to be addressed in financing integrated initiatives — the major funding (capital and operation & maintenance) needed for water resources development and infrastructure —for pipelines, storage systems, irrigation, water treatment plants, and so on— and the financial resources needed for 'soft' interventions, such as policy work, law making, institutional and governance reforms, the development of management instruments and capacity-building. Experience has shown that early allocation of funds for both purposes in national budgets is critical for success. Some countries have found it useful to develop a rough estimate of funding needs for implementation at the early stages of the process of developing an IWRM strategy or plan, for inclusion in the future national budget. This helps maintain a reality check during strategy formulation as well as ensure immediate action. Some funds may need to be earmarked to address "hot spots" identified during preparation, rather than waiting for the strategy to be finalized and adopted.

For countries counting on donor support for implementation, holding donor meetings to secure buy-in during strategy preparation makes good sense. Organizing related activities in stages under "programs" may be more effective than either an all-inclusive or a piecemeal approach to seeking funding. However, sometimes it may be useful to include a portfolio of sub-projects (such as strengthening data acquisition) that could be immediately funded.

From an IWRM perspective, the key issue in formulating a financing strategy is to reconcile the often competing goals of economic efficiency, social equity and environmental sustainability. This frequently poses thorny problems that require careful analysis; for example, while making water affordable to the poor is a pre-requisite for a socially equitable policy, cost related water pricing is desirable from the point of view of sustainability.

Importantly, an integrated approach is often critical to the success of financing local initiatives. In many countries, water is a weak sector, with fragile institutions, poorly financed with poor cost recovery and a small part of central government budgets. Integrated approaches that emphasize institutional reform can help make investments in water infrastructure more attractive for funding. Better decision making, better laws and tighter regulation are essential for attracting financing; without them, the water sector will remain a marginal and subsidised sector.

Importantly, budget allocations should cover the resource management side of development —e.g. allocations that enable sub-national entities (including basin authorities) to function. It is also imperative to put in place mechanisms for raising finance for environmental protection, including watershed management. Innovative ideas are beginning to emerge in this area, such as hydropower companies paying for watershed management to protect their source of water.

As highlighted in the baseline document for the cross-cutting perspective on financing local activities, there is substantial agreement on some key principles that should guide financing strategies. One important principle is that, while a country's water sector should be dealt with as an integral whole, each component needs its own distinctive financing solution. Another is that, within a clear national policy framework, there should be appropriate decentralization of responsibility for raising finance.

Conclusions and Future Perspectives

As the preceding sections make clear, **there are no universal blueprints or prescriptions to follow in moving towards more integrated approaches to water resources development, management and use**. However, countries and communities can draw on existing tools and learn from each other's experiences —thereby increasing their chances of success. The World Water Forum can play a key role in this process of global learning.

One important way in which the Forum will contribute to global learning will be through the numerous opportunities that will be provided for countries to share their IWRM strategies and plans. The Forum will thus serve as an initial focal point to bring together the efforts of the global community to meet the action target of the Johannesburg Plan of Implementation and the 2005 World Summit. It is anticipated that subsequent volumes of the World Water Development Report (starting with the third volume, to be initiated in 2006) will carry this process forward and address the implementation of these strategies. In this way, the WWDR could serve as a mechanism to help monitor the progress that countries make along the road towards more integrated approaches to the management of resources to meet their national development goals.

The Forum will also advance efforts to move towards more integrated approaches by providing opportunities to share experience at the local, national and international levels, both through the sessions that will be held on day 2 of the Forum and the many integrated initiatives that have been registered as local actions:

- At the community level, actions to design and implement measures to reach the communities' own integrated strategies. Documenting the experiences of these initiatives will be an important contribution to the Forum.
- At the national level, multi-stakeholder efforts to develop national IWRM and Water Efficiency Strategies, and documenting these experiences so that lessons learned from these experiences can be utilized elsewhere.
- At the regional level, increasing awareness of region-specific challenges and building regional multi-stakeholder coalitions for accelerated action.
- At the global level, providing a springboard for promoting efforts to catalyze change among key water sector actors —from Ministers to community groups.
- Workshops to share lessons from community level initiatives, and showcasing of local projects amenable to rapid scaling-up.
- Discussions of lessons and experience that could be transferred between and among industrialized and developing countries —i.e., south-south, north-north, south-north & north-south.
- Reaching consensus at the Ministerial Conference on the most salient challenges to the adoption of integrated problem solving approaches, and ways to overcome them.

In 1992, first in Dublin and then in Rio at the UN Conference on Environment and Development, countries agreed that the business-as-usual approach to water management, development and use was economically inefficient, socially inequitable, and environmentally unsustainable. Those agreements —the Dublin Principles and Agenda 21— pointed the way towards a better way of doing things, and communities and countries have been evolving these principles into practice. We anticipate that the experiences of local action to be shared at the Forum will take this evolution another important step forward.

References: Key Documents and Organizations

This document has not attempted to present a comprehensive overview of integrated water resources management, but rather simply highlight some key issues that merit discussion at the Forum. **There are, however, many publications and organizations that interested participants can turn to for detailed advice or information on the subject**. Some of these are detailed below. This is not intended to be a comprehensive listing; the focus is on documenting relevant international organizations and generic resources.

A. Organizations and Programs

- **Cap-Net** - www.cap-net.org
- **Global Water Information Network (GLOBWINET)** - www.globwinet.org
- **Global Water Partnership** - www.gwpforum.org
- **Inter-American Water Resources Network** - www.iwrn.net
- **DHI Water and Environment** - www.dhi.dk/
- **H R Wallingford** - www.hrwallingford.co.uk/
- **International Water Management Institute (IWMI)** - www.iwmi.org
- **Swedish Water House** - www.swedishwaterhouse.se

B. Water Portals, Databases, and News Services

- **EarthTrends Environmental Information Portal** - (World Resources Institute) www.earthtrends.org
- **Eldis Gateway to Development Information** - www.eldis.org
- **Development Gateway** - www.developmentgateway.org
- **Globwinet** - www.globwinet.org
- **GWP IWRM ToolBox** - www.gwpforum.org
- **IRC Source Water and Sanitation News Service** - www.irc.nl/source
- **InterWATER** - www.wsscc.org/interwater
- **UNESCO water portal** - http://www.unesco.org/water
- **UNEP.Net thematic portal on freshwater** - http://freshwater.unep.net/
- **Water Conserve** - www.waterconserve.info
- **The Water Page** - www.thewaterpage.com
- **Water Portal of the Americas** - www.waterportal-americas.org
- **Water Research** - www.waternet.org
- **WatSan Web** - www.skat.ch/watsanweb/
- **The WCA infoNET** - www.wca-infonet.org
- **Winrock Water** - www.winrockwater.org
- **World Bank Water Resources Management** - www.worldbank.org/water
- **World's Water** - www.worldwater.org

C. Links to other plans/strategies

- Poverty reduction strategy papers (PRSPs) - sorted by Country and Policy www.imf.org/external/np/prsp/prsp.asp
- National Strategies for Sustainable Development: Challenges, Approaches and Innovations in Strategic and Coordinated Action. www.iisd.org/measure/capacity/sdsip.asp
- National Sustainable Development Strategies - www.nssd.net/
- United Nations Convention to Combat Desertification (UNCCD) - www.unccd.int/
- United Nations Framework Convention on Climate Change http://unfccc.int/

D. Supporting agencies

- **African Development Bank (AfDB)**: The AfDB has a policy that encourages borrowers to adopt and implement an integrated approach to water resources management. The objectives of the policy are to rationalize and strengthen Bank Group interventions in the water sector. http://www.afdb.org/

- **Asian Development Bank (ADB)**: ADB is a multilateral development finance institution dedicated to reducing poverty in Asia and the Pacific. Established in 1966, it is now owned by 63 members, mostly from the region. http://www.adb.org/default.asp

- **Canadian International Development Agency (CIDA)**: CIDA has an active interest in IWRM Plans and has contributed $10 million through the Global Water Partnership (GWP) to assist in the preparation of national IWRM frameworks and the integration of water issues into Poverty Reduction Strategy Papers (PRSPs) in a select number of African countries, and institutional development of existing and new GWP partnerships at the regional and country level in Africa. http://www.acdi-cida.gc.ca/index.htm

- **Danish International Development Agency (DANIDA)**: Reducing poverty in developing countries is central to Danish development cooperation priorities. A number of crosscutting themes are built into DANIDA's development assistance: women's participation in development, the environment, promotion of democracy and observation of human rights. These crosscutting themes are integrated into DANIDA's development activities more generally. http://www.um.dk/english/

- **Department for International Development (DFID)**: The overall aim of this UK government department is to reduce global poverty and promote sustainable development, in particular through achieving the Millennium Development Goals (MDGs). DFID's assistance is concentrated in the poorest countries of sub-Saharan Africa and Asia, but also contributes to poverty reduction and sustainable development in middle-income countries, including those in Latin America and Eastern Europe. www.dfid.gov.uk

- **Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ)**: The German development cooperation organization GTZ works worldwide with sustainable development issues. The aim is to improve the living conditions and perspectives of people in developing and transition countries. www.gtz.de

- **European Union (EU)**: The ultimate objective of the EU policy is to give disadvantaged people in the third world control over their own development. This means attacking the sources of their vulnerability, including poor access to food and clean water, or to education, health, employment, land, social services, infrastructure and a sound environment. It also means disease eradication and access to cheap medicines to combat scourges like HIV/Aids, as well as action to reduce debt burdens. Nearly half the money spent to help poor countries comes from the European Union and its member states, making it the world's biggest aid donor. http://europe.eu.int/

- **Finland's Ministry for Foreign Affairs/Development Cooperation**: According to Finland's Policy on Relations with Developing Countries, the development cooperation aims are: promotion of global security, reduction of widespread poverty, promotion of human rights and democracy, prevention of global environmental problems and promotion of economic dialogue. http://global.finland.fi/

- **Ford Foundation**: The mission of the Ford Foundation is to strengthen democratic values, reduce poverty and injustice, promote international cooperation and to advance human achievement. www.fordfound.org

- **Global Environment Facility**: The Global Environment Facility (GEF), established in 1991, helps developing countries fund projects and programs that protect the global environment. GEF grants support projects related to biodiversity, climate change, international waters, land degradation, the ozone layer, and persistent organic pollutants. http://www.gefweb.org/

- **Inter-American Development Bank (IADB)**: The Inter-American Development Bank website posts a helpful set of publications divided into subsections on best practices, strategies and policies, and technical studies and conference proceedings. http://www.iadb.org/sds/ENV/publication_188_e.htm

- **Japanese International Co-operation Agency (JICA)**: JICA aims to advance international cooperation through the sharing of knowledge and experience and will work to build a more peaceful and prosperous world. http://www.jica.go.jp/english

- **Netherlands Development Cooperation**: The Netherlands wants to combat poverty in a sustainable manner. This is the essence of development cooperation. The ideas enshrined in the Millennium Development Goals adopted by the United Nations, which set out what the international community wants to achieve by 2015, are one of the bases of Dutch development policy. http://www.minbuza.nl/

- **Norwegian Agency for Development Cooperation (NORAD)**: The main goal of Norwegian development cooperation is to contribute towards lasting improvements in the economic, social and political conditions under which people live in developing countries, with special emphasis on assistance that benefits the poorest sector of the community. http://www.norad.no

- **Swedish International Development Cooperation Agency (SIDA)**: SIDA, the Swedish International Development Cooperation Agency, is a government agency that reports to the Ministry for Foreign Affairs. The goal of SIDA's work is to improve the standard of living of poor people and, in the long term, to eradicate poverty. SIDA is also responsible for cooperation with countries in Central and Eastern Europe. http://www.sida.se/

- **Swiss Agency for Development Cooperation (SDA)**: The SDA's Water Strategy 2004 supports and promotes a global vision on the issue of the water cycle based on IWRM recognizing that the relationships between water and health, hygiene, nutrition and productivity and integrated approach in the way we deal with water is a must. http://www.sdc.admin.ch/mainportal.

- **United States Agency for International Development (USAID)**: USAID supports economic growth, agriculture and trade, global health and, democracy, conflict prevention and humanitarian assistance. The preservation and environmentally sound development of the world's water resources is another top priority. www.usaid.gov

- **World Bank**: The World Bank Group's mission is to fight poverty and improve the living standards of people in the developing world. It is a development bank that provides loans, policy advice, technical assistance and knowledge sharing services to low and middle income countries to reduce poverty. http://www.worldbank.org

In addition, the IWRM Info-Forum is an Informal Forum for Sharing Information and Developments in Integrated Water Resources Management processes, created in response to the needs of the various development partners to effectively support IWRM processes and achievement of the 2005 IWRM target, which the Info-Forum can help address. The overriding purpose of the Forum is to provide a means for exchanging information, staying abreast of developments in IWRM, and facilitating synergies and complementary action between the various development partners involved in supporting IWRM processes.

E. GWP Publications
(available at www.gwpforum.org)

Handbooks
Catalyzing Change: A Handbook for Developing Integrated Water Resources Management (IWRM) and Water Efficiency Strategies

TEC Background papers
Jonch-Clausen, Torkil. 2004. "IWRM and Water Efficiency Plans by 2005: Why, What and How?" TEC Background paper No. 10.

Falkenmark, Malin. 2003. "Water Management and Eco Systems: Living with Change." TEC Background paper No. 9

Black, Maggie, based on the work of Ramesh Bhatia and Kumbulani Murenga, with contributions from the Global Water Partnership Technical Committee. February 2003. "Poverty reduction and IWRM." TEC Background Paper No. 8

Rogers, Peter and Alan W. Hall. February 2003. "Effective Water Governance." TEC Background Paper No. 7

Rees, Judith. July 1998. "Risk and Integrated Water Management." TEC Background Paper No. 6
Cheret, Ivan. March 2000. "Letter to my Minister." TEC Background Paper No. 5 (available also in French)

Global Water Partnership Technical Committee. March 2000. "Integrated Water Resource Management." TEC Background Paper No. 4 (available also in Arabic, French and Spanish)

Solanes, Miguel and Fernanco Gonzalez-Villarreal. June 1999. "The Dublin Principles for Water as Reflected in a Comparative Assessment of Institutional and Legal Arrangements for Integrated Water Resources Management." TEC Background Papers No.3

Rogers, Peter, Ramesh Bhatia and Annette Huber. August 1998. "Water as a Social and Economic Good: How to Put the Principle into Practice." TEC Background Paper No. 2

Rees, Judith. July 1998. "Regulation and Private Participation in the Water and Sanitation Sector." TEC Background Paper No. 1

Technical Briefs:

Technical Brief No. 1. "Creating a checklist for change: determining the content of an IWRM strategy" (First Technical Brief on Indicators)
Technical Brief No. 2. "Tools for keeping IWRM planning on track" (Second Technical Brief on Indicators)
Technical Brief No. 3. Third Technical Brief on Indicators (for M&E)
Technical Brief No. 4. Technical Brief on Water Efficiency
Technical Brief No. 5. Technical Brief on Gender Mainstreaming

Policy Briefs:

Policy Brief No. 1. Policy Brief on Catalyzing Change (already printed)
Policy Brief No. 2. Policy Brief on Water and sustainable development: Lessons from Chile
Policy Brief No. 3. Policy Brief on Gender Mainstreaming
Policy Brief No. 4. GWP/IWMI Policy Brief on multiple-use systems
Policy Brief No. 5. GWP/IWMI Policy Brief on wastewater use

Reports

IWRM Status Report: Baseline survey: Status of national efforts towards sustainable integrated water management

Selected Reports of GWP Associated Programs and other Partner Organizations

- **IWRM tutorial (CapNet)** - cap-net.org/iwrm_tutorial/mainmenu.htm.
- **Investing in the Future – Water's Role in Achieving the Millennium Development Goals** - www.swedishwaterhouse.se
- **The Cap-Net/GWP publication and CD**, *Integrated Water Resources Management Plans*. Training manual and operational guide. http://www.cap-net.org/captrainingmaterialsearchdetail.php?TM_ID=67
- **The Millennium Development Goals and Water** (The World Water Assessment Program) - http://www.unesco.org/water/wwap/facts_figures/mdgs.shtml
- **Governing Water Wisely for Sustainable Development** (chapter from the World Water and Development Report) - www.unesco.org/water/wwap/wwdr/pdf/chap15.pdf

References

[1] Global Water Partnership Technical Advisory Committee, TEC Background Paper No. 4: Integrated Water Resources Management (Stockholm: Global Water Partnership, 2000), p. 22.
[2] The Dublin Principles were agreed to at the International Conference on Water and Environment, Dublin 1992.
[3] Health, Dignity and Development: What will it take", final report of the UN Millennium Project Task Force on Water and Sanitation, January 2005.

Photo Credits

Getty Imagex/RVG Images/Latinstock México/Conagua
EU audiovisual library
Pan-American Health Organization
David Dahmen for SIWI
Ulf Ehlin, SIWI
Thomas Hartwell, USAID
Mats Lannerstad, for SIWI
Frida Lanshammar, SIWI
Rebecca Löfgren, SIWI
Jan Lundqvist, SIWI
Michael Moore, SIWI
Maria Stenström, SIWI
Susanna Tomic, SIWI
Vishwanath for SIWI

The Global Water Partnership (GWP), established in 1996, is an international network open to all organizations involved in water resources management: developed and developing countries government institutions, agencies of the United Nations, bilateral and multilateral development banks, professional associations, research institutions, non-governmental organizations, and the private sector. Its mission is to support countries in the sustainable management of their water resources.

Through its network, the GWP fosters integrated water resources management (IWRM). IWRM aims to ensure the coordinated development and management of water, land, and related resources in order to maximize economic and social welfare —without compromising the sustainability of vital environmental systems. The GWP promotes IWRM by facilitating dialogue at global, regional, national and local levels to support stakeholders in promoting more sustainable water resources development, management and use.

The GWP network works in 14 regions: Southern Africa, Eastern Africa, Central Africa, West Africa, the Mediterranean, Central and Eastern Europe, Central America, South America, Caribbean, Central Asia and the Caucasus, South Asia, Southeast Asia, China and Australia. The GWP Secretariat is located in Stockholm, Sweden.

GWP thanks the Swedish International Water Institute (SIWI) for providing the photographs contained herein.