Catalyzing Change:

A handbook for developing integrated water resources management (IWRM) and water efficiency strategies

Produced by the Global Water Partnership (GWP)
Technical Committee
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Foreword

To meet national sustainable development goals and tackle specific water challenges, countries need to make investments in water infrastructure—pipelines, boreholes, treatment plants, irrigation systems, hydropower plants, and storage facilities. They also need to invest in improving management of their existing water resources. Creation of an integrated water resources management (IWRM) and water efficiency strategy ensures that countries get the most from these investments, that benefits are equitably distributed, and that gains are sustainable and not bought at the price of ecosystem health.

In an effort to encourage a move towards more sustainable approaches to water development and management, the World Summit on Sustainable Development (WSSD) in 2002 called for all countries to craft IWRM and water efficiency strategies[1] by the end of 2005. Such strategies are intended to support countries in their efforts to:

- Meet development goals, such as reducing poverty, increasing food security, fostering economic growth, protecting ecosystems.
- Tackle specific water challenges, such as controlling flooding, mitigating the effects of drought, expanding access to water and sanitation, and addressing increasing competition for water and water scarcity.

This document does not provide strict guidelines for crafting a strategy, rather, it seeks to provide countries with the knowledge they need to act on the WSSD action target in the way that is most useful for them. Strategies should catalyze action, not retard it. Each country must decide the scope and timeline for change based on its goals and its resources. The important thing is to take the first steps.

Making progress

At the end of 2003, the GWP conducted an informal survey to see how countries were progressing towards more sustainable and integrated approaches to water development and management and, in particular, towards meeting the WSSD action target.[2] The preliminary results show that of the 108 countries surveyed to date around 10% have made good progress towards more integrated approaches, 50% have taken some steps in this direction but need to increase their efforts, while the remaining 40% are in the initial stages of the process.

The survey results suggest that some countries are having difficulty seeing how an IWRM strategy helps them to further their social and economic development, while others are encountering various stumbling-blocks in their efforts to get the process off the ground. The recommendations and lessons offered here, it is hoped, will address both types of obstacles.

Encouraging a strategic approach

We have chosen to use the word "strategy" rather than "plan" to emphasize the dynamic and change-oriented nature of the process. The idea is not to create a traditional water plan covering water development and management actions to be taken over the course of a limited time span, but to develop a dynamic framework that will encourage better planning and decision-making on an on-going basis.

A number of countries saw the value of adopting an IWRM approach, even before the WSSD, and are already some way down the path. We have tried to relate lessons from their experiences for the benefit of those who are just starting out. And for the more advanced, we offer some guidance on refining and implementing their strategies.

Capturing lessons learned

The lessons and recommendations offered here have been collected through the GWP's world-wide network of partners, and through a number of specially con-

[1] The actual language of the WSSD Plan of Implementation is "integrated water resources management and water efficiency plans". However, we believe the word "strategy" better reflects the spirit of the WSSD call.

[2] See www.gwpforum.org for the complete report.

vened workshops, which brought together representatives engaged in preparing strategies from countries in Asia, Africa and Latin America. Stakeholders and professionals representing a wide range of water and development expertise also contributed to this handbook through an inclusive process of consultation and review.

Throughout the handbook we have included references to relevant GWP TEC Background Papers, case studies and tools from the IWRM ToolBox. The objective is to give users an overview of the resources available and knowledge of where to go for additional information on the topics pertinent to their situation.

TEC Background Papers 4 and 10—"Integrated Water Resources Management" and "…Integrated Water Resources Management (IWRM) and Water Efficiency Plans by 2005" are recommended reading for all users of this guide. These papers describe the conceptual foundations and specific components of the IWRM process, whereas here we have chosen to focus on practical first steps needed to move such a process forward.

Roberto Lenton
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Concepts

Making the case for IWRM

IWRM is a flexible tool for addressing water challenges and optimizing water's contribution to sustainable development. It is not a goal in itself.

IWRM is about strengthening frameworks for water governance to foster good decision-making in response to changing needs and situations. It seeks to avoid the lives lost, the money wasted, and the natural capital depleted because of decision-making that did not take into account the larger ramifications of sectoral actions. It aims to ensure that water is developed and managed equitably and that the diverse water needs of women and the poor are addressed. It seeks to ensure that water is used to advance a country's social and economic development goals in ways that do not compromise the sustainability of vital ecosystems or jeopardize the ability of future generations to meet their water needs.

The following chapter provides a brief overview of the IWRM concept—basic principles, advantages, and implications for water governance.

Water and sustainable development

Water is a critical, but often overlooked, element in sustainable development. Klaus Toepfer, Executive-Director of the United Nations Environment Programme (UNEP), in his comment on outcomes from the WSSD stated ". . . the WSSD highlighted that water is not only the most basic of needs but is also at the centre of sustainable development and is essential for poverty eradication. Water is intimately linked to health, agriculture, energy and biodiversity. Without progress on water, reaching the other Millennium Development Goals will be difficult, if not impossible."

Countries need to be able to ensure reliable and readily accessible supplies of unpolluted water in order to improve health conditions, reduce childhood mortality, and advance the status of women. Water 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. According to the 2003 United Nations World Water Development Report, between 1991 and 2000 over 665,000 people died in 2,557 natural disasters—90% of which were water-related and 97% of the victims were from developing countries.[3] The recorded annual economic losses associated with these disasters have grown from US$30 billion in 1990 to US$70 billion in 1999. 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—something that is only possible using an IWRM approach.
- How to encourage more efficient use of water as a limited resource.

[3] United Nations World Water Assessment Programme. 2003. UN World Water Development Report: Water for People, Water for Life. Paris, New York and Oxford, UNESCO (United Nations Educational, Scientific and Cultural Organization) and Berghahn Books.

Defining the "Integrated" in IWRM

An IWRM approach promotes 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.[4]

This includes more coordinated development and management of:

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

But IWRM is not just about managing physical resources, it is also about reforming human systems to enable people—men and women as well as men—to benefit from those resources.

For policy-making and planning, taking an IWRM approach requires 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.

In practice, this means 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

Solving problems: Many countries are experiencing water-related problems that are proving intractable to conventional, single-sector approaches. Some possible examples: 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. In such cases, an IWRM approach makes identifying and implementing effective solutions much easier. It also avoids the all too common situation where solving one problem creates another.

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

[4] Global Water Partnership Technical Advisory Committee, TEC Background Paper No. 4: Integrated Water Resources Management (Stockholm: Global Water Partnership, 2000), p. 22.

Box 1. Basic IWRM principles

IWRM is not a dogmatic framework, but a flexible, common-sense approach to water management and development. While there are no set IWRM "rules", the approach is founded on the Dublin principles, which assert that:

1. Fresh water is a finite and vulnerable resource, essential to sustain life, development and the environment – Since water sustains life, effective management of water resources demands a holistic approach, linking social and economic development with protection of natural ecosystems. Effective management links land and water uses across the whole of a catchment area or groundwater aquifer.
2. Water development and management should be based on a participatory approach, involving users, planners and policy-makers at all levels – The participatory approach involves raising awareness of the importance of water among policy-makers and the general public. It means that decisions are taken at the lowest appropriate level, with full public consultation and involvement of users in the planning and implementation of water projects.
3. Women play a central part in the provision, management and safeguarding of water – This pivotal role of women as providers and users of water and guardians of the living environment has seldom been reflected in institutional arrangements for the development and management of water resources. Acceptance and implementation of this principle requires positive policies to address women's specific needs and to equip and empower women to participate at all levels in water resources programs, including decision-making and implementation, in ways defined by them.
4. Water has an economic value in all its competing uses and should be recognized as an economic good – Within this principle, it is vital to recognize first the basic right of all human beings to have access to clean water and sanitation at an affordable price. Past failure to recognize the economic value of water has led to wasteful and environmentally damaging uses of the resource. Managing water as an economic good is an important way of achieving efficient and equitable use, and of encouraging conservation and protection of water resources. [5]

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, in the Aral Sea disaster, 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 consideration of environmental impacts from the outset. This avoids the losses associated with unsustainable development and the high costs of undoing the damage later. For example, the annual cost of undoing the effects of land and water degradation in Asia has been estimated at US$35 billion.[6] In the US, the restoration of the Everglades wetland alone is budgeted at US$10 billion.

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

[5] From The Dublin Statement on Water and Sustainable Development., International Conference on Water and Environment, Dublin, 1992.

[6] Jalal, K. and P. Rogers. 1997. Measuring Environmental Quality in Asia. Cambridge: Harvard University Press.

Box 2. An IWRM approach to galvanizing economic development in Yemen

Yemen's move towards IWRM was part of a series of economic, financial and administrative reforms designed to bring the country's economy back from the brink of collapse. In the first half of the 1990's, Yemen was suffering from high unemployment, inflation and budget deficits. Severe groundwater mining for irrigation in many basins was costing the country an estimated US$0.5 billion per year. The country's water management situation was marked by institutional fragmentation, poor governance and inadequate policy frameworks.

An IWRM approach helped policy makers address the groundwater mining problem using a more effective multi-pronged approach—including reducing subsidies on diesel fuel and eliminating subsidies on pumping equipment. It also provided a way to look at allocation of the country's scarce water resources in terms of the goal of economic development. This analysis suggested a strategy of transferring water out of agriculture—which uses 85 – 90 percent of the water but contributes only 15 percent to GDP—to higher value uses. [7]

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, by 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 (see the case of Yemen for example, Box 2).

Strategic allocation is rarely accomplished through administrative decree. 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.

The role of water efficiency

Improving efficiency in the use of water and related resources (including financial

[7] Case study provided by Aslam Chaudhry.

Before simply "providing more water" (often implying construction of new and expensive infrastructure) the first step should be to look for opportunities to improve water use efficiency—either by reducing wasteful usage or through reallocation.

resources) is another way to maximize *the economic and social welfare* derived from water as a scarce resource, and is an integral part of an IWRM approach. Before simply "providing more water" (often implying construction of new and expensive infrastructure) the first step should be to look for opportunities to improve water use efficiency—either by reducing wasteful usage or through reallocation. In northern France when cities and industries found their water supply endangered by rapidly dropping water tables due to over abstraction of groundwater, they proposed supply-side solutions—either building a dam on a river 30 miles away and piping water in, or building a desalination plant. The cost? The equivalent of one billion USD for the French taxpayer. But policymakers chose a demand-side solution instead: they imposed a small tax on each cubic meter of water pumped from the aquifer. Confronted with this tax, industry operators and cities found that they could after all reduce their water consumption, and as a result groundwater use in the area is now sustainable. [8]

The WSSD action target highlights two different aspects of efficiency: one dealing with *technical efficiency* in the use of water; the second dealing with *allocative efficiency*, i.e. the efficiency with which society allocates water and related resources for sustainable social and economic development. The first calls for demand management interventions; the second involves strategic water allocation (as touched on in the preceding section). From an IWRM perspective, both technical and allocative efficiency require recognizing the social and environmental as well as the economic value of water.

Aspects of improving technical water efficiency:

User efficiency: User efficiency is often achieved through changes in the behaviour of the users—for instance through information campaigns, economic incentives and technological means (e.g. metering and retrofitting), generally referred to as "demand management". In the French example above, efficiency improved as a result of the tax imposed per cubic meter of water taken from the aquifer. In Chile, agricultural water users are motivated to increase their efficiency, not by the cost of water, which is minimal, but by the high value of their crops on the international market. More efficient water use means they are able to irrigate a larger area, thereby increasing production and hence profits.

Water recycling and reuse: Recycling and reuse are already prevalent in most water-scarce basins. For example, in Egypt and North China, it is common practice for farmers to place small pumps in drainage ditches to reuse water. The irrigation agency supports this reuse strategy by blending drainage water with freshwater to increase the useable supplies. The main water management challenges associated with recycling and reuse are controlling pollution, preventing soil and water salinization, and, especially in relation to wastewater reuse, eliminating health risks.

Supply efficiency: Supply efficiency relates to the efficient functioning of irrigation systems, urban water supply schemes and other water infrastructure. Possible interventions to improve supply efficiency include fixing leaks in urban water systems, rehabilitating irrigation systems, and introducing innovations such as drip irrigation and dry sewerage. When implementing interventions to increase supply efficiency in irrigated areas, it is important to keep two things in mind: 1) Because of the prevalence of water recycling and reuse in irrigated systems, efforts to improve supply efficiency need to be considered within an integrated basin context—water that seeps

[8] Case study provided by Ivan Chéret.

from irrigation canals and fields may in fact be recharging groundwater or supporting ecosystems, and 2) measures to improve supply efficiency need to be accompanied by policies to ensure that the water saved goes to other beneficial uses.

Aspects of improving allocative efficiency:

Allocative efficiency is achieved through a range of measures to ensure allocation of water to the highest value uses—for example, through water markets, water rights, systems or other economic or regulative allocation mechanisms—as well as through adequate and realistic cost benefit assessment. Importantly, from an IWRM perspective the determination of the "highest value uses" must take into account social and environmental as well as economic considerations; likewise, costs and benefits need to be assessed in social and environmental as well as economic terms. This means, for example, focusing on the productive and biodiversity values of terrestrial and aquatic ecosystems though ensuring adequate environmental flows through economic or regulatory means.

In low income countries, it also imlplies a focus on poverty reduction, i.e. how does a society best contribute to increasing access to resources and income-generating opportunities for men and women through water development and management.

IWRM as a tool for change

An IWRM approach requires positive change—in the enabling environment, in institutional roles, and in management instruments (see Box 3, page 11). Funda-

Box 3. 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 organizational 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.

Figure 1. IWRM is a on-going process to respond to changing situations and needs.

mentally, it is about 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.

Given that change is a fundamental part of the approach, IWRM should be viewed as a process rather a one-shot approach—one that is long-term and forward-moving but iterative rather than linear in nature (see Figure 1). Inherent in this view is the need for an effective governance framework that fosters good decision-making on an on-going basis in response to changing needs and scenarios. As a process of change which seeks to shift water development and management systems from their currently unsustainable forms, IWRM has no fixed beginnings or endings. The global economy and society are dynamic and the natural environment is also subject to change; IWRM systems will, therefore, need to be responsive to change and be capable of adapting to new economic, social and environmental conditions and to changing human values.

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 adopting IWRM does not 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.

Most countries that have honestly evaluated their current water situation have chosen to move towards an IWRM approach. They found that sectoral approaches were in fact, failing to deliver in a number of key areas. In Malaysia, sectoral 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 (see Box 2, page 9).

These countries, and others, have recognized that effectively addressing such issues is essential for the welfare of the people and the prosperity of the country. A more integrated holistic approach that considers water strategically in the context of different institutional systems; different, often competing uses and the scarcity of resources lies at the heart of sustainable development.

Content

A strategy to spark and guide change

The process of creating a strategy is an opportunity for countries to take a coherent, as opposed to an ad hoc, approach to improving how they develop, manage and use water resources to further sustainable development goals.

Some countries may choose to begin by considering the various ways in which water resources development and management have the potential to advance or hinder development goals. Others may choose a more targeted approach and focus on specific water-related problems that are hampering the achievement of goals.

Countries may choose to create new strategies from scratch, build on existing IWRM or water plans, or incorporate water into current national development strategies.

Regardless of the initial approach, strategies should go beyond the actions needed to solve current problems or to achieve immediate objectives. They should aim at nothing less than institutionalizing changes that will promote more strategic and coordinated decision-making on an on-going basis.

The following chapter provides some guidance on choosing an entry point into the strategy development process and on defining the core issues and reforms the strategy needs to address.

Key messages from the WSSD action target

Article 26 of the WSSD Plan of Implementation, in addition to calling for the development of IWRM and water efficiency strategies, also includes a number of specific recommendations on the issues such strategies should address and to some extent how they should be addressed (see Annex 1 for the full text of Article 26). Countries have to 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 integrating 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, page 16: 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.

Choosing an entry point

In theory, a comprehensive approach that seeks to optimize water's contribution to sustainable development across the board should have a greater impact. In practice,

starting with concrete issues can yield better results. Being too ambitious at the outset—ignoring the political, social and capacity problems that must be solved for effective implementation—can result in a strategy that looks great on paper but doesn't translate into doable actions. Experience suggests that major initial reforms are not essential to catalyzing change—first steps that can easily be implemented are often enough to begin the process of moving towards more sustainable water development and management.

According to the GWP's informal survey, countries that have made the most progress towards more integrated and sustainable approaches to water have often started by focusing on specific water challenges associated with development goals. South Africa developed one of the most progressive approaches to water in the world, by focusing first on the challenge of providing every citizen with access to good quality drinking water.

This type of "problem-based" approach more readily leads to an action strategy based on tangible and immediate issues and can help win broad public support. However, it can also lead to a dead-end or to the same kind of myopic decision-making found in more sectoral approaches. The keys to avoiding these dangers are to ensure that the strategy is firmly linked to larger sustainable development goals and that the objective is not simply to solve a particular problem but to take the opportunity to put into place processes that will facilitate better water development and management decisions on an on-going basis.

Some possible entry points:

- Countries concentrating on the achievement of the Millennium Development Goals might take the need to harmonize water resource development and management to achieve this overall set of goals and targets as their entry point.
- Other countries might wish to focus on remedying a recurrent water-related problem hampering national development—such as reducing vulnerability to droughts and floods by enhancing coping strategies, both structural and non-structural.
- Industrialized countries may focus first on ways to remedy unsustainable situations and to mitigate environmental costs of past policies.
- Countries sharing transboundary rivers—particularly those located downstream of powerful neighbours—might focus initially on the challenges relating to sharing water resources (see Box 6, page 24), not just as an added level of integration but as a potential catalyst to more efficient and effective national decision-making.
- Small Island Developing States may choose to focus on coastal zone management—developing management links between freshwater and coastal resources.

In countries lacking the broad political support needed to get the process of creating an IWRM strategy off the ground, it may be effective to define a geographic entry point—focusing on one or two areas where water problems are particularly acute and using them as pilot cases to demonstrate IWRM's effectiveness.

Defining issues and setting priorities

Once an entry point has been agreed upon, the key substantive issues radiating out from that point need to be identified. At this stage, it is particularly important to consider the possible role of other resources—such as land, energy, fisheries, forests, livestock—and other sectors—such as agriculture, tourism, transportation, environment, health, education, finance, industry—in addressing the problem or issue.

Box 4. Meeting the water for environment challenge

A need highlighted in the WSSD action target, and one which underlies the whole IWRM concept, is balancing ecosystem protection with other needs.

Some key points:

- Ecosystem protection should consider land ecosystems as well as aquatic ecosystems.
- Land ecosystems are impacted by water availability but also have an impact on it. For example, within the dry tropics, land cover change, especially in forestry, can impact stream flow and alter groundwater recharge.
- Aquatic ecosystems critically depend on the amount, timing and quality of water flows.
- Environmental flow requirements have been defined in many different ways around the world and globally range from 20 to 50 percent of the mean annual flow in a basin.
- When valuing ecosystems, it is important to consider contribution to social goals as well as economic ones.

Examples of questions for defining substantive issues:

Linked to reducing poverty:

- How to expand access to water for productive uses—for example through groundwater development, affordable small-scale technologies, and multiple-use supply systems?
- How to define poor people's water needs?
- What types of water development and service provision are most appropriate given users' needs, their ability to pay, and their capacity to manage and maintain infrastructure?
- What additional elements are needed for people to take maximum advantage of water for farming, livestock, fisheries, and cottage industries?

Linked to addressing water scarcity and competition for water:

- How to allocate water strategically?
- How to improve water efficiency and promote demand-side management?
- What is the potential for development of non-conventional water resources?

Linked to improving the situation of women:

- How to provide nearby access to good quality water for drinking and domestic use?
- What sorts of income-generating activities do women engage in that require water?
- How to ensure enforceable water rights for women?
- How to anchor women's issues strategically in water-related institutions and programs?
- How to involve women in the dialogue on water and to ensure that their views and needs are heard? How to involve women in decision-making structures?

Linked to protecting ecosystems:

- How to allocate water for environmental flows?
- How to manage water to meet the water timing and quality needs of ecosystems, as well as the quantity?
- When evaluating trade-offs, how to value the goods and services ecosystems provide?
- How to reduce water pollution?

- How does freshwater management impact coastal and marine environments?
- How to factor in the impact of terrestrial ecosystems on the water balance?
- How to ensure the sustainable use of groundwater and inland valleys?

Linked to human health:
- How can better water development and management reduce water-related diseases such as malaria, schistosomaisis, and diarrhoeal diseases?
- What are the options for improving sanitation in urban and rural areas?
- How can water and sanitation be linked to hygiene education programs?
- What are the options for ensuring sustainable delivery of water and sanitation services for the poorest populations?

Linked to economic development;
- What are the economic activities that are impacted by water availability and quality?
- How to allocate water between sectors in a way that encourages economic development, while also considering poverty reduction and environmental sustainability goals?
- How to create a macro-economic environment conducive to good water management?

Steps towards more integrated development and management

Once a country has determined where it wants to go—in terms of goals, objectives and priorities—the next step is to figure out how to get there along the specific IWRM change areas defined in Box 3 (page 11). What changes in policies, institutions, and practices are needed to make integrated solutions, sustainable management, and better decision-making a reality? This means looking at the enabling environment, institutional roles and management instruments.

While the specific changes needed will vary from country to country depending on the current governance framework and the goals to be achieved, most countries will find that there are two fundamental questions that need to be addressed: 1) how to promote more coordinated decision-making across sectors and 2) how to improve communication between levels of decision-making, from the water user to local water management organizations to basin and national decision-making structures.

IWRM change areas

Adopting a more sustainable and integrated approach to water management and development requires change in many areas and at many levels. And while this can be a daunting proposition, it is important to remember that gradual change will produce more sustainable results than an attempt to completely overhaul the whole system in one go. When beginning the process of change, consider:

- What changes *must* happen to achieve agreed-upon goals?
- Where is change possible given the current social, political, and economic situation?
- What is the logical sequence for change? What changes need to come first to make other changes possible?

The GWP's IWRM ToolBox offers tools and case studies linked to each of the 13 change areas. These tools and examples can help guide the process of change, but to be effective they must be adapted to the social, political, and economic situation.

The enabling environment: A proper enabling environment ensures the rights and assets of all stakeholders (individuals as well as public and private sector organizations and companies, women as well as men, the poor as well as the better off), and protects public assets such as intrinsic environmental values. Basically the enabling environment is determined by national, provincial and local policies and legislation that constitute the "rules of the game" and enable all stakeholders to play their respective roles in the development and management of water resources. It also includes the forums and mechanisms, including information and capacity-building, created to establish these "rules of the game" and to facilitate and exercise stakeholder participation.

From top to bottom: In order to achieve efficient, equitable and sustainable water management within the IWRM approach, major institutional change is needed. Both top-down and bottom-up participation of

all stakeholders needs to be promoted—from the national-level down to the catchment or watershed level. Decision-making should be governed by the principle of subsidiarity, which drives down action to the lowest appropriate level.

From companies to communities: In addition to government agencies and private companies, water development and management should involve NGOs, community-based organizations that have full participation of women and disadvantaged groups, and other sections of civil society. All these organizations and agencies have an important role to play in enhancing access to water, in bringing about a balance between conservation and development, and in treating water as a social and economic good.

Areas to target for change:

- *Policies* – setting goals for water use, protection and conservation. Policy development gives an opportunity for setting national objectives for managing water resources and water service delivery within a framework of overall development goals.
- *Legislative framework* – the rules to follow to achieve policies and goals. The required water laws cover ownership of water, permits to use (or pollute) it, the transferability of those permits, and customary entitlements. They underpin regulatory norms for e.g. conservation, protection, priorities, and conflict management.
- *Financing and incentive structures* – allocating financial resources to meet water needs. Water projects tend to be indivisible and capital-intensive, and many countries have major backlogs in developing water infrastructure. Countries need smart financing approaches and appropriate incentives to achieve development goals.

Institutional roles: Institutional development is critical to the formulation and implementation of IWRM policies and programs. A number of factors determine what is appropriate in a given context; stage of development, financial and human resources, traditional norms and other specific circumstances all play a role. Flawed demarcation of responsibilities between actors, inadequate co-ordinating mechanisms, jurisdictional gaps or overlaps, and the failure to match responsibilities with authority and capacities for action are all major sources of difficulty with implementing an IWRM approach. The agencies involved in water resources management have to be considered in their various geographic settings, taking into account the political structure of the country, the unity of the resource in a basin or aquifer and the existence and capacities of community organizations. Institutional development is not simply about the creation of formally constituted organizations (e.g. service agencies, authorities or consultative committees). It also involves consideration of a whole range of formal rules and regulations, customs and practices, ideas and information, and interest or community group networks, which together provide the institutional framework or context within which water management actors and other decision-makers operate.

The importance of effective co-ordination mechanisms: A key issue is the creation of effective co-ordination mechanisms between different agencies. Integration in the sense of organizational consolidation does not automatically lead to co-operation and co-ordination or more effective water resources management. Fragmented and shared responsibilities are a reality and are always likely to exist. There are many examples where agencies or responsibilities have been merged without significant performance improvements; conversely, there are

Flawed demarcation of responsibilities between actors, inadequate co-ordinating mechanisms, jurisdictional gaps or overlaps, and the failure to match responsibilities with authority and capacities for action are all major sources of difficulty with implementing an IWRM approach.

several examples where effective co-ordination mechanisms have allowed problems to be handled well despite the need to involve several agencies. The simple act of putting all water functions within one agency will not necessarily remove conflicts of interest, and can result in the loss of transparency.

Areas to target for change:

- *Creating an organizational framework* – forms and functions. Starting from the concept of reform of institutions for better water governance, the practitioner needs to consider the required organizations and institutions – from transboundary to basin level, and from regulatory bodies, to local authorities and civil society organizations.
- *Institutional capacity building* – developing human resources. This includes upgrading the skills and understanding of decision-makers, water managers and professionals in all sectors, and undertaking capacity-building for regulatory bodies and for empowerment of civil society groups.

Management instruments: Management instruments are the elements and methods that enable and help decision-makers to make rational and informed choices between alternative actions. These choices should be based on agreed policies, available resources, environmental impacts and the social and economic consequences. Systems analysis, operations research and management theory offer a wide range of quantitative and qualitative methods. These methods, combined with a knowledge of economics, hydrology, hydraulics, environmental sciences, sociology and other disciplines pertinent to the problem in question, help define and evaluate alternative water management options and implementation schemes. The art of IWRM is about knowing the available elements and methods and selecting, adjusting and applying the mix appropriate to the given circumstances.

Areas to target for change:

- *Water resources assessment* – understanding resources and needs. Includes the collection of hydrological, physiographic, demographic and socio-economic data, through to setting up systems for routine data assembly and reporting.
- *Planning* – combining development options, resource use and human interaction. River, aquifer and lake basin planning entail a comprehensive assembly and modelling of data from all relevant domains. The planning process must recognise social, economic and environmental needs using a range of assessment tools.
- *Demand management* – using water more efficiently. Demand management involves the balancing of supply and demand, focusing on the better use of existing water withdrawals or reducing excessive use rather than developing new supplies.
- *Social change instruments* – encouraging a water-oriented civil society. Information is a powerful tool for changing behaviour in the water world, through school curricula, university water courses and professional and mid-career training. Transparency, product-labelling and access to information are other key instruments.
- *Conflict resolution* – managing disputes, ensuring sharing of water. Conflict management has a separate focus as conflict is endemic in the management of water in many places and resolution models must be at hand.
- *Regulatory instruments* – allocation and water use limits. Regulation in this context covers water quality, service provision, land use and water resource protection. Regulations are key for imple-

Box 5. Reforming institutions for good governance

Governance models must fit the prevailing social, economic and cultural particularities of a country, but certain basic principles or attributes are essential. The approach taken to water governance should be transparent, inclusive, coherent and equitable. Similarly, the governance system should be accountable, efficient and responsive. Better governance requires the participation of government, civil society and the private sector—as all are instrumental in different ways in the successful implementation of institutional reforms.

In reforming institutions for better governance, an assessment of existing institutional systems should be carried out first to understand who does what for whom, and to whom they are accountable. An institutional assessment should identify, for example, conflicting laws, duplication or lack of clarity of mandates for different organizations and jurisdiction of different tiers of authority—local, sub-regional, national and, increasingly, international. Determining what to reform and the sequence that reforms should take is critical to the success of the process.

menting plans and policies and can fruitfully be combined with economic instruments.

- *Economic instruments* – using value and prices for efficiency and equity. Economic tools involve the use of prices, subsidies, and other market-based measures to provide incentives to all water users to use water carefully, efficiently and avoid pollution.
- *Information management and exchange* – improving knowledge for better water management. Data sharing methods and technologies increase stakeholder access to information stored in public domain data banks and effectively complement more traditional methods of public information.

Creating links across sectors and scales

Many organizations whose primary function is not water management are responsible for sectors where the impact of, and on water resources can be enormous—agriculture, industry, trade, and energy are examples. Similarly water resources organizations need to consider issues, such as environment or tourism, that lie within the domain of other agencies.

Institutional structures vary from country to country, but whatever the specific structure, it is essential to have mechanisms for dialogue and co-ordination to ensure some measure of integration. A balance has to be met between providing a fully integrated approach where specific issues may get lost due to lack of expertise or interest, and a sectoral approach where different policies are followed without any heed to needs and impacts in other sectors.

To some extent, the very process of creating a strategy should bring water-related sectors together and begin the process of cementing more formal ties. But it is important that the strategy formulate clear links between decision-making processes in water-related sectors. In terms of generating support, it is helpful if the strategy can demonstrate how changes can contribute to key objectives in water-related sectors.

In some cases countries have created new organizations, or significantly

...experience shows that the formation of apex or river basin organizations alone will not guarantee an IWRM approach-they must also be supported by appropriate policies, legislation and capacity building.

changed the mandate of existing ones as part of IWRM reform—apex bodies and river basin (or catchment) organizations are the most common examples. Reasons for establishing such bodies include: encouraging coordinated action on water and related issues, such as land management, across sectors and/or decision-making levels and encouraging more participatory management of resources.

However, experience shows that the formation of apex or river basin organizations alone will not guarantee an IWRM approach—they must also be supported by appropriate policies, legislation and capacity building. Nor is the formation of such bodies essential to ensure an IWRM approach. Other options include strengthening coordination on water issues between existing sector-based agencies or placing water under the purview of an agency with a broad natural resources mandate. For example, in Vietnam, water falls under the Ministry of Natural Resources and Environment.

This section focuses on organizations to transfer information and coordinate activities. However, it should be noted that another type of institution, namely the market, can also provide information to users and affect their behaviour; pricing, subsidies and marketable rights can also play a role.

Apex bodies:

Apex bodies consist of a range of entities such as high-level steering groups within national governments, inter-agency task forces (for specific purposes, e.g. water pollution control), and international consortia for the management of water resources.

For encouraging coordination: The aim of such bodies is to provide structures for co-ordination between different organizations involved in water resource management. In some cases water policy and management is centred in a specific body of government but in many situations responsibility for water is shared between a number of bodies (e.g. ministries for irrigation, environment and public works) that may not be able to operate easily together. Here an apex body may provide a useful co-ordinating function.

For encouraging a more "big picture" approach to water decision-making: The creation of apex bodies can free water allocation decisions from being driven solely by sectoral interests, enabling more strategic allocation. Or it can enable reforms, which, although badly needed from the point of view of sustainable development, may run counter to political interests within a specific sector. In Mexico, the formation of the National Water Commission (CNA) under the Ministry of Environment has proved to be one of the keys to dealing with the country's unsustainable groundwater use. Without the power to transcend state boundaries and independence from the powerful farmer voting block, the CNA would not have been able to implement many of the needed groundwater reforms.[9]

Lessons in establishing apex bodies from the IWRM ToolBox:

- Successful experience to date in establishing robust and respected apex bodies is limited.
- Establishment of a successful apex or coordinating body can be a slow process, since it takes time for a new body to achieve legitimacy.
- The effectiveness of an apex body is linked to the specific political and historical context.
- For an apex body to function effectively, all the stakeholders who are involved in the functions under its jurisdiction need to develop commitment to it and

[9] See Scott, C. A. and Shah T., 2004. Groundwater Overdraft Reduction Through Agricultural Energy Policy: Insights from India and Mexico. International Journal of Water Resources Development, 20(2):149-164.

ensure it has appropriate powers. Conflict management and awareness raising techniques are important here.

River basin organizations:
Basin organizations deal with the water resource management issues in a river basin, a lake basin, or across an important aquifer. They can be useful in transcending administrative divisions within countries as well as national boundaries. Basin organizations provide a mechanism for ensuring that land use and needs are reflected in water management—and vice versa. Their functions range from water allocation, resource management and planning; to education of basin communities; to developing natural resources management strategies and programs of remediation of degraded lands and waterways. They may also play a role in consensus building, facilitation, and conflict management.

For achieving integrated management across sectors, and state and national boundaries: River basin organizations, if successful, can ensure integrated management across sectoral and administrative lines. The Tennessee Valley Authority (TVA) is one of the best known examples of a successful river basin organization. The TVA is responsible for a range of water-related activities—minimizing flood risk, maintaining navigation, providing recreational opportunities, protecting water quality, and generating power—within the Tennessee river basin, a 106,000 km^2 area encompassing parts of seven states.

In Malaysia, progress towards dealing with a number of water challenges was being stymied by the relative powerlessness of the federal government to interfere in matters concerning water management and allocation because these come under the jurisdiction of the individual states.[10] In order to address this issue, the country passed water legislation to enable establishment of river basin organizations that could cut across Federal and State administrative boundaries.

For encouraging more participatory management: River basin or catchment agencies can also serve as linking mechanisms between national planning and more local decision-making. In South Africa, minimum environmental water allocation levels are set at the national level, and catchment agencies work with communities to negotiate environmental flows using the minimum as a guide.

Thailand used the creation of river basin organizations to improve the responsiveness of water management to local conditions.[11] During Thailand's development phase, water management became increasingly centralized, creating conflicts between existing water uses and users. In an attempt to resolve these conflicts and develop a more inclusive management process, the country created River Basin Committees with a wide-ranging membership of water stakeholders.

Failures of basin organizations: There are also numerous examples of river basin organizations that didn't take. For example, China created Basin Management Committees in the 1950s with the aim of managing hydropower generation, mitigating flood damage and providing facilities for navigation; however in the end Committees have focused only on irrigation. The Damodar Valley Authority, India's attempt to adopt the TVA model, has failed to live up to its original broad mandate, and now, four decades after it was established, only manages a thermal power plant. There has been some question as to whether basin-level organizations are capable of addressing many of the more pressing challenges of developing country basins—particularly basins with

[10] National Water Resources Policy and Legislation - A case submitted for the IWRM ToolBox by Low Kwai Sim, Malaysia.

[11] GWP IWRM ToolBox, Thailand – Decentralization and the Development of River Basin Committees, Case # 186.

Box 6. How should a strategy address transboundary issues?

Strategies are developed by each country at the national level. Still, they must take into account transboundary water use, especially where there may be significant potential for conflict between different water users. Almost half the world's land is situated in a transboundary river basin. Many cooperation arrangements for such transboundary systems are already in place (in the Mekong Basin, for example), or are emerging (as in the Nile Basin). These agreements are made between countries at the regional level, but they require policy changes and reforms at the national level.

Preparing a strategy provides an opportunity for synergies in addressing multiple water resource uses and potential conflicts, including the sustainability of aquatic ecosystems. Forming a transboundary organization or river basin commission will guide coordinated planning efforts. Transboundary coordination can create synergies for development among riparians and help to create benefits beyond the river flows.

vast numbers of small-scale users who get their water without any mediation from public agencies or regulated water service providers. [12]

Key characteristics of effective river basin management organizations from the IWRM Toolbox:

- An ability to establish trusted technical competencies;
- A focus on serious recurrent problems such as flooding or drought or supply shortages, and the provision of solutions acceptable to all stakeholders;
- Broad stakeholder involvement, catering for grassroots participation at a basin-wide level (e.g. through water forums);
- The capacity to collect fees, and attract grants and/or loans;
- Clear jurisdictional boundaries and appropriate powers.

[12] See Shah, T.; Makin, I.; Sakthivadivel, R. 2002. "Limits to Leapfrogging: Issues in Transposing Successful River Basin Management Institutions in the Developing World" in Intersectoral Management of River Basins. Colombo: International Water Management Institute.

Process

The nuts and bolts of strategy development

The following section addresses some nuts and bolts issues of managing a strategy development process: roles and responsibilities, a framework for involving stakeholders, creating a knowledge base, and setting milestones and indicators and putting into place mechanisms for monitoring and evaluation.

The difference between a plan and a strategy

Planning and strategy development are closely related. But where planning is meant to identify concrete activities, strategy development is more concerned with defining future direction. A strategy defines goals and agrees on how goals could be pursued—perhaps even outlining a range of possibilities suited to different contingencies. Planning is then the translation of the chosen strategy into concrete objectives, activities and related means. The table below outlines some of the key differences between planning and strategy development.

Defining responsibilities

How a country chooses to define roles and responsibilities depends to a large extent on its particular situation, including its planning framework and decision-making structure. Some countries have centrally organized planning processes, while others delegate much of responsibility for planning and decision-making on water resource issues to provinces or states. There is no one correct administrative model. But whatever the model, the roles and responsibilities of the different actors need to be clearly defined at an early stage and accountability mechanisms need to be put into place. Table 2 (page 28) shows a possible breakdown of roles and responsibilities.

Table 1. Some key differences between planning and strategy development[13]

Strategy development	Planning
Defines direction	Direction is given
Encourages innovation	Relies on existing ideas
Governed by vision, goals	Governed by objectives
Long-term	Short-term
Synthesis	Analysis
Attention to strengths and opportunities	Attention to problem-solving (weaknesses, threats)
Based on future possibilities	Based on present trends

[13] Adapted from Strategic Orientation (SOR), MDF Training and Consultancy, Ede, The Netherlands

Box 7. Not just another water plan

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, tourism, industry, agriculture, and environment.

Broader focus: Whereas water plans tend to be concerned exclusively with water supply and demand issues, an IWRM strategy looks at water in relation to other ingredients needed to achieve larger development goals.

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 far broader and more extensive participation from stakeholders than a traditional planning process.

Establishing a steering group: Putting together an inter-ministerial steering group—preferably supported by a management team of qualified professionals—can help create joint ownership of the strategy across sectors and help enact the reforms adopted. Experience with GEF-supported programs to test integrated land and water resources management processes in a number of river basins around the world, for example, suggests that national inter-ministerial committees can play active roles in these processes, not simply approving finished plans and strategies but in fact taking a role in *steering* the process. Because the steering committee does play such an important role in the success of a strategy, choice of members needs to weigh both level of influence and commitment to the process. The same steering group might also monitor implementation progress and be held to account to a higher authority. A high-quality management team should be identified early in the formulation process. Making the same team responsible for managing the strategy development and the implementation process encourages ownership and capitalizes on momentum.

Distribution of roles and responsibilities across levels of government: The strategy must be well anchored at various levels of government (central, regional, local) and in the community at large to avoid disruption from change of government or departure of key personnel. This can be achieved through the selection of the steering and management groups and through facilitating organizations, such as NGOs.

If much of the responsibility for strategy development is to be undertaken at the state level, coordinating mechanisms need to be put into place to ensure the process results in a single coherent strategy, rather than numerous strategies with no or only tenuous links to each other.

Table 2. Suggested breakdown of roles and responsibilities

National government	• Lead role, 'owner' of the process • Mobilize funding • Sets 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

Involving stakeholders

To be effective, strategies must balance two often-conflicting demands. They must win broad-based support from stakeholders to be effectively implemented. But they must also not fall into the trap of endless consultation at the expense of action. The key to balancing these demands is to ensure broad participation by diverse stakeholders in a well-organized, time-bound fashion at appropriate stages of the process and include mechanisms for conflict resolution. However, it should be recognized that building stakeholder support and participation in integrated water resource management and development is an on-going process, not one that simply stops when the initial strategy is complete.

Encouraging meaningful participation: Communication activities should help all stakeholder groups to construct a realistic picture of water resource use and management, and ensure all are up-to-date on strategy preparation and understand how they can contribute and how their contributions will be used. Communication among stakeholders must be two-way and be "bottom up" as well as "top down." Trying to "sell" decisions made behind closed doors will not work.

An associated "participatory platform" entailing a wide range of forums—informal meetings, workshops, consultation processes, public meetings, focus group interviews, policy dialogues, round tables, and media events—can help different groups meaningfully contribute to the strategic development process. Such a platform should encourage a continuous refining of aims, objectives, and activities. Ideally the platform should be perceived generally as the appropriate and logical forum for any matter concerning the management of water resources. Strategies are much more likely

to achieve their objectives if women are active participants and decision-makers.

Negotiation and conflict management: It is not going to be possible to please everyone, so mechanisms for negotiation and managing conflict are an important ingredient. Much of integrated water resources management is essentially conflict management. It is ultimately Government's role to sort out potential conflicts at the strategy formulation phase. While these measures will reduce the numbers of conflicts that emerge at later implementation stages, they will not eliminate them. Thus, it will normally be necessary to set up some formal process for conflict resolution on an ongoing basis.

Core stakeholders to engage in formulating a strategy may include:

- Government Ministries and related institutions involved in national development planning and policy making.
- Government Ministries and related institutions involved in key water-related sectors, including domestic water supply and sanitation, irrigation, agriculture, energy, health, industry, transport, fisheries and tourism.
- Water utilities, agencies and related bodies (e.g. Water Development Boards).

Stakeholders to be brought into the process at key stages will likely include most of the following:

- Local communities and community-based organizations (mayors and religious leaders, for example).
- The private sector, including but not limited to water supply and sanitation service providers.
- Financial agencies (e.g. donor agencies, international banks, micro-credit institutions).
- Sectoral interest groups such as farmers and fishermen.
- Women's groups and associations
- Representatives of indigenous communities
- Non-government organizations
- Media representatives
- Research and training institutions, including Universities.

Creating a knowledge base

There are two aspects to creating a knowledge base for a strategy:

- Pulling together the knowledge needed to identify key water-related challenges, determine where change is needed, and set a baseline for monitoring progress and impacts.
- Developing systems to feed knowledge into the decision-making process on an on-going basis.

A baseline assessment of key water resources and development issues provides a good basis for identifying and prioritizing water challenges and objectives. The Global Environment Facility strongly recommends starting with a basin-by-basin analysis of competing uses of water resources and the land-use decisions influencing them.

Conducting a water resources assessment: A water resources assessment involves taking a holistic view of the water resources in a given country or region related to its use by society. This includes issues related to both water supply and water demand, and the non-consumptive use of water, e.g. for energy and transportation. Examples of components such an assessment might include:

- Major water resources issues and potential conflicts, their severity and social implications, as well as risks and hazards such as flood and drought.
- Pertinent social and economic development issues which could impact water demand or supply such as urban growth, trade policies, and food security choices.
- The multiple water needs of the poor and

A comprehensive water resources assessment is a good investment, but it is a big undertaking. Countries may want to prioritize their knowledge needs, initially focusing on those topics directly related to their chosen entry point.

of women, and current levels of access to water.
- Water requirements of different development alternatives.
- Socio-economic aspects of water use, including user behaviour, elasticity of demand, and the potential effects of demand management.
- For both terrestrial and aquatic ecosystems, water requirements (including quantity timing and quality), current condition, and potential threats.
- Both the quantity and quality of surface- and groundwater, and basic parameters of the hydrological cycle.

A comprehensive water resources assessment is a good investment, but it is a big undertaking. Countries may want to prioritize their knowledge needs, initially focusing on those topics directly related to their chosen entry point.

A good water resources assessment needs to be based on good physical and socio-economic data. Routine physical measurements at monitoring and gauging stations need to be made at appropriate times and often enough to allow the assessment to draw valid conclusions. This in turn requires adequate financing of the monitoring system by government.

Modelling can be used to study impacts and trends resulting from various development options. However, for models to be useful in the pursuit of sustainable solutions, they must address and simulate not only technical merits and overall benefits and costs, but also the preferences and priorities of stakeholders. To be truly useful as decision-support tools, models need to be integrated into the local institutional and cultural context.

Other knowledge to collect for the strategic development process includes:
- Current planning and management processes in water- and related sectors, including an institutional assessment (see Box 5, page 21: Reforming institutions for good governance).
- Available human resources and capacity-building needs associated with development and implementation of an IWRM strategy.
- Relevant national and international experience and IWRM tools.

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.

Making knowledge accessible: 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.

The establishment of permanent open access information resource bases can help policy-makers, natural resource managers, and stakeholders on the ground negotiate trade-offs and make informed decisions that take into account changing conditions and

scenarios. Tools to model or explore scenarios that are tailored to stakeholders needs are often extremely useful mechanisms to allow new ways of doing things.

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.

Lessons in knowledge sharing (from the IWRM ToolBox):

- 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 organizations) 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.

Setting a timeframe and milestones

How long will it take to prepare an IWRM strategy? This depends. Some countries may take a rapid initial approach, and then update as they delve into implementation. Other countries, may elect to invest more time—perhaps to build stakeholder participation and ownership—in the strategic development process. Either way, agreeing on milestones and time-frames for completing the strategy is critical for success.

While the strategy should be flexible enough to adapt to changing political, economic and environmental conditions, it may be useful to agree on a timeframe for regular review and updating. Many organizations update their strategies every five years, but may do so more often during periods of rapid change.

Implementation may take place on a step-by-step basis, in terms of geographical scope and the sequence and timing of reforms. Scope, timing, and content of measures can be adjusted according to experience. This offers room for change, improvement and process adjustment, provided that the proper bases for sound decision making have been established.

In developing a strategy and framework for change, it is important to recognize that the process of change is unlikely to be rapid. It has taken almost one half a century for the Rhine Commission in Europe to evolve into more integrated up and downstream planning. River basin organizations on the Delaware and Susquehanna in the United States evolved over 60 years of court battles into multi-stakeholder forums for more integration. The Murray-Darling Basin Commission in Australia grew into its current integrated planning after a generation of discussions.

Monitoring and evaluation

Defining indicators, establishing benchmarks, and setting up mechanisms to ensure ongoing monitoring and evaluation are all key activities in any successful implementation plan. Monitoring and evaluation activities have three main objectives—to see whether the implementation process is on track, to

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.

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.

Monitoring and evaluation (M&E) criteria: Monitoring and evaluation of an IWRM reform process takes place at many different levels, from simple project progress to impact on national socio-economic and environmental aggregate indicators. The higher the level, 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.

An instrument or model for monitoring is often linked to a Logical Framework for the project, programme or process. A generic evaluation model will have the following elements[14]:

- **Efficiency** – "Efficiency in converting inputs to outputs". How the results relate to the effort, how economic inputs are converted to outputs and whether the same results could have been achieved in a better way.
- **Effectiveness** – "Effectiveness of the outputs in reaching the objectives". The extent to which the objectives have been achieved and whether this has happened on the basis of the of the project/programme/process outputs.
- **Impact** – "Impact relative to the transition from objectives towards the goals". Changes and effects (positive and negative, planned and unforeseen) due to the project/programme/process, seen in relation to both target population and others affected.
- **Relevance** – "Concurrence with development priorities". The degree to which the project/programme/process as described in outputs, objectives and goals concurs with local and national development priorities.
- **Sustainability** – "Continued positive impact at projected levels". The extent to which the positive effects of the project can be expected to continue based on national resources.

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 and 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.

[14] Adapted from Norad, 1993.

Box 8. The foundations of a successful strategy

- Agreeing on goals and targets.
- Laying down a framework for better decision-making on an on-going basis.
- Linking to broader development goals and national development planning processes.
- Anticipating capacity needs and making adequate investments in capacity-building.
- Involving and gaining the support of stakeholders, including women and the poor.
- Allocating sufficient human and financial resources to the process.
- Setting a timetable with milestones/targets.
- Putting into place monitoring and evaluation mechanisms that feed back into the process.

Challenges for monitoring and evaluation: The Commission on Sustainable Development identifies several potential M&E stumbling-blocks in its guidance document for preparing national development strategies which are also relevant here: [15]

- Lack of a culture of evaluation, and often a negative attitude toward evaluation;
- Evaluations driven by external sources – these can be politically difficult to internalize as well as involve assessment skills not conducive to participatory assessment by local stakeholders (for example stressing third party evaluations because of the need to ensure accountability for funds);
- Fear that evaluation may lead to inappropriate comparisons internationally;
- Lack of agreement on definitions and indicators, which would result in inconsistency of data;
- Obtaining access to data and (especially for process evaluation) access to concerned stakeholders;
- Integrating different evaluations carried out by different organizations, e.g. civil society and government evaluations, or those of different ministries and ensuring complementarities between them;
- Framing the evaluation in ways that reduce the risk of it being 'buried' because of political opposition.

[15] United Nations Department of Economic and Social Affairs, 2002. National Sustainable Development Strategy: Managing Sustainable Development in the New Millennium.

Addressing potential stumbling blocks

According to the informal GWP survey and feedback from partners, the three most common reasons that countries find their strategy development and implementation processes slowed down or stalled are: lack of support for the process, lack of funding, and lack of capacity.

Lack of support and high-level leadership and commitment—often underlain by a lack of understanding as to what a strategy is and how to go about it—is the primary obstacle in getting the process off the ground. And without a broad base of support—from the prime minister down to the farmer in the field—successful implementation is unlikely.

Lack of funding should not be an excuse for failing to do a strategy. Most countries should be able to finance the process on their own, but for those who cannot, a number of donors are willing to offer assistance. When it comes to implementation, not including an adequate financing plan and waiting to begin raising funds until after the strategy is complete are the primary pitfalls.

Not developing appropriate capacities within the country is another false step that has slowed progress at various points in the process. In some cases, needed expertise may not be available within the country; here the focus should be on transferring skills rather than simply depending on outside consultants.

The following chapter offers some suggestions on how to address, and, if possible, avoid these stumbling blocks.

Mobilizing support

Support is needed from the highest political levels to the grass roots. Without strong political support from the top leadership of a country, as well as from local government, it is difficult to even get the strategy development process off the ground. And without continuing commitment at these levels, implementing the changes needed to move towards integrated approaches is next to impossible. On the other hand if the process does not take care to establish a broad base of support and relies entirely on political will to move it forward, it may be completely derailed by a change in political regime. Securing the participation of stakeholders in the development and implementation process is also very much a function of mobilizing support.

The process of mobilizing support needs to pay particular attention to those who will be responsible for the day-to-day implementation of IWRM and water efficiency measures. It should be cognizant of the fact that civil servants may regard the strategy as a potential threat to their job security or as additional work foisted upon an already overburdened staff. Providing someone with a useful tool is relatively easy, convincing them to use it is an altogether different matter.

The first step in mobilizing support is often creating awareness. Adopting an IWRM approach to water management

and development involves changes at different levels—in policies, institutions and practices, but must start with a change in thinking. People—from policy makers to the farmers in the field—need to understand how the change process benefits them and how it addresses their concerns and challenges, as well as the larger goals of the society.

Promoting positive examples: One way to garner support at multiple levels is to publicize positive IWRM examples—ideally examples of where integration is already happening in the country. In most countries, such examples exist, often where multiple agencies have cooperated with communities to solve a water-related problem. In Sri Lanka for example, the Mahaweli Authority (the agency responsible for water development and management in the Mahaweli Basin), the Ministry of Health, and local farmer organizations worked together to find ways of reducing malaria. This partnership allowed them to tackle the problem from several angles, including eliminating mosquito breeding sites in irrigation schemes and identifying better land and water management practices in the community. Communicating the benefits of such integrated approaches can go a long way towards convincing people that IWRM is a useful tool based on common sense, rather than a new fangled theory that is going to have little impact beyond making their jobs more difficult.

Adding value: Another good tactic is identifying "low-hanging fruit"—situations where an IWRM approach and a little investment can yield immediate benefits. Providing policy makers with a cost benefit analysis of IWRM opportunities can help sell the larger idea of a strategy that would put into place mechanisms for identifying and acting on such opportunities on an ongoing basis. Take a look at existing or planned infrastructure investments. Are there opportunities to add value to such investments by taking a more integrated approach? The GWP's IWRM ToolBox is a good place to look for inspiration in identifying opportunities. Keep in mind however, that for such IWRM interventions to work anywhere but on paper, they must involve the end users.

Calculating costs of "business as usual": It is also possible to go the opposite route—offering examples of the costs of not having taken a more IWRM approach. For example, in an economic analysis of the Kano River irrigation project in Northern Nigeria and the downstream floodplain, researchers found the net economic benefits of the floodplain (agriculture, fishing, fuel wood) were at least US$32 per 1000 m^3 of water, whereas the irrigation scheme was getting at most only US$1.73 per 1000 m^3 (US$0.04 per 1000 m^3 when operation costs were included).[16] The extent of the flooded area had already decreased by more than two-thirds due to upstream irrigation development. Researchers calculated that given the high productivity of the floodplain, implementing all the planned upstream dams and large-scale irrigation schemes would result in net losses of around US$20 million. Here taking an IWRM approach from the outset would have made more economic sense. In Yemen, the government became convinced of the need for a new approach to water management only after studies were carried out showing the economic losses that would result from continued poor management and unsustainable practices—which then paved the way for a process of awareness-building and consensus.

Mobilizing financial resources

There are two aspects of funding that need to be addressed. The first relates to the financial resources needed for the prepara-

[16] See Acreman, M. 2000. Background study for the World Commission of Dams and Barbier, E. B.; Thompson, J. R. 1998. The value of water: Floodplain versus large-scale irrigation benefits in northern Nigeria. Ambio, 27(6):434-440.

Efforts to mobilize funding for implementation should parallel the strategy development process if at all possible; otherwise there is a risk of losing momentum and support while the necessary funds are gathered.

tion of strategies for IWRM; the second relates to the resources required for implementation of *both* the changes in water governance identified in the strategy *and* the infrastructure to make things happen. Efforts to mobilize funding for implementation should parallel the strategy development process if at all possible; otherwise there is a risk of losing momentum and support while the necessary funds are gathered.

Securing funding: Most industrialized and middle-income countries are able to carry out the strategic development process with their own resources. But some low-income countries simply do not have the human, technical or financial resources to meet the WSSD 2005 target. The WSSD Plan of Implementation recognized this constraint and emphasized strong support to such countries.

Several donor countries have either already committed to supporting developing countries in the preparation of their Strategies or are considering such actions, both through bilateral and through multilateral mechanisms. Canada (CIDA), the Netherlands, Norway, the United States of America (USAID) and the Global Environment Facility (GEF) are providing or considering support through the GWP to various strategy development processes. Other donors, such as Denmark, Germany and the UK, are providing support for IWRM strategy development and implementation directly to countries through their bilateral processes.

Budgeting for implementation: The resources required to implement a strategy are of course far more significant. On the one hand is the major funding needed for water resources development and infrastructure—for pipelines, storage systems, irrigation, water treatment plants, and so on. On the other hand, are the financial (as well as technical and human) 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 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 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.

Mobilizing human resources

Many countries are finding that they have capacity-building needs associated with aspects of the strategy development process, as well as implementation. Clearly, developing the substantive content an IWRM strategy requires 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 strategy development—meaning skills in communications, negotiation, conflict resolution, facilitation, consensus building, time management, and community mobilization.

If needed expertise is not available within the country, outside consultants can play a valuable role in building local capacity

and helping to facilitate the strategy development process. The danger is depending too heavily on outside experts to supply necessary skills or to drive the process.

Building capacity for strategy development and implementation is a continuous process. Each step brings demands new knowledge and competencies 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.

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 (see Box 5, page 21). 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 in-line 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 need to address. The overall goal is to have strong institutions, staffed by skilled professionals.

Action

Ensuring effective implementation

In the end, a strategy's success or failure depends on its ability to catalyze change. This is what matters—not the specific process, not the form of the strategy document, but whether or not it results in positive action. In the following chapter, we have tried to lay out some final suggestions to help countries ensure that their strategies don't end up gathering dust, but instead spark a process of on-going change that leads to more sustainable, equitable, and efficient use of their water resources.

Avoiding non-action

In 1995, Nicaragua began the preparation of a National Water Action Plan which would address the challenges of integrated water management within the existing institutional, legislative, economic, political and technical framework of the country. At the end of 29 months, the project issued its final reports, consisting of thirteen volumes dealing with, inter alia, policy, legislation, institutional aspects, economic instruments, technical issues and the Action Plan recommendations themselves.[17]

Subsequent follow-up to the Plan has been minimal, despite the active participation of relevant institutions in the execution of the project activities and the preparation of project reports. So why has the Action Plan not resulted in any action? One of the factors identified by the project implementers was failure to establish effective follow-up mechanisms needed to ensure that momentum is not lost after project closure. Another possible reason is that the Action Plan was approached as a "project", the output of which was a written plan rather than actual action.

While it is useful to embody the strategy in a physical document, this should not be viewed as the end of the process, which should be on-going. Some of the suggestions mentioned in previous sections that can help avoid non-action include:

- Securing funds for implementation during the strategy formulation phase, to prevent the loss of momentum while funds are raised for implementation.
- Giving due attention to capacity-building and institutional strengthening to ensure that organizations are able to take on new responsibilities and challenges.
- Ensuring a broad-base of support grounded in different levels of government and the broader society so that the strategy is not vulnerable to changes in political regimes or the departure of key personnel.
- Tasking the same body responsible for leading the strategy development with overseeing implementation, and making them accountable to a higher authority.
- Being realistic in terms of what can be accomplished given the current socio-economic, institutional, and political context.
- Ensuring that water development and service provision are well-matched to user needs and sustainable, in terms of financing and maintenance.
- Ensuring that monitoring and evaluation activities feedback into the process so that problems or potential obstacles can be immediately dealt with.
- Employing an implementation process that is flexible enough to adapt to changing conditions and take advantage of new opportunities.

[17] GWP IWRM ToolBox, Nicaragua – Evaluation of The National Water Action Plan, Case #12

Defining a transition strategy to move from the current situation to the future desired scenarios in terms of the specific IWRM change areas defined in Box 3 (page 11), with milestones and timeframes, is another important component for guaranteeing action. This should include the way in which existing approaches will be modified to bring them in line with the desired new approach, indicators to measure impacts, and mechanisms for monitoring and evaluating the effectiveness of the transition.

Linking to other national plans and strategies is another way to encourage action and guarantee the relevance of the strategy. Examples of relevant plans and strategies an IWRM strategy should link to include:

- National Five Year Plans or Sustainable Development Strategies,
- National Plans on women's development and empowerment,
- National Biodiversity Strategy and Action Plans,
- National Plans to Combat Desertification,
- Country poverty reduction strategy papers (PRSPs), and
- National strategies to meet the Millennium Development Goals.

Enacting reforms

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.

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 IWRM 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.

Global learning

Implementing IWRM strategies is a process of trial and error. There are no universal blueprints or prescriptions. However, countries can draw on existing tools and learn from each other's experiences—thereby increasing their chances of success.

The IWRM ToolBox is one mechanism for sharing that knowledge. It brings

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.

together tested tools and solid lessons learned from actual experiences with implementation from around the world—as well as providing links to relevant specialist organizations and information products.

The case studies in the ToolBox have three characteristics:

- They describe actual experience, actions which have been taken in response to problems, and the outcomes and lessons learned.
- They illustrate the way in which tools are used—including examples of both successes and failures.
- They go through a peer review process through the GWP network, so that they focus on IWRM and how to move towards it.

The tools included in the ToolBox represent a wide range of the available options—but the list is not definitive and is certainly not prescriptive. The types of tools which can be used, and the way in which they can be combined will vary from place to place, from society to society.

The ToolBox organises the tools into three types: those which create the 'enabling environment', the laws, investments and policies which are the framework for other tools; the building of appropriate institutions, and building capacity within these institutions; and finally management tools, all of which can be used in an IWRM approach.

The ToolBox is a dynamic resource, and users are encouraged to add to its value by commenting on tools and case studies and by adding new ones.

Annexes

Annex 1: Article 26 from the WSSD Plan of Implementation

Johannesburg, September 2002

Develop integrated water resources management and water efficiency plans by 2005, with support to developing countries, through actions at all levels to:

(a) Develop and implement national/regional strategies, plans and programs with regard to integrated river basin, watershed and groundwater management and introduce measures to improve the efficiency of water infrastructure to reduce losses and increase recycling of water;

(b) Employ the full range of policy instruments, including regulation, monitoring, voluntary measures, market and information-based tools, land-use management and cost recovery of water services, without cost recovery objectives becoming a barrier to access to safe water by poor people, and adopt an integrated water basin approach;

(c) Improve the efficient use of water resources and promote their allocation among competing uses in a way that gives priority to the satisfaction of basic human needs and balances the requirement of preserving or restoring ecosystems and their functions, in particular in fragile environments, with human domestic, industrial and agriculture needs, including safeguarding drinking water quality;

(d) Develop programs for mitigating the effects of extreme water-related events;

(e) Support the diffusion of technology and capacity-building for non-conventional water resources and conservation technologies, to developing countries and regions facing water scarcity conditions or subject to drought and desertification, through technical and financial support and capacity-building;

(f) Support, where appropriate, efforts and programs for energy-efficient, sustainable and cost-effective desalination of seawater, water recycling and water harvesting from coastal fogs in developing countries, through such measures as technological, technical and financial assistance and other modalities;

(g) Facilitate the establishment of public-private partnerships and other forms of partnership that give priority to the needs of the poor, within stable and transparent national regulatory frameworks provided by Governments, while respecting local conditions, involving all concerned stakeholders, and monitoring the performance and improving accountability of public institutions and private companies.

Annex 2. Example of a strategic results framework

From the Partnership of Africa's Water Development (PAWD), the framework is currently being used to prepare IWRM plans in five African countries.

OBJECTIVE: Facilitate Integrated Water Resources Management (IWRM) at the national and regional level through action oriented planning and implementation of IWRM frameworks, integration of water PRSPs, and strengthened partnerships in selected African countries and regions.

GOAL: Support African countries in the sustainable management of their water resource as a contribution to eliminating poverty, improving well-being and protecting

ACTIVITIES	OUTPUTS	OUTCOMES	IMPACT(S)
A) Support the development of National IWRM Frameworks Process oriented activities 1. Countries establish project management systems and carry out program to raise awareness of principles of IWRM. 2. Project management facilitates the creation of political will and commitment to IWRM process. 3. Major stakeholder groups participate in a country water partnership and by representation in overall project management and a system for wider national consultation is established and used at strategic steps in the development of the IWRM plan. Content oriented activities 4. Carry out capacity building activities in support of the planning process to improve understanding of IWRM, strategies and options for improved management of water resources and to prepare for implementation. 5. Review past and ongoing activities and experience related to water resources management, water and poverty and water efficiency and the analysis and use of this information (knowledge management) to guide national and international steps towards establishment of IWRM plans and their implementation. 6. Identify, assess and prioritize IWRM issues in each country and at all levels. 7. Identify strategies, functions and management frameworks to address water resources management issues in consultation with stakeholders taking into account present management systems potentials and constraints. 8. Government drafts IWRM plan with input/ participation of multistakeholders. Implementation oriented activities 9. Presentation and discussion of IWRM plan with relevant ministries and stakeholders followed by approval and endorsement at relevant, high political levels. 10. Develop actions into fundable implementation programs and project portfolios pursuing funding from national sources and international donors and build implementation capacity.	Process oriented outputs 1. Awareness on IWRM raised. 2. Political will and support for the reform process built. 3. Framework for broad stakeholder participation in place. Content oriented outputs 4. Capacity building activities for implementing the reform process initiated 5. Knowledge from past and ongoing activities that the process can build on compiled and available (knowledge management). 6. Water resources management related issues and challenges identified in a participatory way. 7. Water resources management related functions and arrangements required to deal with the priority issues and sustainable management of water resources identified in a participatory way. 8. Action plan and transition strategy towards IWRM prepared in a participatory way. Implementation oriented outputs 9. Action plan and transition strategy adopted at all political levels. 10. Detailed program and funding strategy for the reform process prepared.	• National frameworks for sustainable water resource management and service provision are in place and/or well advanced for the selected countries. • Ownership of the National Frameworks and the process is developed by all stakeholders. • Improved water resource management and water service delivery. • Stronger collaboration with potential relevant Financing Institutions to support projects being prepared.	• Sustainable water resource management contributing to social equity, economic efficiency and environmental sustainability in selected African countries.
B) Support to institutional development of water partnerships 11. Build capacities of the partners of multi-stakeholder platforms in core competencies (such as participatory approaches, conflict resolution, fundraising, planning and management) and support operation of the platform in terms of limited staffing and operational costs.	11. Capabilities and competences of the partners are enhanced.	• Strengthened regional and country level partnerships in selected countries to ensure that they function as effective multi-stakeholder platforms.	• Streamlined multi-stakeholder participatory approach will contribute to effective water governance.
C) Support to integration of water into PRSPs. 11. Prepare a document outlining how sustainable water resource management is linked to economic development and poverty reduction. 12. Training/workshop for all stakeholders, with specific attention to the ministries responsible of water issues and ministries responsible of the PRSP process.	12. Guidelines (in appropriate languages) are developed on how to integrate IWRM into the PRSP process. 13. Increased capacity of stakeholders and ministries to influence the PRSP process.	• Water issues are integrated into PRSPs for a selected number of African countries.	

Annex 3: List of 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

The Development Gateway
The Development Gateway Foundation builds partnerships and information systems that provide access to knowledge for development. They have an extensive section on water, including resources specifically on integrated water resources management.

http://www.developmentgateway.org/node/130676/

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

The International Water Academy - Norway
The academy's vision is to foster the existence of a community of experts with the purpose of aiding in management and use of water for the benefit of all humankind. The Academy hosted the "Water for the Poorest" international conference in Nov. 2003 to facilitate dialogue, learning and a commitment to action in the area of sustainable water supply and sanitation.

http://www.thewateracademy.org/

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/default.asp?V_DOC_ID=244

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/Sida/jsp/polopoly.jsp?d=107

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/

The Global Water Partnership (GWP), established in 1996, is an international network open to all organizations involved in water resources management: developed and developing country 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, area, national and local levels to support stakeholders in implementing IWRM.

GWP Secretariat
Hantverkargatan 5
SE-112 21 Stockholm, Sweden
E-Mail: gwp@gwpforum.org
Website: www.gwpforum.org

Catalyzing Change:

A handbook for developing integrated water resources management (IWRM) and water efficiency strategies

Technical Committee (TEC)

Produced by the Global Water Partnership (GWP)
Technical Committee
with support from Norway's Ministry of Foreign Affairs

Global Water Partnership

In an effort to encourage a move towards more sustainable approaches to water development and management, the World Summit on Sustainable Development (WSSD) in 2002 called for all countries to craft an integrated water resources management (IWRM) and water efficiency strategy by the end of 2005. Such strategies are intended to support countries in their efforts to meet development goals, such as reducing poverty, increasing food security, fostering economic growth, protecting ecosystems; and tackle specific water challenges, such as controlling flooding, mitigating the effects of drought, expanding access to water and sanitation, and addressing increasing competition for water and water scarcity.

This document, prepared by the GWP Technical Committee (TEC), seeks to provide countries with the knowledge they need to act on the WSSD recommendation in the way that is most useful for them. Strategies should catalyze action, not retard it. Each country must decide the scope and timeline for change based on its goals and its resources. The important thing is to take the first steps.

The GWP TEC is a group of internationally recognised professionals and scientists skilled in the different aspects of water management. This committee, whose members come from different regions of the world, provides technical support and advice to the other GWP entities and to the GWP Partnership as a whole.

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